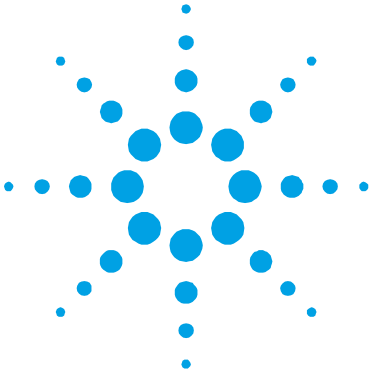

MS120 Single Stage Rotary Vane Pumps

Model:

X3702-64000

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

87-900-150-01 (C.00)

01/2021

Agilent Technologies

Notices

Manual Part Number

Publication Number: 87-900-150-01 (C.00)

Edition

Edition 01/2021

Printed in ITALY

Agilent Technologies Italia S.p.A.

Vacuum Products Division

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ITALY

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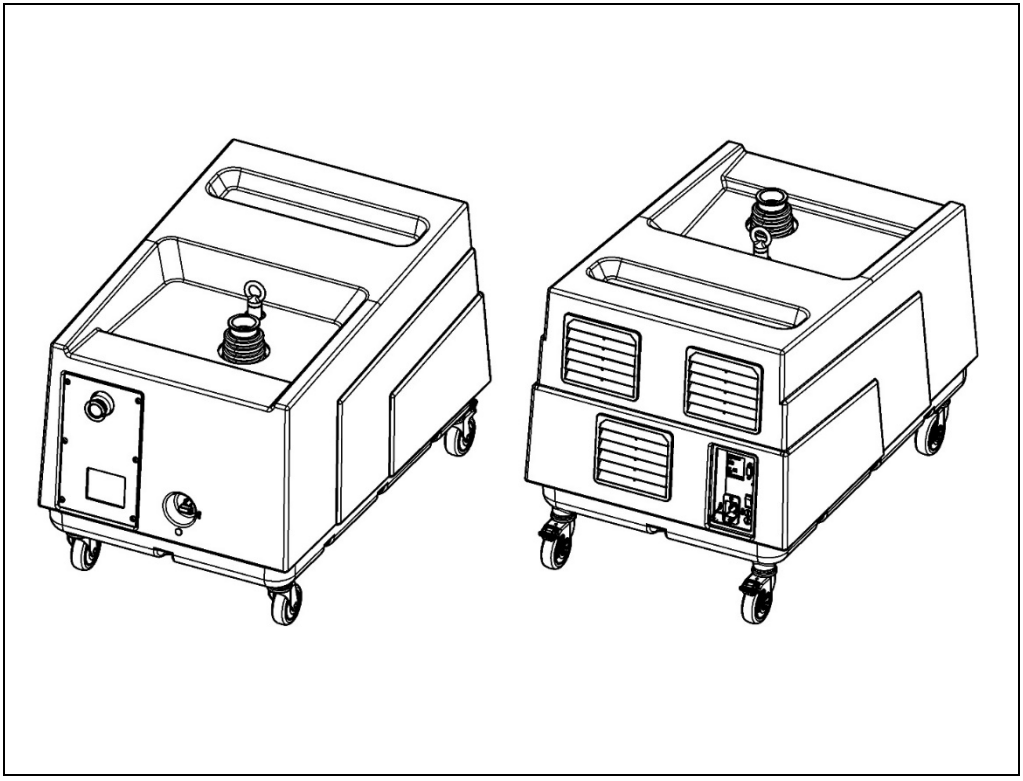
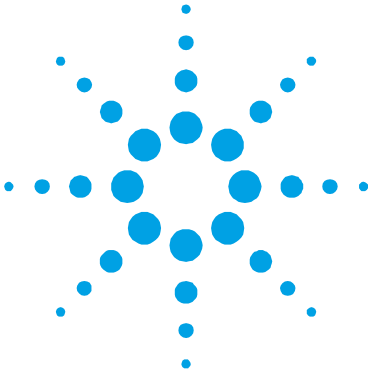
WARNING

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.

MS120 Single Stage Rotary Vane Pumps



Contents



1 Istruzioni per l'uso

Traduzione delle istruzioni originali

Agilent Technologies

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.

Nessun altro tipo di operazione dovrà essere fatto senza aver prima contattato il Servizio Assistenza Agilent. Le informazioni fornite non intendono sostituire, integrare o modificare qualsiasi norma, prescrizione, decreto, direttiva o legge a carattere specifico in vigore nel luogo in cui avviene l'installazione.

I consigli rivolti al personale addetto all'installazione e alla manutenzione presuppongono che lo stesso sia esperto e preparato nell'affrontare qualsiasi problematica di manutenzione, sia meccanica che elettrica. Per qualsiasi dubbio o informazioni non riportate su questo manuale si prega di contattare il nostro servizio assistenza, comunicando sempre: modello (Model), numero di serie (Serial), anno di costruzione, riportati sulla targhetta di identificazione.

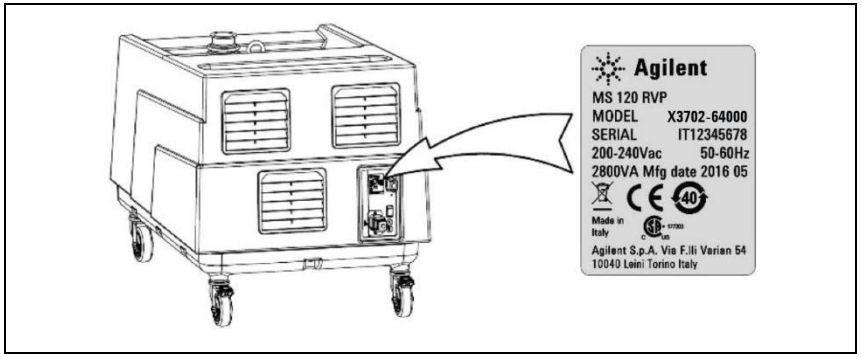


Figura 1 Targhetta di identificazione

Le MS120 Single Stage Rotary Vane Pumps sono delle pompe rotative monostadio a palette, a tenuta in bagno d'olio, azionate da motore elettrico pilotato da inverter. Queste pompe da alto vuoto sono adatte esclusivamente al pompaggio di aria e piccole quantità di vapor d'acqua. L'aspirazione di altri tipi di gas o di vapori deve essere preventivamente dichiarata alla Agilent che, se del caso, rilascerà la conformità all'impiego specifico.

Il motore elettrico flangiato è accoppiato a mezzo di giunto elastico. Il raffreddamento viene assicurato da una potente ventola centrifuga.

In aspirazione è presente un filtro a rete per proteggere la pompa da corpi solidi di diametro maggiore di 4,7 mm. Inoltre, una valvola di ritegno integrata impedisce la risalita dell'olio ed il rientro dell'aria nella camera da svuotare durante la fase d'arresto.

Nel serbatoio è inserito un sistema di separazione delle nebbie d'olio dall'aria di scarico (residuo max. 2PPM/ peso equivalenti a 2,4 mg/m^3).

L'olio abbattuto viene recuperato in modo automatico dalla pompa.

Lo zavorratore, impedisce la condensazione all'interno della pompa quando si aspirano piccole quantità di vapore (fare riferimento al paragrafo "Zavorratore (Gas-ballast)").

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.

NOTA Le note contengono informazioni importanti estrapolate dal testo.

Simboli usati

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

Simboli	Descrizione	Simboli	Descrizione
	Superficie calda "Pericolo di scottature se vengono toccate le parti calde"		Sicurezza elettrica
	Emissione di sostanze nocive		Pericolo di incendio
	Non disperdere nell'ambiente		Leggere il manuale d'uso
	Attacco in aspirazione		Attacco allo scarico
	L'apparato è contrassegnato da questo simbolo quando l'utente deve mettere a massa l'apparato.		

Prescrizioni di sicurezza

AVVERTENZA!

Nonostante le precauzioni prese in fase di progetto, esistono elementi di rischio che si presentano durante le operazioni che si eseguono in fase di uso e manutenzione.

AVVERTENZA!

SUPERFICI CALDE.

Durante le operazioni di manutenzione si toccano superfici che possono superare la temperatura di 80 °C. Adottare idonei mezzi di protezione in modo da evitare scottature da contatto fortuito.

È buona norma, prima di effettuare qualsiasi intervento sulla pompa, attendere il suo raffreddamento.

AVVERTENZA!

EMISSIONI DI SOSTANZE NOCIVE

L'aria di scarico della pompa contiene tracce di nebbie d'olio (residuo max. 2PPM/ peso equivalenti a 2,4 mg/m³). Verificare la compatibilità con l'ambiente di lavoro. Garantire un corretto ricambio d'aria oppure portare lo scarico della pompa all'esterno. Un guasto o l'usura delle tenute possono provocare perdite d'olio lubrificante. Evitare la dispersione nel terreno e l'inquinamento di altri materiali.

Nel caso di aspirazione d'aria contenente sostanze pericolose (esempio agenti biologici o microbiologici), adottare dei sistemi di abbattimento prima della pompa per vuoto.

ATTENZIONE!

NON DISPERDERE NELL'AMBIENTE

Gli oli esausti provenienti dalla pompa devono essere smaltiti secondo le normative vigenti nel Paese d'utilizzo della pompa.

AVVERTENZA!

PERICOLO GENERATO DA DEPRESSIONE

Il contatto con punti in depressione può essere causa di infortuni. Evitare il contatto con l'attacco aspirazione della pompa durante il funzionamento. Immettere aria nel circuito di aspirazione prima di ogni intervento.

AVVERTENZA!

PERICOLO GENERATO DA PRESSIONE

Il serbatoio della pompa è pressurizzato.

Non aprire e non dimenticare aperti i tappi di carico o scarico durante il funzionamento.

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!

SICUREZZA ELETTRICA

Nell'equipaggiamento elettrico esistono parti sottoposte a tensione che, al contatto, possono provocare gravi danni a persone e cose.

AVVERTENZA!

PERICOLO DI INCENDIO

L'utilizzo della pompa per impieghi non previsti o proibiti da questo manuale, oppure la mancanza di una corretta manutenzione, possono provocare anomalie di funzionamento con rischio di surriscaldamento e incendio. In caso di incendio non usare acqua per spegnere le fiamme. Utilizzare estintori a polvere o CO_2 od altri mezzi compatibili con la presenza di equipaggiamenti elettrici ed oli lubrificanti.

Immagazzinamento, trasporto e movimentazione

Immagazzinamento

Le pompe devono essere trasportate senza olio.

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

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

Sollevamento

L'orientamento dei componenti imballati deve essere mantenuto conforme alle indicazioni fornite dai pittogrammi presenti sull'involucro esterno d'imballaggio.

Eseguire l'operazione di scarico con mezzo di sollevamento adeguato al peso della pompa. Per il sollevamento dell'imballo e della pompa fare riferimento alle figure seguenti.

Il peso dell'imballo, comprensivo della pompa, è, al massimo, di circa 120 kg, mentre il peso della sola pompa è di 100 kg.

Tab. 1 Dimensioni dell'imballo

Quota	L	B	H
Dimensione	920 mm	610 mm	790 mm

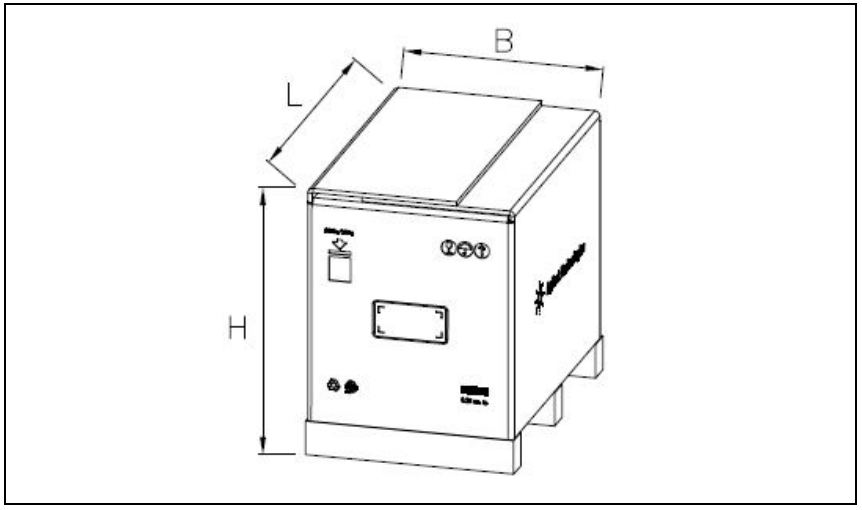


Figura 2 Pompa imballata

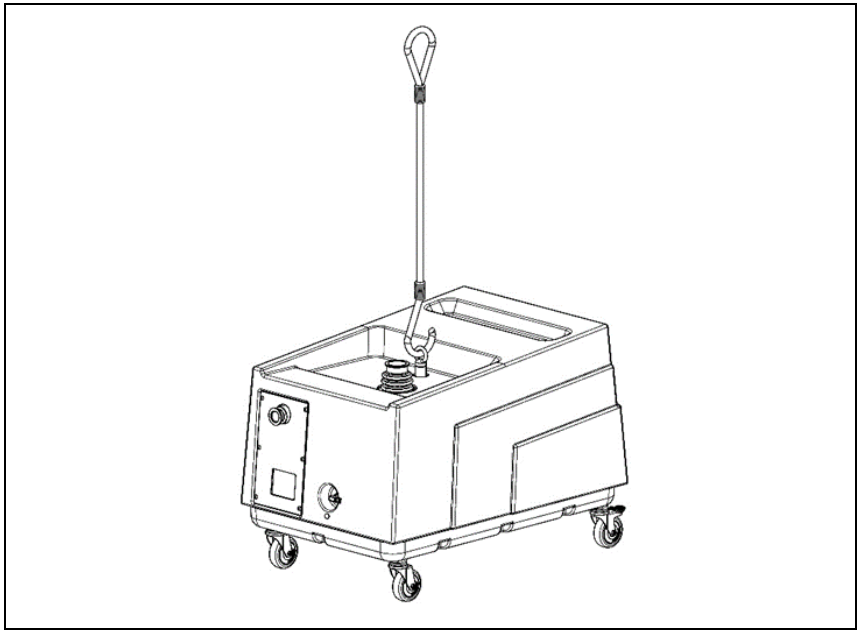


Figura 3 Pompa

Disimballaggio

La pompa viene fornita in un imballo protettivo speciale; se si presentano segni di danni, che potrebbero essersi verificati durante il trasporto, contattare il Contact Center.

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.

Rimuovere le reggette che chiudono il cartone sul pallet, quindi rimuovere il cartone.

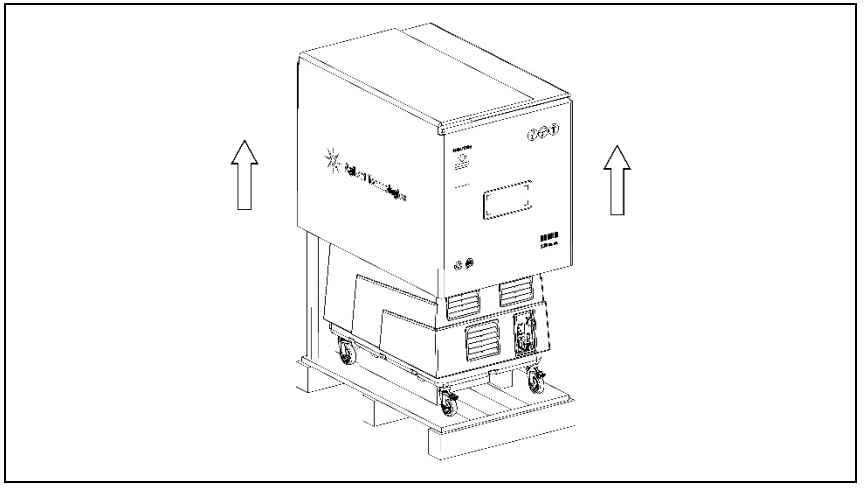


Figura 4

Rimuovere le n. 8 viti che chiudono le staffette, quindi rimuovere le n.4 staffette.

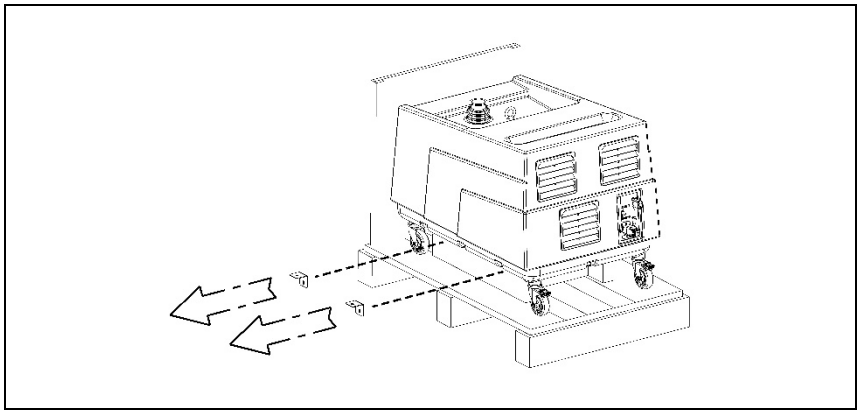


Figura 5

Sbloccare i freni di arresto delle ruote.

Fissare la rampa di discesa con n.1 vite come mostrato nella figura.

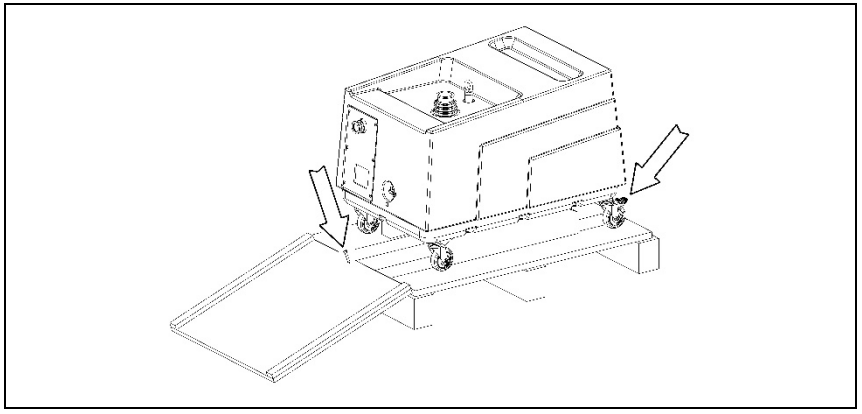


Figura 6

Spingere la pompa posteriormente per farla scivolare giù dal pallet.

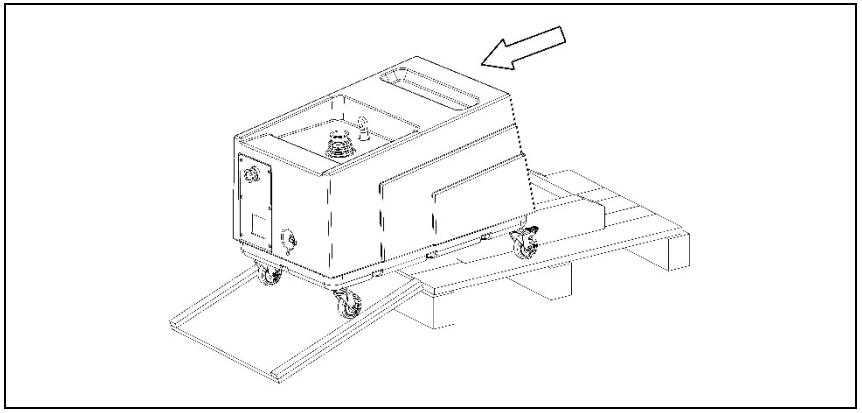


Figura 7

Preparazione per l'installazione

Accessori forniti con la pompa

La pompa viene consegnata completa dei seguenti accessori necessari alla messa in servizio e alla manutenzione ordinaria:

- Bottiglia olio
- Beccuccio carico olio
- Tubo scarico olio
- I/O Mating Connector
- Fusibili di ricambio

Assemblaggio

Togliere i tappi in aspirazione ed allo scarico.

La pompa viene fornita pronta all'uso, non vi sono altre parti da assemblare.

La pompa è priva di olio, vedere il paragrafo "Sostituzione olio lubrificante" per le istruzioni di carico olio.

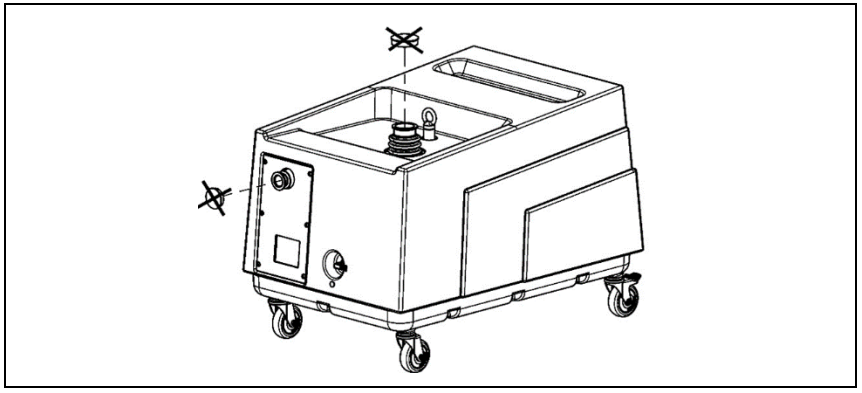


Figura 8

Ubicazione

AVVERTENZA! **La pompa;**

- **deve essere bloccata agendo sui freni posti sulle ruote di appoggio, su un piano orizzontale.**
- **deve essere accessibile per una corretta e facile manutenzione rispettando le distanze minime da eventuali ingombri (vedere figura seguente). Dovrebbe essere inoltre accessibile con idonei mezzi di sollevamento.**
- **va protetta da getti o spruzzi d'acqua che potrebbero causare cortocircuiti elettrici e/o la folgorazione degli operatori vicini alla macchina.**

Tab. 2 Minima Distanza

Quota	A	B	C	D
Dimensione	150 mm	200 mm	150 mm	500 mm

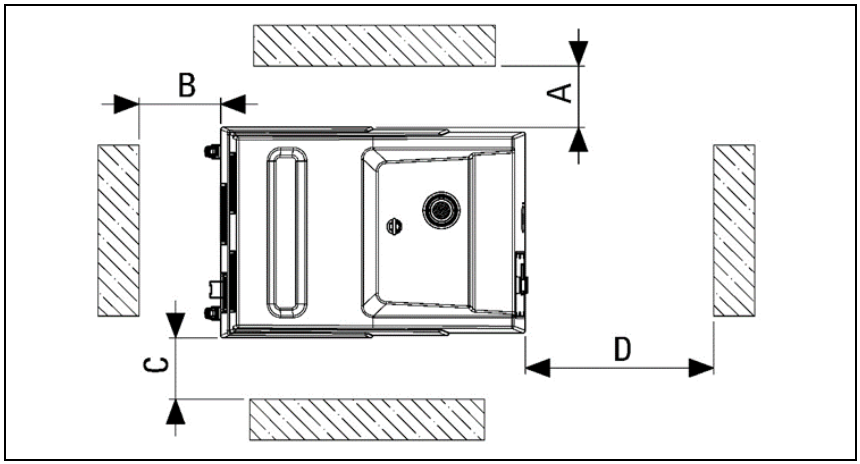


Figura 9

ATTENZIONE! La pompa non deve essere installata all'esterno e deve sempre essere protetta dagli agenti atmosferici.

Evitare che l'aria calda proveniente dallo scarico o dalle ventole di raffreddamento possa creare disagio al personale.

Non installare la pompa in una zona con polvere o altri materiali che potrebbero intasare o coprire rapidamente le superfici di raffreddamento.

Collegamento alla macchina utilizzatrice

Il collegamento della pompa alla camera da evacuare deve essere eseguito con tubazioni dello stesso diametro della bocca di aspirazione.

Il peso delle tubazioni e le eventuali dilatazioni non devono gravare sulla pompa. Effettuare il tratto finale di collegamento all'attacco aspirazione della pompa con tubo/ raccordo flessibile.

È importante che tutte le tubazioni ed i vari giunti siano a tenuta.

Tubazioni molto lunghe o di diametro piccolo diminuiscono le prestazioni della pompa.

NOTA Questo simbolo identifica l'attacco in aspirazione.

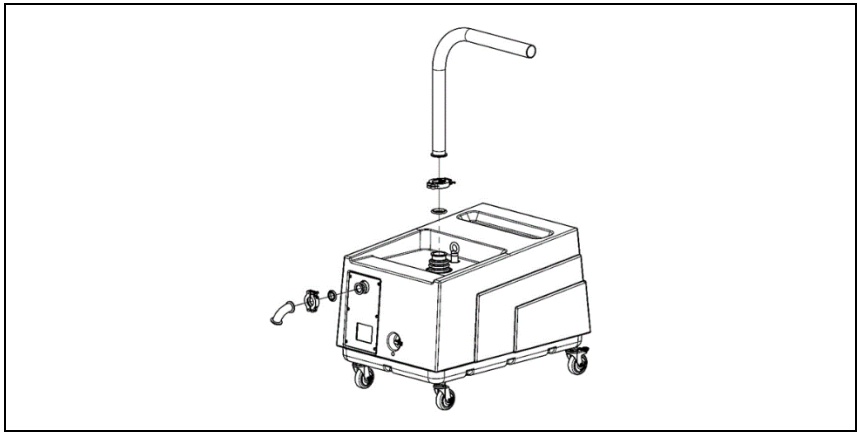


Figura 10

Convogliamento aria di scarico

Nel caso di un insufficente ricambio d'aria nel locale pompa è possibile convogliare l'aria di scarico in altri ambienti o all'esterno.

Utilizzare tubazioni di diametro uguale alla bocca di scarico del serbatoio per una lunghezza massima di 15 m.

Per lunghezze superiori aumentare il diametro del tubo. Il peso delle tubazioni non deve gravare sulla pompa.

Utilizzare nel tratto finale raccordi o tubi flessibili.

AVVERTENZA! **Questa tubazione deve essere discendente per evitare il rientro di condensa nel serbatoio della pompa.**

ATTENZIONE! Non inserire rubinetti in questa tubazione. Non ostruire l'uscita.

NOTA Questo simbolo identifica l'attacco allo scarico.

Collegamento elettrico

Verificare la tensione e la frequenza di rete con i dati riportati sulla targhetta della pompa.

Assicurarsi dell'efficienza dell'impianto di messa a terra.

AVVERTENZA! **Assicurarsi che l'interruttore di accensione sia settato su off (0) onde evitare partenze indesiderate della pompa.**

Eseguire l'allacciamento elettrico inserendo lo spinotto del cavo di alimentazione nella presa della pompa e bloccandolo con la molla in dotazione (vedi figura seguente).

