

VP200 Vacuum Pump

For use with the Hoefer GD2000 Vacuum Gel Dryer





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Important Information – English

- If this equipment is used in a manner not specified by Hoefler, Inc. the protection provided by the equipment may be impaired.
- This instrument is designed for indoor laboratory use only.
- Only accessories and parts approved or supplied by Hoefler, Inc. may be used for operating, maintaining, and servicing this product.
- Warning! Because this instrument can develop sufficient voltage and current to produce a lethal shock, care must be exercised in its operation.
- This instrument is designed in accordance with the EN61010-1:2001 electrical safety standard. Nevertheless, it should be used only by properly trained operators. Read this entire manual before using the instrument and use only according to the instructions.
- The instrument must always be used with the earth lead of the power cord correctly grounded to earth at the mains outlet.
- Use only undamaged electrical wire and equipment specific for the voltages you will use. All equipment connected to high voltage should be in accordance with EN61010-1:2001.
- Keep the instrument as dry and clean as possible. Wipe regularly with a soft, damp cloth. Let the instrument dry completely before use.
- Do not operate the instrument in extreme humidity (above 80%). Avoid condensation by letting the unit equilibrate to ambient temperature when taking the instrument from a colder to a warmer environment.
- To permit sufficient cooling, ensure that the vents of the instrument are not covered.

Důležité Informace – Czech

- Pokud by toto zařízení je použito způsobem, který není podle Hoefler, ochrana poskytnutá na základě Inc. zařízení může být narušena.
- Tento nástroj je určen pro vnitřní použití v laboratoři pouze.
- Pouze příslušenství a části schválené, nebo poskytnutých Hoefler, Inc. mohou být použity pro provoz, údržbu, a údržbě tohoto výrobku.
- Pozor! Protože tento nástroj může vyvinout dostatečný napětí a proud, který má vyrábět a smrtící šok, péče musí být vykonávána v jeho provoz.
- Tento nástroj je určen v souladu s EN61010-1:2001 elektrické bezpečnostní normy. Přesto, že by měly být

použity pouze řádně vyškolení operátorů. Číst celé toto ruční před použitím nástroje a použití pouze v souladu s pokyny.

- Přístroj musí být vždy používají se na výkonu zemi vést šňůra správně zemněny k zemi na síti výústce.
- Využití pouze nepoškozené elektrické dráty a vybavení pro napětí budete používat. Všechna zařízení spojené s vysokým napětím by měla být v souladu s EN61010-1:2001.
- Si ponechá nástroje jako suchý a čistý jako možné. Otřete pravidelně s a měkké, vlhkým hadříkem. Necht' je nástroj nenastavený úplně před použitím.
- Nejsou provozována na nástroj v extrémní vlhkost (nad 80%). Předěšlo kondenzaci o pronájmu jednotky na okolní teplotu nechá při přijímání nástroj z chladnější do tepleho prostředí.
- Pro umožnění dostatečné chlazení, zajistit, aby otvory nástroje jsou nevztahuje.

Vigtig Information – Danish

- Hvis dette udstyr bruges i en måde ikke specificeret ved Hoefler, Inc. den beskyttelse, som er blevet forsynet af udstyret kan måske svækkes.
- Dette instrument er designet for indendørs laboratoriumbrug bare.
- Bare tilbehør og del godkendede eller forsynede ved Hoefler, Inc. kan måske bruges for drive, funktionsfejl, og betjening dette produkt.
- Advar! Fordi dette instrument kan udvikle tilstrækkelig spænding og strøm at fremstille et døbringende chok, skal pleje bruges i dets drift.
- Dette instrument er designet i overensstemmelse med EN61010-1:2001 elektrisk sikkerhedsstandard. Alligevel, skulle det bruges bare af passende trænede operatører. Læs denne hel håndbog før brugning instrumentet og brug bare i henhold til instruktionerne.
- Instrumentet skal altid bruges med jordblyet af netledningen rigtigt jordede til jord på hovedledning-sudløbet.
- Bruger bare uskadte elektrisk tråd og udstyr, som være specifikt for spændingerne du vil bruge. Alt udstyr forbundet til høj spænding skulle være i overensstemmelse med EN61010-1:2001.
- Beholder instrumentet så tørt og ren som mulig. Tør regulært med et blødt, fugtigt stof. Lad instrument-tørken komplet før brug.
- Driver ikke instrumentet i yderst fugtighed (ovenfor 80%). Undgå kondensation ved lade enheden equilibrere til omgivende temperatur ved tageen instru-

mentets fra et koldere til et varmere miljø.

- At tillade tilstrækkelig afkøling, forsikrer, at lufthullerne af instrumentet er ikke dækket.

Belangrijke Informatie – Dutch

- Indien deze uitrusting in een manier wordt gebruikt die niet door Hoefer is gespecificeerd, Nv. de bescherming die door de uitrusting is verzorgd kan worden geschaad.
- Dit instrument is voor binnenlaboratoriumgebruik enkel ontworpen.
- Enkel onderdelen en delen keurden goed of leverden door Hoefer, Nv. kan voor het bedienen worden gebruikt, handhavend en onderhouden van dit product.
- Waarschuwend! Omdat dit instrument voldoende spanning en stroom kan ontwikkelen om een dodelijke schok te produceren, moet zorg in zijn operatie worden geefend.
- Dit instrument is in overeenstemming met de EN61010-1:2001 elektrische veiligheidsstandaard ontworpen. Niettemin zou het enkel door goed getrainde bedieningslieden moeten worden gebruikt. Lees dit volledige handboek voor het gebruik het instrument en gebruik enkel volgens de instructies.
- Het instrument moet altijd met de aardeleiding van het stroomsnoer correct grondde naar aarde aan het hoofdafzetgebied worden gebruikt.
- Gebruik enkel onbeschadigde elektrische draad en uitrustings specifiek voor de spanningen u zult gebruiken. Alle uitrustingen sloten aan aan hoogspanning zou in overeenstemming met EN61010-1:2001 moeten zijn.
- Houd het instrument zo droge en schone zoals mogelijk Bij. Wis regelmatig met een zacht, temperdoek. Verhuur het instrument droogt volledig voor het gebruik.
- Bedien niet het instrument in extreme vochtigheid (bovenstaande 80%). Vermijd condensatie door het verhuur van de eenheid in evenwicht brengt naar omgevingstemperatuur wanneer nemen het instrument van een kouder naar een lievere omgeving.
- Om toe te staan voldoende afkoelen, verzeker dat de luchtopeningen van het instrument niet bedekt zijn.

Tärkeää Tietoa – Finnish

- Jos tätä varusteita käytetään tavassa ei määritetty Hoeferille, Inc. suojelu ehkäisty varusteille saattaa olla avuton.

