

**Karlsruher Glastechnisches Werk  
KGW-ISOTHERM**

Germany  
76185 Karlsruhe  
Gablونzer Straße 6  
Tel. 0049 / 721 / 95897-0  
Fax. 0049 / 721 / 95897-77  
E-Mail: info@kgw-isotherm.de  
Internet: kgw-isotherm.com



**Operating Instructions**

**CP1 Chemical Pumping Station  
TYPE : CP2**

## **Table of Contents**

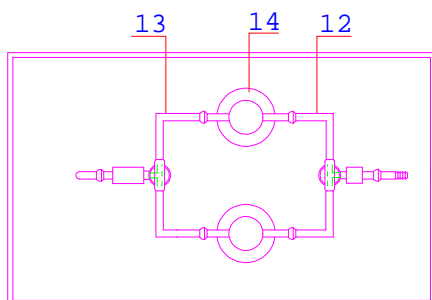
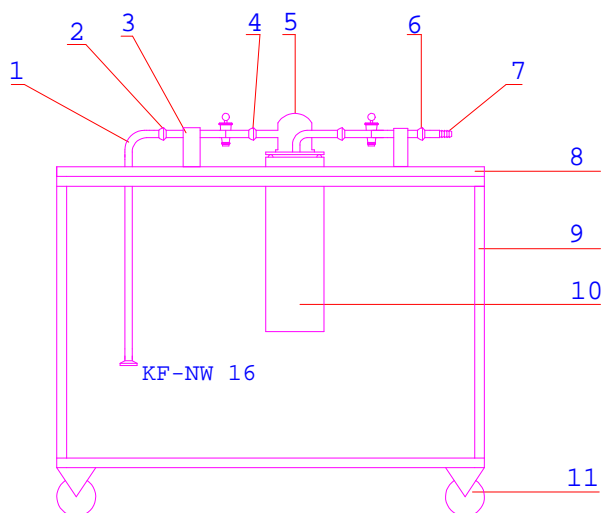
- 1) Assembly and Function of the CP2 Chemical Pumping Station**
- 2) Unpacking**
- 3) Assembly**
- 4) Start-up**
- 5) Condensate - Emptying the Cold Trap**
- 6) Maintenance and Cleaning**
- 7) Spare Parts Available**
- 8) Technical Data**
- 9) Warranty**

# 1) Assembly and Function of the CP2 Chemical Pumping Station

The CP2 chemical pumping station is a mobile vacuum unit that produces an oil-free vacuum in conjunction with a vacuum pump. It is used wherever gases need to be purged of unwanted substances.

The pumping station has two cold traps and Dewar vessels that are removable. The cold traps is connected upstream of the vacuum pump to prevent the pump from becoming damaged from the ingress of moisture or solvents. The cold traps can also protect the vacuum chambers in the opposite direction by condensing the penetrating oil molecules of the vacuum pump using back diffusion.

The standard pumping station is not supplied with a vacuum pump. We can provide vacuum pumps with different designs and suction capacities on request.



- 1 Rubber tube with KF NW 16
- 2 GL18 glass screw with PTFE-olive
- 3 Holder for glass tube
- 4 Spherical joint S29 with O-ring seal
- 5 Cold finger with spherical joint S29 and O-ring
- 6 Spherical joint S29 with O-ring seal
- 7 GL18 with PTFE-Olive
- 8 PE - table plate with holes
- 9 Aluminium profile rack
- 10 Dewar flasks Type 12 C-S with bulge
- 11 Lockable guide rolls
- 12 Glass tube with 3-way stopcock for plant
- 13 Glass tube with 3-way stopcock for pump
- 14 PE - ring for the cold finger

## 2. Unpacking

Carefully unpack the individual parts of the pumping station and check for any damage. It is important that any potential transport damage is identified during the unpacking process. An immediate assessment of any damage is required, where applicable. Please contact the manufacturer to this end.

- Take the technical data from the valid operating instructions.
- Only approved spare parts should be used.

## 3. Assembly

When assembling the pumping station observe the following sequence:

1. Set up pumping station at place of use and lock swivel castors.
2. Insert Dewar vessels into the table top.
3. Insert plastic rings into the Dewar vessels.  
Align the plastic rings such that the filling openings for the refrigerant are easily accessible.
4. Insert cooling finger into plastic ring.  
Align connections parallel to the frame (Assembly, see page 2)
5. Assemble Y-type tubing. (Assembly, see page 2).
  - a. Insert forks into the plastic case on the bracket.
  - b. Produce a spherical joint connection to the cold traps.
  - c. Secure spherical joint connection with clamps.
  - d. Fix forks to the bracket with the screws.