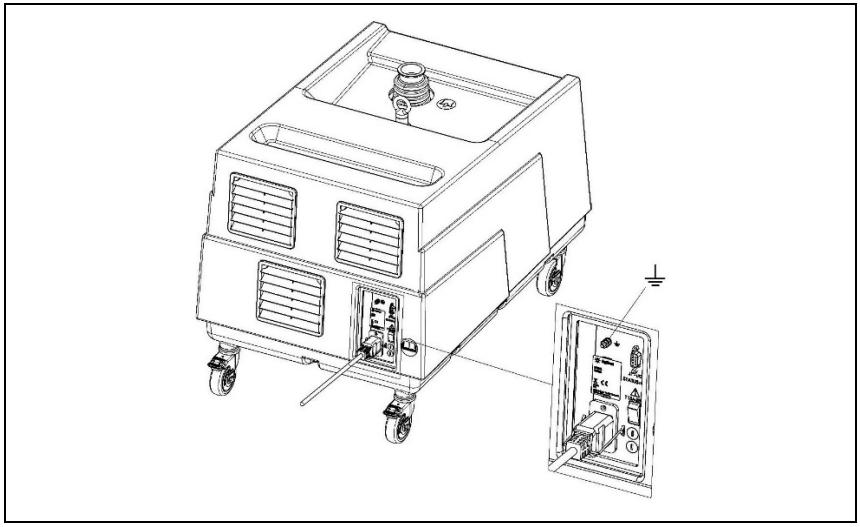


Figura 11

Uso

Impiego previsto

Le pompe per vuoto descritte in questo manuale possono aspirare esclusivamente aria e piccole quantità di vapor d'acqua. L'aspirazione di altri tipi di gas o di vapori deve essere preventivamente dichiarata alla Agilent Technologies che rilascerà la conformità all'impiego specifico.

Sono adatte per l'evacuazione di sistemi chiusi o per funzionare ad un vuoto costante compreso nel seguente campo: 0,07 - 15 mbar (assoluti).

La temperatura ambiente e la temperatura di aspirazione devono essere comprese fra 12 e 35°C.

Impiego proibito

AVVERTENZA! **È proibito aspirare attraverso la pompa:**

- **liquidi o sostanze solide**
- **gas e vapori pericolosi, esplosivi o aggressivi**
- **ossigeno puro o miscele d'aria arricchita di ossigeno.**

AVVERTENZA! **È proibito utilizzare lo scarico della pompa per creare pressioni anche limitate.**

AVVERTENZA! **È proibito installare la pompa in un ambiente potenzialmente esplosivo.**

Protezioni

AVVERTENZA! **Nei casi di impiego in cui l'arresto o un guasto della pompa per vuoto possa causare danni a persone o cose, devono essere previste delle misure di sicurezza nell'impianto.**

Tabella limiti operativi

TENSIONE D'INGRESSO (V)	STATO DEL CONTROLLER
< 180	Guasto all'alimentazione (Errore di Sottotensione/Sovratensione – Win205 bit5 = 1)
180 – 200	In funzione (prestazioni ridotte)
200 – 264	In funzione (prestazioni complete)
> 264	Guasto all'alimentazione (Errore di Sottotensione/Sovratensione – Win206 bit5 = 1)

Messa in servizio

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 +35 °C
- umidità relativa: 0 – 95 % (non condensante)

ATTENZIONE! Prima di avviare la pompa, occorre procedere al rifornimento di olio lubrificante, poichè la pompa viene fornita scarica.

Per maggiori informazioni relative al rifornimento di olio e per la scelta del lubrificante idoneo, fare riferimento al paragrafo "Sostituzione olio lubrificante".

NOTA È importante che il livello dell'olio rimanga tra i valori MIN e MAX visualizzati dall'indicatore di livello posto sul lato della pompa.

Eseguire il primo riempimento attraverso il tappo (E) sino alla metà dell'indicatore di livello (F) e richiudere il tappo (E) (vedere figura seguente).

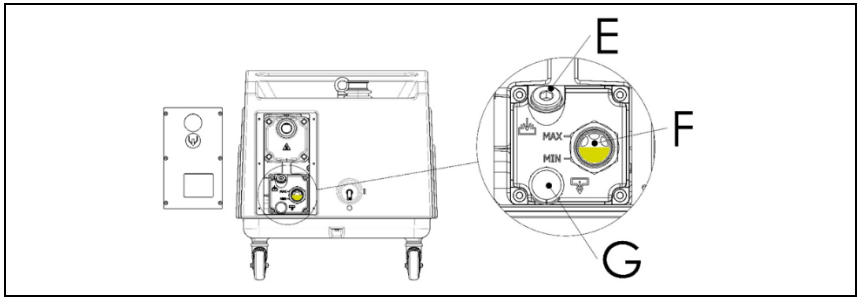


Figura 12

Accendere la pompa e portarla a vuoto massimo per almeno 2 minuti. Fermare la pompa, ricontrollare il livello d'olio ed eseguire un eventuale rabbocco di olio ripristinando il livello corretto.

Consigli per l'utilizzo

Con temperature ambiente inferiori a 18 °C è bene riscaldare per 15 minuti la pompa facendola funzionare a pressione limite (aspirazione chiusa, senza carico).

Durante questa fase la pompa potrebbe non raggiungere i limiti di pressione dichiarati.

AVVERTENZA! **La pompa non è progettata per lavorare a pressione atmosferica.**
È consigliabile non superare i 5 avviamenti/ora.

Zavorratore (Gas-ballast)

La pompa MS120 è dotata di Zavorratore (Gas Ballast) e di una valvola manuale che permette il suo inserimento (I) o l'esclusione(O).

La pressione limite della pompa varia in funzione di questa scelta. Per un corretto utilizzo vedi "Aspirazione vapor acqueo.

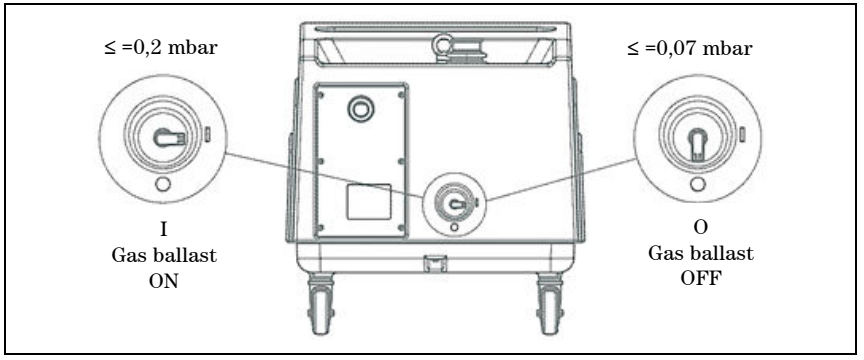


Figura 13

Aspirazione vapor acqueo

Nel caso di aspirazione di vapor acqueo è consigliato:

- Prima di aspirare vapori, portare la temperatura della pompa a regime, facendola funzionare per trenta minuti a vuoto massimo.

- Alla fine del ciclo di lavoro, nel caso di presenza di condensa nell'olio lubrificante, lasciare funzionare la pompa a vuoto massimo per almeno trenta minuti con lo zavorratore aperto.
- Effettuare questa operazione prima di fermi macchina prolungati; lo zavorratore consentirà di eliminare le condense dall'olio lubrificante.

Per la procedura d'inserimento o esclusione dello zavorratore fare riferimento all'appendice "Technical Information".

Manutenzione

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

Oltre alle prescrizioni sotto riportate, fare riferimento al paragrafo "Prescrizioni di sicurezza".

AVVERTENZA! **Prima di ogni intervento, immettere aria attraverso l'attacco in aspirazione.**

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 gli 80 °C.**

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.

La tabella mostra tutti gli interventi periodici necessari per mantenere in perfetta efficienza la pompa.

Manutenzioni più frequenti possono rendersi necessarie in base al tipo di utilizzo (aspirazione di vapori condensabili o sostanze inquinanti).

In questi casi solo l'esperienza diretta può suggerire i corretti intervalli di manutenzione. L'olio esausto e i pezzi di ricambio sostituiti devono essere considerati rifiuti speciali e gestiti secondo la normativa vigente nel paese d'utilizzo.

Tab. 3 Interventi di manutenzione

Intervallo di manutenzione	Descrizione intervento	Personale abilitato
24 ore / ogni giorno	Controllo livello olio prima dell'avviamento.	**Operatore**
100 Ore / ogni settimana	Pulire con panno morbido le superfici della pompa. Eventualmente è possibile utilizzare un detergente neutro.	**Operatore**
9000 Ore / ogni anno	Sostituire olio lubrificante	**Tecnico qualificato**
	Sostituire l'elemento disoleatore	**Tecnico qualificato**
14000 Ore / ogni 2 anni	Verificare i collegamenti elettrici.	**Tecnico qualificato**
30000 Ore / ogni 5 anni	Revisione pompa	**Servizio Assistenza**

Sostituzione olio lubrificante

E' raccomandato di attendere 1 ora e 30 minuti dopo lo spegnimento della pompa per effettuare l'operazione di sostituzione dell'olio lubrificante per permettere alla temperatura della pompa e dell'olio di raffreddarsi sufficientemente.

AVVERTENZA! **Utilizzare guanti protettivi per evitare scottature.**

Con riferimento alla Figura 14, svitare il tappo di carico (E) e quello di scarico olio (G) solo dopo aver posizionato sotto il serbatoio un contenitore adatto (per forma e dimensioni) a raccogliere tutto l'olio della pompa (vedere Figura 15).

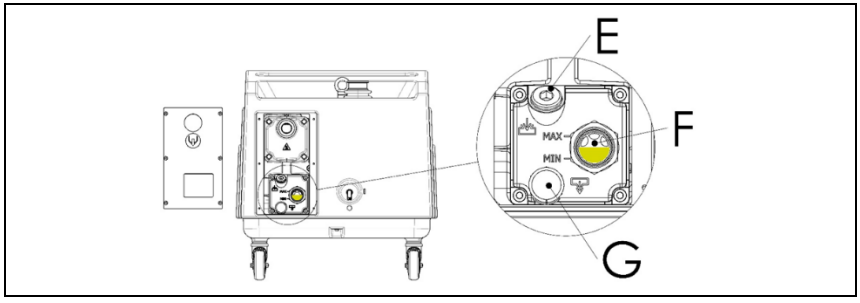


Figura 14

Avvitando il tubo scarico olio (pos. A1) sullo scarico (G) il lubrificante comincerà ad uscire. Si raccomanda di inclinare la pompa in avanti sollevando la parte posteriore della pompa di almeno 40 mm per garantire la fuoriuscita completa del lubrificante, ricordarsi di frenare le ruote per evitare che la pompa possa cadere. Quando l'olio esausto contenuto nel serbatoio sarà fuoriuscito rimontare entrambi i tappi ("E" e "G") e far girare la pompa a vuoto massimo per circa 30 secondi in modo da svuotare anche il circuito di lubrificazione dai residui d'olio esausto, quindi togliere i tappi e scaricare la rimanenza d'olio.

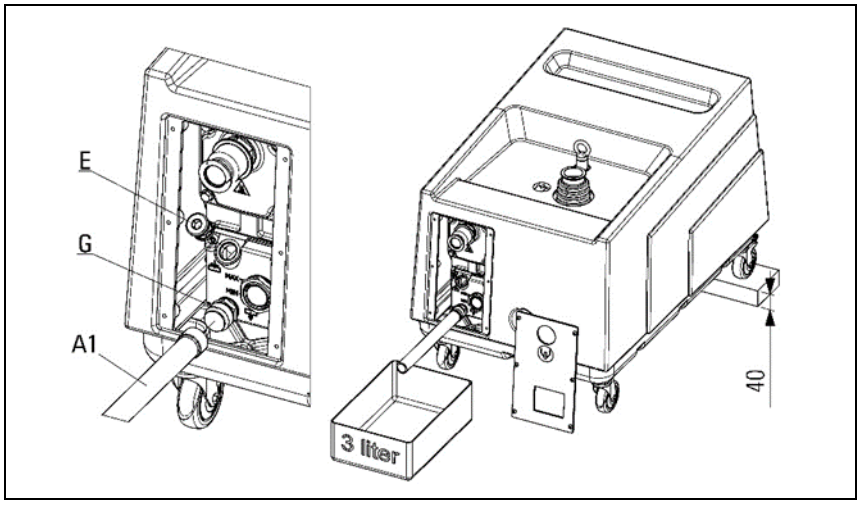


Figura 15

Se nell'olio sono presenti grosse quantità di sostanze inquinanti o si riscontra la presenza di acqua, procedere ad un lavaggio della pompa facendola funzionare a vuoto massimo per almeno 5 minuti.

Utilizzare per questa operazione una quantità di olio tale da raggiungere il livello minimo riportato sul serbatoio.

Scaricare nuovamente l'olio.

Eseguire il riempimento come segue (con riferimento alla Figura 16):

1. Rimuovere il tappo di carico olio (E).
2. Avvitare il beccuccio di carico olio (A2) sulla bottiglia di olio (A1).

3. Procedere al riempimento inserendo il beccuccio all'interno del foro di carico olio (Vedi "Messa in servizio" e "Lubrificanti").

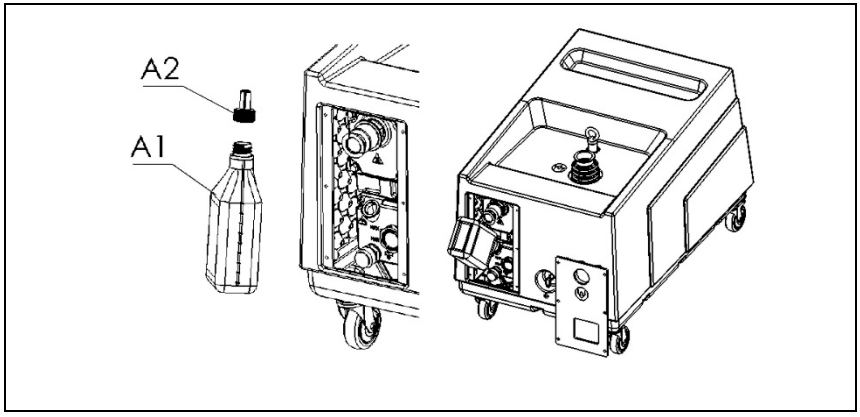


Figura 16

Sostituzione elementi disoleatori

Elementi disoleatori molto sporchi possono causare un sensibile aumento di temperatura della pompa e in casi estremi autocombustione dell'olio lubrificante.

La massima pressione ammessa nel serbatoio è di 0,6 bar misurata a portata massima (quando la pompa sta funzionando con l'aspirazione a pressione atmosferica). La pressione può essere rilevata mediante un manometro (opzionale), connesso nel foro di carico olio (Figura 14 "E"). Se è presente il manometro, verificare l'intasamento della cartuccia a pompa calda.

Per la sostituzione dell'elemento disoleatore, in riferimento a Figura 17, procedere come segue;

1. rimuovere il coperchio del cover (pos.C1) svitando le relative viti (C2),
2. togliere il coperchio serbatoio (pos. B1) svitando le relative viti (pos. B2),

3. estrarre e sostituire l'elemento disoleatore (pos. B4) e i relativi O.R. (pos. B5),
4. rimontare il coperchio di scarico (pos. B1),
5. se necessario sostituire la guarnizione (pos. B3),
6. rimontare il coperchio del cover (pos.C1).

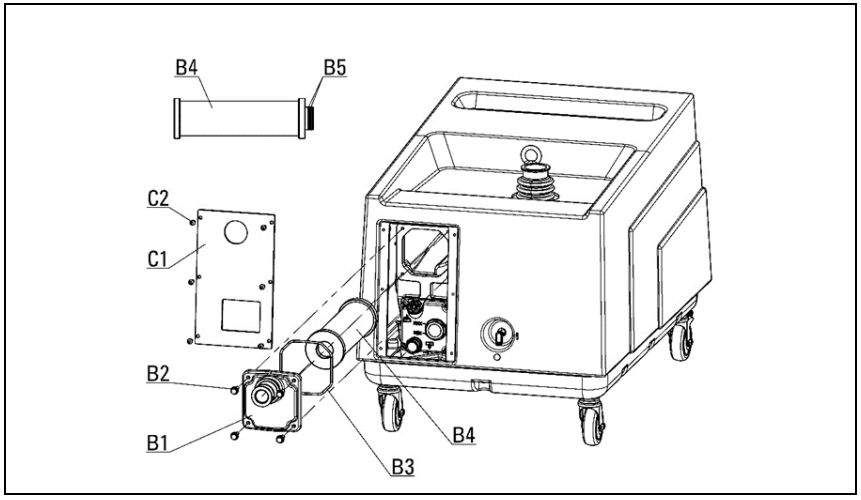


Figura 17

Manutenzione ordinaria

I ricambi necessari alla manutenzione ordinaria sono riportati nella tabella seguente. Usare solo ricambi originali. Per l'ordinazione riportare il Part Number indicato.

Tab. 4 Ricambi per la manutenzione

Part Number	Descrizione
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-68201	MS 120 Exhaust Filter Cartridge

Revisione pompa

Per questa operazione si consiglia di rivolgersi al Servizio Assistenza di Agilent.

La revisione consiste nello smontaggio completo, la pulizia di tutti i particolari e la sostituzione delle parti soggette ad usura (bronzine della pompa, palette e guarnizioni). Usare solo ricambi originali. Per l'ordinazione riportare il Part Number indicato.

Tab. 5 Ricambi per revisione della pompa

Part Number	Descrizione
X3702-68202	MS 120 Major Maintenance Kit

Accessori ordinabili

Tab. 6 Accessori ordinabili

Part Number	Descrizione
X3702-68300	MS 120 Noise Abatement System
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-64001	Power Cord USA Plug-IEC320 15A
X3760-64006	Power Cord UE Plug-IEC320 15A
9699883	Serial cable and A-PLUS
X3702-68001	MS 120 Remote I/O Adapter Cable

Come ordinare i ricambi

Per ordinare i ricambi indicare sempre il modello della pompa (model), numero di matricola (serial), anno di costruzione, Part Number, descrizione e quantità richiesta.

Lubrificanti

Nella tabella seguente sono riportati gli olii consigliati per un uso generico della pompa.

Tab. 7 Lubrificanti

Temperatura ambiente	Viscosità	Olio Agilent Technologies
12 – 35 °C	ISO 53	AVF 60 Gold

Nel caso di cambio della tipologia di lubrificante, è necessario procedere ad un lavaggio della pompa facendola funzionare a vuoto massimo per almeno 5 minuti.

Utilizzare per questa operazione una quantità di olio tale da raggiungere il livello minimo riportato sul serbatoio.

Scaricare nuovamente l'olio e procedere con nuova carica olio.

Messa fuori servizio

Per la messa fuori servizio togliere l'olio dalla pompa prima della sua movimentazione. Se l'olio appare inquinato eseguire un lavaggio con olio nuovo (vedi "Sostituzione olio lubrificante").

Svuotare il serbatoio dell'olio, tappare l'aspirazione e lo scarico della pompa e immagazzinare.

Ritorno per riparazione

NOTA Prima di restituire la pompa a Agilent per qualsiasi scopo, deve essere emesso un numero di autorizzazione al reso.
Si prega di utilizzare la "Health and Safety Certification" alla fine di questo manuale di istruzioni per richiedere il numero di RMA dal Contact Center Agilent locale.
Quando si spedisce la pompa, assicurarsi di aver scaricati l'olio e di includere nella confezione una copia cartacea del foglio H&S compilato e firmato.

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

Inconvenienti e rimedi

NOTA In caso di calo delle prestazioni, rumori anomali o intervento della protezione del motore, contattare il Contact Center Agilent.

Tab. 8 Inconvenienti e rimedi

INCONVENIENTI	CAUSA	SOLUZIONE
Riduzione delle prestazioni	Perdite nelle tubazioni in aspirazione o sulla macchina utilizzatrice	Eliminare le perdite
	Mancanza di lubrificazione	Controllare livello e condizioni dell'olio. Ripristinare il livello o eseguire la sostituzione dell'olio
	Tensione di alimentazione troppo bassa (< 200 Vac)	Collegare la pompa ad una rete elettrica con la giusta tensione e utilizzare un cavo con la dimensione appropriata (vedi paragrafo Tabella limiti operativi)
Nebbie d'olio allo scarico	Elemento disoleatore inefficiente	Sostituire elemento disoleatore
	Elevata temperatura dovuta all'olio contaminato	Sostituire olio
	Elevata temperatura di esercizio dovuta a temperatura ambiente troppo elevata	Diminuire temperatura ambiente assicurando un migliore ricambio d'aria
	Elemento disoleatore intasato	Sostituire elemento disoleatore
La pompa non parte	Tensione di alimentazione fuori dal range previsto	Collegare la pompa a una rete con tensione idonea (vedere paragrafo Tabella limiti operativi)

Smaltimento

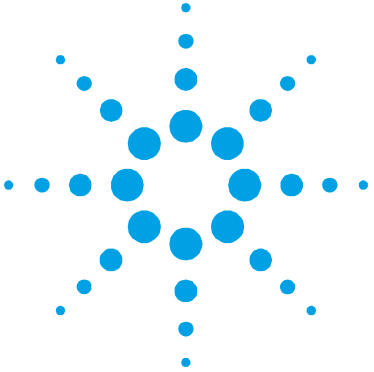
Significato del logo "WEEE" presente sulle etichette.

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



2 Gebrauchsanleitung

Übersetzung der Originalanleitungen

Allgemeine Hinweise

Das Gerät ist für den professionellen Gebrauch bestimmt. Das Bedienungspersonal muss das vorliegende Handbuch und alle zusätzlichen Informationen von Agilent aufmerksam lesen, bevor das Gerät in Betrieb genommen wird. Agilent übernimt keinerlei Verantwortung für Schäden, die durch die vollständige oder partielle Nichtbeachtung der Instruktionen entstanden sind, durch unsachgemäße Bedienung durch nicht geschultes Personal, durch nicht autorisierte Eingriffe oder durch eine Verwendung, die den vor Ort geltenden Vorschriften zuwiderläuft.

Ein abweichender Betrieb ist nur nach vorheriger Rücksprache mit dem Kundendienst von Agilent zulässig. Die bereitgestellten Informationen stellen keine Ersetzung, Ergänzung oder Abänderung von Vorschriften, Richtlinien oder Gesetzen dar, die am Betriebsort gelten.

Die Ratschläge für das mit Installation und Wartung betraute Personal setzen voraus, dass dieses Personal kompetent und darauf vorbereitet ist, bei Problemen, wie sie bei der Wartung von Mechanik und Elektrik auftreten können, angemessen zu reagieren. Bei Unklarheiten oder wenn festgestellt wird, dass bestimmte Informationen in diesem Handbuch fehlen, wenden Sie sich bitte an unseren Kundendienst. Nennen Sie dabei immer Modell, Seriennummer und Baujahr. Sie finden diese Angaben auf dem Typenschild.

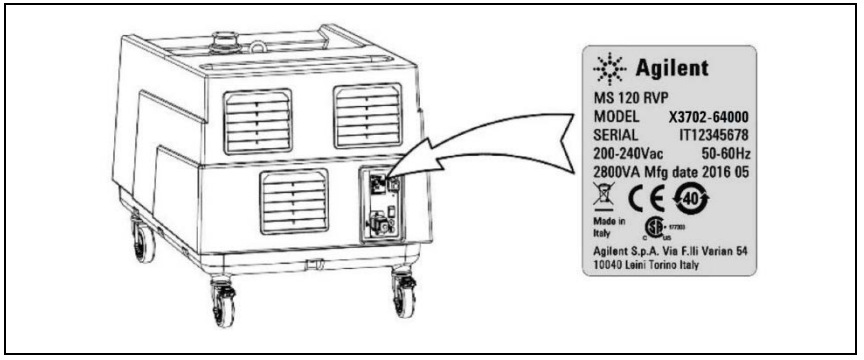


Abbildung 1 Typenschild

Die Pumpe Modell MS120 Single Stage Rotary Vane Pump ist eine Einstadium-Rotationsflügelpumpe im Ölbad, die von einem Elektromotor inverter angetrieben. Die Pumpe Modell MS120 Single Stage Rotary Vane Pump ist eine Einstadium-Rotationsflügelpumpe im Ölbad, die von einem durch einen Inverter gesteuerten Elektromotor angetrieben wird. Die Ansaugung anderer Arten von Gas oder Dämpfen muss zuvor Agilent gemeldet werden. Agilent kann dann die entsprechende Verwendung gestatten.

Der geflanschte Elektromotor ist über eine elsatische Verbindung angeschlossen. Die Kühlung erfolgt über ein starkes Lüfterrad.

An der Ansaugung befindet sich ein Netzfilter zum Schutz der Pumpe vor festen Fremdkörpern mit Durchmessern über 4,7 mm. Außerdem verhindert ein integriertes Rückhalteventil das Aufsteigen des Öls und das Eintreten der Luft in die beim Anhalten zu leerende Kammer.

Im Tank sitzt ein System zur Trennung der Ölnebel von der ausgestoßenen Luft (max. 2 PPM, entsprechend einem Gewicht von 2,4 mg/m^3).

Das aufgefangene Öl wird von der Pumpe automatisch zurückgeführt.

Der Gas-Ballast verhindert die Kondensationin der Pumpe, wenn kleine Mengen von Wasserdampt angesaugt werden (siehe Abschnitt “Gas-ballast“).

In den folgenden Abschnitten finden Sie alle Informationen, die nötig sind, um die Sicherheit während des Betriebs zu gewährleisten. Detaillierte Informationen finden Sie im Anhang “Technical Information”.

Dieses Handbuch verwendet folgende Symbole:

WARNUNG!

Diese Warnung weist auf gefährliche Arbeitsschritte hin, die bei unsachgemäßer Durchfüh-rung das Risiko von Personenschäden bergen.

VORSICHT! Diese Warnung weist auf Arbeitsschritte hin, die das Risiko von Schäden am Gerät bergen.

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

Verwendete Symbole

Folgende Symbole wurden durchgängig in allen Illustrationen verwendet:

Symbole	Beschreibung	Symbole	Beschreibung
	Heiße Oberfläche “Gefahr von Verbrennungen beim Berühren der heißen Teile”		Elektrische Sicherheit
	Emission von schädlichen Substanzen		Brandgefahr
	Nicht in die Umwelt gelangen lassen		Betriebshandbuch lesen
	Anschluss an die Ansaugung		Anschluss an den Ausgang
	Das Gerät ist mit diesem Symbol gekennzeichnet, wenn der Bediener es an die Masse anschließen soll.		

Sicherheitsvorschriften

WARNUNG!

Trotz allen in der Planungsphase ergriffenen Vorsichtsmaßnahmen sind Betrieb und Wartung noch mit einigen Risikofaktoren behaftet.

WARNUNG!

HEISSE OBERFLÄCHEN.

Bei den Wartungsarbeiten müssen Oberflächen berührt werden, deren Temperatur über 80 °C betragen kann. Schützen Sie sich angemessen, um Verbrennungen durch versehentlichen Kontakt zu vermeiden.

Es ist üblich, vor allen Eingriffen an der Pumpe abzuwarten, bis diese sich abgekühlt hat.

WARNUNG!