- Tämä väline suunnitellaan sisälaboratoriokäyttöön vain.
- Vain lisävarusteet ja osat hyväksytyvät tai toimitti Hoeferin oheen, Inc.ää voi käyttää käyttämiselle, valvoalle, ja servicing tämä tuote.
- Varoittaminen! Koska tämä väline voi kehittää riittävää jännitteen ja virran tuottaa kuolettavan järkytyksen, huolta täytyy harjoittaa toiminnossaan.
- Tämä väline suunnitellaan EN61010-1:2001 sähköturvallisuusstandardin mukaisesti. Silti pitäisi käyttää vain ohi oikeasti koulutetut käyttäjät. Lue tämä kokonainen manuaalinen ennen välinettä ja käyttö vain ohjeiden mukaan.
- Välinettä täytyy käyttää aina valtanuoran maalyijystä perusti oikein maadoittaa sähköverkkoaukossa.
- Käyttää vain undamaged sähkömetallilankaa ja varusteita, täsmällinen jännitteille käyttää. Kaikki varusteet yhdistetty korkeaan jännitteeseen pitäisi olla EN61010-1:2001IN mukaisesti.
- Pitää välineen yhtä kuiva ja puhdas kuin mahdollinen. Pyyhi säännöllisesti pehmeällä, kostealla kankaalla. Anna väline kuivua täysin ennen käyttöä.
- Ei käytä välinettä extreme-ilmankestuudessa (80%)n yläpuolella. Vältä tiivistymistä antamalla yksikön equilibrate ympäröivään lämpötilaan kun ottaminen väline kylmempi lämpimämpään ympäristöön.
- Sallia riittävän jäähdyttäminen, varmistaa että välineen ilmareiät peitetään.

Information Importante – French

- Si cet équipement est utilisé dans une manière pas spécifique par Hoefer, Inc. la protection fourni par l'équipement pourrait être diminuée.
- Cet instrument est conçu pour l'usage de laboratoire intérieur seulement.
- Seulement les accessoires et les parties ont approuvé ou ont fourni par Hoefer, Inc. pourrait être utilisé pour fonctionner, maintenir, et entretenir ce produit.
- Avertissement! Parce que cet instrument peut développer la tension et le courant suffisants pour produire un choc mortel, le soin doit être exercé dans son opération.
- Cet instrument est conformément conçu à l'EN61010-1:2001 norme de sécurité électrique. Néanmoins, il devrait être seulement utilisé par les opérateurs convenablement entraînés. Lire ce manuel entier avant utiliser l'instrument et l'usage seulement selon les instructions.
- L'instrument toujours doit être utilisé avec l'avance de terre du cordon d'alimentation correctement a fondé à

la terre à la sortie principale.

- Utiliser le fil et l'équipement électriques seulement intacts spécifiques pour les tensions que vous utiliserez. Tout équipement connecté à haute tension devrait être conformément à EN61010-1:2001.
- Garder l'instrument aussi sec et propre comme possible. Essuyer régulièrement avec un doux, étouffer du tissu. Laisser l'instrument sèche complètement avant l'usage.
- Ne pas fonctionner l'instrument dans l'extrême humidité (au-dessus de 80%). Éviter la condensation en laissant l'équilibré d'unité à la température ambiante en prenant l'instrument d'un plus froid à un environnement plus chaud.
- Permettre le refroidissement suffisant, garantir que les conduits de l'instrument ne sont pas couverts.

Wichtige Informationen – German

- Wenn diese Ausrüstung gewissermaßen nicht angegeben durch Hoefel, Inc verwendet wird, kann der durch die Ausrüstung zur Verfügung gestellte Schutz verschlechtert werden.
- Dieses Instrument wird für den Innenlaborgebrauch nur dafür entworfen.
- Nur Zusätze und Teile genehmigten oder lieferten durch Hoefel, Inc kann für das Funktionieren, das Aufrechterhalten, und die Wartung dieses Produktes verwendet werden.
- Die Warnung! Weil dieses Instrument genügend Stromspannung und Strom entwickeln kann, um einen tödlichen Stoß zu erzeugen, muss Sorge in seiner Operation ausgeübt werden.
- Dieses Instrument wird in Übereinstimmung mit dem EN61010-1:2001 elektrischen Sicherheitsstandard dafür entworfen. Dennoch sollte es nur von richtig erzo-genen Maschinenbedienern verwendet werden. Lesen Sie dieses komplette Handbuch vor dem Verwenden des Instrumentes und verwenden Sie nur gemäß den Instruktionen.
- Das Instrument muss immer mit der Erdleitung der Macht-Schnur richtig niedergelegt zur Erde am Hauptausgang verwendet werden.
- Nur unbeschädigte elektrische Leitung und Ausrüstung spezifisch für die Stromspannungen verwenden, die Sie verwenden werden. Die ganze mit der Hochspannung verbundene Ausrüstung sollte in Übereinstimmung mit EN61010-1:2001 sein.
- Das Instrument ebenso trocken halten und reinigen wie möglich. Wischen Sie regelmäßig mit einem weichen, befeuchten Sie Stoff. Lassen Sie das Instru-

ment trocken völlig vor dem Gebrauch.

- Das Instrument in der äußersten Feuchtigkeit (über 80 %) nicht bedienen. Vermeiden Sie Kondensation, die Einheit equilibrate zur Umgebungstemperatur laßend, wenn Sie das Instrument von einem kälteren bis eine wärmere Umgebung nehmen.
- Um das genügend Abkühlen zu erlauben, stellen Sie sicher, dass die Öffnungen des Instrumentes nicht bedeckt werden.

Informazioni Importanti – Italiano

- Se quest'apparecchiatura è usata in un modo specificato da Hoefel, Inc. la protezione fornito dall'apparecchiatura potrebbe essere indebolita.
- Questo strumento è disegnato per l'uso di laboratorio interno solo.
- Solo gli accessori e le parti hanno approvato o hanno fornito da Hoefel, Inc. potrebbe essere usato per operare, per mantenere, e per revisionare questo prodotto.
- Avvertendo! Perché questo strumento può sviluppare il voltaggio sufficiente e la corrente di produrre una scossa letale, la cura deve essere esercitata nella sua operazione. Questo strumento è disegnato conformemente all'EN61010-1:2001 la norma di sicurezza elettrica. Tuttavia, dovrebbe essere usato degli operatori solo correttamente addestrati. Leggere questo manuale intero prima di usare lo strumento e l'uso solo secondo le istruzioni.
- Lo strumento deve essere sempre usato col piombo di terra della spina di alimentazione correttamente hanno messo a terra alla terra alla presa di corrente principale.
- Usa il filo metallico e l'apparecchiatura solo intatti elettrici specifici per i voltaggi che lei userà. Tutta l'apparecchiatura collegata all'alto voltaggio dovrebbe essere conformemente a EN61010-1:2001.
- Tiene lo strumento come secco e pulito come possibile. Pulire regolarmente con un morbido, per spegnere il panno. Lasciare lo strumento asciuga completamente prima dell'uso.
- Non opera lo strumento nell'umidità estrema (al di sopra di 80%). Evitare la condensazione lasciando l'unità equilibra alla temperatura ambiente quando portare lo strumento da un più freddo a un ambiente più caldo.
- Di permettere raffreddare sufficiente, assicura che gli sbocchi dello strumento non sono coperti.

