

# Cryogenic liquid transfer pump



This pump is exclusively intended for the transfer of **liquid nitrogen** from one vessel to another.



- Since the motor is not the explosion-proof type, the pump must not be used in explosive atmospheres.
- Since the pump is a manual device, it must not be left running without surveillance.
- The pump must not be run dry and must be stopped when the vessel is empty.
- The pump body (ref. 2) must not be immersed in the nitrogen to be pumped.
- While transferring liquid nitrogen, the user must wear appropriate safety clothing (safety visor, gloves and overalls).
- The suction opening must be free of any foreign objects.
- All joints and connections must be securely fastened.
- Check that the On-Off button is in the “O” position before connecting the pump to the mains supply.
- The regulations of each country with regard to preventing accidents must be strictly respected.

## DELIVERED ITEMS

Check that the following items are present:

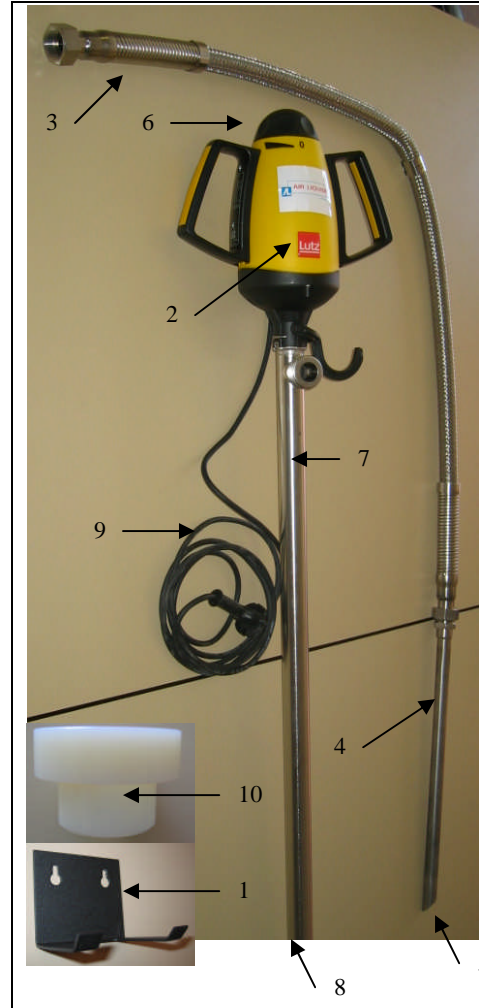
Designation	Qty
Pump with power supply cord (3 m).	1
Plastic bag containing a 1.5 m DN16 flexible hose with a 1" G connector and TC type adaptor.	1
Support rack.	1
Adjustable stop.	1
The present instructions for use.	1

## DESCRIPTION OF THE PUMP

This pump meets the requirements of users wishing to transfer liquid nitrogen. The nitrogen to be transferred (ref. 8) is drawn up through the dip tube (ref. 7) and discharged

out by the end (ref. 5). The diameter of the pump dip tube allows it to be introduced into any vessel with a neck diameter of at least 30 mm.

The pump (ref. 2) is of the immersed, vertical, joint-free centrifuge type, with an axial effect rotor.



Ref.	Designation
1.	Support rack.
2.	Pump body.
3.	Transfer hose.

4.	TC type tube.
5.	Sucked up nitrogen outlet.
6.	On-Off switch.
7.	Dip tube.
8.	Sucked up nitrogen inlet.
9.	Power supply cord.
10.	Adjustable stop.

The drive motor, with double electrical insulation, protected against splashes of liquid (IP44) and with interference suppression, operates on 230 V AC mains power. With an electrical power of 230 V, the pump equipped with the DN16 flexible hose is capable of an output of around 5 l/min and discharging nitrogen to a maximum height of 7 m CE. An overload circuit breaker incorporated in the motor is set off if the pump is overloaded.

## INSTALLATION OF THE SUPPORT

Firstly fasten the support rack (ref. 1) to a well-protected and easy to access place, around 130 cm from the floor. This device makes it possible to dry the pump after use and also to store it when not in use. In addition, storing the pump in a vertical position extends its lifetime and prevents the body of the pump from being damaged or deformed.

## PRIOR TO USE

Check that the voltage indicated on the rating plate corresponds to the mains voltage.