EMISSIONEN SCHÄDLICHER SUBSTANZEN

Die aus der Pumpe austretende Luft enthält Spuren von Ölnebel (max. 2 PPM, entsprechend einem Gewicht von 2,4 mg/m³). Vergewissern Sie sich, dass das mit den Umständen der Arbeitsumgebung vereinbar ist. Sorgen Sie für einen geeigneten Luftaustausch oder leiten Sie die aus der Pumpe austretende Luft nach außen. Ein Defekt oder Verschleiß an den Dichtungen kann zum Austritt von Schmieröl führen. Dieses darf nicht in den Boden gelangen oder zu anderen Formen von Verschmutzung führen.
Wenn Luft mit gefährlichen Substanzen angesaugt wird (beispielsweise biologische oder mikrobiologische Wirkstoffe), bauen Sie vor der Pumpe Systeme ein, die diese unschädlich machen.

VORSICHT!

NICHT IN DIE UMWELT GELANGEN LASSEN

Das Altöl aus der Pumpe muss nach den in dem jeweiligen Land geltenden Vorschriften entsorgt werden.

WARNUNG!

GEFAHR DURCH UNTERDRUCK

Der Kontkt mit Unterdruck kann Ursache von Unfällen sein.
Vermeiden Sie den Kontakt mit der Ansaugöffnung, während die Pumpe läuft.
Leiten Sie vor jedem Eingriff Luft in den Ansaugkreislauf.

WARNUNG!

GEFAHR DURCH DRUCK

Der Tank der Pumpe steht unter Druck.
Öffnen Sie die Deckel zum Laden und Entladen nicht während des Betriebs und lassen Sie sie nicht versehentlich unverschlossen.

WARNUNG!

Klemmen Sie die Pumpe immer von der Versorgung ab, bevor Sie Wartungsarbeiten durchführen. Stellen Sie beim Stromversorgungsschalter Warnschilder auf: GERÄT WIRD GEWARTET – STROM NICHT EINSCHALTEN! Aktivieren Sie die Sicherheitsvorrichtungen nach dem Ende der Wartungsarbeiten wieder.

WARNUNG!

ELEKTRISCHE SICHERHEIT

Einige Teile der Elektrik stehen unter Strom. Bei Kontakt kann es zu schweren Sach- und Personenschäden kommen.

WARNUNG!

BRANDGEFAHR

Die Verwendung der Pumpte für andere als die in diesem Handbuch genannten oder für verbotene Zwecke sowie eine nicht ausreichende Wartung können zu Funktionsstörungen führen und bergen die Gefahr von Überhitzung und Brand. Verwenden Sie im Brandfall kein Wasser zum Löchen. Nehmen Sie Feuerlöscher mit Pulver oder CO_2 oder andere Löschmittel, die mit elektrischen Komponenten oder mit Schmieröl verträglich sind.

Einlagerung, Transport und Bewegung

Einlagerung

Die Pumpe muss ohne Öl transportiert werden.

Bei Transport und Einlagerung der Pumpe müssen folgende Bedingungen eingehalten werden:

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

Anheben

Die Ausrichtung der verpackten Komponenten muss den Abbildungen auf der Außenseite der Verpackung entsprechen.

Laden Sie die Pumpe mit einer zu deren Gewicht passenden Hebevorrichtung ab. Zum Anheben der Verpackung und der Pumpe richten Sie sich nach den folgenden Abbildungen.

Das Gewicht der Verpackung mit Pumpe beträgt maximal etwa 120 kg, das Gewicht der Pumpe allein 100 kg.

Tab. 1 Abmessungen der Verpackung

Wert	L	B	H
Abmessung	920 mm	610 mm	790 mm

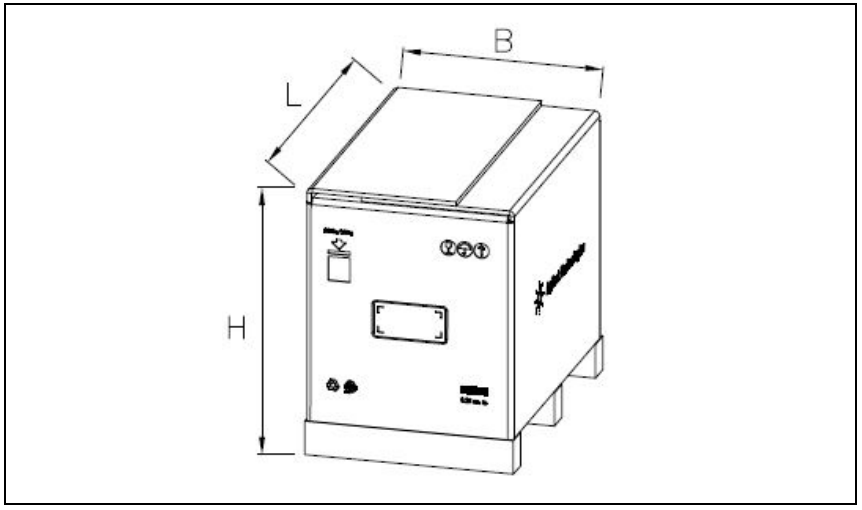


Abbildung 2 Verpackte Pumpe

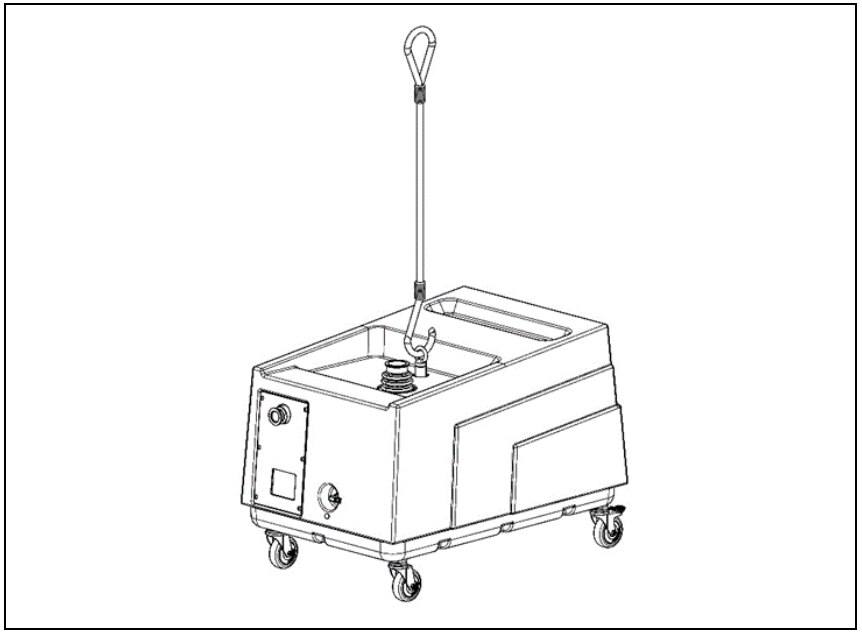


Abbildung 3 Pumpe

Auspacken

Die Pumpe wird in einer speziellen Schutzverpackung geliefert. Wenn diese Spuren von Beschädigungen aufweist, die beim Transport aufgetreten sein könnten, wenden Sie sich an das Contact Center.

Achten Sie beim Auspacken vor allem darauf, dass die Pumpe nicht herunterfällt und keinen Stößen oder Vibrationen ausgesetzt wird.

Lassen Sie die Verpackung nicht in die Umwelt gelangen. Das Material ist vollständig recyclingfähig und entspricht den Vorgaben der Umweltschutzrichtlinie 85/399 EWG.

HINWEIS Durch atmosphärische Einflüsse kann die Pumpe nicht beschädigt werden. Es empfiehlt sich dennoch, sie in der Verpackung zu lassen, bis sie im System installiert wird, um eine Verschmutzung durch Staub zu verhindern.

Entfernen Sie die Riemen, die den Karton auf der Palette halten. Entfernen Sie dann den Karton.

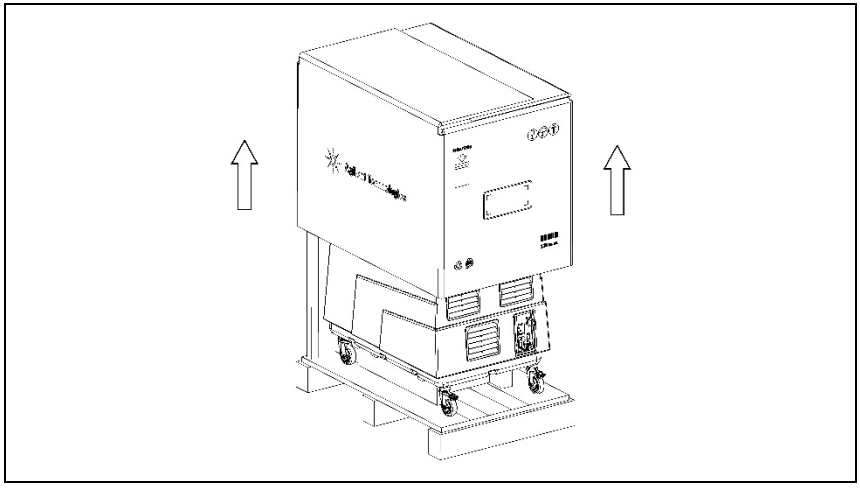


Abbildung 4

Entfernung der 8 Schrauben, die die Bügel halten, dann Entfernung der 4 Bügel.

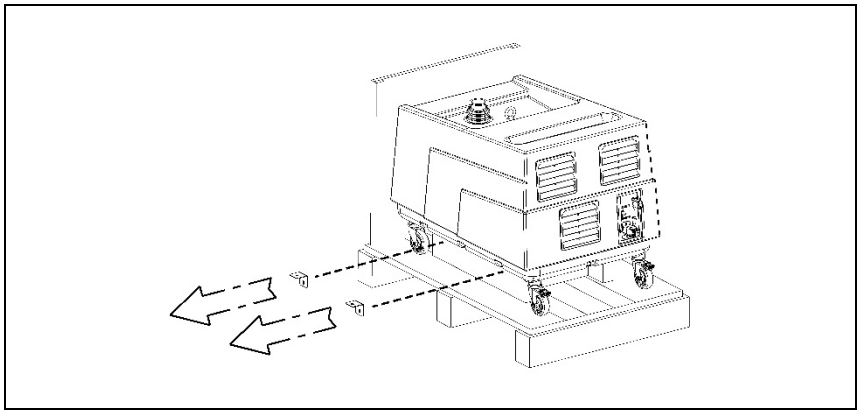


Abbildung 5

Entblocken der Radbremsen.

Befestigung der Abfahrtrampe mit einer Schraube, wie in der Abbildung gezeigt.

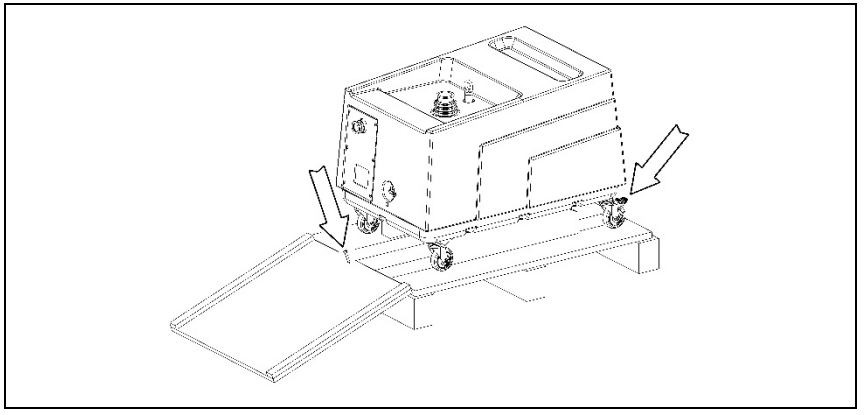


Abbildung 6

Pumpe rückwärts schieben, damit sie von der Palette rollt.

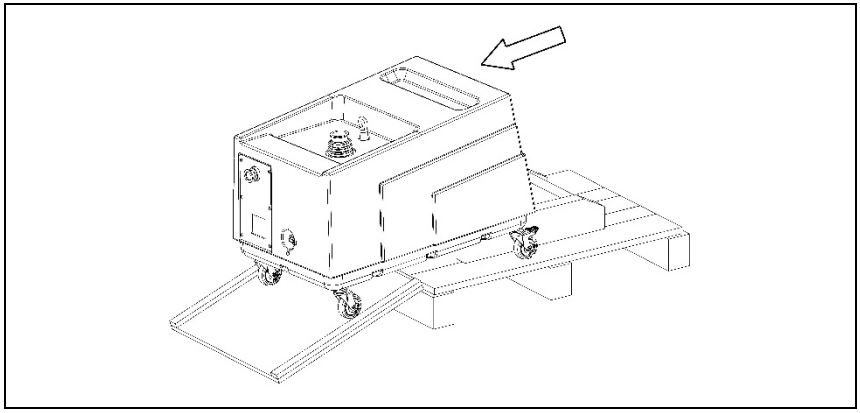


Abbildung 7

Vorbereitung für die Installation

Mitgeliefertes Zubehör

Die Pumpe wird mit folgendem Zubehör geliefert, das für die Inbetriebnahme und die planmäßige Wartung gebraucht wird:

- Ölflasche
- Ölfüllschnabel
- Schlauch zum Ableiten des Öls
- I/O Mating Connector
- Ersatz-Sicherungen.

Zusammenbau

Nehmen Sie die Deckel von der Ansaugung und vom Ausgang ab.

Die Pumpe wird betriebsbereit geliefert. Weitere Komponenten müssen nicht angebaut werden.

Die Pumpe wird ohne Öl geliefert. Sehen Sie im Absatz “Ersetzung des Schmieröls” nach, dort finden Sie die Instruktionen zum Einfüllen des Öls.

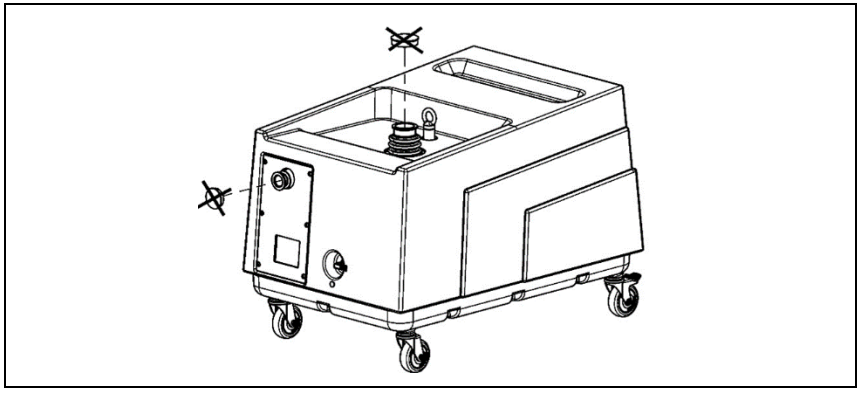


Abbildung 8

Lage

WARNUNG!

Die Pumpe:

- **muss blockiert werden. Stellen Sie dazu die Bremsen an den Rädern fest, wenn die Pumpe auf einer horizontalen Ebene steht.**
- **muss für eine korrekte und problemlose Wartung zugänglich sein, dazu müssen die korrekten Abstände zu umgebenden Hindernissen eingehalten werden (siehe folgende Abbildung). Sie muss außerdem an passenden Hebevorrichtungen befestigt werden können.**
- **muss vor Wasserstrahlen und Spritzern geschützt werden, die zu Kurzschlüssen und Stromschlägen führen können, durch die in der Nähe befindliches Personal verletzt werden kann.**

Tab. 2 Mindestabstand

Wert	A	B	C	D
Abmessung	150 mm	200 mm	150 mm	500 mm

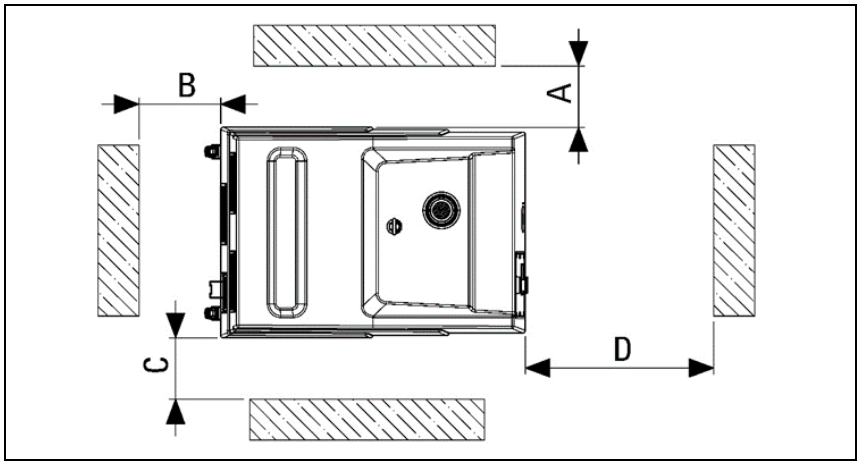


Abbildung 9

VORSICHT! Die Pumpe darf nicht außen installiert werden. Sie muss immer vor atmosphärischen Einflüssen geschützt werden.

Die heiße Luft aus dem Ausgang oder aus den Lüfterrädern kann zu Belästigungen des Personals führen.

Installieren Sie die Pumpe nicht in Bereichen, in denen sich Staub oder andere Materialien in der Luft befinden. Diese könnten die Pumpe verstopfen und die Kühlungsflächen schnell zusetzen.

Anschluss an die Maschine

Der Anschluss der Pumpe an den leerzupumpenden Raum muss mit Leitungen erfolgen, die den gleichen Durchmesser wie die Ansaugöffnung haben.

Das Gewicht der Leitungen und der zugehörigen Erweiterunge darf nicht an der Pumpe hängen. Verbinden Sie den letzten Abschnitt und die Ansaugöffnung der Pumpe mit einem Schlauch oder einem anderen flexiblen Verbindungsstück.

Alle Leitungen und Verbindungen müssen unbedingt dicht sein.

Lange Leitungen oder solche mit geringem Querschnitt verringern die Leistungsfähigkeit der Pumpe.

HINWEIS Dieses Symbol steht für die Ansaugöffnung.

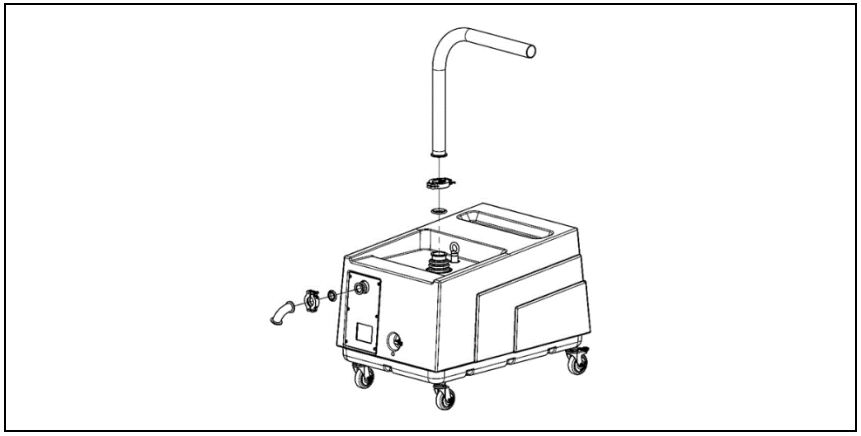


Abbildung 10

Umleitung der Abgasluft

Wenn der Luftaustausch im Pumpenraum unzureichend ist, kann die austretende Luft in andere Räume oder nach außen geleitet werden.

Verwenden Sie Leitungen, die den gleichen Durchmesser haben wie der Ausgang des Tanks bei maximaler Länge von 15 m.

Wenn die Leitungen länger sind, vergrößern Sie den Durchmesser. Das Gewicht der Leitungen darf die Pumpe nicht beschweren.

Verwenden Sie im letzten Abschnitt Schläuche oder flexible Leitungen.

WARNUNG!

Diese Leitung muss ein Gefälle haben, damit kein Kondenswasser in den Tank der Pumpe gelangt.

VORSICHT! Stecken Sie diese Leitung nicht auf Hähne. Blockieren Sie den Ausgang nicht.

HINWEIS Dieses Symbol kennzeichnet den Anschluss an den Ausgang.

Elektrische Anschlüsse

Vergewissern Sie sich, dass Spannung und Frequenz des Netzanschlusses mit den Daten auf dem Typenschild der Pumpe übereinstimmen.

Vergewissern Sie sich, dass die Erdung korrekt vorgenommen wurde.

WARNUNG! **Vergewissern Sie sich, dass der Hauptschalter wird ausgeschaltet (0) steht, um eine unerwünschte Einschaltung auszuschließen der Pumpe.**

Schließen Sie die Elektrik an, indem Sie den Stecker des Versorgungskabels an die Pumpe anschließen und mit der zugehörigen Feder blockieren (siehe Abbildung unten).

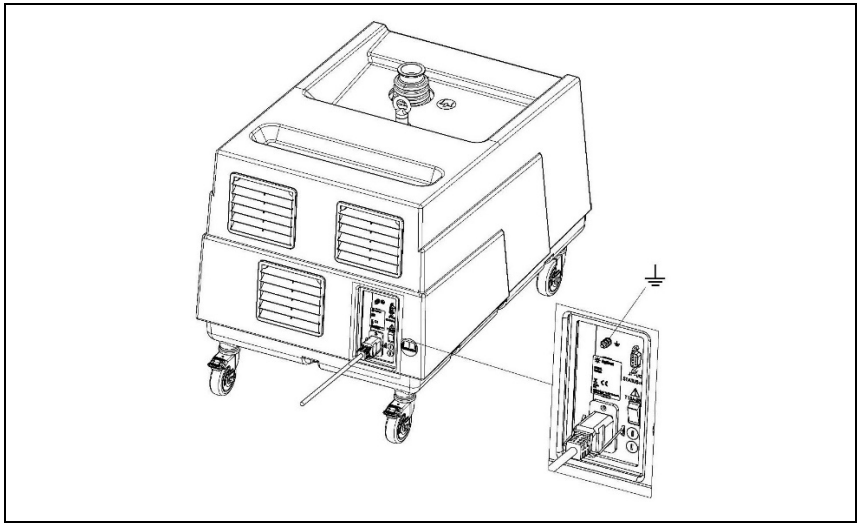


Abbildung 11

Betrieb

Vorgesehene Verwendung

Die in diesem Handbuch beschriebenen Vakuumpumpen können nur Luft und kleine Mengen Wasserdampf ansaugen. Die Ansaugung anderer Arten von Gas oder Dämpfen muss zuvor der Firma Agilent Technologies gemeldet werden, die dann die entsprechende Verwendung genehmigt.

Diese Pumpen eignen sich für das Leerpumpen geschlossener Systeme oder für ein konstantes Vakuum im Bereich zwischen 0,07 und 15 mbar (absolut).

Die Umgebungstemperatur und die Temperatur der Ansaugluft müssen dabei zwischen 12 und 35°C liegen.

Verbotene Verwendung

WARNUNG! **Die Ansaugung folgender Substanzen mit der Pumpe ist verboten:**

- **Flüssigkeiten oder Festkörper**
- **gefährliche, explosive oder aggressive Gase und Dämpfe**
- **reiner Sauerstoff oder mit Sauerstoff angereicherte Luftmischungen.**

WARNUNG!

Der Ausgang der Pumpe darf nicht zum Aufbau von Druck verwendet werden, auch nicht wenn es sich um geringen Druck handelt.

WARNUNG!

Es ist verboten, die Pumpe in einem Raum zu installieren, in dem Explosionsgefahr herrscht.

Schutz

WARNUNG!

Bei Verwendungen, bei denen ein Defekt oder ein Schaden an der Vakuumpumpe zu Personen- oder Sachschäden führen könnte, müssen an der Anlage besondere Sicherheitsvorkehrungen getroffen werden.

Tabelle mit Betriebs-Grenzwerten

EINGANGS-SPANNUNG (V)	STATUS DES CONTROLLERS
< 180	Schaden an der Versorgung (Fehler wegen zu geringer oder zu hoher Spannung – Win205 bit5 = 1)
180 – 200	in Betrieb (verringerte Leistung)
200 – 264	in Betrieb (volle Leistung)
> 264	Schaden an der Versorgung (Fehler wegen zu geringer oder zu hoher Spannung – Win206 bit5 = 1)

Inbetriebnahme

Installieren und verwenden Sie die Pumpe nicht in Räumen, die von atmosphärischen Einflüssen betroffen sind (Regen, Schnee, Frost), oder von Staub oder aggressiven Gasen. Verwenden Sie sie nicht in explosiver Umgebung oder an Orten mit Brandgefahr.

Während des Betriebs müssen folgende Umgebungsbedingungen eingehalten werden:

- Temperatur: zwischen +12°C und +35 °C
- relative Luftfeuchtigkeit: 0 bis 95 % (nicht kondensierend).

VORSICHT! Bevor Sie die Pumpe starten, muss Schmieröl eingefüllt werden, da die Pumpe leer geliefert wird.

Für weitere Informationen zum Nachfüllen des Öls und zur Auswahl des geeigneten Schmiermittels schauen Sie im Abschnitt “Ersetzung des Schmieröls” nach.

HINWEIS Der Ölpegel muss immer zwischen den Werten MIN und MAX bleiben, die an der Seite der Pumpe angezeigt sind.

Nehmen Sie die erste Füllung über den Stöpsel (E) vor. Füllen Sie bis zur Hälfte der Pegelanzeige (F) auf und schließen Sie den Stöpsel (E) (siehe Abbildung unten).

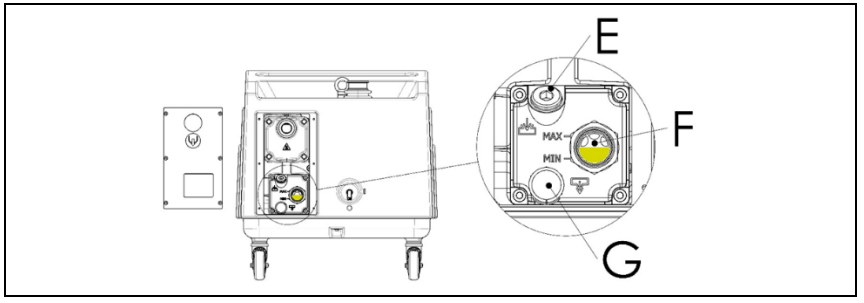


Abbildung 12

Schalten Sie die Pumpe ein und bringen Sie sie für mindestens zwei Minuten auf das maximale Vakuum. Halten Sie die Pumpe dann wieder an, prüfen Sie den Ölstand und füllen Sie dann das Öl erneut bis auf den korrekten Pegel auf.

Tipps für den Betrieb

Bei Umgebungstemperaturen unterhalb von 18 °C sollte die Pumpe 15 Minuten lang auf Temperatur gebracht werden, indem man sie mit Druck am Grenzwert (Ansaugung geschlossen, keine Last) laufen lässt.

Während dieser Phase kann es sein, dass die Pumpe nicht die angegebenen Grenzwerte für den Druck erreicht.

WARNUNG! **Die Pumpe wurde nicht entwickelt, um mit atmosphärischem Druck zu arbeiten.**
Es wird geraten, fünf Einschaltungen pro Stunde nicht zu überschreiten.

Gas-ballast

Die Pumpe MS120 ist mit einem Gas-Ballast und mit einem manuellen Ventil ausgestattet, das ihre Einschaltung (I) und Abschaltung (0) erlaubt.

Der Grenzwert für den Druck der Pumpe variiert je nach dieser Einstellung. Für einen korrekten Betrieb schlagen Sie unter “Ansaugung von Wasserdampf” nach.