Viktig Informasjon – Norwegian

- Hvis dette utstyret blir brukt i en måte ikke spesifisert ved Hoefer, Inc. beskyttelsen som har blitt git av utstyret kan bli svekket.
- Dette instrumentet er utformet for innendørs laboratoriumbruk bare.
- Bare tilbehør og deler godkjente eller forsynte ved Hoefer, Inc. kan bli brukt for drive, vedlikeholde, og betjene dette produktet.
- Varsler ! Fordi dette instrumentet kan utvikle tilstrekkelig spenning og strøm til å produsere et dødelig sjokk, må bli øvd bekymring i dets drift.
- Dette instrumentet er utformet i samsvar med EN61010-1:2001 elektrisk sikkerhetsstandard. Likevel burde bli brukt det bare av skikkelig utdannede operatører. Les denne hele håndboken for brukning instrumentet og bruken bare gi til instruksjonene.
- Instrumentet må alltid bli brukt med jorden blyet av kraftkabelen som riktig ha blitt jordet til jord på hovedledningen utløp.
- Bruker bare uskadd elektrisk ledningsfremføring og utstyr som er spesifikk for spenningene du vil bruke. All utstyr koplet til høyspenning burde være i samsvar med EN61010-1:2001.
- Beholder instrumentet som tørker og rengjør som mulig. Visk regulært med et mykt, fuktig stoff. La instrumentet tørker komplett før bruk.
- Driver instrumentet i ekstrem fuktighet ikke (ovenfor 80%). Unngå kondensasjon ved å la enheten equilibrere til omgivelsestemperatur ved taen instrumentets fra et kaldere til et varmere miljø.
- Til å tillate tilstrekkelig kjølig, sikrer at ventilasjon-såpningene av instrumentet er ikke dekket.

Wazne Informacje – Polish

- Jeżeli ten sprzęt jest wykorzystywany w sposób nie określone przez Hoefer, Inc. do ochrony przewidzianej przez urządzenie może zostać obniżony.
- Instrument ten jest przeznaczony do użytku w laboratoriach kryty tylko.
- Tylko akcesoriów i części zatwierdzone lub dostarczone przez Hoefer, Inc. mogą być wykorzystane do eksploatacji, utrzymania i obsługi tego produktu.
- Uwaga! Ponieważ ten akt prawny może być rozwinięcie odpowiednich napięcie i bieżących do wyprodukowania śmiertelnego szoku, opiekę musi być wykonywane w działaniu.

- Ten instrument został zaprojektowany zgodnie z tym EN61010-1: 2001 Bezpieczeństwo elektryczne standard. Niemniej jednak, należy stosować jedynie przez odpowiednio przeszkoleni operatorów. Znajdą państwo to cały podręcznika przed zastosowaniem instrumentu i stosować jedynie zgodnie z instrukcjami.
- Instrument musi zawsze być wykorzystane z ziemi doprowadzić do zasilania detonującego właściwie uzasadnione na ziemię w sieci wodociągowej rynku zbytu.
- Wykorzystanie tylko nieuszkodzona elektrycznych drutów i urządzenia specjalne do napięć zapłącą wykorzystania. Wszystkie urządzenia podłączone do wysokiego napięcia powinny być zgodne z EN61010-1: 2001.
- Kontrolować instrumentu jako suche i czyste jak to możliwe. Wytrzeć regularnie przy pomocy miękkiego wilgotnej szmatki. Niech się instrumentem całkowicie wysuszyć przed użyciem.
- Nie prowadzą do instrumentu w skrajnych wilgotności (powyżej 80%). Zapobiec kondensacji najmu przez jednostkę równoważyć do temperatury pokojowej przy podejmowaniu instrumentu z chłodniejsze w cieplejszych środowiska.
- Aby umożliwić wystarczające chłodzenia, zapewniają, że rozłączenia of the instrument nie objęte ubezpieczeniem.

Informações Importantes – Portuguese

- Se este equipamento é usado numa maneira não especificada por Hoefer, Inc. que a protecção fornecida pelo equipamento pode ser comprometida.
- Este instrumento é projectado para uso de interior de laboratório só. Só acessórios e partes aprovaram ou forneceu por Hoefer, Inc. pode ser usada para operar, manter, e servicing este produto.
- Advertindo! Porque este instrumento pode desenvolver voltagem suficiente e corrente produzir um choque letal, cuidado deve ser exercitado em sua operação.
- Este instrumento é projectado de acordo com o EN61010-1:2001 condição de segurança eléctrica. Não obstante, deve ser usado só por operadores adequadamente treinados. Leia este manual inteiro antes de usar o instrumento e use só de acordo com as instruções.
- O instrumento sempre deve ser usado com o chumbo de terra do cordão de poder corretamente baseou a

terra nos canos saída principais.

- Usa fio eléctrico só intacto e equipamento específico para as voltagens que você usará. Todo equipamento conectado a voltagem alta deve ser de acordo com EN61010-1:2001.
- Mantem o instrumento tão seco e limpo como possível. Limpe regularmente com um pano húmido macio. Deixe o instrumento secar completamente antes de uso.
- Não opera o instrumento em humidade extrema (acima de 80%). Evite condensação deixando o equilíbrio de unidade a temperatura ambiental quando tomar o instrumento de um mais frio a um ambiente mais quente.
- Permitir esfriar suficiente, assegura que as aberturas do instrumento não são cobertas.

Información Importante – Spanish

- Si este equipo es utilizado en una manera no especificado por Hoefer, S.a. la protección proporcionado por el equipo puede ser dañada.
- Este instrumento es diseñado para el uso interior del laboratorio sólo. Sólo accesorios y partes aprobaron o suministraron por Hoefer, S.a. puede ser utilizado para operar, para mantener, y para atender a este producto.
- Advertiendo! Porque este instrumento puede desarrollar voltaje y corriente suficientes para producir un golpe mortal, el cuidado debe ser ejercitado en su operación.
- Este instrumento es diseñado de acuerdo con el EN61010-1:2001 estándar eléctrico de seguridad. No obstante, debe ser utilizado sólo por operarios adecuadamente capacitados. Lea este manual entero antes de utilizar el instrumento y el uso sólo según las instrucciones.
- El instrumento siempre debe ser utilizado con el plomo de la tierra del cable de alimentación molió correctamente a la tierra en la salida de red.
- Utiliza alambre y equipo eléctricos sólo ilesos específicos para los voltajes que usted utilizará. Todo equipo conectado al voltaje alto debe ser de acuerdo con EN61010-1:2001.
- Mantiene el instrumento tan seco y limpio como posible. Enjague regularmente con un suave, el trapo húmedo. Permita que el instrumento seque completamente antes de uso.
- No opera el instrumento en la humedad extrema

(encima de 80%). Evite condensación permitiendo la unidad equilibra a la temperatura ambiente al tomar el instrumento de un más frío a un ambiente más tibio.