6. Produce a connection to the vacuum pump.
  - a. Feed vacuum hose through the opening on the table top.
  - b. Attach hose connection to the Y-type tubing (GL18).
  - c. Attach KF NW 16 hose connection to vacuum pump.



7. Produce a connection to the vacuum chamber.
  - a. Attach vacuum hose connection to the Y-type tubing (GL18).
  - b. Attach vacuum hose connection to vacuum chamber.



## 4. Start-up

### **IMPORTANT!!! Wear protective goggles and gloves!!**

To ensure everything runs smoothly, please observe the following sequence during the start-up:

1. Connect vacuum chamber to the pumping station
2. Fill Dewar vessel with refrigerant.

Check whilst in operation that the Dewar vessel on the cold trap contains enough refrigerant (Top up with refrigerant, if necessary). The cold trap can either be run with liquid nitrogen (LN2) or with a dry ice - acetone mixture.

3. Switch on vacuum pump

Switch on the pump immediately after the refrigerant has been inserted. Whilst the cold trap in the condensate chamber is not evacuated this results in a higher consumption of refrigerant.

## 5. Condensate - Emptying the Cold Trap

The cold trap can only accommodate a limited amount of condensate. Check whilst in operation that not too much condensate gathers on the cold walls of the cold trap. When the pressure in the pump changes significantly (see manometer) check if the cold trap is full. If necessary, the operation must be interrupted so that the condensate can be removed from the cold trap.

Proceed as follows when emptying the condensate:

1. Switch off vacuum pump.
2. Disassemble cooling finger from pumping station
  - a. Slacken screws on the fork brackets
  - b. Slacken clamps on the spherical joint connections
  - c. Remove cooling finger from above
3. Wait until condensate and cooling finger are warm enough that the condensate has liquefied.
4. Remove Dewar vessel and empty the LN2.

## 6. Maintenance and Cleaning

The pumping station is maintenance-free. Please contact the manufacturer in case of repairs.

### 6.1. Cleaning

#### 6.1.1 Glass parts (cooling finger, Y-type tubing)

The glass parts should be rinsed with surfactant-based water or with solvent (See Chapter 8.1, Chemical Resistance).

Disassemble the glass parts from the pumping station to clean with solvent. Please ensure that the solvent does not come into contact with the frame or other components, that no damage occurs to the glass (e.g. scratches) and that the stop-cocks are greased after any cleaning.

#### 6.1.2 Frame and other components (brackets, clamps, vacuum hose)

Components that are not made of glass should be cleaned with water and a surfactant-based detergent additive. Use a damp cloth for this.

## 7. Spare Parts Available

	<b>Art. no.</b>
- S 29 0 cooling finger (with O-ring seal)	1736
- O-ring for S 29 0 cooling finger (silicon, teflon-coated)	17703
- Plastic ring for cooling finger bracket	1733-(two-part)
- Clamps for S 29 spherical joint connection	17341
- Type 12 CAL - S Dewar vessel	17071
- Y-type tubing on vacuum chamber side	17073
- Y-type tubing on pump side	17075
- GL 18 cap with olive	17331

## 8. Technical Data

Dimensions L x W x H	: approx. 750 x 500 x 750 mm	(Assembly, see drawing on pg. 2)
Weight	: approx. 25 kg	(without vacuum pump)
Glass parts	: Borosilicate glass 3.3	(in accordance with DIN ISO 3585)
Evaporation rate LN2	: approx. 40 ml/hr	(at operating pressure: $10^{-3}$ mbar)
Standby time: LN2	: approx. 20 hrs	(ambient temperature: 23°C)
Condensate volume	: approx. 150 ml	
Connections	: to the pump	: KF NW 16 small flange
	to the vacuum chamber	: GL18 hose olive ( $\varnothing$ 10 mm )

### 8.1 Acceptable operating conditions

Operational overpressure	: Vacuum or overpressure up to 0,5 bar
Ambient temperature	: 0 °C to 50°C
Refrigerant	: - Liquid nitrogen (LN2) : - Acetone / dry ice (CO2) mixture

Chemical resistance of the glass	: DIN 12111, DIN 12116 and DIN 52322 stipulates that the following suffice: the glass meets the conditions of Hydrological Class 1 - Acid Class 1 - Leaching Class 2
----------------------------------	---

The glass is only affected by:	- Hydrofluoric acid - Hot phosphoric acid - Highly concentrated alkaline solution
--------------------------------	---

## 9. Warranty

You have purchased an original KGW pumping station.  
We offer a warranty of 12 months (from delivery by the manufacturer) when handled properly. The maximum warranty covers the purchase value of the device. Please contact the manufacturer in the case of any warranty claim.

Datum 03.2012