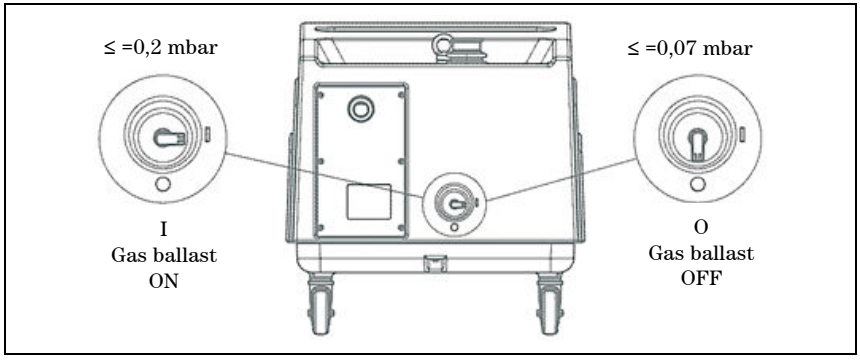


Abbildung 13

Ansaugung von Wasserdampf

Bei der Ansaugung von Wasserdampf raten wir folgendes:

- Vor der Ansaugung von Dämpfen sollte die Pumpe auf Betriebstemperatur gebracht werden. Lassen Sie sie dazu eine halbe Stunde lang bei maximalem Vakuum laufen.
- Wenn nach dem Betrienszyklus Kondenswasser im Schmieröl auftritt, lassen Sie die Pumpe eine mindestens halbe Stunde lang bei maximalem Vakuum laufen. Der Gas-Ballast muss dabei offen sein.
- Führen Sie diese Schritte vor längeren Stillstandszeiten durch. Der Gas-Ballast sorgt für die Entfernung des Kondenswassers aus dem Schmieröl.

Für die Ein- und Abschaltung des Gas-Ballasts schauen Sie im Anhang “Technical Information” nach.

Wartung

Das Bedienungs- und Wartungspersonal der Pumpe muss gut geschult sein und über profunde Kenntnisse der Vorschriften zur Unfallverhütung verfügen.

Neben den unten wiedergegebenen Vorschriften sollten Sie auch im Abschnitt “Sicherheitsvorschriften” nachschlagen.

WARNUNG! **Vor jedem Eingriff sollten Sie Luft in durch die Ansaugöffnung.**

WARNUNG! **Wenn die Pumpe nach dem Betrieb gewartet werden soll, muss sie erst abkühlen, da die Temperatur an der Außenfläche auf über 80°C steigen kann.**

WARNUNG! **Klemmen Sie die Pumpe immer von der Versorgung ab, bevor Sie Wartungsarbeiten durchführen. Stellen Sie beim Stromversorgungsschalter Warnschilder auf: GERÄT WIRD GEWARTET – STROM NICHT EINSCHALTEN! Aktivieren Sie die Sicherheitsvorrichtungen nach dem Ende der Wartungsarbeiten wieder.**

Die Tabelle zeigt alle regelmäßig notwendigen Wartungseingriffe, damit die Pumpe in einem perfekten Zustand bleibt.

Die Notwendigkeit der häufigeren Wartungen richtet sich nach der Art der Verwendung (Ansaugung von kondensierbaren Dämpfen oder verschmutzenden Substanzen).

In diesen Fällen kann nur die Erfahrung sagen, welche Intervalle für die Wartungseingriffe richtig sind. Das Altöl und die ausgebauten Teile gelten als Sondermüll und sind nach den im jeweiligen Land geltenden Vorschriften zu behandeln.

Tab. 3 Wartungseingriffe

Wartungsintervall	Beschreibung des Eingriffs	Geeignetes Personal
24 Stunden / täglich	Kontrolle des Ölstands vor dem Start.	**Bedienungspersonal**
100 Stunden / wöchentlich	Reinigung der Oberfläche der Pumpe mit einem weichen Tuch. Eventuell kann ein neutrales Reinigungsmittel verwendet werden.	**Bedienungspersonal**
9000 Stunden / jährlich	Ersetzen des Schmieröls	**qualifizierter Techniker**
	Ersetzen des Ölreinigungselements	**qualifizierter Techniker**
14000 Stunden / alle zwei Jahre	Prüfung der elektrischen Anschlüsse	**qualifizierter Techniker**
30000 Stunden / alle fünf Jahre	Revision der Pumpe	**Kundendienst-mitarbeiter**

Ersetzung des Schmieröls

Es wird empfohlen, 1 Stunde und 30 Minuten nach dem Ausschalten der Pumpe zu warten, um den Schmierölersatzvorgang durchzuführen, damit die Temperatur der Pumpe und des Öls ausreichend abkühlen können.

WARNUNG! **Verwenden Sie Handschuhe zum Schutz vor Verbrennungen.**

Drehen Sie den Stöpsel (E) und den Stöpsel auf dem Ausgang (G) erst ab (Abbildung 14), nachdem Sie unter dem Tank einen nach Form und Größe passenden Behälter platziert haben, der das ganze Öl aus der Pumpe aufnehmen kann (siehe Abbildung 15).

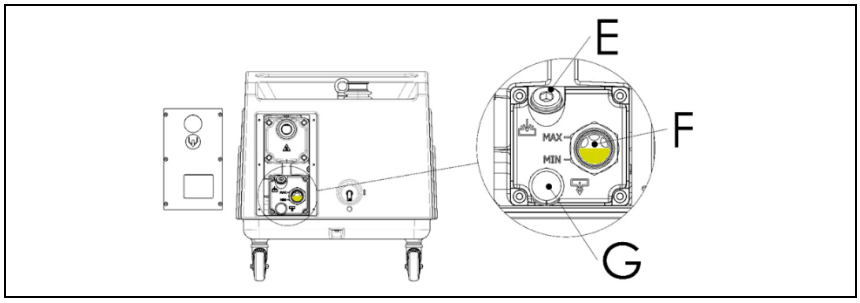


Abbildung 14

Nachdem Sie den Schlauch zum Ablassen des Öls (A1) auf den Ausgang (G) gesetzt haben, beginnt das Schmieröl auszulaufen. Es wird empfohlen, die Pumpe nach vorne zu kippen, indem Sie die Rückseite der Pumpe um mindestens 40 mm, damit sichergestellt ist, dass das gesamte Öl abläuft. Denken Sie auch daran, die Bremsen an den Rädern festzustellen, damit die Pumpe nicht herunterfallen kann. Wenn das alte Öl aus dem Tank abgelaufen ist, setzen Sie die Stöpsel (E und G) wieder auf und lassen Sie die Pumpe bei maximalem Vakuum etwa 30 Sekunden lang laufen, so dass auch der Schmierkreislauf sich von Ölrückständen leeren kann. Nehmen Sie dann wieder die Stöpsel ab und lassen Sie das restliche Öl ablaufen.

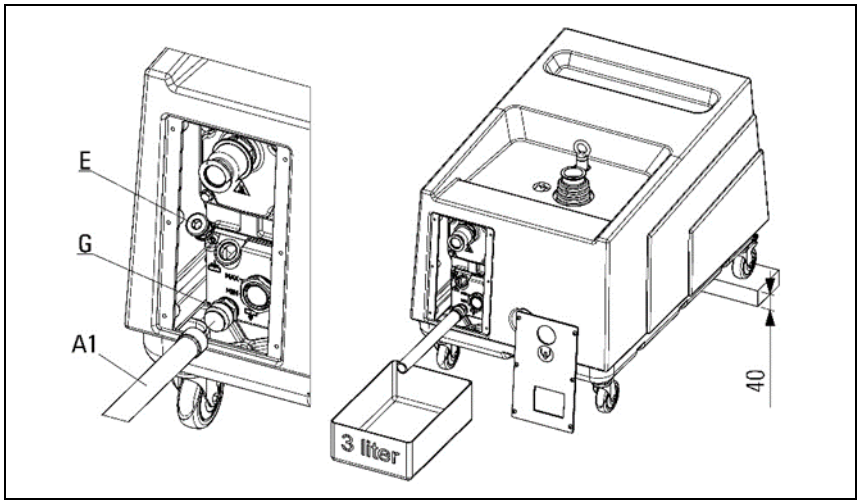


Abbildung 15

Wenn sich im Öl viele Verschmutzungen oder Wasser befinden, reinigen Sie die Pumpe, indem Sie sie bei maximalem Vakuum für etwa fünf Minuten laufen lassen.

Verwenden Sie dafür soviel Öl, dass gerade der als Minimalstand angezeigte Pegel erreicht wird.

Lassen Sie das Öl erneut ab.

Füllen Sie wie folgt nach (siehe Abbildung 16):

1. Drehen Sie den Stöpsel der Ölfüllöffnung (E) heraus.
2. Schrauben Sie den Öllfüllschnabel (A2) auf die Ölflasche (A1).
3. Füllen Sie mit Öl auf und stecken Sie dazu den Öllfüllschnabel in die Ölfüllöffnung (siehe "Inbetriebnahme“ und "Schmiermittel").

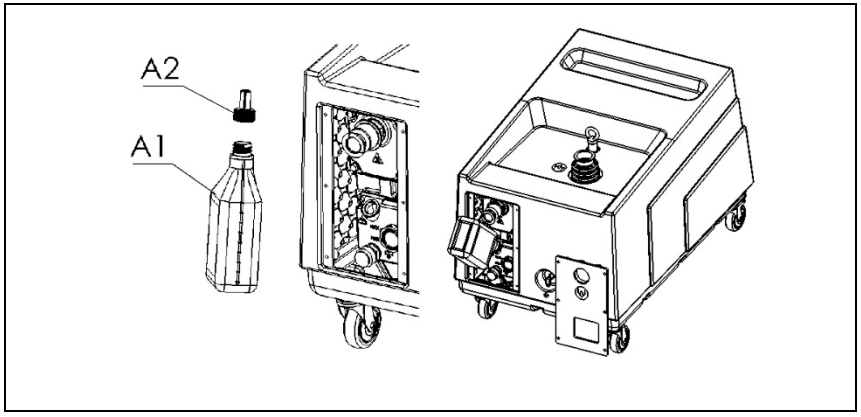


Abbildung 16

Ersetzung der Ölreinigungselemente

Stark verschmutzte Ölreinigungselemente können zu einem spürbaren Temperaturanstieg in der Pumpe und in extremen Fällen zur Selbstentzündung des Schmieröls führen.

Der maximal zulässige Druck im Tank beträgt 0,6 bar, gemessen bei maximalem Durchsatz (wenn die Pumpe mit Ansaugung bei atmosphärischem Druck arbeitet). Der Druck kann durch einen Manometer (optional) gemessen werden, der mit der Öffnung zum Einfüllen des Öls verbunden wird (Abbildung 14, E). Wenn der Manometer verwendet wird, prüfen Sie die Kartusche bei heißer Pumpe auf Verstopfung.

Zur Ersetzung des Ölreinigungselements gehen Sie wie folgt vor (Abbildung 17);

1. Nehmen Sie die Abdeckung (C1) ab, indem Sie die zugehörigen Schrauben (C2) herausdrehen,
2. Nehmen Sie den Deckel des Tanks (B1) ab, indem Sie die entsprechenden Schrauben herausdrehen (B2),
3. Ziehen Sie das Ölreinigungselement (B4) heraus und ersetzen Sie die O-Ringe (B5),
4. Setzen Sie den Deckel wieder auf den Ausgang (B1),
5. Ersetzen Sie wenn nötig die Dichtung (B3),
6. Setzen Sie die Abdeckung wieder auf (C1).

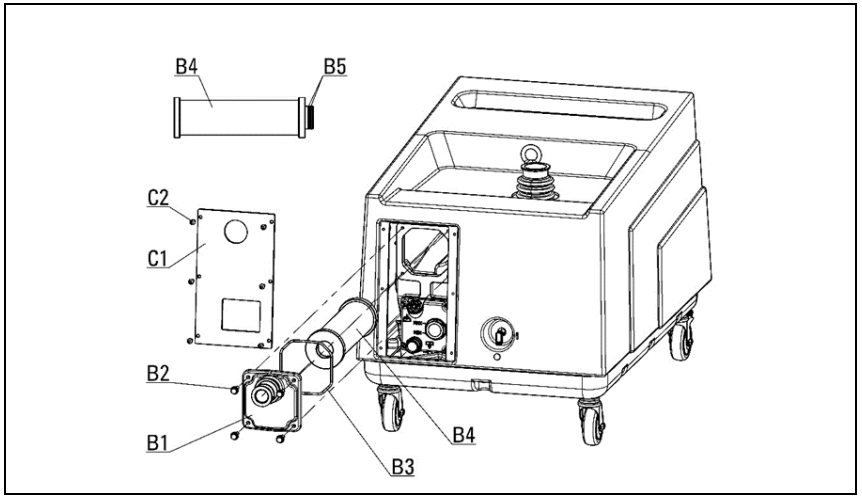


Abbildung 17

Routinewartung

Die Routinewartung finden Sie in der folgenden Tabelle. Verwenden Sie nur Original-Ersatzteile. Bei der Bestellung geben Sie bitte die Ersatzteilnummer an.

Tab. 4 Ersatzteile für die Wartung

Ersatzteilnummer	Beschreibung
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-68201	MS 120 Exhaust Filter Cartridge

Revision der Pumpe

Für diesen Schritt sollten Sie sich an den Kundendienst von Agilent wenden.

Die Revision besteht in einer kompletten Zerlegung, in der Reinigung aller Teile und in der Ersetzung der von Verschleiß betroffenen Teile

(Lagerhülse der Pumpe, Flügel und Dichtungen). Verwenden Sie nur Original-Ersatzteile. Bei der Bestellung geben Sie bitte die Ersatzteilnummer an.

Tab. 5 Ersatzteile für die Revision der Pumpe

Ersatzteilnummer	Beschreibung e
X3702-68202	MS 120 Major Maintenance Kit

Bestellbares Zubehör

Tab. 6 Bestellbares Zubehör

Ersatzteilnummer	Beschreibung
X3702-68300	MS 120 Noise Abatement System
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-64001	Power Cord USA Plug-IEC320 15A
X3760-64006	Power Cord UE Plug-IEC320 15A
9699883	Serial cable and A-PLUS
X3702-68001	MS 120 Remote I/O Adapter Cable

So bestellen Sie Ersatzteile

Bei der Bestellung von Ersatzteilen geben Sie immer das Modell der Pumpe an, ferner die Seriennummer, das Baujahr, die Ersatzteilnummer, die Beschreibung und die gewünschte Menge.

Schmiermittel

In der folgenden Tabelle finden Sie die für den normalen Betrieb der Pumpe empfohlenen Öle.

Tab. 7 Schmiermittel

Umgebungstemperatur	Viskosität	Öl von Agilent Technologies
12 – 35 °C	ISO 53	AVF 60 Gold

Wenn auf einen anderen Typ von Schmiermittel gewechselt werden soll, muss die Pumpe gereinigt werden. Lassen Sie sie dazu für mindestens fünf Minuten bei maximalem Vakuum laufen.

Verwenden Sie dafür soviel Öl, dass gerade der als Minimalstand angezeigte Pegel erreicht wird.

Lassen Sie das alte Öl ab und füllen Sie neues nach.

Stilllegung

Für die Stilllegung müssen Sie das Öl aus dem Tank ablassen, bevor die Pumpe bewegt wird. Wenn das Öl veschmutzt erscheint, führen Sie eine Reinigung mit neuem Öl durch (siehe “Ersetzung des Schmieröls”).

Leeren Sie den Tank, schließen Sie Ansaugung und Ausgang der Pumpe und lagern Sie diese ein.

Rücksendung zur Reparatur

HINWEIS Vor der Rücksendung der Pumpe an Agilent für alle Zwecke muss eine Rückgaberechtnummer ausgegeben werden. Bitte nutzen Sie die "Health and Safety Certification" am Ende dieser Bedienungsanleitung, um die RMA-Nummer bei Ihrem regionalen Agilent Contact Center oder Vertriebsbüro anzufordern. Bitte beachten Sie beim Versand der Pumpe, dass sie aus dem Öl abfließt und eine Kopie des ausgefüllten und signierten H&S-Blechs mit der Verpackung enthält.

Wenn eine Pumpe verschrottet werden muss, richten Sie sich dabei nach den vor Ort geltenden Vorschriften.

Fehler und ihre Behebung

HINWEIS Bei Leistungsabfall, anormale Geräuschentwicklung oder Motorschutzeingriff wenden Sie sich bitte an das Agilent Contact Center.

Tab. 8 Fehler und ihre Behebung

FEHLER	URSACHE	LÖSUNG
Leistungsminderung	Undichte Stellen in den Ansaugleitungen oder an der Maschine	Undichte Stellen beseitigen
	keine Schmierung	Prüfen Sie Pegel und Zustand des Öls. Füllen Sie Öl nach oder ersetzen Sie es
	Versorgungsspannung zu niedrig (< 200 V Wechselstrom)	Schließen Sie die Pumpe an eine Stromquelle mit der korrekten Spannung an und verwenden Sie ein Kabel mit passendem Querschnitt (siehe “Tabelle mit Betriebs-Grenzwerten” für den Betrieb)
Ölnebel am Ausgang	Ölreinigungselement funktionsuntüchtig	Ölreinigungselement ersetzen
	Hohe Temperatur durch verschmutztes Öl	Öl ersetzen
	Hohe Betriebstemperatur durch zu hohe Umgebungstemperatur	Umgebungstemperatur durch bessere Luftzirkulation senken
	Ölreinigungselement verstopft	Ersetzung des Ölreinigungselements
Pumpe startet nicht	Versorgungsspannung außerhalb des zulässigen Bereichs	Schließen Sie die Pumpe an ein Netz mit geeigneter Spannung an (siehe “Tabelle mit Betriebs-Grenzwerten” für den Betrieb)

Entsorgung

Bedeutung des "WEEE" Logos auf den Etiketten.

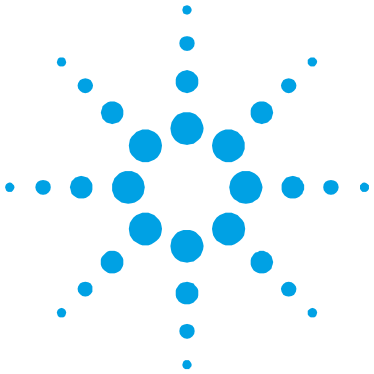
Das folgende Symbol ist in Übereinstimmung mit der EU-Richtlinie WEEE (Waste Electrical and Electronic Equipment) angebracht.

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



3 Mode d’emploi

Traduction de la mode d’emploi originale

Indications générales

Cet appareil est destiné à un usage industriel. Utilisateur doit lire attentivement ce manuel d'instruction et tout autre information supplémentaire fournie par la société Agilent avant l'utilisation de l'appareil. La société Agilent décline toute responsabilité éventuelle en cas de non-observation totale ou partielle des instructions, d'usage impropre de la part d'un personnel non formé, d'interventions non-autorisées ou d'un usage contraire aux réglementations nationales spécifiques.

Aucun autre type d'opération ne devra être effectué sans avoir préalablement contacté le Service d'Assistance Agilent. Les informations fournies ne peuvent en aucun cas remplacer, compléter ou modifier toute norme, prescription, décret ou loi à caractère spécifique, en vigueur sur le lieu d'installation.

Les conseils s'adressent à un personnel préposé à l'installation et à l'entretien expert et préparé pour affronter tout problème d'entretien, mécanique et électrique. En cas de doute ou d'informations ne figurant pas dans ce manuel, veuillez contacter notre service d'assistance en communiquant toujours le modèle (Model), le numéro de série (Serial), l'année de construction indiqués sur la plaque d'identification.

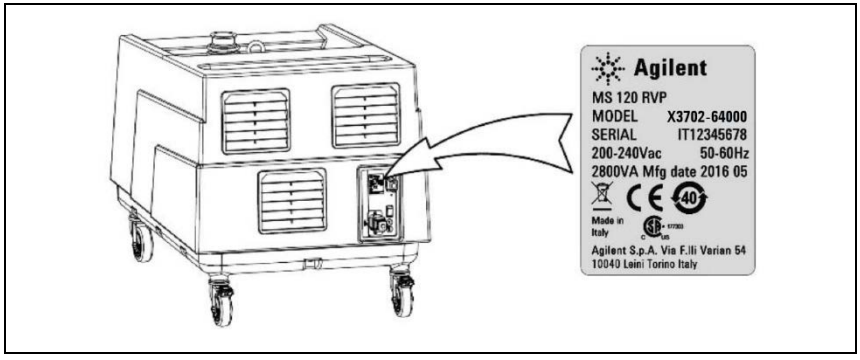


Figure 1 Plaques d'identifications

Les MS120 Single Stage Rotary Vane Pumps sont des pompes rotatives à simple étage à palettes, étanches à bain d'huile, actionnées par un moteur électrique commandé par inverter. Ces pompes à vide poussé sont exclusivement indiquées pour le pompage de l'air et de petites quantités de vapeur d'eau. L'aspiration d'autres types de gaz ou de vapeur doit être préalablement déclarée à la société Agilent qui délivrera au besoin la conformité à l'usage spécifique.

Le moteur électrique bridé est accouplé par l'intermédiaire d'un joint élastique. Le refroidissement est assuré par un ventilateur centrifuge puissant.

À l'aspiration, un filtre à crépine protège la pompe contre les corps solides d'un diamètre supérieur à 4,7 mm. En outre, un clapet de retenue intégré empêche la remontée de l'huile et le retour de l'air dans la chambre à vide au cours de la phase d'arrêt.

Dans le réservoir, un système de séparation des brouillards d'huile de l'air d'extraction (résidu max. 2PPM/ poids équivalant à 2,4 mg/m^3).

L'huile éliminée est automatiquement récupérée par la pompe.

Le dispositif de lest empêche la condensation à l'intérieur de la pompe lorsqu'on aspire de petites quantités de vapeur (voir le paragraphe “Dispositif de lest (Gas-ballast)“).

Les paragraphes suivants fournissent toutes les informations nécessaires pour garantir la sécurité de l'opérateur durant l'utilisation de l'appareil. On fournit des informations détaillées dans l'appendice “Technical Information”.

Ce manuel utilise les conventions suivantes:

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 dont le non-respect pourrait endommager sérieusement l'appareil.

NOTE Les notes contiennent des renseignements importants, isolés du texte.

Symboles utilisés

Les symboles suivants sont utilisés dans les différentes illustrations:

Symboles	Description	Symboles	Description
	Surface chaude “Danger de brûlure en cas de contact avec les parties chaudes”		Sécurité électrique
	Émission de substances nocives		Danger d'incendie
	Ne pas déverser dans l'environnement		Lire le manuel d'utilisation
	Raccord d'aspiration		Raccord d'évacuation
	Ce symbole apposé sur l'appareil signale à l'utilisateur qu'il doit mettre l'appareil à la terre.		

Prescriptions de sécurité

AVERTISSEMENT!

Malgré les précautions prises en phase de projet, il existe des éléments de risque qui se présentent durant les opérations effectuées durant l'utilisation et l'entretien.

AVERTISSEMENT!

SURFACES CHAUDES.

Durant les opérations d'entretien, on touche des surfaces dont la température peut dépasser 80°C. Adopter des moyens de protection appropriés pour éviter les brûlures dues à un contact fortuit.

On recommande d'attendre le refroidissement de la pompe avant toute intervention sur cette dernière.

AVERTISSEMENT!

ÉMISSIONS DE SUBSTANCES NOCIVES

L'air d'extraction de la pompe contient des traces de brouillards d'huile (résidu max. 2PPM/ poids équivalant à 2,4 mg/m³). Vérifier la compatibilité avec le milieu de travail. Garantir un renouvellement correct de l'air ou amener l'évacuation de la pompe à l'extérieur. Une défaillance ou l'usure des garnitures peut provoquer des fuites du huile lubrifiante. Éviter le déversement sur le terrain et la pollution d'autres matériaux.
En cas d'aspiration d'air contenant des substances dangereuses (comme des agents biologiques ou microbiologiques), prévoir des systèmes de captage avant la pompe à vide.

ATTENTION!

NE PAS DÉVERSER DANS L'ENVIRONNEMENT

Les huiles usées provenant de la pompe doivent être éliminées conformément aux réglementations en vigueur dans le pays d'utilisation.

AVERTISSEMENT!

DANGER GÉNÉRÉ PAR LA DÉPRESSION

Le contact avec des points en dépression peut provoquer des accidents. Éviter le contact avec le raccord d'aspiration de la pompe durant le fonctionnement. Injecter de l'air dans le circuit d'aspiration avant toute intervention.

AVERTISSEMENT!

DANGER GÉNÉRÉ PAR LA PRESSION

Le réservoir de la pompe est pressurisé.

Ne pas ouvrir et ne pas oublier de fermer les bouchons de remplissage et de vidange durant le fonctionnement.

AVERTISSEMENT!

Toujours exclure l'alimentation de la pompe avant d'effectuer des opérations d'entretien. Appliquer des pancartes spécifiques d'avertissement : ENTRETIEN EN COURS SUR L'APPAREIL - NE PAS METTRE SOUS TENSION, au niveau de l'interrupteur d'alimentation. Rétablir les dispositifs de sécurité au terme de l'opération.

AVERTISSEMENT!

SÉCURITÉ ÉLECTRIQUE

L'équipement électrique comprend des pièces sous tension qui, en cas de contact, peuvent provoquer des dommages corporels et matériels graves.

AVERTISSEMENT!

DANGER D'INCENDIE

L'utilisation de la pompe pour des usages non prévus ou interdits dans ce manuel ou un entretien incorrect peuvent provoquer des anomalies de fonctionnement et générer un risque de surchauffe et d'incendie. Ne pas éteindre les flammes avec de l'eau en cas d'incendie. Utiliser des extincteurs à la poudre ou au CO_2 ou d'autres moyens compatibles avec la présence d'équipements électriques et d'huiles lubrifiantes.

Stockage, transport et manutention

Stockage

Les pompes doivent être transportées sans huile.

Respecter les conditions ambiantes suivantes durant le transport et le stockage:

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

Levage

L'orientation des composants emballés doit rester conforme aux indications fournies par les pictogrammes présents à l'extérieur de l'emballage.

Effectuer l'opération de déchargement avec un moyen de levage compatible avec le poids de la pompe. Pour le levage de l'emballage et de la pompe voir les figures suivantes.

Le poids de l'emballage, comprenant la pompe, atteint un maximum de 120 kg, tandis que le poids de la pompe seule et de 100 kg.