- Permitir refrigeración suficiente, asegure que las aberturas del

Viktig Information – Swedish

- om denna utrustning används i ett sätt som inte har specificeras av Hoefer, Inc. skyddet tillhandahöll vid utrustningen kan skadas.
- Detta instrument formges för inomhuslaboratorium användning bara.
- Bara medhjälpare och delar godkände eller levererade vid Hoefer, Inc. kan användas för fungera, underhålla, och servicing denna produkt.
- varna! Därför att detta instrument kan utveckla tillräcklig spänning och ström att producera en dödlig stöt, måste övas omsorg i dess funktion.
- Detta instrument formges i överensstämmelse med EN61010-1:2001 elektriska säkerheten standarden. Icke desto mindre, bör det användas bara av riktigt utbildade operatörer. Läs denna hela handbok före använda instrumentet och använd bara enligt undervisningarna.
- Instrumentet måste alltid användas med jorden blyet av kraften repet riktigt grounded till jorden på det huvudutloppet.
- Använder bara undamaged elektrisk tråd och utrustning specifik för spänningarna du ska använda. All utrustning kopplats som till hög spänning skulle vara i överensstämmelse med EN61010-1:2001.
- Håller instrumentet då torkar och rengör som möjlig. Torka regelbundet med en mjuk, fuktig trasa. Låt instrumentet torka fullständigt före användningen.
- Fungerar inte instrumentet i extrem fuktighet (över 80%). Undvik kondensering vid låta enheten jämbalansera till omgivande temperatur när ta instrumentet från en kallare till en varmare miljö.
- Att tillåta tillräcklig kyla, ser till att hålen av instrumentet inte täcks.

Waste Electrical and Electronic Equipment (WEEE)

English



This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.

French



Ce symbole indique que les déchets relatifs à l'équipement électrique et électronique ne doivent pas être jetés comme les ordures ménagères non-triées et doivent être collectés séparément. Contactez un représentant agréé du fabricant pour obtenir des informations sur la mise au rebut de votre équipement.

German



Dieses Symbol kennzeichnet elektrische und elektronische Geräte, die nicht mit dem gewöhnlichen, unsortierten Hausmüll entsorgt werden dürfen, sondern separat behandelt werden müssen. Bitte nehmen Sie Kontakt mit einem autorisierten Beauftragten des Herstellers auf, um Informationen hinsichtlich der Entsorgung Ihres Gerätes zu erhalten.

Italian



Questo simbolo indica che i rifiuti derivanti da apparecchiature elettriche ed elettroniche non devono essere smaltiti come rifiuti municipali indifferenziati e devono invece essere raccolti separatamente. Per informazioni relative alle modalità di smantellamento delle apparecchiature fuori uso, contattare un rappresentante autorizzato del fabbricante.

Spanish



Este símbolo indica que el equipo eléctrico y electrónico no debe tirarse con los desechos domésticos y debe tratarse por separado. Contacte con el representante local del fabricante para obtener más información sobre la forma de desechar el equipo.

Swedish



Denna symbol anger att elektriska och elektroniska utrustningar inte får avyttras som osorterat hushållsavfall och måste samlas in separat. Var god kontakta en auktoriserad tillverkarrepresentant för information angående avyttring av utrustningen.

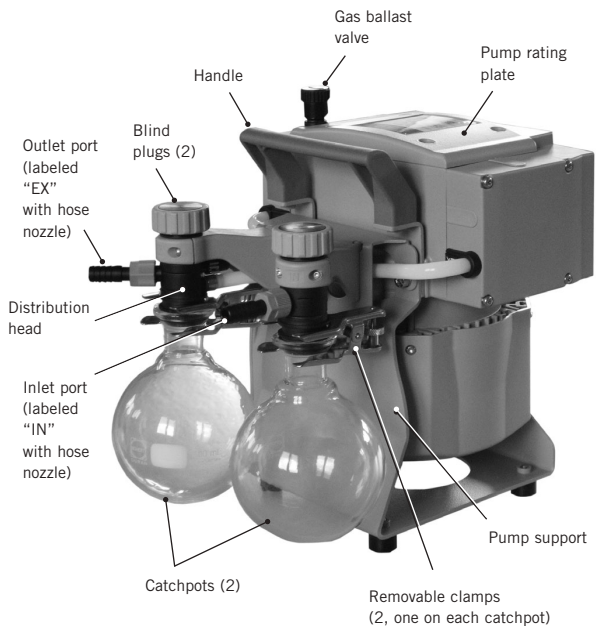
1. VP200 Vacuum Pump function and description



Important! Remove both protective port covers before turning on the pump!

The VP200 Vacuum Pump is especially well suited to dry gels on the Hoefer GD2000 Vacuum Gel Dryer—the pump is highly resistant to water vapor, acid, and gel staining solution vapors. Two catchpots capture condensate, one at the pump inlet and one at the outlet. Each catchpot is held in place by a single clamp for quick and easy removal and cleaning. The pump is robust, easy to use, and requires minimal maintenance.

Fig 1. Main components of the VP200 Vacuum Pump.



Unpacking

Unwrap all packages carefully and compare contents with the packing list, making sure all items arrived. If any part is missing, contact your local Hoefler, Inc. sales office. Inspect all components for damage that may have occurred while the unit was in transit. If any part appears damaged, contact the carrier immediately. Be sure to keep all packing material for damage claims or to use should it become necessary to return the unit.

2. Specifications

This declaration of conformity is only valid for the instrument when it is:

- used in laboratory locations.
- used as delivered from Hofer, Inc. except for alterations described in the user manual.
- connected to other CE labeled instruments or products recommended or approved by Hofer, Inc.

Max. pumping speed 50/60 Hz	2.0/2.3 m ³ /h
Max. pumping speed 60 Hz	1.2/1.4 cfm
Ultimate (total) pressure (absolute)	7/5 mbar/torr
Ultimate (total) pressure (absolute) with gas ballast	12/9 mbar/torr
Max. permitted outlet pressure (absolute)	1.1 bar
Motor power	180 W
Motor protection	overload cutout (manual reset)
Rated current draw 120 V~ 60 Hz ¹ 230 V~ 50/60 Hz ²	3.0 A 1.4/1.6 A
Degree of protection IEC 529	IP 40
Operating temperature	10–40 °C
Storage temperature	-10–60 °C
Operating relative humidity (non-condensing)	30–85%
A-weighted emission sound pressure level, uncertainty KpA, 3 dB(A)	45 dB(A)
Rated motor speed at 50/60 Hz	1500/1800 rpm
Inlet/outlet port hose nozzle tubing size	10 mm
Dimensions (w × h × d)	319 × 243 × 309 mm
Weight	13.6 kg
Product certifications	CE 89/336/EEC (EMC directive) CE 72/23/EEC (LV directive) EN-61010-1 (IEC 1010-1) UL 3101-1, C5AA22.2 1010-1)

¹Supplied voltage must be within +5, -10% of the pump rating.

