

PROVA ORALE 20 DICEMBRE 2022

Traccia lettera B) Estratta

- a) Il candidato scelga un'attività che ha svolto correlata alle tematiche del bando e brevemente (10 minuti) la descriva (obiettivo, modalità di realizzazione e risultati ottenuti)
- b) Il candidato illustri la procedura di riempimento/prelievo da un dewar di azoto liquido e i DPI da utilizzare
- c) Conoscenza lingua inglese

Storage and disposal

We recommend that you avoid long-term storage of the EXPT Pumping Station. If you will store the EXPT Pumping Station for several months, refer to the storage instructions in the relevant instruction manual.

Storage

Use the following procedure to store the EXPT Pumping Station:

Shut down the EXPT Pumping Station as described in Section 4.3.

Isolate the EXPT Pumping Station from the electrical supply and disconnect it from the vacuum system.

Drain the oil from the backing pump (rotary vane pumps only) as described in the instruction manual for the pump. Refer to the following documents: Rotary vane pumps E2M0.7 / E2M1.5 (A371-22-880) RV3 / RV5 / RV8 / RV12 (A652-01-880)

Place protective covers over the inlet and outlet-flanges.

For the fastest pump-down after the EXPT Pumping Station is reinstalled, seal the turbomolecular pump inside a plastic bag together with a suitable desiccant.

Store the EXPT Pumping Station in cool, dry conditions until required for use.

Disposal

Dispose of the EXPT Pumping Station and any components safely in accordance with all local and national safety and environmental requirements.

Particular care must be taken with components which have been contaminated with dangerous process substances.

Traccia lettera A) (non estratta)

- a) Il candidato scelga un'attività che ha svolto correlata alle tematiche del bando e brevemente (10 minuti) la descriva (obiettivo, modalità di realizzazione e risultati ottenuti)
- b) Il candidato illustri come imposterebbe il progetto di un assieme di particolari meccanici utilizzando un programma di CAD 3D
- c) Conoscenza lingua inglese

Pump Description

The pump consists of a high frequency motor driving a turbine fitted with 9 bladed stages and 3 Macrotrorr stages. The turbine rotates in an anti-clockwise direction when viewed from the high vacuum flange end.

The turbine is made of high-strength aluminium alloy, machined from a single block.

The turbine rotor is supported by permanently lubricated high precision ceramic ball bearings installed on the fore vacuum side of the pump.

The static blades of the stator are made of stainless steel. These are supported and accurately positioned by spacer rings. The Macrotrorr stators are in the form of self-positioning machined discs with pumping channels and an opening restricted by the corresponding rotor discs. These are made of aluminium alloy.

During normal operation, the motor is fed with a voltage of 54 Vac three-phase at 1350 Hz (max). To reduce losses during start-up to a minimum, the frequency increases according to a ramp with a higher initial voltage/frequency ratio.

The pump can be water cooled or air cooled: in the first case the customer can use a dedicated external plate made of nickel-plated brass, in the second case an external optional fan is available.

A thermistor sensor is mounted near the upper bearing to prevent the pump from overheating.

Traccia lettera C) (non estratta)

- a) Il candidato scelga un'attività che ha svolto correlata alle tematiche del bando e brevemente (10 minuti) la descriva (obiettivo, modalità di realizzazione e risultati ottenuti)
- b) Il candidato illustri le principali caratteristiche di un tornio e una fresatrice con riferimento al tipo di lavorazioni che possono essere realizzate
- c) Conoscenza inglese

Installation

Set-up

The installation location is to be chosen so that components that need servicing are freely accessible at all times. No special foundations or base are necessary for installation. The unit must not be used outdoors.

Conditions are:

- *The ambient conditions specified for the area of use.*
- *a level, vibration-free surface.*
- *Distance to side walls or adjacent devices: at least 50 cm.*
- *Distance to possible edges of tables: at least 10 cm.*
- *When using a casing heating and a water cooling unit the temperature of the connected flange of the vacuum chamber must not exceed 120 °C.*
- *It is not allowed to operate the device in systems where impact-like stresses and vibrations or periodically forces occur.*

Preparatory work

Ensure sufficient cooling for the pumping station.

Where magnetic fields > 3 mT are involved, a suitable shielding must be used. Check installation location and consult Pfeiffer Vacuum if needed!

The maximum permissible rotor temperature for the turbopump is 90 °C. If high temperatures arise for process reasons, the radiated heat input must not exceed 3 W. Install suitable screening sheets, if necessary (design information on request).

Connecting the high vacuum side

The assembly of superstructure on the pumping station HiCube 80 Eco is in the operator's responsibility. The load capacity of the high vacuum flange is specific for the used turbopump. The gross weight of superstructure on the pumping station HiCube 80 Eco may not exceed 50 kg! Observe barycentric shifting by using high or lateral protruding superstructure (e.g. vacuum chamber). Danger of tilting!

Install the high vacuum flange in accordance with the instructions in the operating manual of the turbopump.

Ensure the greatest possible cleanliness when installing any high vacuum parts. Unclean components prolong the pump-down time.

Observe the minimum strength of 170 N/mm² for the flange material.