Tab. 1 Dimensions de l'emballage

Cote	L	B	H
Dimension	920 mm	610 mm	790 mm

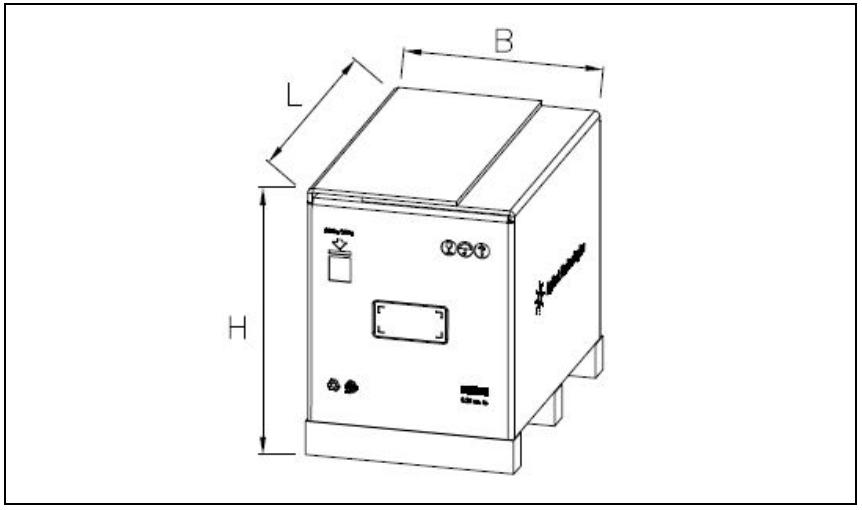


Figure 2 Pompe emballée

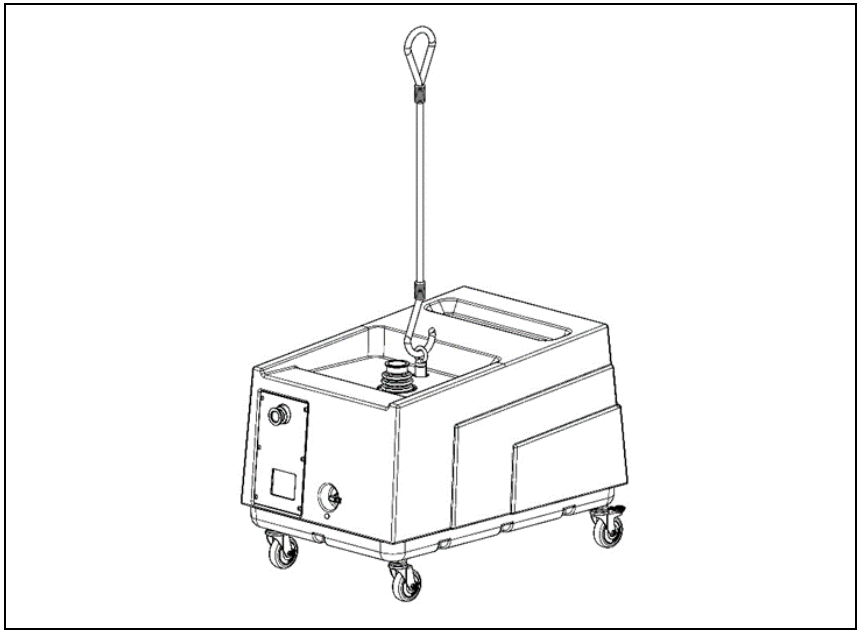


Figure 3 Pompe

Déballage

La pompe est fournie dans un emballage de protection spécial ; en cas de dommages dus au transport, contacter contacter avec le "Contact Center".

Durant l'opération de déballage, faire particulièrement attention à ne pas laisser tomber la pompe et à ne pas la soumettre à des chocs ou à des vibrations.

Ne pas abandonner l'emballage dans l'environnement. Le matériel est complètement recyclable et il est conforme à la directive CEE 85/399 pour la protection de l'environnement.

NOTE La pompe ne se détériore passimplement lorsqu'elle est exposée à l'atmosphère. On conseille toutefois de ne pas la déballer jusqu'au moment de l'installation sur le système pour éviter toute contamination éventuelle due à de la poussière.

Enlever les feuillards qui ferment le carton sur la palette puis enlever le carton.

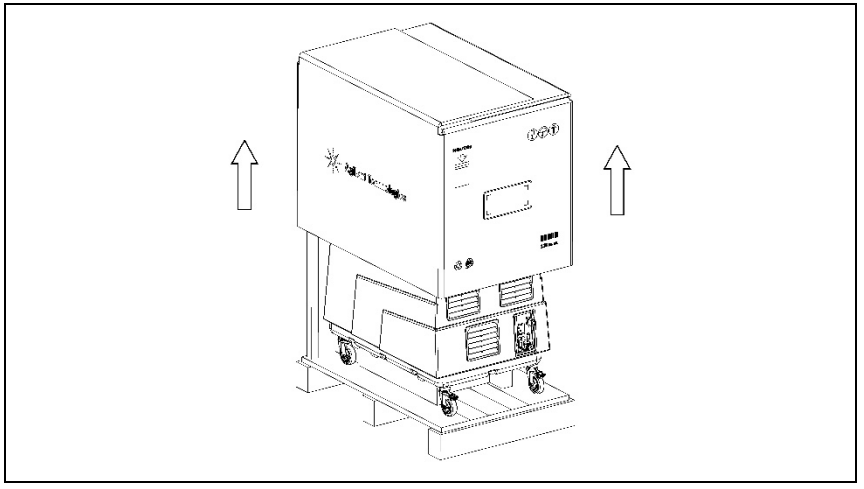


Figure 4

Extraire les 8 vis qui ferment les étriers, puis enlever ces derniers.

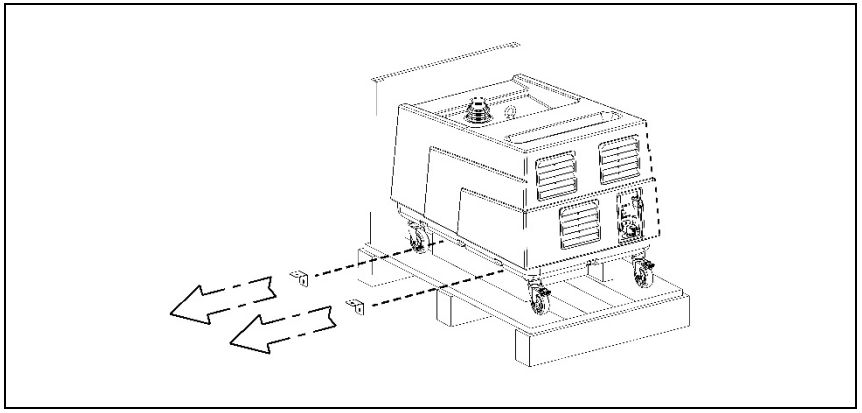


Figure 5

Débloquer les freins d'arrêt des roues.

Fixer la rampe de descente avec 1 vis d'après la figure.

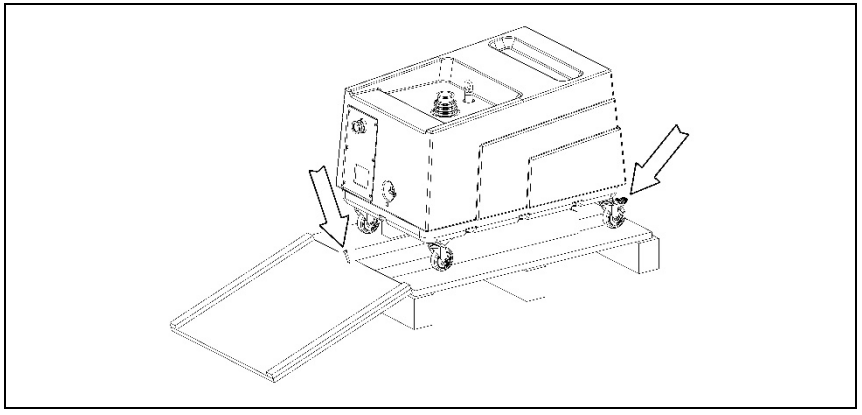


Figure 6

Pousser la pompe par l'arrière pour la faire glisser et la descendre de la palette.

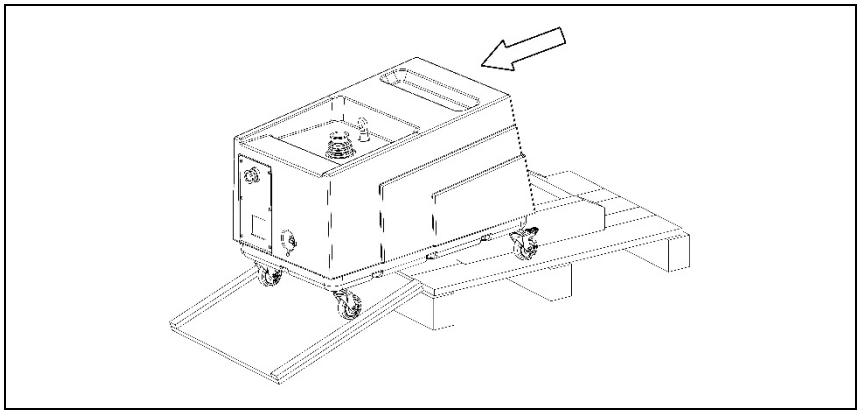


Figure 7

Préparation pour l'installation

Accessoires fournis avec la pompe

La pompe est livrée avec les accessoires suivants nécessaires pour la mise en service et l'entretien ordinaire:

- Bouteille d'huile
- Embout de remplissage d'huile
- Type de vidange de l'huile
- I/O Mating Connector
- Fusibles de rechange.

Assemblage

Enlever les bouchons sur l'aspiration et la vidange.

La pompe est fournie prête à l'emploi, sans aucune partie à assembler.

La pompe est sans huile, voir le paragraphe "Remplacement de l'huile lubrifiante" pour les instructions du remplissage en huile.

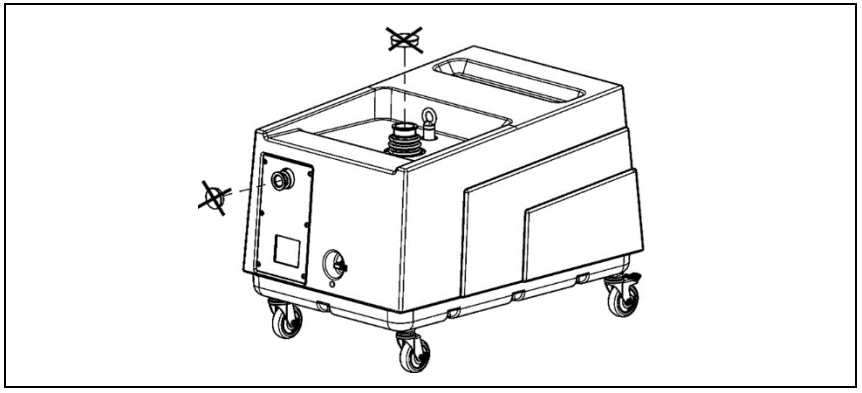


Figure 8

Positionnement

AVERTISSEMENT! **La pompe;**

- **doit être bloquée au moyen des freins situés sur les roues d'appui, sur un plan horizontal.**
- **doit être accessible pour un entretien correct et aisé en respectant les distances minimales par rapport aux encombrements éventuels (voir la figure suivante). Elle devrait également être accessible avec des moyens de levage approprié.**
- **doit être protégée contre les jets ou les éclaboussures d'eau qui risquent de provoquer des courts-circuits électriques et / ou l'électrocution des opérateurs à proximité de la machine.**

Tab. 2 Distance minimale

Cote	A	B	C	D
Dimension	150 mm	200 mm	150 mm	500 mm

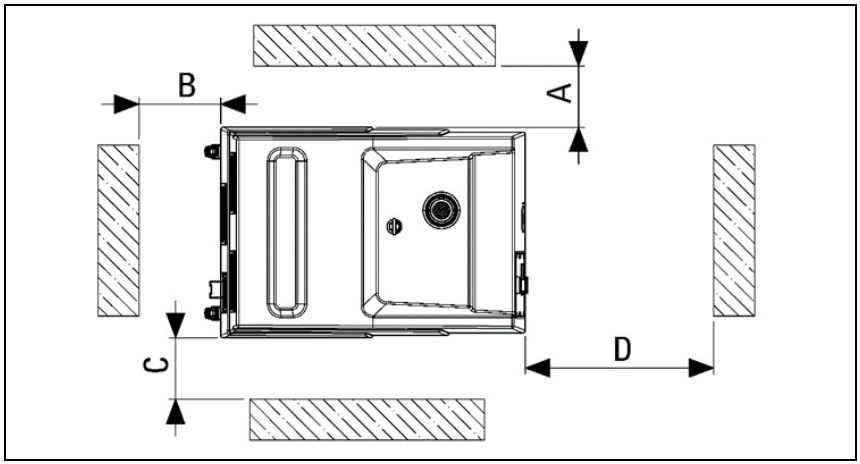


Figure 9

ATTENTION! La pompe ne pas être installée à l'extérieur et elle doit toujours être protégée contre les agents atmosphériques.

Éviter que l'air chaud provenant de l'évacuation ou des ventilateurs de refroidissement ne gênent le personnel.

Ne pas installer la pompe dans une zone où la poussière ou d'autres matériaux risquent d'engorger ou de couvrir rapidement les surfaces de refroidissement.

Raccordement à la machine utilisatrice

Le raccordement de la pompe à la chambre à évacuer doit être réalisé avec des conduites du même diamètre que la bouche d'aspiration.

Le poids des conduites et les éventuelles dilatations ne doivent pas peser sur la pompe. Réaliser le segment final de connexion au raccord d'aspiration de la pompe avec un tube / raccord flexible.

Il est important que toutes les conduites et les différents joints soient étanches.

Des conduites très longues ou de petit diamètre réduisent les performances de la pompe.

NOTE Ce symbole identifie le raccord d'aspiration.

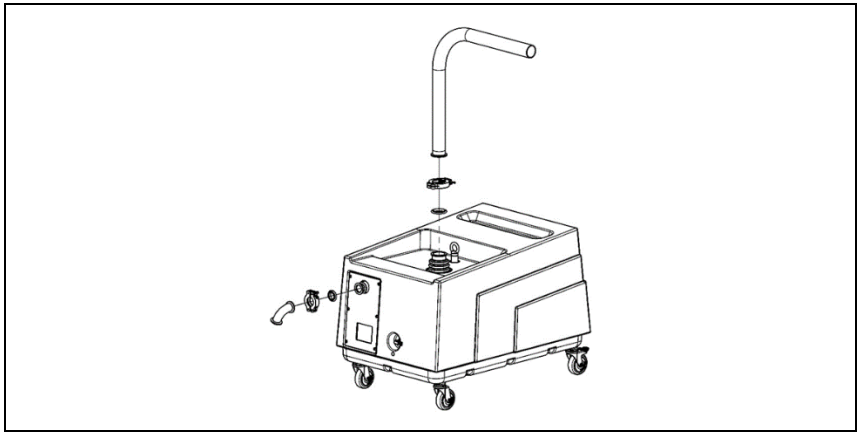


Figure 10

Acheminement de l'air d'extraction

En cas de renouvellement insuffisant de l'air dans le local de la pompe, on peut acheminer l'air d'extraction vers d'autres locaux ou à l'extérieur.

Utiliser des conduites du diamètre de la bouche d'évacuation du réservoir et d'une longueur maximale de 15 m.

Pour des longueurs supérieures, augmenter le diamètre du tube. Le poids des conduites ne doit pas peser sur la pompe.

Utiliser des raccords ou des tuyaux flexibles pour réaliser le segment final.

AVERTISSEMENT! **Cette conduite doit être inclinée pour éviter le retour de la condensation dans le réservoir de la pompe.**

ATTENTION! Ne pas installer de robinets sur cette conduite. Ne pas obstruer la sortie.

NOTE Ce symbole identifie le raccord d'évacuation.

Raccordement électrique

Vérifier la tension et la fréquence de réseau avec les données indiquées sur la plaque de la pompe.

S'assurer que le circuit de mise à la terre fonctionne.

AVERTISSEMENT! **S'assurer que l'interrupteur d'allumage et est mis sur le hors tension (0) pour éviter les démarrages indésirables de la pompe.**

Réaliser le raccordement électrique en introduisant la broche du câble d'alimentation dans la prise de la pompe et en la bloquant avec le ressort fourni (voir la figure suivante).

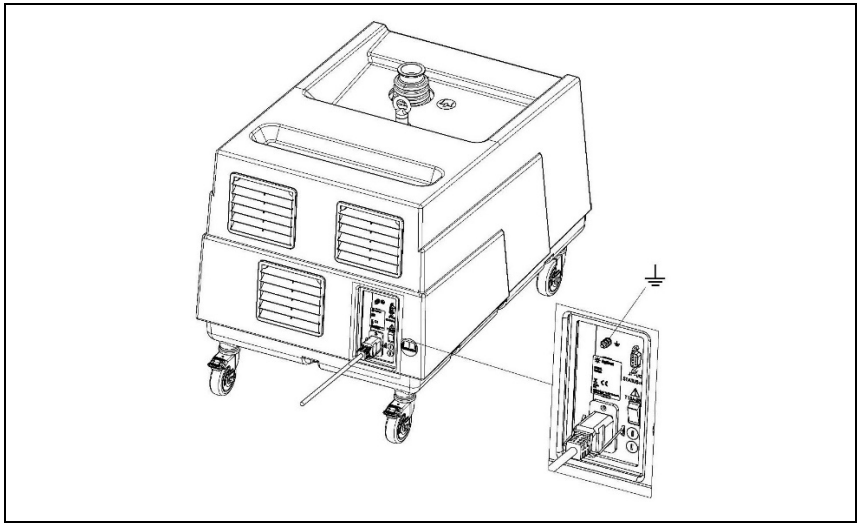


Figure 11

Utilisation

Usage prévu

Les pompes à vide décrites dans ce manuel peuvent exclusivement aspirer de l'air et de petites quantités de vapeur d'eau. L'aspiration d'autres types de gaz ou de vapeurs doit être préalablement déclarée à la société Agilent Technologies qui délivrera au besoin la conformité à l'usage spécifique.

Elles sont indiquées pour l'évacuation de systèmes fermés ou pour fonctionner avec un vide constant compris dans le champ suivant : 0,07 - 15 mbar (absolus).

La température ambiante et la température d'aspiration doivent être comprises entre 12 et 35°C.

Usage interdit

AVERTISSEMENT! **Il est interdit d'aspirer avec la pompe:**

- **des liquides ou des substances solides**
- **des gaz et des vapeurs dangereux, explosifs ou agressifs**
- **de l'oxygène pur ou des mélanges d'air enrichi d'oxygène.**

AVERTISSEMENT! **Il est interdit d'utiliser l'évacuation de la pompe pour créer des pressions même limitées.**

AVERTISSEMENT! **Il est interdit d'utiliser la pompe dans des milieux potentiellement explosifs.**

Protections

AVERTISSEMENT! **Prévoir des mesures de sécurité sur l'installation lorsque l'arrêt ou une défaillance de la pompe à vide risquent de causer des dommages corporels et matériels.**

Tableau des limites opératoires

TENSION D'ENTRÉ (V)	ÉTAT DU CONTROLLER
< 180	Défaut d'alimentation (Erreur de Sous-tension/Surtension – Win205 bit5 = 1)
180 – 200	En fonction (performances réduites)
200 – 264	En fonction (performances complètes)
> 264	Défaut d'alimentation (Erreur de Sous-tension/Surtension – Win206 bit5 = 1)

Mise en service

Ne pas installer et/ou utiliser la pompe dans des milieux exposés aux agents atmosphériques (pluie, gel, neige), aux poussières, aux gaz agressifs, dans des milieux explosifs ou présentant un risque d'incendie important.

Respecter les conditions environnementales suivantes durant le fonctionnement:

- température : de +12 °C à +35 °C
- humidité relative : 0 – 95 % (non condensante).

ATTENTION! La pompe est fournie sans huile lubrifiante ; ainsi, avant de la démarrer la pompe, faire le plein en huile.

Pour de plus amples informations relatives à l'approvisionnement en huile et au choix du lubrifiant approprié, voir le paragraphe “Remplacement de l'huile lubrifiante”.

NOTE Il est important que le niveau d'huile se stabilise entre les valeurs MIN et MAX affichées par l'indicateur de niveau situé sur le côté de la pompe.

Procéder au premier remplissage à travers le bouchon (E) jusqu'à la moitié de l'indicateur de niveau (F) et refermer le bouchon (E) (voir la figure suivante).

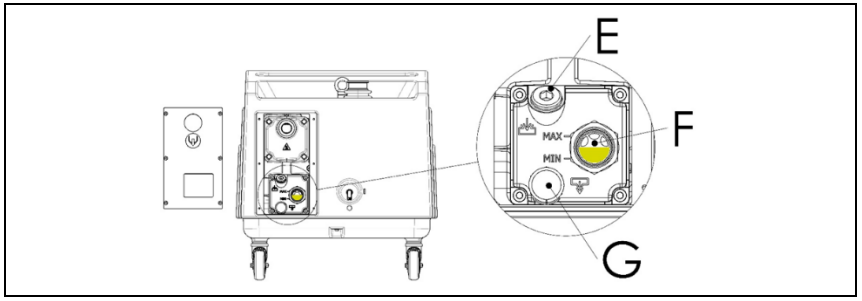


Figure 12

Allumer la pompe et l'amener au vide maximum pendant au moins 2 minutes. Arrêter la pompe, recontrôler le niveau d'huile et éventuellement faire l'appoint en rétablissant le niveau correct.

Conseils d'utilisation

À des températures inférieures à 18 °C, on conseille de chauffer la pompe pendant 15 minutes en la faisant tourner à la pression limite (aspiration fermée, sans charge).

Au cours de cette phase, la pompe pourrait ne pas atteindre les limites de pression déclarées.

AVERTISSEMENT! **La pompe n'a pas été conçue pour fonctionner à la pression atmosphérique. On conseille de ne pas dépasser 5 démarrages/heure.**

Dispositif de lest (Gas-ballast)

La pompe MS120 est équipée d'un dispositif de lest (Gas Ballast) et d'une vanne manuelle qui permet son activation (I) ou son exclusion (O).

La pression limite de la pompe varie en fonction de ce choix. Pour une utilisation correcte, voir "Aspiration de vapeur d'eau".

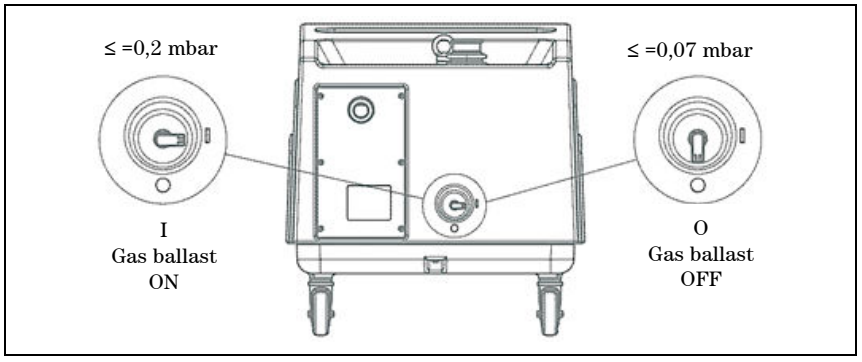


Figure 13

Aspiration de vapeur d'eau

Si l'on aspire de la vapeur d'eau, on conseil:

- d'aspirer d'abord les vapeurs, d'amener la température de la pompa à plein régime, en la faisant fonctionner pendant 30 minutes au vide maximum.
- au terme du cycle de fonctionnement, en présence de condensation dans l'huile lubrifiante, laisser fonctionner la pompe au vide maximum pendant au moins 30 minutes avec le dispositif de lest ouvert.
- effectuer cette opération avant les arrêts prolongés de la machine; le dispositif de lest permettra d'éliminer les condensations de l'huile lubrifiante.

Pour la procédure d'activation ou d'exclusion du dispositif de l'Est, consulter l'appendice “Technical Information”.

Entretien

Le personnel préposée à l'utilisation et à l'entretien de la pompe doit être bien formé et posséder une connaissance approfondie des normes de prévention des accidents.

Outre les prescriptions indiquées ci-après, consulter le paragraphe "Prescriptions de sécurité".

AVERTISSEMENT! **Avant toute intervention, introduire de l'air par le raccord d'aspiration.**

AVERTISSEMENT! **S'il faut procéder à des opérations d'entretien de la pompe au terme d'une période de fonctionnement, il faut la laisser refroidir car la température externe peut dépasser 80 °C.**

AVERTISSEMENT! **Toujours exclure l'alimentation de la pompe avant d'effectuer des opérations d'entretien. Appliquer des pancartes spécifiques d'avertissement: ENTRETIEN EN COURS SUR L'APPAREIL - NE PAS METTRE SOUS TENSION, au niveau de l'interrupteur d'alimentation. Rétablir les dispositifs de sécurité au terme de l'opération.**

Le tableau indique toutes les interventions périodiques nécessaires pour garder la pompe en parfait état de marche.

Des interventions d'entretien plus fréquentes peuvent être nécessaires selon le type d'utilisation (aspiration de vapeurs condensables ou de substances polluantes).

Dans ces cas, seule l'expérience directe peut suggérer les intervalles d'entretien corrects. L'huile usée et les pièces de rechange remplacées doivent être considérées comme des déchets spéciaux et gérées conformément à la réglementation en vigueur dans le pays d'utilisation.

Tab. 3 Interventions d'entretien

Intervalle d'entretien	Description intervention	Personnel habilité
24 heures / par jour	Contrôle du niveau d'huile avant le démarrage.	**Opérateur**
100 heures / par semaine	Nettoyer les surfaces de la pompe avec un chiffon doux. On peut éventuellement utiliser un détergent neutre.	**Opérateur**
9000 heures / par an	Remplacer l'huile lubrifiante	**Technicien qualifié**
	Remplacer l'élément déshuileur	**Technicien qualifié**
14000 heures / tous les 2 ans	Vérifier les raccordements électriques.	**Technicien qualifié**
30000 heures / tous les 5 ans	Révision pompe	**Service d'Assistance**

Remplacement de l'huile lubrifiante

L'est recommandé d'attendre 1 heure et 30 minutes après l'arrêt de la pompe pour effectuer l'opération de remplacement de l'huile de lubrifiant pour permettre à la température de la pompe et de l'huile de refroidir suffisamment.

AVERTISSEMENT! **Utiliser des gants de protection pour éviter de se brûler.**

D'après la Figure 14, dévisser le bouchon de remplissage (E) et le bouchon de vidange d'huile (G) uniquement après avoir positionné sous le réservoir un récipient indiqué (au niveau de la forme et des dimensions) afin de récupérer toute l'huile de la pompe (voir Figure 15).

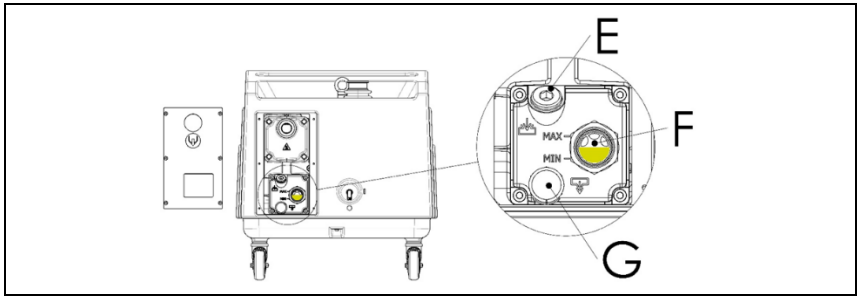


Figure 14

Lorsqu'on visse le tube de vidange d'huile (rep. A1) sur l'orifice d'évacuation (G), le lubrifiant commence à s'écouler. L'est recommandé d'incliner la pompe vers l'avant en soulevant l'arrière de la pompe d'au moins 40 mm pour garantir l'écoulement complet du lubrifiant; ne pas oublier de freiner les roues pour éviter une chute de la pompe. Quand l'huile usée contenue dans le réservoir se sera complètement écoulée, remonter les deux bouchons (“E” et “G”) et faire tourner la pompe au vide maximum pendant environ 30 secondes de manière à éliminer également du circuit de lubrification les résidus d'huile usée, puis enlever les bouchons et vidanger l'huile restante.