²Supplied voltage must be within ±10% of the pump rating.

3. Important information



- Install the pump on a level and stable surface in an area with adequate air circulation to allow heat generated by the pump to dissipate.
- Ensure that the power supplied to the pump conforms to the specifications on the pump rating plate.
- Plug the pump into a properly grounded outlet. If plugging the pump into the gel dryer receptacle, the gel dryer must be plugged into a properly grounded outlet.

The color code for the power cord wires is: green or green yellow = earth/ground; blue or white = neutral; brown or black = live. If wires are crossed, the pump motor direction may be reversed and the system will become pressurized and may burst.

- Remove both protective port covers before turning the pump on!
- Always disconnect the power cord before servicing.
- If using the VP200 pump with instruments other than the Hofer GD2000 Gel Dryer, ensure that the vacuum pressure rating is suitable for the application and that the pumped gases are compatible with the materials listed on page 7.
- Only connect the gel dryer to the inlet port of the vacuum pump; connecting it to the outlet port will cause the system to become pressurized. (In general, ensure that the exhaust line is never blocked to prevent the system from becoming pressurized.)



- The pump body will become hot under normal pump operation. Do not touch!
- The motor may overheat at altitudes above 1000 m (3250 ft.), which causes the motor to automatically switch off.
- Observe laboratory safety procedures to prevent the release of hazardous fluids; while solvent recovery is very high with this system, the pump should be operated under ventilation conditions adequate for the substances being handled. Although not necessary, installing a cold trap between the dryer and the pump will minimize vapors released into the work area.
- Prevent condensation inside the pump by clearing the pump by running at atmospheric pressure for several minutes before turning the pump off.
- Empty the catchpots when they are approximately half full to prevent liquid from entering the pump head. Dispose of solvents in accordance with local regulations.
- The catchpots are safety coated to prevent fragment dispersion in case of breakage or implosion.
- Allow the unit to equilibrate to ambient temperature if you bring it from a cold environment into a room prior to operation.

4. Operating instructions

Setting up the GD2000 system

Connecting the VP200 vacuum pump to the Hoefer GD2000 Vacuum Gel Dryer. Use the mounted handle when moving the pump.

①

Important! Remove both red protective coverings from the inlet and outlet ports, if they are in place.

②

Attach one end of the provided vacuum tubing to the vacuum nozzle at the back of the gel dryer. Connect the other end of the tubing to the inlet port on top of the catchpots (front, right-hand side).

③

The power outlet must be grounded. Plug the power cord into the side panel of the gel dryer. When the pump is plugged into the dryer control cabinet, the vacuum timer on the dryer automatically turns the pump on and off.

④

Turn on the VP200 mains power.

⑤

Check the connections for leaks by turning on the vacuum and timer without heat, as described in the Hoefer GD2000 gel dryer manual.

Note: When replacing this tubing, only use flexible larger diameter vacuum tubing, and use the shortest possible length.



Installing a cold trap

You may install a cold trap, such as a vacuum flask in dry ice, between the gel dryer and the pump. A cold trap is not required to protect the pump, but it minimizes the amount of vapor released to the atmosphere.

1

Once the cold trap is in place, create a vacuum reservoir in the front end of the system, at the pump and cold trap. Then open the valve to the back end of the system—the dryer and gel stack—to quickly seal the rubber overlay against the heater surface.

2

Once the gel stack is properly placed according to the instructions accompanying the gel dryer, turn on the mains power switch for the gel dryer, then turn on the mains power switch on the front left part of the vacuum pump body. Watch for the seal between the clear silicone rubber overlay and the gel.

The VP200 Vacuum pump as a component in other systems

The VP200 Vacuum Pump can be used for any application in which the requirements are within the stated pump ratings (see pump specifications, page 3) and in which the pumped gases are compatible with the following materials:

Component	Wetted part
Housing cover insert	PTFE carbon reinforced
Head cover	ETFE carbon fibre reinforced
Diaphragm clamping disc	ETFE carbon fibre reinforced
Valve	FFKM
Diaphragm	PTFE
Inlet/outlet	PTFE carbon reinforced
Hose	PTFE
Fitting	ETFE/ECTFE

Abbreviations

ETFE:	Ethylene/Tetrafluoroethylene
PTFE:	Polytetrafluoroethylene
FFKM:	Perfluoro elastomer
ECTFE:	Ethylene/Chlorotrifluoroethylene

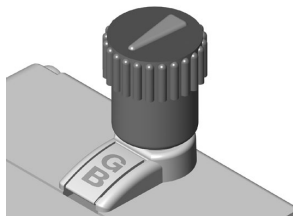


Fig 2. Gas ballast valve in the open position when cap is pointing towards the labelling “GB”.

Note: The pump’s capability to pull a vacuum is reduced with the valve open. Also, opening the gas ballast valve decreases the solvent recovery rate.

Use of gas ballast and handling condensible vapors

Operate the pump with the gas ballast valve open if conditions are such that the pumped vapors are likely to condense. Allow the pump to reach its operating temperature by turning it on approximately 15 min. before introducing the condensible vapor.

Do not introduce any gas through the gas ballast valve that could create an explosive mixture. Inert gases are a good choice. Continue to run the pump at atmospheric pressure after isolating the pump from the condensible vapors to purge the pump before turning it off.

Note: The pump's residual leak rate is extremely low, but an exchange of gas between the environment and the vacuum system may occur.

If you will be evacuating a system containing hazardous vapors:

- Adopt suitable measures to prevent the release of dangerous, explosive, corrosive or polluting fluids from the pump outlet. Always install the catchpots at the outlet port and if required, install a suitable treatment system. Observe applicable regulations when disposing of chemicals.
- Take adequate precautions to protect yourself and others from hazardous substances (e.g. wear protective clothing and work under adequate ventilation).
- Pumped gases or condensate may be released when the gas ballast valve is open.
- Adopt suitable measures to prevent the formation of explosive fluids or explosive or flammable mixtures, e.g. control the air gas ballast, leaks, and compression.
- Avoid the formation of explosive mixtures in the housing. If the diaphragm should crack, mechanically generated sparks, hot surfaces or static electricity may ignite such mixtures. Use inert gas for venting the diaphragm pump if necessary.
- When using an inert gas, avoid overpressure of more than 0.2 bar.
- The pressure differential between the inlet and outlet ports must not exceed 1 bar. Attempting to start the motor at higher pressure differentials may result in blockage or damage to the motor.
- If a valve is installed to isolate the exhaust end of the system, make sure that the pump cannot be operated with the valve closed. A closed valve will cause the system to pressurize and possibly burst.
- The pump will not reach maximum vacuum until it has run approximately 15 minutes to warm up. If maximum pressure is required immediately upon connecting the pump to the system, install a suitable in-line valve upstream from the inlet port. A valve placed here is also useful for isolating the pump to clear it before shutting it off.
- Pumping at high inlet pressure may lead to overpressure at the gas ballast valve due to the high compression ratio of the pump.
- Construct the system so that pump failure (e.g. during a power failure) will not create a hazardous situation.