## USE

Proceed as follows:

1. **Before starting up the pump, check that it is completely defrosted and dried and that the voltage corresponds to the voltage indicated on the rating plate.** If the defrosting and drying are not fully completed, see § *After use*.
2. **Position the receiving vessel next to the vessel to be emptied.**

**3. Place the flexible hose (ref. 4) in the receiving vessel then slowly introduce the dip tube (ref. 7) into the vessel to be emptied.**

Leave the pump to temperature stabilise for at least five minutes.

**4. Connect the pump to the mains.**

**5. Turn the On-Off switch (ref. 6). Adjust its position to the desired output level to begin the transfer of fluid.**

Closely monitor every transfer phase so as to be able to intervene as quickly as possible if any incident occurs.

**Information regarding use of the pump**

- The loss of cryogenic liquid is around 10 litres at least.
- The pump cannot suck up a liquid below a minimum level of 6.5 cm.
- Do not allow the pump to run dry in an empty vessel or with a liquid level below 6 cm to avoid it overheating and being damaged.
- Do not obstruct the inlet of the withdrawal tube in order to conserve its maximum output.

**AFTER USE**

This operation is necessary and indispensable to ensure the correct operation of the pump after the transfer of cryogenic liquid. In fact, if the device is left as it is in the open air the formation of frost begins very quickly on all parts that have come into contact with the cryogenic liquid, due to the presence of humidity in the air. Frost can block the movement of moving parts and obstruct the suction and discharge orifices, rendering the device inoperable.

When the device thaws, a considerable amount of water is then present on the previously frozen parts. The pump must not be started up during this period. On contact with the cryogenic liquid (-196 °C), the water will immediately be transformed into ice. There is a risk of considerably overheating the motor, blocking the moving parts and obstructing the

orifices, which could lead to breakage of the pump. To avoid any damage to the pump when it is next used, the following procedure must be followed:

1. Place the pump in a vertical position on the support rack (ref. 1).
2. *Method A:* Leave the device to warm up to room temperature and drain naturally for at least 4 h so as to eliminate all traces of humidity.  
*Method B:* Connect the dip tube (ref. 8) to a pressured air pipe (dry, de-oiled air) at 2 bars maximum and blow for around 2 hours so as to eliminate all traces of humidity.
3. Remove the transfer hose (ref. 3) by unscrewing it and proceed in the same manner. The user must wear appropriate protective equipment (safety visor, gloves and overalls). The drying time can be reduced.

**DEFECTS**

The motor may not start if the overload circuit breaker in the motor has been set off. In this case, turn the button to the “0” position (Ref.6). Once the motor has cooled down, the pump can once again be used.

**SURVEILLANCE AND MAINTENANCE**

After each use, the pump must be cleaned in accordance with the paragraph *After use*. The leak tightness and sound condition of the flexible hose and connections must be regularly checked. The good operating condition of the electrical power supply cord must also be regularly checked. If any pumped liquid is visible on the outlet connection (ref. 16), an immediate repair of the pump is necessary.



Ref. 16

**REPAIRS**

All repairs must be carried out by *Air Liquid*.

**TECHNICAL CHARACTERISTICS**

Item reference	NH102895-1	NH102895-2
Immersion depth	1000 mm	1000 mm
Maximum output (1)	5 l/min	5 l/min
Maximum discharge head (1)	6.5 m <b>CE</b>	6.5 m <b>CE</b>
Weight	3.5 kg	3.5 kg
Maximum T°	90 °C	90 °C
Liquid transferred	Liquid nitrogen (-196 °C)	Liquid nitrogen (-196 °C)
Materials in contact with liquid nitrogen	Stainless steel, Viton, PTFE, ETFE	Stainless steel, Viton, PTFE, ETFE
Mains voltage	230 V AC	115 V AC
Frequency	50-60 Hz	50-60 Hz
Power	200 W	160-230 W
Nominal current	0.9 A	1.7 A
Permanent noise level	Max. 70 dB(A)	Max. 70 dB(A)
Vibration acceleration	<2.5 m/s <sup>2</sup>	<2.5 m/s <sup>2</sup>

(1) VDE approved



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Indice	Date	Auteur		Paragraphes modifiés	Approbation	
		Nom	Visa		Nom	Visa
0	12/05	ACHARD		Edition originale	SERMET	
A	07/06	ACHARD		Ajout de la version 115V	SERMET	
B	08/09	MALBOZE		MAJ suite nouveau design	REYMOND	
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