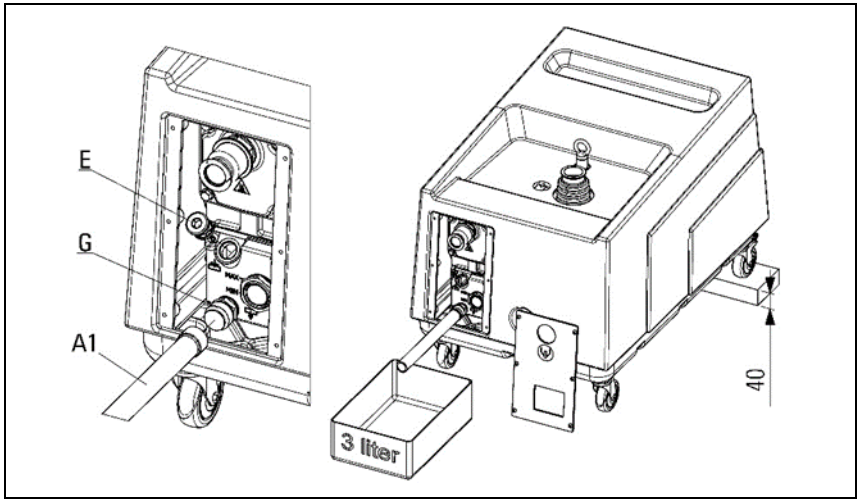


Figure 15

Si l'huile contient de grandes quantités de substances polluantes ou si l'on relève la présence d'eau, procéder à un lavage de la pompe en la faisant fonctionner au vide maximum pendant au moins 5 minutes.

Pour cette opération, utiliser une quantité d'huile suffisante pour atteindre le niveau minimum indiqué sur le réservoir.

Vidanger de nouveau l'huile.

Procéder au remplissage comme suit (voir la Figure 16):

1. Enlever le bouchon de remplissage d'huile (E).
2. Visser l'embout de remplissage d'huile (A2) sur la bouteille d'huile (A1).

3. Procéder au remplissage en insérant l'embout à l'intérieur du trou de ravitaillement en huile (voir "Mise en service" et "Lubrifiants").

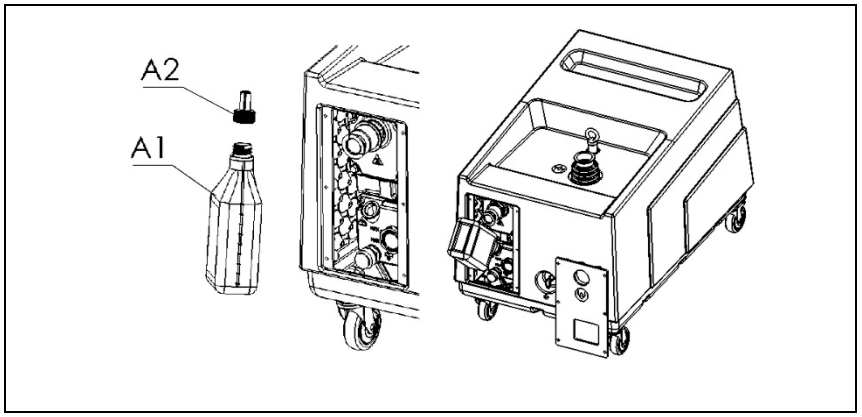


Figure 16

Remplacement des éléments déshuileurs

Des éléments déshuileurs très encrasséspeuvent provoquer une augmentation sensible de la température de la pompe et dans des cas extrêmes, une autocombustion de l'huile lubrifiante.

La pression maximale admise dans le réservoir est de 0,6 bars mesurée au débit maximum (quand l'aspiration fonctionne à la pression atmosphérique). On peut relever la pression avec un manomètre (en option), raccordé à l'orifice de remplissage en huile (Figure 14 "E"). En présence du manomètre, vérifier l'engorgement de la cartouche lorsque la pompe est chaude.

Pour le remplacement de l'élément déshuileur, voir Figure 17, et procéder comme suit:

1. enlever le couvercle du cover (rep.C1) en desserrant les vis correspondantes (C2),
2. enlever le couvercle du réservoir (rep. B1) en desserrant les vis correspondantes (rep. B2),

3. extraire et remplacer l'élément déshuileur (rep. B4) et les joints toriques correspondants (rep. B5),
4. remonter le couvercle de vidange (rep. B1),
5. au besoin, remplacer le joint (rep. B3),
6. remonter le couvercle du cover (rep. C1).

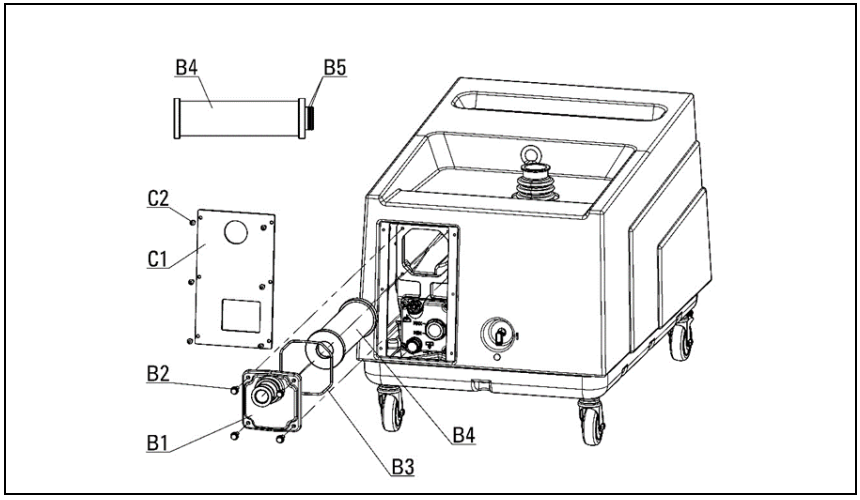


Figure 17

Entretien de routine

Les pièces de rechange nécessaires pour l'entretien de routine sont indiquées dans le tableau suivant. Utiliser exclusivement des pièces de rechange originales. Au moment de la commande, indiquer le Part Number fourni.

Tab. 4 Pièces de rechange pour l'entretien

Part Number	Description
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-68201	MS 120 Exhaust Filter Cartridge

Révision pompe

Pour cette opération, on conseille de s'adresser au Service d'Assistance de la société Agilent.

La révision consiste à démonter complètement, à nettoyer toutes les pièces et à remplacer les pièces d'usure (coussinets de la pompe, palettes et joints). Utiliser exclusivement des pièces de rechange originales. Au moment de la commande, indiquer le Part Number fourni.

Tab. 5 Pièces de rechange pour la révision de la pompe

Part Number	Description
X3702-68202	MS 120 Major Maintenance Kit

Accessoires à commander

Tab. 6 Accessoires à commander

Part Number	Description
X3702-68300	MS 120 Noise Abatement System
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-64001	Power Cord USA Plug-IEC320 15A
X3760-64006	Power Cord UE Plug-IEC320 15A
9699883	Serial cable and A-PLUS
X3702-68001	MS 120 Remote I/O Adapter Cable

Comment commander les pièces de rechange

Pour commander les pièces de rechange, toujours indiquer le modèle de la pompe (model), le numéro de série (serial), l'année de construction, le Part Number, la description et la quantité nécessaire.

Lubrifiants

Le tableau suivant indique les huiles préconisées pour un usage générique de la pompe.

Tab. 7 Lubrifiants

Température ambiante	Viscosité	Huile Agilent Technologies
12 – 35 °C	ISO 53	AVF 60 Gold

Lorsqu'on change de type de lubrifiant, il faut procéder à un lavage de la pompe en la faisant fonctionner au vide maximum pendant au moins 5 minutes.

Pour cette opération, utiliser une quantité d'huile suffisante pour atteindre le niveau minimum indiqué sur le réservoir.

Vidanger de nouveau l'huile et procéder à un nouveau remplissage.

Mise hors service

Pour la mise hors service, vidanger l'huile de la pompe avant sa manutention. Si l'huile est contaminée, procéder à un lavage avec de l'huile neuve (voir “Remplacement de l'huile lubrifiante”).

Vider le réservoir d'huile, boucher l'aspiration et vider la pompe avant le stockage.

Retour pour une réparation

NOTE Avant de renvoyer la pompe à Agilent à toute fin, un numéro d'autorisation de retour doit être délivré.
Veuillez utiliser la "Health and Safety Certification" à la fin de ce manuel d'instructions pour demander le numéro RMA auprès de votre Contact Center régional Agilent ou de votre bureau de vente.
Lors de l'expédition de la pompe, assurez-vous de le vider de l'huile et d'inclure une copie papier de la feuille H&S remplie et signée avec l'emballage.

S'il faut ettre une pompe au rebut, procéder à son élimination dans le respect des réglementations nationales spécifiques.

Problèmes et solutions

NOTE En cas de détérioration des performances, de niveau de bruit anormal ou de intervention de la protection du moteur, veuillez prendre contact avec Agilent Contact Center.

Tab. 8 Problèmes et solutions

PROBLÈMES	CAUSE	SOLUTION
Réduction des performances	Fuite au niveau des conduites d'aspiration ou sur la machine utilisatrice	Éliminer les fuites
	Manque de lubrification	Contrôler le niveau et l'état de l'huile Rétablir le niveau ou remplacer l'huile
	Tension d'alimentation trop faible (< 200 Vca)	Raccorder la pompe à un réseau électrique suffisamment puissant et utiliser un câble d'une dimension appropriée (voir paragraphe "Tableau des limites opératoires")
Brouillards d'huile à l'échappement	Éléments déshuileur inefficace	Remplacer l'élément déshuileur
	Haute température due à une huile contaminée	Remplacer l'huile
	Haute température d'exercice due à une température ambiante trop élevée	Réduire la température ambiante en assurant un meilleur renouvellement de l'air
	Élément déshuileur engorgé	Remplacer l'élément déshuileur
La pompe ne démarre pas	Tension d'alimentation hors de la gamme prévue	Raccorder la pompe à un réseau présentant une tension appropriée (voir paragraphe "Tableau des limites opératoires")

Mise au rebut

Signification du logo "WEEE" figurant sur les étiquettes.

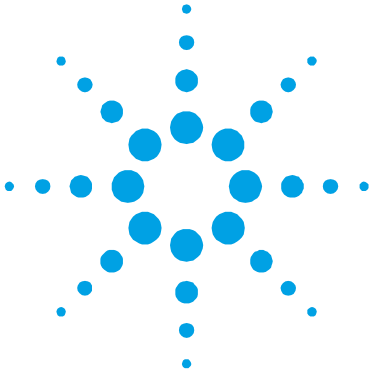
Le symbole ci-dessous est appliqué conformément à la directive CE nommée "WEEE".

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



4 Instructions for Use

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.

Do not attempt any other type of operation without having first contacted our Service Department. The information provided herewith does not intend to replace, integrate or change any rules, regulations, law by decree, directive or law of specific character in force in the Country where the installation takes place.

The suggestions given to the staff engaged in the installation and servicing assumes that the personnel is expert and prepared in facing any problem of servicing, both mechanical and electrical. For any questions or information not included in this manual, please contact our Service Department, always providing: model (Model), serial number (Serial), year of manufacture, stated on the pump name plate.

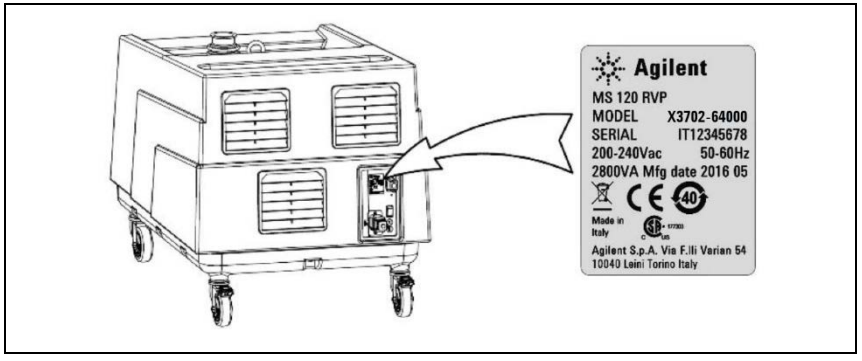


Figure 1 Plate

The MS120 Single Stage Rotary Vane Pumps are single-stage, rotary vane pumps oil sealed, driven by an electric motor controlled by an inverter. These high vacuum pumps are suitable for pumping air and small quantity of water vapor only. Pumping of other types of gas or vapors must be declared in advance to Agilent Technologies that will give the conformity to the specific use.

The flanged electric motor is coupled by means of an elastic coupling. The cooling is ensured by a powerful centrifugal fan.

At the pump inlet there is a mesh filter in order to protect it from solid parts having diameter larger than 4.7 mm. Furthermore, an integrated non-return valve prevents the oil coming back and the return of air in the chamber to be pumped down during the stop phase.

In the tank there is a system of oil vapor separation from the discharged air (maximum residual 2PPM/weight corresponding to 2.4 mg/m^3).

The separated oil is recovered automatically by the pump.

The gas ballast valves prevent condensation inside the pump when pumping down small quantity of vapor (see paragraph “Gas ballast valves”).

The following paragraphs contain all the information necessary to guarantee the safety of the operator when using the equipment. Detailed information is supplied in the appendix "Technical Information".

This manual uses the following standard protocol:

WARNING!

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

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

NOTE The notes contain important information taken from the text.

Symbols used

The following symbols are used consistently throughout in all illustration:

Symbols	Description	Symbols	Description
	Hot surfaces “Danger of burns if hot parts are touched”		Electric safety
	Harmful substances emissions		Fire hazard
	Do not dispose into the environment		Read the operating instructions
	Inlet port		Exhaust port
	The apparatus is marked with this symbol when the user has to connect a protective earth connection to the apparatus.		

Safety rules

WARNING!

Despite of all the precautions adopted when designing the equipment, there are some risk elements that arise during operation and servicing.

WARNING!

HOT SURFACES.

The pump surfaces may exceed the temperature of 80°C. Adopt the necessary safeguards to avoid burns due to chance contact..

Before carrying out any maintenance on the pump, be sure the pump is cool.

WARNING!

HARMFUL SUBSTANCES EMISSIONS

The discharged air contains part of traces of oil mist (maximum residual 2PPM/weight corresponding to 2.4 mg/m^3). Check the compatibility with the environment. Make sure a correct air change is allowed otherwise convey the pump discharge outside. A failure or the seals wear can cause an oil leakage. Avoid the dispersion to the ground and the pollution of other materials.

In case that any air containing dangerous substances must be pumped down (for example, biological or microbiological agents), make sure to adopt filtering systems before introducing air in the work environment.

CAUTION!

DO NOT DISPOSE INTO THE ENVIRONMENT

Used discharged oil from the pump must be disposed in accordance with the regulations in force in the Country of use.

WARNING!

HAZARD CAUSED BY VACUUM

Any contact with parts under vacuum can cause injuries.
Avoid any contact with the pump inlet port during the pump operation.
Introduce air in the inlet circuit before every operation cycle.

WARNING!

HAZARD CAUSED BY PRESSURE

The pump tank is pressurized.
Do not open the oil filling and discharge plugs during operation.

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!

ELECTRIC SAFETY

Some components of the electric equipment are electrically charged during operation. Any contact may cause serious injuries to persons or objects.

WARNING!

FIRE HAZARD

The use of the pump in situations unforeseen or not recommended by this manual, as well as lack of correct maintenance, may create high risks for overheating or fire. In case of a fire do not use water to extinguish but use a powder CO_2 extinguisher or other means compatible with the electrical equipment and lubricating oil.

Storage, transport and handling

Storage

The pumps must be stored or transported without oil.

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

- temperature: from -20 °C to 70 °C
- relative humidity: 0 – 95 % (non-condensing).

Lifting

The orientation of the packed components must correspond to the instructions given by the pictograms on the external covering of the packaging.

For unloading use a lifting equipment suitable for the pump weight. For lifting the packaging and the pump, refer to the following figures.

Total weight of the pack, including the pump, is max. 120 kg. Weight of the pump only is 100 kg.

Tab. 1 Packing size

Quota	L	B	H
Dimension	920 mm	610 mm	790 mm

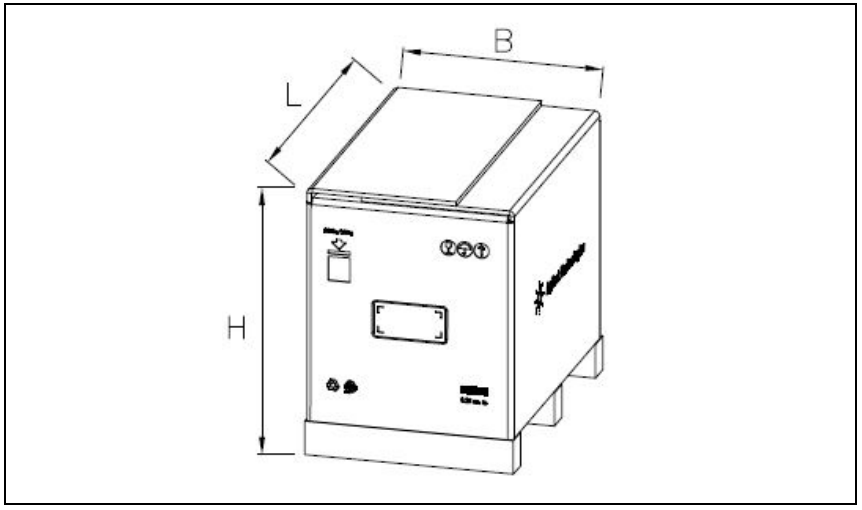


Figure 2 Pump packaged

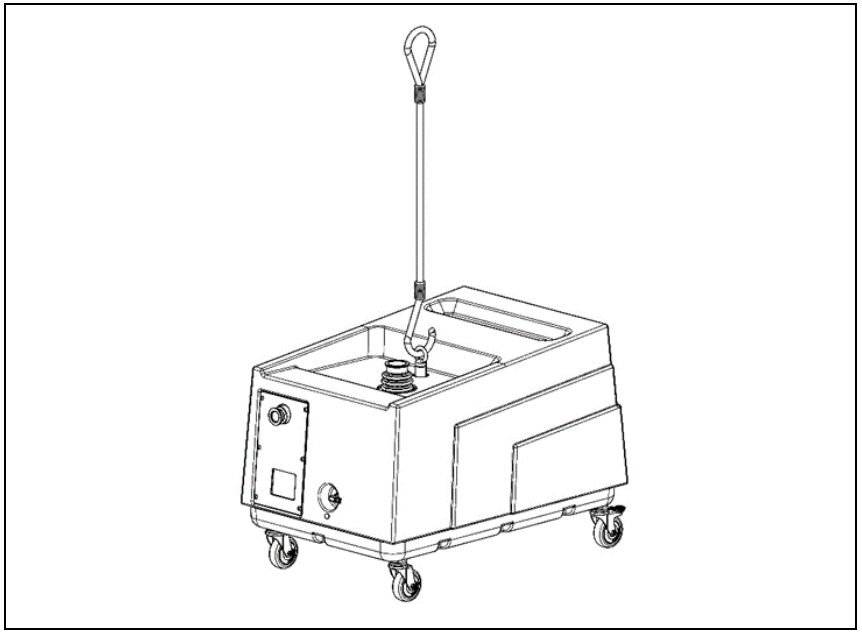


Figure 3 Pump only

Unpacking

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

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.

Remove the strips that close the carton box on the pallet. Remove the carton box.

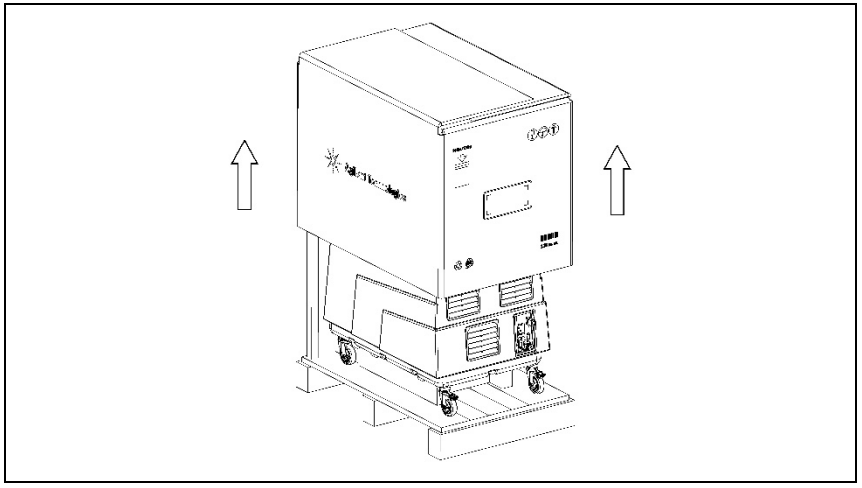


Figure 4

Remove 8 screws which close the clamps and then remove 4 clamps.

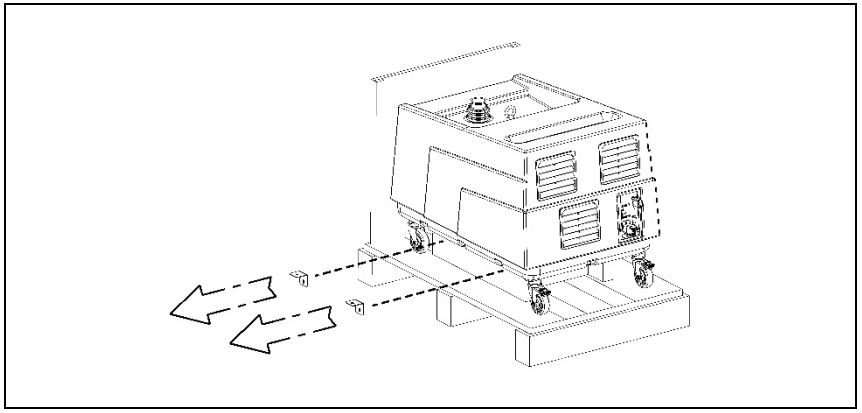


Figure 5

Unlock the brakes of the wheels.

Fasten the drop ramp with one screw as shown in the following figure.

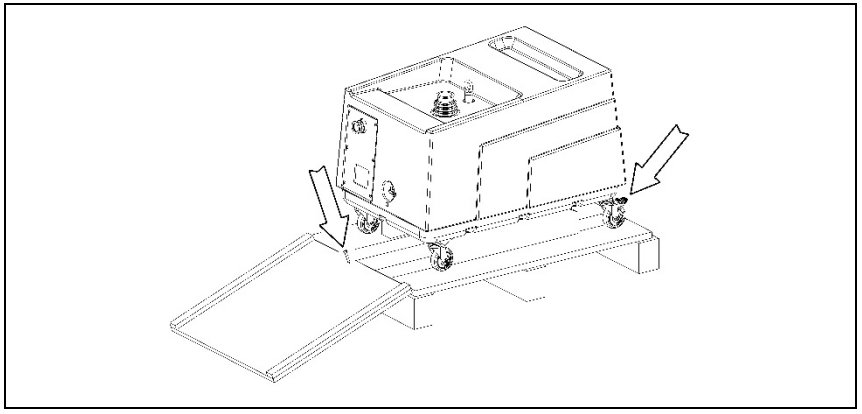


Figure 6

Push the pump behind to let it slide down from the pallet.

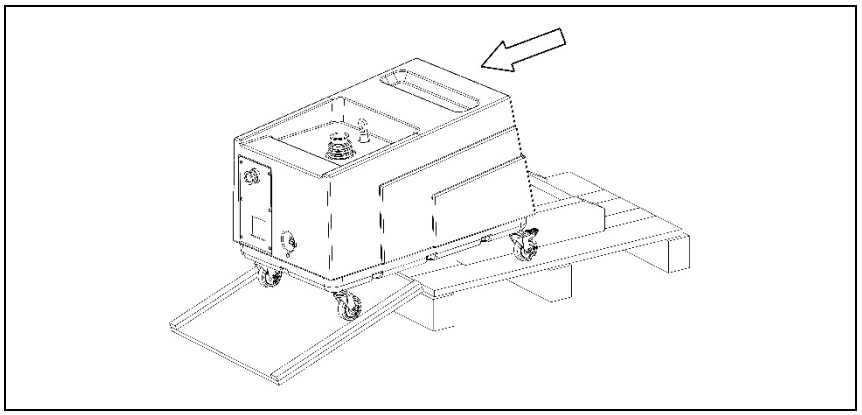


Figure 7

Preparation for Installation

Accessories supplied with the pump

The pump is delivered with the following accessories required for commissioning and maintenance:

- Oil Tank
- Nozzle cap load oil
- Oil drain pipe
- I/O Mating Connector
- Spare fuses.

Assembly

Remove inlet and exhaust plastic caps.

The pump is supplied ready for use, there are not other parts to be assembled.

Pump is without oil, see paragraph “Oil change” for the instructions on how to fill in the oil.

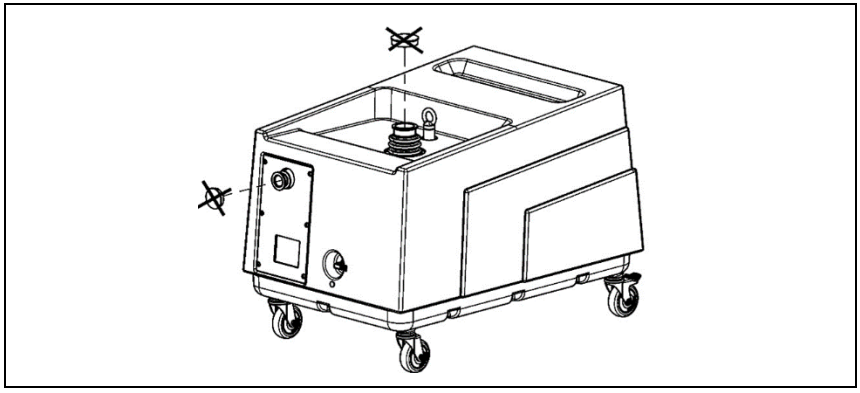


Figure 8

Location

WARNING!