5. Troubleshooting

Problem	Solution
Pump fails to start or suddenly stops	<p>Check that the power cord is completely plugged into a working power outlet.</p> <hr/> <p>When the pump motor overheats, a thermal cutoff switch stops the motor. If this occurs, check that the mains power switch is in the off position, wait for the pump to cool, and correct the cause for overheating (e.g. constricted tubing). To restart the motor, switch the mains power switch to on. In case of supply voltage below 100 V, the lock of the cutout might be restricted and the pump might restart on its own after sufficient cooling down.</p> <hr/> <p>Clear any blockage at the outlet end of the system.</p> <hr/> <p>If the pump seizes, call your local Hoefer, Inc. sales office.</p>
Pump does not achieve rated pressure or normal pumping speed	<p>Close the gas ballast valve (arrow pointing up or down instead of right). Check the vacuum strength with a vacuum gauge installed at the pump inlet port. If the pressure is outside the rating, check all lines and connections for leaks.</p> <hr/> <p>Vacuum tubing should be as short as possible.</p> <hr/> <p>Use the recommended 8 (or up to 10) mm i.d. heavy walled vacuum tubing. Thinner walled or smaller i.d. tubing may not withstand the vacuum pressure without collapsing.</p> <hr/> <p>Clear excess condensate from the system by running the pump at atmospheric pressure (not connected to a load) for several minutes.</p> <hr/> <p>Replace worn diaphragms or valves (see “Servicing diaphragms and valves” page 12).</p>
Pump too noisy	<p>Check if the diaphragm clamping disc is loose (see “Servicing diaphragms and valves” page 12).</p> <hr/> <p>If the pump is operated under conditions of high inlet pressure, the resulting sound of pumped gas can be dampened considerably by connecting a hose to the pump outlet nozzle and conducting the hose to a more remote area such as under a fume hood.</p>

6. Care and maintenance

All bearings are sealed and filled with non-wearing lubricant. Under normal operating conditions, these components require no maintenance. Serviceable parts include the catchpots, diaphragms, and valves. Their care is described below.

Adjusting the gas ballast valve

When the gas ballast valve is in the open position (Fig 2, page 7), a small amount of air enters the system through a pinhole at the bottom of the white fitting, which reduces the vacuum.

Open the gas ballast valve to help clear the system of condensate, and close the valve to increase the strength of the vacuum.

Cleaning the catchpots

Condensed vapor in the pump system collects in the catchpots.

1

Turn the mains power off and allow the system to reach atmospheric pressure (open the gas ballast valve for quick pressure bleed-off).

2

Supporting the catchpot to be released, slide the clamp holding the catchpot off of the support flange.

3

Dispose of the condensate according to local disposal regulations.

4

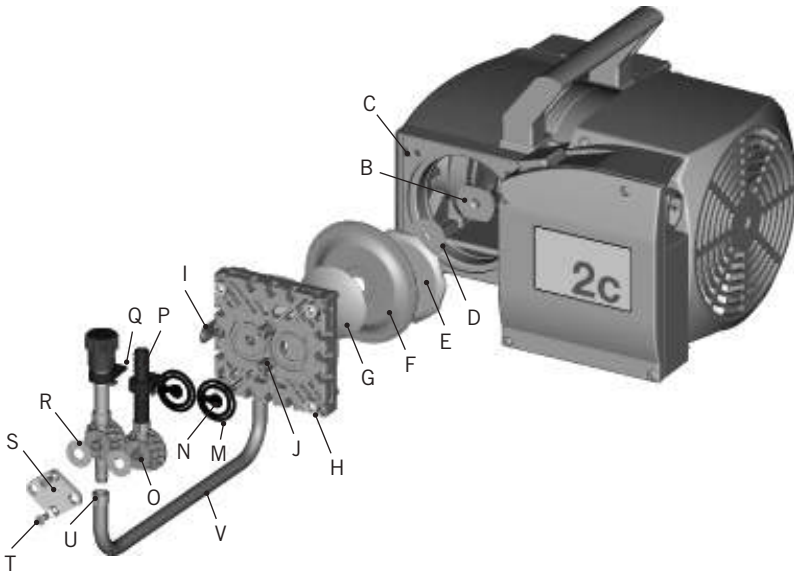
Replace the catchpots and secure with the clamp.

5

If required, repeat steps 1–4 for the second catchpots.



Important! Empty the catchpots as required, when about half full, to prevent condensates from entering the pump head. Condensates flascan damage internal parts.



Pump head components

- | | |
|---|--|
| A. Head alignment pin/mark (not shown) | K. Square nut (not shown) |
| B. Connecting rod | L. Fillister head screw (not shown) |
| C. Housing | M. O-ring |
| D. Washer | N. Valve |
| E. Diaphragm support disc | O. Valve head |
| F. Diaphragm | P. Hose nozzle |
| G. Diaphragm clamping disc with square head screw | Q. Connection fastener with hinged cover |
| H. Allen screw | R. Disc spring |
| I. Cap | S. Clamping bracket |
| J. Head cover | T. Countersunk screw |
| | U. Hose clip |
| | V. Connection tube |

Servicing diaphragms and valves

Note: Under normal wear, diaphragms and valves should perform satisfactorily for a minimum of 10,000 operating hours. If your pump is put to heavy use, or if internal parts are regularly exposed to corrosive gases or vapors, a regular maintenance program is recommended to prolong the life of the pump.

Note: If the pump head is potentially contaminated with condensates of process chemicals, take proper precautions to protect yourself from chemical exposure, and decontaminate the pump as required.

If your pump no longer achieves the rated vacuum, possible causes include an accumulation of condensates inside the pump head or damage to sealing parts. Each of the three sections of the pump head must be disassembled, cleaned, and inspected for damage. Two diaphragms and four valves are the only customer serviceable parts in the pump head.

Service only one side of the pump at a time to avoid mixing of parts.

Disassembly:

①

Turn the mains power off and allow the system to reach atmospheric pressure (adjust the gas ballast valve for quick pressure bleed-off). Disconnect the pump from any device for which it was drawing a vacuum and unplug the power cord.

