

Nr.: 0010b-R01e
2020-03-25

OPERATING INSTRUCTIONS

According to Betriebs-sicherheitsverordnung

UNIVERSITÄT
DUISBURG
ESSEN

Offen im Denken
Faculty of Chemistry

Institute: AAC

Work place: AAC Labs

Activity: Laboratory work

EQUIPMENT

Cryotherm Apollo

DANGERS FOR HUMANS AND ENVIRONMENT



Dangers due to cryogenic gases:

- Burns and eye injuries from splashing liquid nitrogen.
- Danger of suffocation due to escaping nitrogen in the event of improper transport (escorts in elevators)
- Bursting of the vessel during transport under pressure.

PROTECTIVE MEASURES AND RULES OF CONDUCT



Transport under filled conditions:

- Pressure relieved with loose transport stopper
- With demounted removal lifter (EK)

Assembly of the EK lifter:

1. Clean sealing surface, centering ring and O-ring of dirt and ice (hairdryer, heat gun)
2. Place the centering ring with O-ring on the flange
3. Close the filling / withdrawal valve (fig. 1 no.4) on the EK lifter
4. Open exhaust / overflow valve (fig.1 no.3) to prevent pressure increase
5. Insert EK lifter vertically in the vessel neck
6. Put on the clamping ring and tighten the thumbscrew
7. Close exhaust / overflow valve (fig.1 no.3)

Disassembly of the EK lifter:

1. Close pressurisation valve (fig.2 no.2)
2. Close the filling / withdrawal valve (fig.1 No.4)
3. Open the exhaust / overflow valve (fig.1 no.3) to relieve the tank pressure
4. Release thumbscrew on pressure-free container and remove clamping ring
5. Remove the EK lifter and insert the transport plug loosely

Withdrawal of nitrogen:

1. Mount EK lifter
2. Open the fill / abstraction valve (fig.1 no.4) to withdraw liquid nitrogen
3. Adjust the desired pressure by opening the pressure build-up valve (fig.2 no.2).

Maximum operating pressure: 1.3 bar

Pressure build-up:

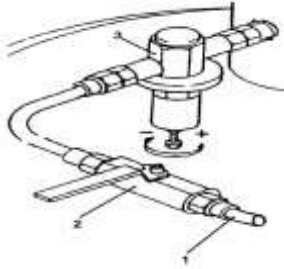
1. Close exhaust / overflow valve (fig. 1 no.3)
2. Close the filling / withdrawal valve (fig.1 No.4)
3. Slowly open the pressure build-up valve (fig.2 no.2)
4. Watch the manometer
5. At the desired pressure, close the pressure build-up valve (fig.2 no.2)

Relieving pressure:

Open the exhaust / overflow valve (fig. 1 no. 3) until the operating pressure at the monometer has been reached, then close again!

Do not point the opening of the exhaust / overflow valve towards people or equipment as cold gas will cause burns or spillage.

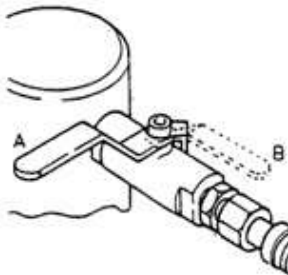
Transfer siphon



No.	Bezeichnung	Description
1	Druckaufbauleitung	Pressurization connector/line
2	Druckaufbauventil	Pressurization valve
3	Druckaufbauregelventil	Pressurization control valve

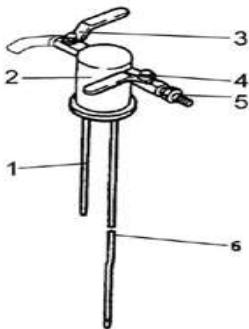
Position of the ball valves

Liquid nitrogen, cryogenic gas



A – geschlossen	A - closed
B – geöffnet	B - opened

Presurisation valve



Nr.	Bezeichnung	Description
1	Abgas-/Überlaufleitung	Exhaust gas- / overflow line
2	Grundkörper mit Kleinflanschanschluss	Base body with flangeconnecting
3	Abgas- / Überlaufventil	Exhaust gas- / overflow valve
4	Füll- / Entnahmeventil	Fill- / withdrawal valve
5	Anschlussverschraubung für flexiblen Anschlusschlauch	Screw connection for flexible fill hose
6	Füll- / Entnahmeleitung	Fill- / withdrawal line

RESPONSE TO MALFUNCTIONS



- Shut down device immediately, faults must be reported to:
Maria Madani, if not present O. Schmitz, M. Sulkowski,
F.Uteschil, S. Meckelmann.

BEHAVIOR IN CASE OF ACCIDENT / FIRST AID



- Keep calm.
- Call first responders.
- Emergency call: 0112
- Report accident.

MAINTENANCE / DISPOSAL

- Maintenance only by authorized, competent persons.
- Switch off the device and disconnect it from the mains.
- Regular inspection of wearing parts.