The pump;

- **may be blocked from movement by engaging the brakes on the wheels, on a horizontal plane.**
- **must be accessible for correct and easy maintenance, by respecting the minimum distances from possible obstructions (see following figure). It should be accessible to suitable lifting equipment.**
- **it must be protected from jets or sprays of water which could cause electrical shorts and / or to the electrocution of operators near to the machine.**

Tab. 2 Minimum distance

Quote	A	B	C	D
Dimension	150 mm	200 mm	150 mm	500 mm

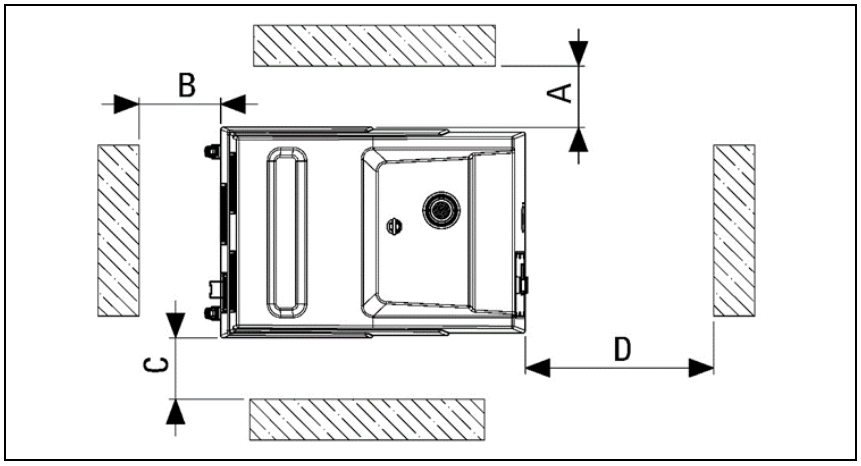


Figure 9

CAUTION! The pump must not be installed outdoors and must always be protected from the weather.

Avoid warm air coming from the exhaust or the cooling fans causing discomfort to the personnel.

Do not install the pump in a dusty area or where other materials may block or cover the cooling surfaces quickly.

Connection to the machine

The connection to the chamber to be pumped down must be carried out by means of pipes of the same diameter as the inlet port.

Pipe weights and expansions, if any, must not rest on the pump. It is advisable to make the final connection to the pump inlet port with flexible pipes or fittings.

It is important that all the pipes and the different fittings are tight.

Very long or small diameter pipes decrease the pump performances.

NOTE This symbol identifies the inlet port.

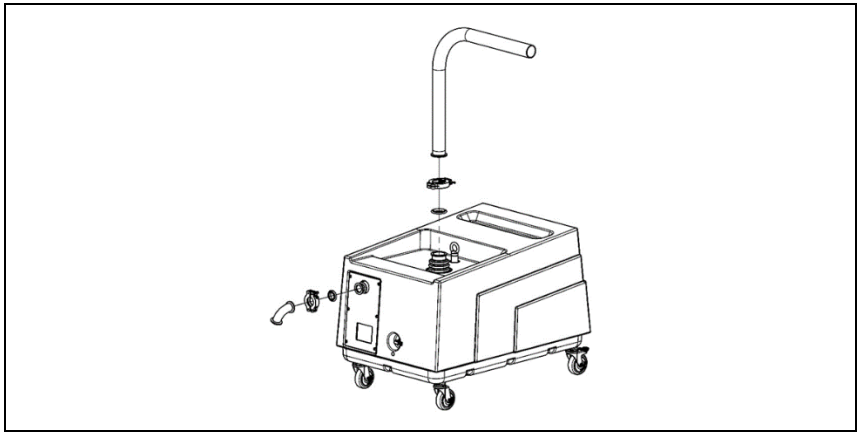


Figure 10

Discharge air pipe line installation

If the pump has been installed in a room with poor air exchange, it is possible to pipe the pump discharge air to other rooms or outside.

Use pipes with the same diameter as the tank discharge port with a maximum length of 15 m.

For longer pipes increase pipe diameter. Pipe weights must not rest on the pump.

In the final length use flexible pipes or pipe fittings.

WARNING! **This pipe must be descending, to avoid the condensate going back to the tank.**

CAUTION! Do not connect ball valves to this pipeline. Do not clog the outlet.

NOTE This symbol identifies the exhaust port.

Electrical connection

Check the main voltage and frequency in use to correspond to the data stamped on the pump name plate.

Make sure the grounding is correctly done.

WARNING! **Make sure the power switch is set to off (0) in order to avoid unintended initialization of the pump.**

Perform the electrical connection by inserting the plug of the power cord into the outlet of the pump and block it with the supplied spring (see following figure).

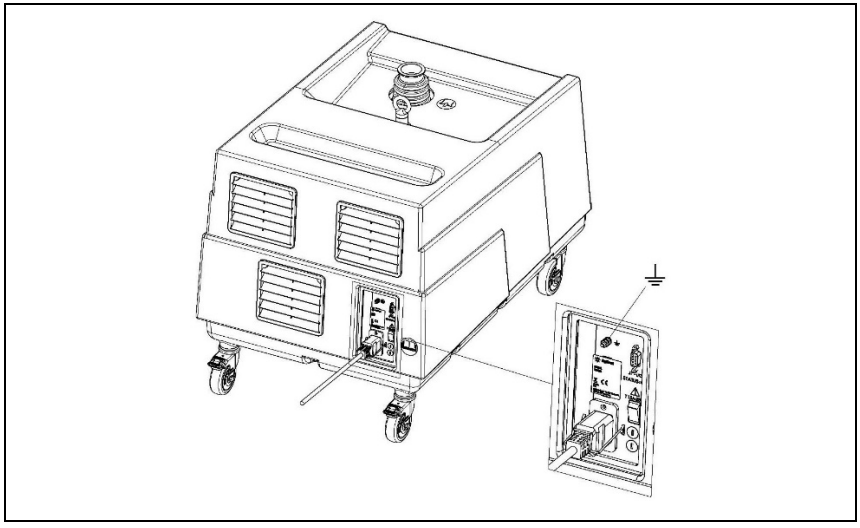


Figure 11

Use

Expected use

These vacuum pumps have been designed to handle air and small quantity of water vapor only. Handling of other types of gas or vapors must be declared in advance to Agilent Technologies that will give the conformity to the specific use.

They are suitable to evacuate closed systems or to operate at a constant vacuum within the following vacuum range: 0.07 - 15 mbar (abs.).

The ambient temperature and the inlet temperatures must be included between 12° and 35 °C.

Forbidden use

WARNING! **The pump must not handle:**

- **liquids or solid substances**
- **dangerous, explosive or aggressive gases and vapors**
- **pure oxygen or air mixtures enriched with oxygen.**

WARNING! **It is prohibited to use the discharge of the pump to create even limited pressures**

WARNING! **It is forbidden to install the pump in a potentially explosive environment.**

Protections

WARNING! **In case of applications where the pump stop or failure can cause damages to people or things, safety measures for the system must be adopted.**

Operating limits table

INPUT VOLTAGE (V)	CONTROLLER STATUS
< 180	Power fail (Undervoltage/Overvoltage Error – Win205 bit5 = 1)
180 – 200	Operative (reduced performance)
200 – 264	Operative (full performance)
> 264	Power fail (Undervoltage/Overvoltage Error – Win206 bit5 = 1)

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 +35 °C
- relative humidity: 0 – 95% (non-condensing).

CAUTION! Before starting the pump, fill up with lubricating oil as the pump is delivered empty.

Further information for the oil refurbishment and the choice of the suitable oil, refer to paragraph “Oil change”.

NOTE It is important that the oil level stays within the range MIN and MAX that is indicated by the level gauge on the side of the pump.

Carry out the first filling up through the plug (E) up to the half of the sight glass (F) and close the plug (E) (see following figure).

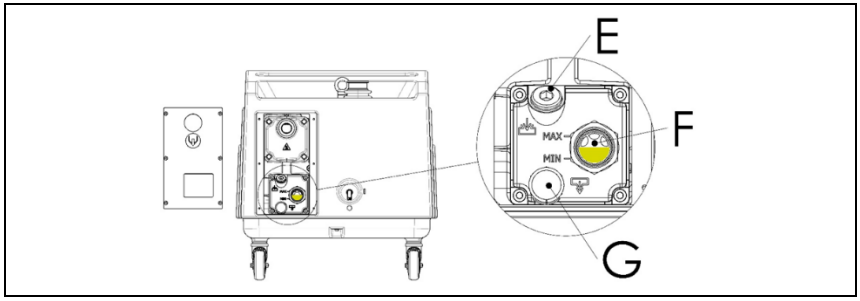


Figure 12

Start the pump and take it to the maximum vacuum level for at least 2 minutes. Stop the pump, check again the oil level and add the lacking oil, if necessary, in order to get the correct oil level.

Tips for using

When the room temperature is lower than 18°C, it is a good practice to let the pump operate at the ultimate pressure (Inlet port closed, without load) for about 15 minutes..

During this period the pump may not reach the stated pressure limits.

WARNING! **Avoid operating the pump with inlet port vented to atmospheric pressure. It is recommended not to exceed 5 pump starts per hour.**

Gas-ballast

The pumps of the MS series are equipped with gas ballast valve and with a manual valve which permits its use or its exclusion.

The limit pressure of the pump depends on this selection. For a correct use, please refer to paragraph “Water vapor suction”.

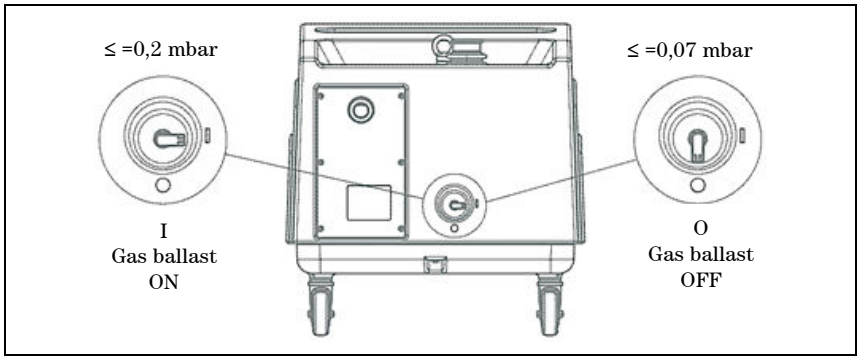


Figure 13

Water vapor intake

In order to pump down any water vapor, the following operations are recommended:

- Before introducing water vapor, let the pump run for thirty minutes at the maximum vacuum in order to bring the pump temperature to its operating value.
- At the end of the working cycle, in case of further presence of condensate in the oil, let the pump run for at least thirty minutes at the maximum vacuum with Gas-ballast open.
- It is advisable to carry out this operation before stopping the pump for a long time. The gas ballast valve will allow the elimination of water condensate from the lubricating oil.

See “Technical Information” for the insertion procedure or exclusion of the gas ballast.

Maintenance

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

In addition to the requirements listed below, please refer to the paragraph “Safety rules”.

WARNING! **Introduce air through the inlet port before every maintenance operation.**

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 80 °C.**

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.**

In order to keep the pump operating at a high efficiency level, it is mandatory to follow all periodical service points listed in the table below.

However, more frequent service operations may be necessary depending on what the pump is used for (suction of condensable vapors, suction polluting substances).

For such cases, only direct experience can indicate the correct service frequency needed. The exhausted oil and the replaced spare parts must be considered as special waste products and handled according to the local regulations in the Country of use.

Tab. 3 Service operations

Servicing frequency	Description of the operation	Authorized personnel
24 Hours/every day	Check oil level before starting.	**Operator**
100 Hours / every week	Clean with soft cloth surfaces of the pump. If necessary, you can use a neutral detergent.	**Operator**
9000 Hours / every year	Change the lubricating oil.	**Skilled Worker**
	Replace the exhaust filter.	**Skilled Worker**
14000 Hours / every 2 years	Check the electrical connections.	**Skilled Worker**
30000 Hours / every 5 years	Pump overhaul.	**Customer Service**

Oil change

It is recommended to wait a hour and a half after turning off the pump before beginning the process of changing the lubricant oil to allow the internal temperature of the pump and oil to cool sufficiently.

WARNING! **Use protective gloves to avoid injury caused by heat.**

Please refer to Figure 14, Unscrew the oil filling plug (E) and the discharge plug (G) only after having placed underneath the pump tank a suitable container suitable container (see Figure 15 proper size and shape) for collecting the total quantity of oil.

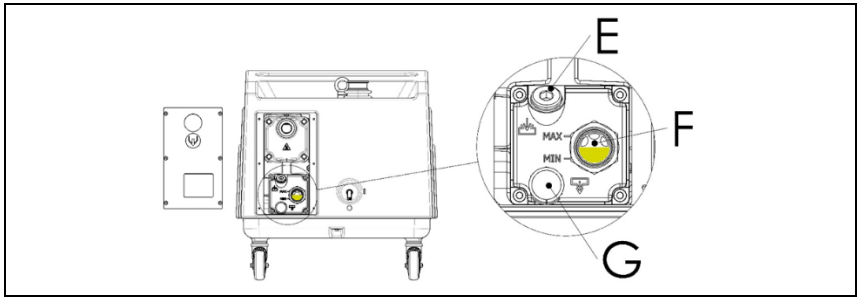


Figure 14

Screwing the oil drain pipe on the discharge (G), the lubricant will start to drain. It is recommended to tilt the pump forwards by raising the back 40 mm to ensure the complete draining of the lubricant, remember to brake the wheels to prevent the pump from falling. Once the oil in tank has completely been discharged from the tank, reassemble both plugs (“E” and “G”) and let the pump run under vacuum for about one minute, so that the lubricating line gets emptied and any oil residual keeps inside the pump. Then remove the plugs and discharge the rest of the oil.

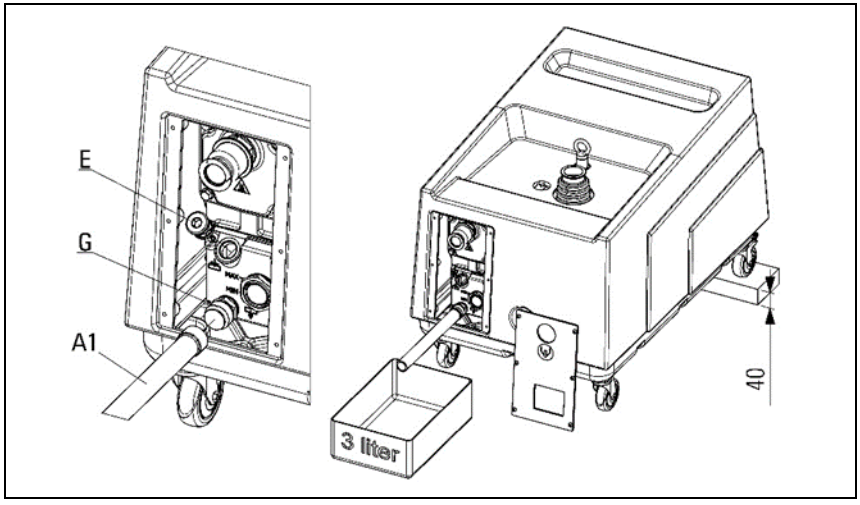


Figure 15

If the oil is polluted or if some water is in the oil, clean the pump by letting it run with a suitable quantity of oil (up to the minimum level shown on the tank) at maximum vacuum level for at least 5 minutes.

Drain the oil again.

Fill in the oil following these steps (see Figure 16):

1. Unscrew the oil charge plug (E).
2. Screw the oil nozzle cap (A2) on the oil bottle (A1).
3. Proceed with the new oil filling inserting the oil nozzle cap in the oil charge hole (see "Installation" and "Lubricants").

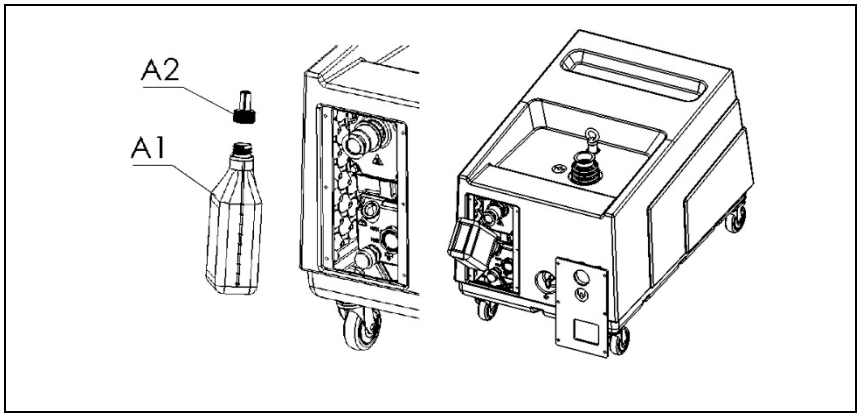


Figure 16

Exhaust filters replacement

Very dirty exhaust filters may cause a considerable pump temperature increase and in extreme cases oil lubricant spontaneous ignition.

Maximum allowed pressure in the tank is 0.6 bar measured at the maximum capacity (when the pump is working with the inlet open to atmospheric pressure). If a pressure gauge (optional) has been fitted to the oil filling hole (Figure 14) check the exhaust filter blockage with the pump warm.

For to replace the exhaust filter (see Figure 17):

1. remove the cover (pos.C1) by unscrewing its screws (C2),
2. remove the tank cover (pos. B1) unscrewing its screws (pos. B2),
3. extract and replace the exhaust filter (pos. B4) and its O Ring (pos. B5),
4. reassemble the fixing cartridge disk (pos. B1),
5. if necessary, replace the gasket (pos. B3),
6. reassemble the discharge cover (pos.C1).

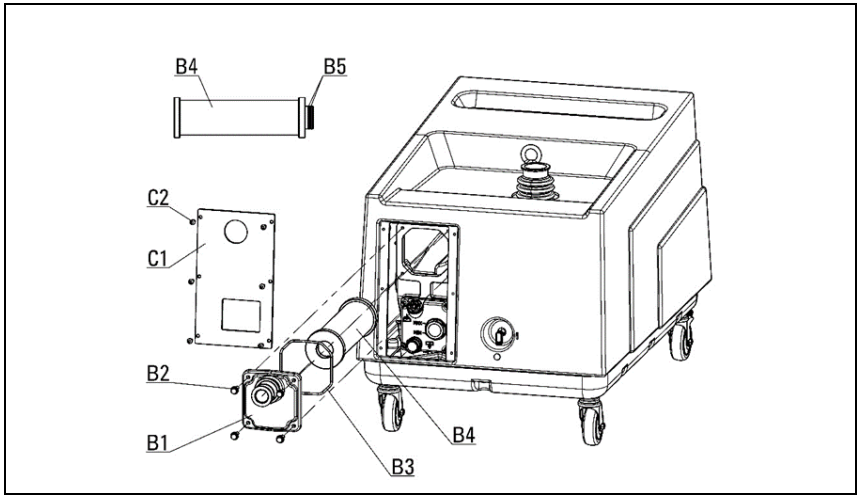


Figure 17

Ordinary maintenance

The spares necessary for the ordinary maintenance are shown in the table below. Use only genuine spare parts. When placing the order, please specify the P/N.

Tab. 4 Normal servicing Spares

Part Number	Description
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-68201	MS 120 Exhaust Filter Cartridge

Pump overhaul

This operation can be performed only by a Agilent Customer Service.

The overhaul consists of a complete disassembly, cleaning of all components as well as replacement of parts that are subject to wear (pump bushings, vanes and gaskets). Use only genuine spare parts.

When placing the order, please specify the P/N.

Tab. 5 Pump overhaul spares

Part Number	Description
X3702-68202	MS 120 Major Maintenance Kit

Accessories can be ordered

Tab. 6 Accessories can be ordered

Part Number	Description
X3702-68300	MS 120 Noise Abatement System
X3760-64005	Rotary Vane Fluid AVF 60 Gold 1lt
X3702-64001	Power Cord USA Plug-IEC320 15A
X3760-64006	Power Cord UE Plug-IEC320 15A
9699883	Serial cable and A-PLUS
X3702-68001	MS 120 Remote I/O Adapter Cable

How to order spare parts

When ordering spare parts, always state the pump model, serial number, year of production, Part number, description and quantity needed.

Lubricants

In the following table are reported the oil recommended for generic use.

Tab. 7 Lubricants

Ambient temperature	Viscosity	Agilent Technologies oil
12 – 35 °C	ISO 53	AVF 60 Gold

In case of change of the type of lubricant, it is necessary to proceed with a pump by letting it run at maximum vacuum for at least 5 minutes.

For this operation use a quantity of oil such as to reach the minimum level indicated on the tank.

Discharge again the oil and proceed with new oil charge.

Decommissioning

Drain the oil from the pump prior to the removal. If the oil is polluted, flush the pump with fresh oil (see “Oil change”).

Drain the oil from the tank, plug the inlet and the discharge ports and store the pump without oil.

Return to Agilent

NOTE

Before returning the pump to Agilent for any purposes, a return authorization number must be issued.
Please use the “Health and Safety Certification” at the end of this instruction manual to request the RMA number from your regional Agilent Contact Center or sales office.
When shipping the pump, please make sure to drain it from the oil and to include a hardcopy of the filled in and signed H&S sheet with the packaging.

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

Troubleshooting

NOTE In case of drop in performance, anomalous noise or motor protection tripping, please get in contact with Agilent Contact Center.

Tab. 8 Troubleshooting

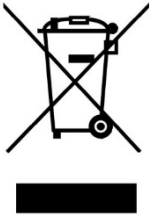
TROUBLE	CAUSE	REMEDY
Reduction in perfomances	Inlet pipes or machine are leaking	Identify leaking point and seal it
	No lubrication	Check oil level and oil conditions. Fill with oil to the right oil level or change the oil
	Supply Voltage too low (< 200 Vac)	Connect the pump to a mains with the correct voltage and use a cable with the appropriate size (see Operating limits table)
Discharge oil mist	Inefficient exhaust filters	Replace exhaust filters
	High temperature due to polluted oil	Oil change
	High operating temperature due to high ambient temperature	Decrease room temperature by allowing a better air exchange
	Blocked exhaust filters	Replace exhaust filters
Pump doesn't start	Supply Voltage out of the range	Connect the pump to a mains with the correct voltage (see Operating limits table)

Disposal

Meaning of the "WEEE" logo found in labels

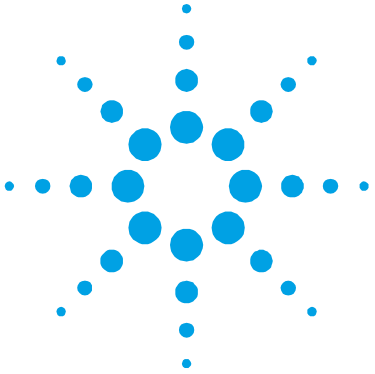
The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive. This symbol **(valid only in countries of the European Community)** indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste 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



5 Technical Information

Original Instructions

Section I

Technical Description

The MS120 Single Stage Rotary Vane Pumps are rotary vane lubricated vacuum pumps, with oil recirculation.

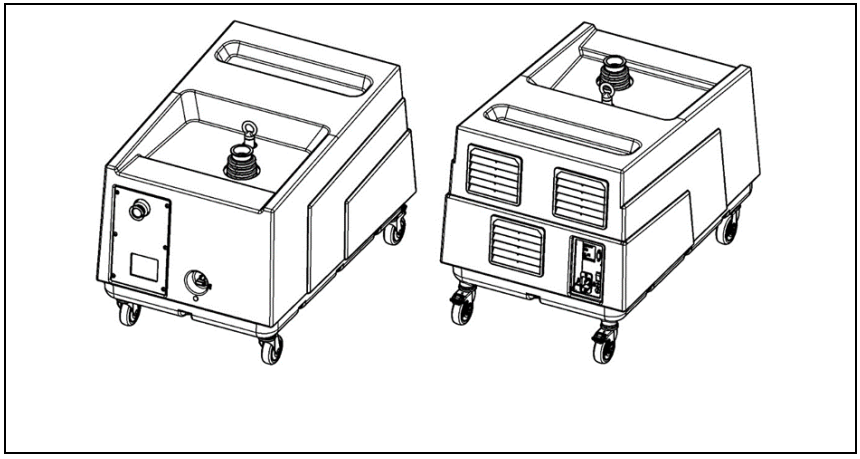


Figure 18

These vacuum pumps are suitable for pumping only air and small quantity of water vapor only. Pumping of other types of gas or vapors must be declared in advance to Agilent Technologies that will give the conformity to the specific use.

The main features are:

- all parts in direct contact with the fluid pumped are free of copper alloys;
- all materials are carefully selected to provide extended life;
- due to its design features and low number of gaskets, the pump requires little maintenance, disassembly and reassemble are easy and require minimal time.

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 anti-suckback device which automatically isolates the vacuum system when the pump stops. This avoids rises in pressure or oil flow in the vacuum system while air is allowed back into the stator chambers.

The air entering the pump after the anti-suckback device has closed prevents the oil in the casing from filling the stator chambers.

Vacuum Seals

A special feature of this pump is the low number of gaskets that are employed.

The seals in the circuit are obtained by means of FKM gaskets.

Sealing of the rotor shaft is guaranteed by a rotating gasket with dust-guard lip.

The suction flange and duct are sealed by mean of OR gaskets.

Technical Data

The following table lists the main technical data of the MS120 Single Stage Rotary Vane Pumps.