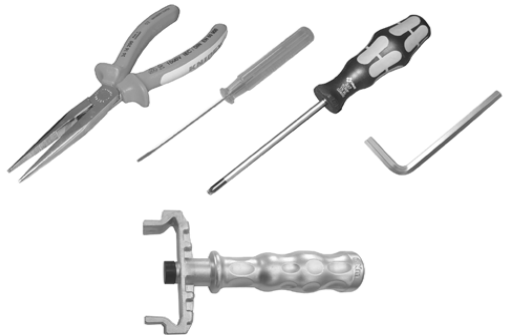
②

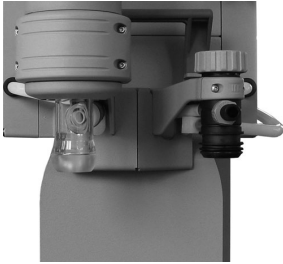
The following (metric) tools are required:

- Torx driver T20
- 5 mm wide Allen key
- 2.5 mm wide slotted screwdriver
- Flat pliers
- Diaphragm key width 66 mm



Important! Do not use a pointed or sharp edged tool such as a screwdriver to pry off the cover. It could damage internal parts.





Step 3

Pump on pump support:

3

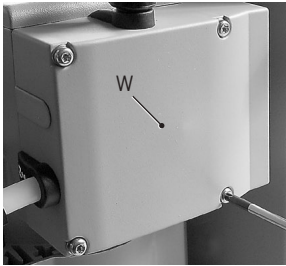
Remove catchpots at inlet and outlet.

4

Remove the 4 screws affixing the head cover cowling (W) with a Torx driver T20. Pay attention to the washers under the screws and remove.

5

Pull off head cover cowling (W) carefully. Do not tilt.



Step 4

Pump at pump support:

6

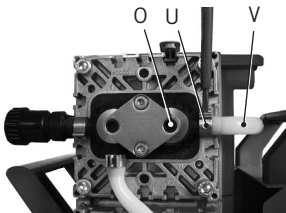
Detach the coupling of the connection tube (V) to the other side of the pump as well as the hose connection to the inlet/outlet of the vacuum system at the valve head (O).

7

Open the hose clip (U) by applying the slotted screwdriver as shown and turn.

8

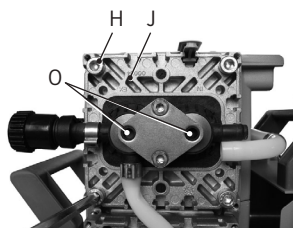
Pull the tubing off the hose connector.



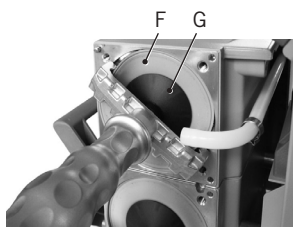
Step 6



Step 7



Step 1



Step 3

Replacing the diaphragm

1

Disassemble head covers (J) to check the diaphragm (F).

2

Unscrew four (pump with one/two heads) Allen screws (H) with a 5 mm wide Allen key. Remove both head covers (J) together with valve heads (O) and connections.

3

Check diaphragm (F) for damage and replace if necessary.

4

Lift diaphragm carefully sidewise. Never use a pointed or sharp-edged tool to lift the diaphragm.

5

Use the diaphragm key to grip the diaphragm support disc (E) below the diaphragm.

6

Unscrew diaphragm support disc (E) with diaphragm (F) and diaphragm clamping disc (G).

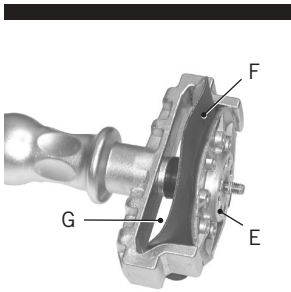
7

Check for washers (D) between the diaphragm support disc (E) and the connecting rod (B). Do not mix the washers from the different pump heads, since these are set at the factory to ensure proper pump performance. Make sure that the original number is reassembled at the individual pump head.

Too few washers: The pump will not attain vacuum specification.

Too many washers: Diaphragm clamping disc will hit head cover, causing noisy operation and possibly causing the pump to seize up.

If the old diaphragm is difficult to separate from the diaphragm support disc, immerse assembly in naphtha or petroleum ether. Do not inhale vapors!



Step 8

8

Position new diaphragm (F) between diaphragm clamping disc with square head screw (G) and diaphragm support disc (E).

Note: Position diaphragm with pale side towards diaphragm clamping disc (facing pump chamber).

Make sure that the square head screw of the diaphragm clamping disc is correctly seated in the guide hole of the diaphragm support disc.

9

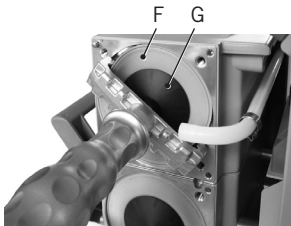
Lift the diaphragm at the side. Place the diaphragm carefully together with diaphragm clamping disc and diaphragm support disc in the diaphragm key.

Avoid damage of the diaphragm: Do not excessively bend or crease the diaphragm.

Assemble the original number of washers (D) between diaphragm support disc (E) and connecting rod (B).

10

Screw diaphragm clamping disc (G), diaphragm (F), diaphragm support disc (E), and washers (D) to connecting rod (B).



Step 10

11

Optimum torque for the diaphragm support disc: 4.4 ft lbf (6 Nm), it is recommended to use a torque wrench. Attach torque wrench to diaphragm key (hexagonal bolt 6 mm wide).

Note: Never use the diaphragm key with any additional tools like tongs or Allen keys without appropriate torque limitation.

Replacing the valves

①

Open the hinged cover of the connection fastener (Q) with a slotted screwdriver.

②

Loosen connection fastener slightly. Turn the fillister head screw (L, not shown) with a Torx driver T20 at most one turn.

Do not detach the fillister head screw from the square nut (K, not shown).

③

Loosen the clamping brackets (S) on the valve heads (O).

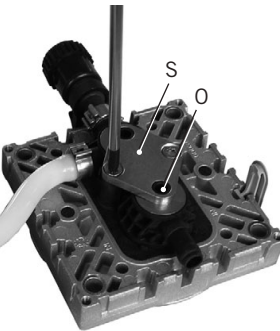
Unscrew at each clamping bracket the two countersunk screws with a Torx driver T20. Remove the clamping brackets.



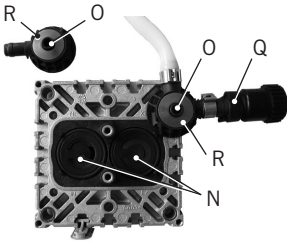
Step 1



Step 2



Step 3



Step 4

4

Remove valve heads (O) along with the disc springs (R), connection tube if applicable, hose nozzles (P) and connection fasteners (Q) or move the valve heads carefully aside. Note position and orientation of the valve heads.

Note position and alignment of valves (N).

5

Check valves (N) and O-rings (M) for damage and soiling.

6

Replace valves or O-rings if necessary.