TECHNICAL DATA	UNITS	VALUE
Nominal speed* (at 1500 rpm)	m^3/h	156
	cfm	92
Effective capacity at 5 mbar abs. (3.75 Torr)	m^3/h	≥ 120
	cfm	≥ 71
Ultimate total pressure with gas ballast valve open*	mbar	≤ 0,2
	Torr	≤ 0.150
Ultimate total pressure with gas ballast valve closed*	mbar	≤ 0,07
	Torr	≤ 0.0525
Nominal Input Voltage and frequency (~1)	V	200 – 240
	Hz	50 - 60
Max input power	VA	3000
Factory Set Frequency	Hz	50 (factory setting)
Internal Mains Fuses (2x T type)	A	16
Touch current (in single fault condition following.... norm)	mA	3.0 maximum
Maximum Ambient temperature	°C	35
Sound pressure level (without gas ballast valve) According to EN ISO 2151	dB(A)	60 ±1
Water vapor tolerance	mbar	15
	Pa	1500
Water vapor pumping capacity	kg/h	1
	Lbs/h	2.2
Operating temperature range	°C	+12 to + 35
	°F	+54 to +95
Ground stud max current	Amp	15

TECHNICAL DATA	UNITS	VALUE
Inlet flange		ISO KF DN40
		ISO KF NW40
Outlet flange		ISO KF DN25
		ISO KF NW25
Main Dimensions:		
- width	mm	516
- length	mm	750
- height	mm	538
Oil capacity	l	1,8
	Gal US	0.47
Type lubricating fluid		AVF 60 Gold
Total weight	kg	100
	lbs	220
IP Value		20
Installation category		II
Pollution degree		2
Max altitude	m	2000

* *According to PNEUROP standard 6602* ** *At ultimate total pressure, 20 °C (68 °F) room temperature*

\# *Valid for temperatures up to 40°C and altitudes lower than 1000 m.*

CE marks

EN61326-1 2013 Electrical equipment for measurement control and laboratory use EMC Requirements	
Emission: EN55011 Class B; EN61000-3-2; EN61000-3-3	
Immunity Industrial Levels:	
EN61000-4-2	EN61000-4-8
EN61000-4-3	EN61000-4-11
EN61000-4-4	EN61000-4-12
EN61000-4-5	EN61010-1
EN61000-4-6	
EN61010-1, 2010 (Safety requirements for electrical equipment for measurement control laboratory use)	

Dimensions

The following figure shows the pumps layout and dimensions:

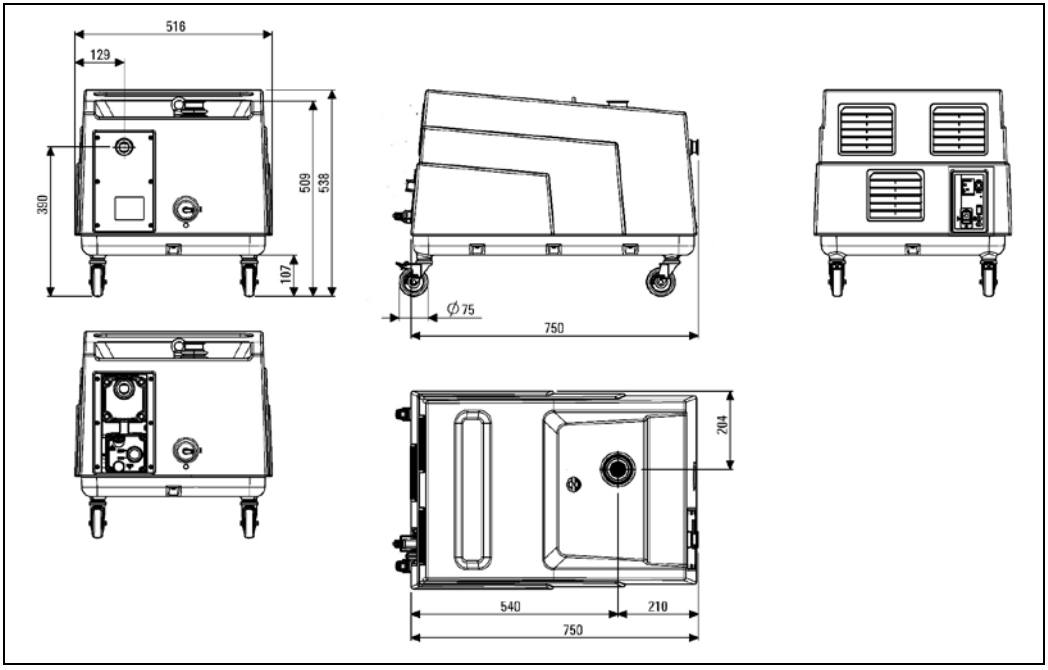


Figure 19 MS120 Single Stage Rotary Vane Pumps dimensions

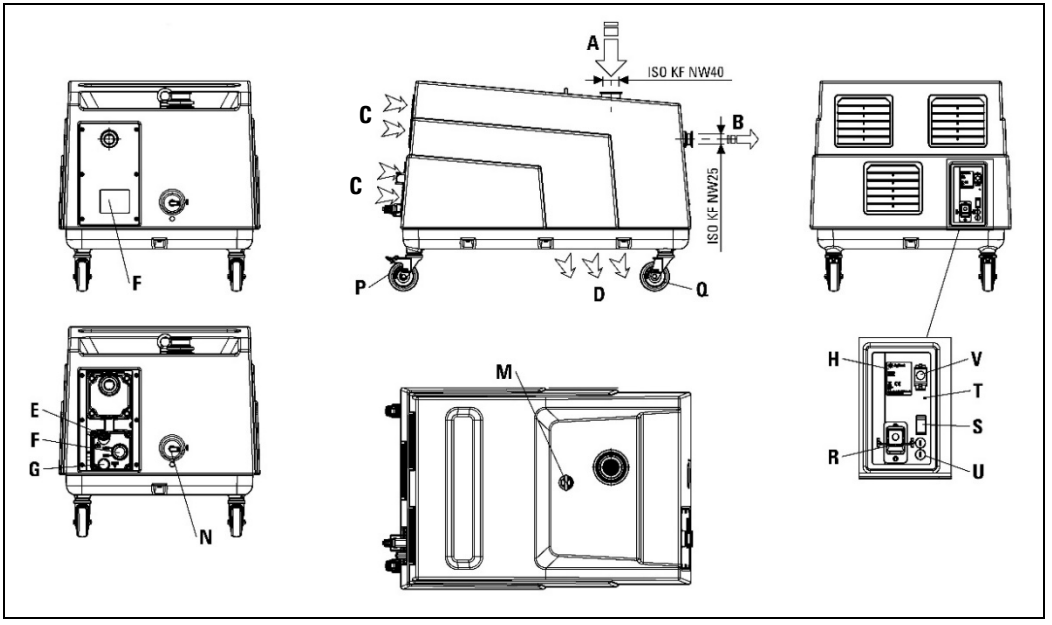


Figure 20 MS120 Single Stage Rotary Vane Pumps layout

Identification of components

Reference (Figure 20)	Component
A	Inlet
B	Exhaust
C	Cooling air inlet
D	Cooling air outlet
E	Oil filling plug
F	Oil level sight glass
G	Oil drain (with extension)
H	Pump name plate
M	Lifting eyebolt
N	Gas ballast valve (ON-OFF)
P	Swivel caster with brake
Q	Swivel caster

Reference (Figure 20)	Component
R	Mains
S	ON-OFF Switch
T	Status Led
U	Fuse
V	Serial port

Section II

Connection to the Electric Supply

CAUTION! It is recommended to connect the pump to the power supply through a dedicated safety switch on the main electrical panel of the installation, or in proximity of the power supply connection point.

WARNING! **The pump must be installed in a way that allows an easy interruption of the line voltage.**

Power supply cord: The correct cable for electrical wiring is a three wires (Ph+N+Earth) cable. The wire section has to be at least 2 mm^2 (AWG14).

Starting and Running the Pump

The pump can be operated in REMOTE mode through the Remote I/O signals or in SERIAL mode through the RS232 or RS485 Serial communication.

The defult configuration is REMOTE mode.

NOTE To allow the pump starting you have to wire properly the START pins by connecting the mating connector provided with the pump or by connecting pin 7 to pin 9 on J1 – I/O connector.

Stopping the Pump

There are no special procedures for switching the pump off; it needs only to be disconnected from the electric power by means of the bipolar switch. 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 tank is hermetically sealed.

Safety Rules

NOTE Use the Retention Spring to secure the mains cable into the IEC320 socket.

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 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 electric 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_2 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 Ensure that all joints and couplings are locked correctly before starting the pump again after repair work.

j Do not wear any objects that may become entangled in the mechanisms and/or act as conductors (chains, bracelets, etc.).

k 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.

l Do not replace the oil immediately after stopping the machine as the oil may still be at high temperature.

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 Always check the lubricant and that it is properly distributed through the pump; inadequate lubrication may damage the pump seriously.

d Give the parts some form of marking as you strip them down to ensure that you reassemble them again in the proper order.

e Check that there are no scratches or grooves on the machined shafts, in their seats inside the pump or on machine-ground surfaces. Slight scratches and abrasions may be eliminated with very fine emery paper or by a little light grinding.

f Before putting a group together, always spread a little oil over inner parts and mating surfaces. Replace all seals with original spare parts before reassembling components.

User Interface

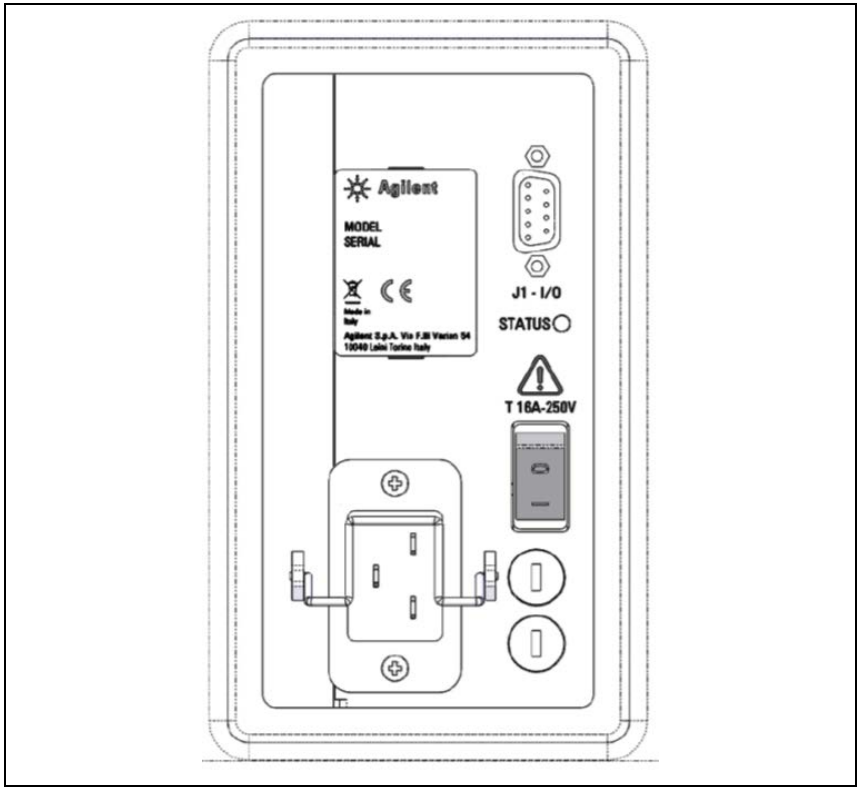


Figure 21

NOTE Use the Retention Spring to secure the mains cable into the IEC320 socket.

Input/Output Communications

J1 – I/O: Remote I/O signals + Serial communication

The connector J1 (D-SUB 9 pins Female connector type) hosts both Remote I/O signals and RS232/485 communication ports.

The RS232 communication port has standard pin out. It can be used with a standard of the shelf RS232 cable.

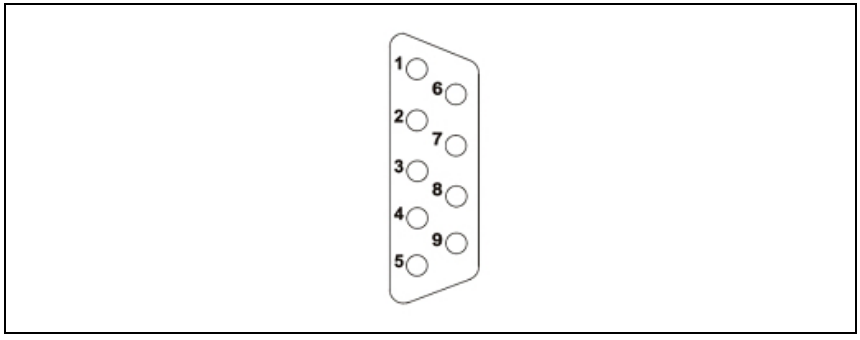


Figure 22

Pin assignment

PIN N.	SIGNAL NAME	IN / OUT
1	Status (N.O. relay contact)	out
2	TX (RS232)	
3	RX (RS232)	
4	Status (N.O. relay contact)	out
5	Ground	
6	A+ (RS485)	
7	START/STOP (Interlock in Serial Mode)	in
8	B- (RS485)	
9	+24V (50 mA max)	out

- Interlock/Status: N.O. Solid State Relay contact – It is closed as soon as the rotational frequency exceed the threshold defined with Win102 (plus histeresys defined by Win105 as % of Win102).
- START/STOP: If the inverter is managed by remote signals, it commands the pump starting. This Input is 0.24V active high. To activate the input (and starting the pump) it should be tied to 24Vdc (pin9), a non active state could be obtained either leaving the input not connected or connecting it to GND.
  More in detail:
  - Active state: *Vinput ≥ 12V or Isink >≥ 1.6 mA*
  - Non Active state: *Vinput ≤ 4V or Isink ≤ 0.1 mA*

Here below there is a typical connection of the START/STOP input to an external system output.

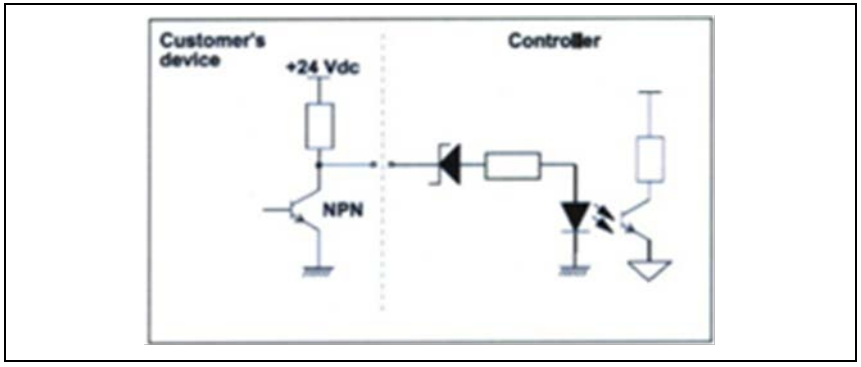


Figure 23

NOTE The pump operation is I/O signals dependent so you must always plug-in the provided mating connector to start the pump.

Serial Communication Connection Examples

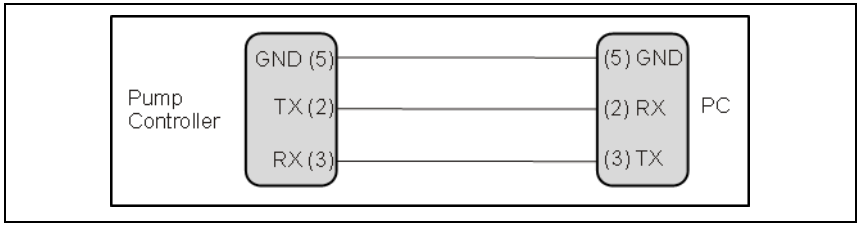


Figure 24

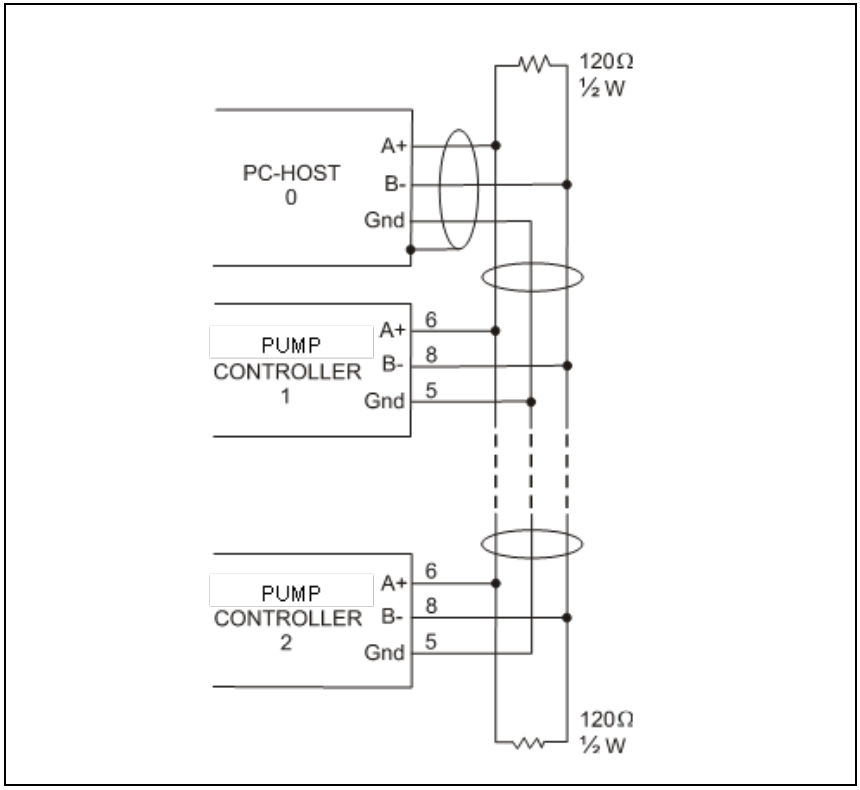


Figure 25

The communication port mating connector is supplied with the unit.

See the host computer's instruction manual for further details on serial port connections.

How to connect the I/O port to an external cable

The following picture shows the right procedure to connect a cable to the I/O port connector.

A shielded cable of 30 m maximum length has to be utilized for both serial and I/O port connection.

NOTE Take care to have a good contact (soldered) between the metallic connector case and the external shield of the cable. Moreover, this connection has to be assured at least on the controller side.

In this way, you will be sure to reduce the influence of the external noise and to accomplish the EMC requests.

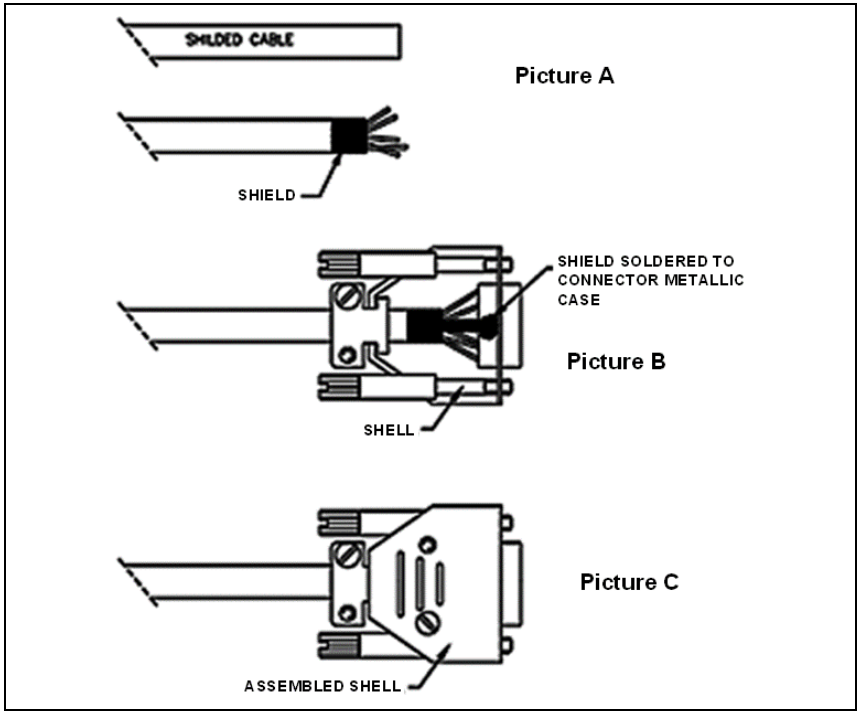


Figure 26

Serial Communication Protocol

Both RS-232 and RS-485 interfaces are available on the J1 I/O connector.

Communication Format

- 8 data bit
- no parity
- 1 stop bit

- baud rate: 600/1200/2400/4800/9600/19200/38400 programmable

Communication Protocol

The communication protocol is a MASTER/SLAVE type where:

- Host = MASTER
- Controller = SLAVE

The communication is performed in the following way:

1. the host (MASTER) send a MESSAGE + CRC to the controller (SLAVE);
2. the controller answer with an ANSWER + CRC to the host.

The MESSAGE is a string with the following format:

<STX>+<ADDR>+<WIN>+<COM>+<DATA>+<ETX>+<CRC>

Where:

NOTE When a data is indicated between two quotes ('...') it means that the indicated data is the corresponding ASCII character.

- <STX> (Start of transmission) = 0x02
- <ADDR> (Unit address) = 0x80 (for RS 232)
- <WIN> (Window) = a string of 3 numeric character indicating the window number (from '000' to '999'); for the meaning of each window see the relevant paragraph.
- <COM> (Command) = 0x30 to read the window, 0x31 to write into the window
- <DATA> = an alphanumeric ASCII string with the data to be written into the window. In case of a reading command this field is not present.
  The field length is variable according to the data type as per the following table:

Data Type	Field Length	Valid Characters
Logic (L)	1	'0' = OFF '1' = ON
Numeric (N)	6	'-', '.', '0' . . . '9' right justified with '0'
Alphanumeric (A)	10	from blank to '_' (ASCII)

- <ETX> (End of transmission) = 0x03
- <CRC> = XOR of all characters subsequent to <STX> and including the <ETX> terminator. The value is hexadecimal coded and indicated by two ASCII character.

The addressed SLAVE will respond with an ANSWER whose structure depends from the MESSAGE type. When the MESSAGE is a reading command, the SLAVE will respond transmitting a string with the same structure of the MESSAGE.

NOTE Using the RS-485 interface, the message structure remains identical to the one used for the RS-232 interface, the only difference being that the value assigned to the ADDRESS <ADDR>.

The controller can answer with the following response types:

Type	Length	Value	Description
Logic	1 byte	-	after a read instruction of a logic window
Numeric	6 bytes	-	after a read instruction of a numeric window
Alphanumeric	Variable 1÷14 bytes	-	after a read instruction of an alphanumeric window
ACK	1 byte	(0x6)	the command execution has been successfully completed
NACK	1 byte	(0x15)	the command execution has been failed
Unknown Window	1 byte	(0x32)	the specified window in the command is not a valid window
Data Type Error	1 byte	(0x33)	the data type specified in the command (Logic, Numeric or Alphanumeric) is not accorded with the specified Window

Type	Length	Value	Description
Out of Range	1 byte	(0x34)	the value expressed during a write command is out of the range value of the specified window
Win Disabled	1 byte	(0x35)	the specified window is Read Only or temporarily disabled (for example you can't write the Soft Start when the Pump is running)

Examples

Command: START
Source: PC
Destination: Pump

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

Source: Pump
Destination: PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command: STOP
Source: PC
Destination: Pump

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

Source: Pump
Destination: PC

02	80	06	03	38	35
STX	ADDR	ACK	ETX	CRC	

Command: READ PUMP STATUS
Source: PC
Destination: Pump (with address = 3)

02	83	32	30	35	30	03	38	37
STX	ADDR	WINDOW			RD	ETX	CRC	

Source: Pump (with address = 3 in stop status)
Destination: PC

02	83	32	30	35	30	30	30	30	30	30	03	38	37
STX	ADDR	WINDOW			DATA (STATUS)						ETX	CRC	

Window Meanings

The following table describes the windows available to the user.

The columns R/W indicates if the window is read-only (R) or if it can also be modified (RW).

The windows default values are shown in **bold**.

WIN	TYPE	R/W	DESCRIPTION
000	L	RW	START/STOP (1= START; **0**= STOP)
008	L	RW	REMOTE/SERIAL CONFIGURATION (**1**= Remote; 0= Serial)
102	N	RW	REMOTE I/O SET POINT VALUE [Hz] (0 – 127) **40**
105	N	RW	REMOTE I/O SET POINT HYSTERESIS [%] (0 – 100) **2**
108	N	RW	SERIAL COMMUNICATION BAUD RATE (0-6) [0=600, 1=1200, 2=2400, 3=4200, 4=9600, **5**=19200 bit/s]
120	N	RW	ROTATIONAL FREQUENCY SETTING [Hz] (40 - 60) **58**
201	N	R	3PHASE VOLTAGE [V] 3phase Voltage supplied to the motor
202	N	R	POWER [W] Electrical power supplied to the motor
203	N	R	DRIVING FREQUENCY [Hz] Reads the actual electrical driving frequency
205	N	R	STATUS (0=Stop; 1=Wait interlock; 2=Start; 3=Autotuning; 5=Normal; 6=Fail)

WIN	TYPE	R/W	DESCRIPTION
206	N	R	ERROR CODE: [*bit field*] Bit 7: Rotor locked Bit 6: Short Circuit Bit 5: Vline Under/Over Voltage Bit 4: Motor Overtemp Bit 3: Line Fault Bit 2: Controller Overtemp Bit 1: Vdc BUS Under Voltage Bit 0: Over Current
211	N	R	CONTROLLLER POWER OUTPUT HEATSINK TEMPERATURE [°C]
216	N	R	CONTROLLER TEMPERATURE [°C] Controller inlet air temperature
222	N	R	CONTROLLLER POWER SUPPLY HEATSINK TEMPERATURE [°C]
234	N	R	BUS VOLTAGE [V] Controller internal DC BUS Voltage
235	N	R	LINE VOLTAGE [V_{pk}] Supply line peak Voltage
300	N	R	CYCLE TIME [min] It indicates the time of the ongoing cycle (from the last Start) or the time of the last cycle if the pump is in Stop status
301	N	R	CYCLE NUMBER Indicates the total number of Start/Stop cycles carried by the pump
302	N	R	PUMP LIFE [h] Indicates the total hours of pump life in running condition
307	N	R	PUMP STAND-BY [h] Indicates the total hours of pump life in stand-by (pump switched-on but not in running condition)
320	A	R	PUMP MODEL NUMBER
321	A	R	PUMP SPECIAL MODEL NUMBER
322	A	R	PUMP SERIAL NUMBER
406	A	R	SW PROGRAM LISTING CODE & REVISION
407	A	R	SW PARAMETER LISTING CODE & REVISION
503	N	RW	RS485 Address [**0** - 31] It defines the RS485 serial communication address
504	L	RW	Serial communication standard [**0** = RS232; 1 = RS485]

Pump Status

The Pump Status indicates the operating status of the pump.

The possible Status are the following:

- Stop = the pump is waiting for a START command
- Ramp = the pump has been started and is increasing the rotational frequency in order to reach the target set point
- Normal Operation = the pump is running at the target frequency
- Fail = the pump is not running because has been detected an error condition. The error condition can be discovered reading the W206 value throug serial communication interface
- Autotuning = the pump rotational speed is not able to reach (or maintain) the target value due to a too high gas load.

The Pump Status can be detected by looking at the STATUS LED or reading the W205 value throug serial communication interface.

LED STATUS	CONTROLLER STATUS
Green blinking (once every 2 seconds)	Stop
Green blinking	Ramp – Autotuning
Green	Normal Operation
Red	Fail

NOTE When you switch the controller on an electronic self-test is performed, during such phase you'll see the led Orange. During this phase the pump is not able to be started.

Agilent Technologies

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.

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

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.lli Varian, 54 – 10040 Leinì (TO) – Italy

E-MAIL: 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.)

Agilent Technologies

Agilent Technologies

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:		**NORTH AMERICA:**		**PACIFIC RIM:**
Fax:	00 39 011 9979 330			
Fax Free:	00 800 345 345 00	Fax:	1 781 860 9252	Please visit our website for
Toll Free:	00 800 234 234 00	Toll Free:	800 882 7426, Option 3	individual office information
vpt-customercare@agilent.com		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.

Agilent Technologies

Vacuum Products Division
Request for Return Form

Customer information		
Company :	Contact Name:	
Address:	Tel:	Fax:
	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

☐ Non Billable ☐ Billable ➡ New PO # (hard copy must be submitted with this form): _____

☐ Exchange ☐ Repair ☐ Upgrade ☐ Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

Health and safety

The product has been exposed to the following substances:
(by selecting 'YES' you MUST complete the table to the right)

Substances (please refer to MSDS forms)

* 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	☐ YES ☐ NO				
Harmful	☐ YES ☐ NO				
Corrosive	☐ YES ☐ NO				
Reactive	☐ YES ☐ NO				
Flammable	☐ YES ☐ NO				
Explosive (*)	☐ YES ☐ NO				
Radioactive (*)	☐ YES ☐ NO				
Biological (*)	☐ YES ☐ NO				
Oxidizing	☐ YES ☐ NO				
Sensitizer	☐ YES ☐ NO				
Other dangerous substances	☐ YES ☐ NO				

Goods preparation

If you have replied YES to one of the above questions. Has the product been purged? ☐ YES ☐ NO
If yes, which cleaning agent/method:

Has the product been drained from oil? ☐ YES ☐ NOT APPLICABLE
I confirm to place this declaration on the outside of the shipping box. ☐

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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