7

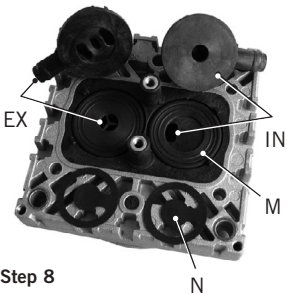
Use petroleum ether or other industrial solvent to remove deposits. Do not inhale vapors.

8

Insert O-rings (M) and valves (N). See figure for the correct position of the valves:

Inlet side (IN): Marked "IN" next to the valve seat. The valve tongue points at the kidney-shaped orifice in the valve seat.

Outlet side (EX): Marked with "EX" next to the valve seat. The valve is oriented the same direction as the valve at the inlet side.

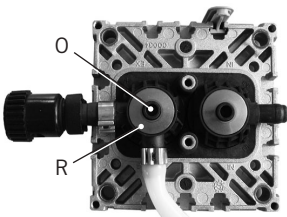


Step 8

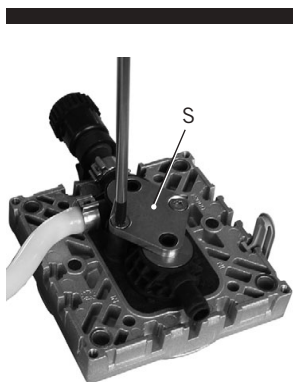
9

Position valve heads (O), with hose nozzle (P), if applicable, connection tube or connection fastener (Q), and disc springs (R) on the valve seats. Position disc springs with large opening downwards. Pay attention to the correct orientation of the valve heads.

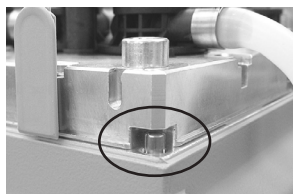
Center the valve head with respect to the valve seat. The valve head must lie flat on the valve seat.



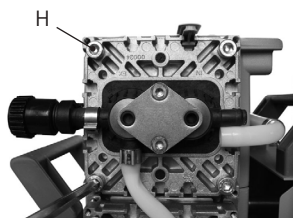
Step 9



Step 11



Step 15



Step 17

10

Valve head with gas ballast or hose nozzle connection: Insert square nut (K, not shown) in the groove of the head cover (J) or position square nut in the groove and then screw on connection fastener. Loosely fasten fillister head screw (L, not shown).

11

Position clamping bracket (S) with countersunk bores facing upwards.

12

Align the countersunk bores with the threaded pegs.

13

Loosely fasten the countersunk screws and correct the alignment of the valve heads if necessary.

14

Tighten countersunk screws with Torx screwdriver T20. Torque: 2.2 ft lb_f (3 Nm).

15

Bring the diaphragms (F) into a position, in which they are in contact with the housing (C) and centered with respect to the bore.

16

Put on head cover (J) with valve heads (O) and connections attached.

Pay attention to the correct orientation of the head covers: Housing with head alignment pin: The head alignment pin (A, not shown) at the pump housing (C) has to fit into the recess at the head cover (J).

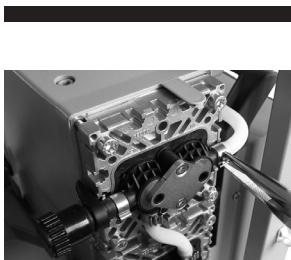
Housing with mark (A, not shown). Align the recess at the head cover with the mark at the pump housing.

17

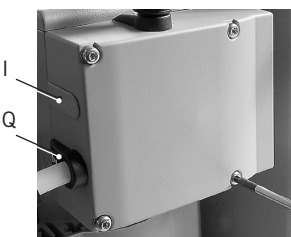
Loosely screw in the Allen head screws (H) at the head covers diagonally at first slightly with a 5 mm wide Allen key, then tighten. Recommended torque: 8.9 ft lb_f (12 Nm).

18

Slide the caps (I) into the head cover.



Step 1



Step 5



Step 8



Step 10

Reassembly

Pump on pump support:

1

Affix the connection tube (V) to the other side of the pump, as well as the hose connection to the inlet or outlet of the vacuum system at the valve head (O).

2

Slip connecting tube (V) onto hose connection of valve head.

3

Slide on the tube and the hose clip (U) until touching the nose at the valve head.

4

Close hose clip (U) with flat pliers.

5

Put head cover cowl on.

6

Slide the head cover cowl in the grooves of the caps (I) and under the connection fasteners (Q).

7

Install the washers. Use a Torx driver T20 to attach the 4 screws holding the head cover cowl.

8

Tighten the fillister head screws (L) of the connection fasteners (Q) with a Torx driver T20.

9

Close the hinged covers.

Pump at pump support:

10

Assemble catchpots with joint clips.

Replace diaphragms and valves of the opposite side of the pump in the same way!

Checking the ultimate vacuum

After any intervention at the equipment (e.g., repair/maintenance) the ultimate vacuum of the pump has to be checked. Only if the pump achieves its specified ultimate vacuum, the pump's leak rate is low enough to ensure that no explosive atmospheres will occur in the interior of the equipment.

If the pump does not achieve the ultimate vacuum:

- Whenever the diaphragms and valves have been replaced, a break-in period of several hours is required before the pump achieves its ultimate vacuum.
- In case of an unusual noise, switch off pump immediately and check clamping disc positions.

If the specified ultimate vacuum is not achieved, and if this does not change after the break-in period:

Check hose connectors at pump heads for leaks. If necessary recheck valve seats and pump chambers.



Fig 3. Measure inlet port pressure.

Measure inlet port pressure

Measure the inlet port pressure with a vacuum gauge (Fig 3). A vacuum of less than 120 mbar should be indicated. Any reading in excess of 120 mbar requires disassembly to check that the valves and diaphragm are properly seated and placed. The diaphragm must be concentric within the bore.

Note: New parts require a run-in period of several hours before achieving the ultimate vacuum. If the pump heads tested below 120 mbar and the ultimate vacuum is not achieved, check all hose connectors for leaks.

7. Ordering information

Product	Quantity	Code no.
Vacuum tubing, 8 mm i.d., 3 m	1	VT3
Catchpot, glass	1	VP200RK-2
Flange O-ring for catchpots	1	VP200RK-3
Maintenance Kit, 2 diaphragms and 4 diaphragm valves	1	VP200RK-9
Diaphragm valve	1	VP200RK-7
Diaphragm	1	VP200RK-8

Companion products

Hoefer GD2000 Vacuum Gel Dryer System

Includes: VP200 Vacuum Pump, and vacuum tubing, stainless steel screen, 10 sheets of filter paper, 50 sheets of porous cellophane, mylar sheet and porous polyethylene sheet.

115 V~	1	GD2000-115V
230 V~	1	GD2000-230V



Hoefer, Inc.

32 Scotland Blvd, Ste. 9,
Bridgewater, MA02324, USA

Toll Free: 1-800-813-0488

Phone: 1-508-807-4665

E-mail: support@hoeferinc.com

Web: www.hoeferinc.com

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