

MBRAUN Re-Circulating Chiller

MB-ULK-1000



INERTGAS TECHNOLOGY



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1.3. General Safety Notice



WARNING

The unit must be connected to a main power source with proper grounding to ensure electrical safety. Never operate it with a damaged power cord.

Make sure that all electrical ratings as indicated at the system type label match the ratings of your local power source (voltage, frequency).

Always turn off the unit and disconnect the power cord from the power source before opening the unit for service. Only authorized and trained personal is allowed to open the unit for service. Use only original **MBRAUN** spare parts for repair.



WARNING

Do not use corrosive cooling fluids (see cooling water specification).

Never operate the unit with flammable liquids!



NOTICE

Heat is transported to ambient air by means of build-in fans. Do not cover the ventilation openings at the sides of the unit. The distance from the both sides of the unit to other equipment must be at least 30cm. Do not operate the system in places with high concentration of airborne particles. Ventilation openings should be cleaned from dust regularly using a vacuum cleaner.

Make sure, that all hose connections are connected tightly and that there are no leaks.



WARNING

The unit must not be operated in medical applications nor, in connection with medical devices.



WARNING

Before transporting the unit, remove all water from the internal reservoir.

The unit must always stand upright. Do not tilt the unit. Tilting the unit, even when empty, may cause damage to the unit (especially to the compressor).

1.4. Addresses

Important service addresses:

MBRAUN GmbH

Dieselstrasse 31
85748 Garching
Germany

Telephone: +44 (0)89 32669-230
Fax: +44 (0)89 32669-235

E-Mail: service@mbraun.de
Internet: www.mbraun.com

1.5. Location

When the system is part of other equipment, attention must be paid to additional documents and regulations of the complete system.

Prerequisites:

Location	<ul style="list-style-type: none">• ambient temperature +15 °C to +30 °C• dry (no condensation)
Surface	<ul style="list-style-type: none">• solid base• levelled
Distance	<ul style="list-style-type: none">• minimum distance to adjacent equipment: 30 cm, plus additional room for service and maintenance work.

1.6. Modification

Only **MBRAUN** specialized personal is allowed to carry out changes and modification to **MBRAUN** systems. Exceptions need a written conformance by the manufacturer.

Improper changes or modifications may cause damage of equipment and personal accidents. All warranty claims are voided by unqualified work on the equipment.

When the unit is part of a larger system, check documentation of complete system for further instructions

2. Installation and Connections

2.1. Electrical Connections

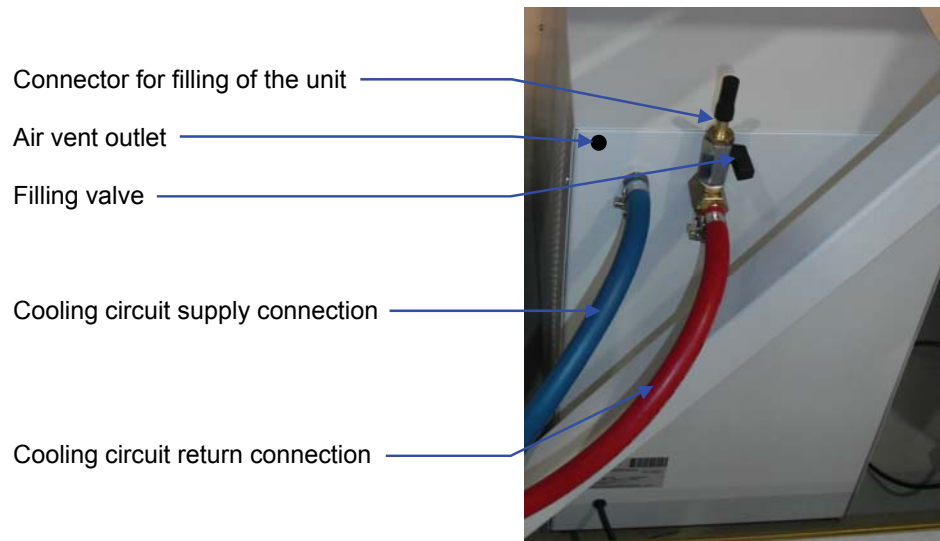


Depending on your local power supply ratings there are different versions of the chiller. See type label for exact specifications.

Voltage	1x 230 V (+/-10%)	1x 200V (+/-10%)	1x 110V (+/-10%)
Frequency	50 Hz	60 Hz	60Hz
Power	Max. 1000 W	Max. 1000 W	Max. 1000 W

2.2. Connection of cooling water hoses

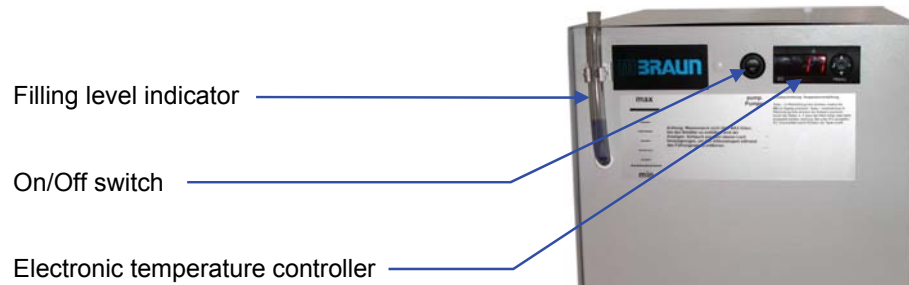
Figure 2.1: MB-ULK-1000 back panel with hose connectors



Hoses for cooling water supply and return are attached to the 8mm hose connectors located at the back plane of the unit. Connections must be secured by means of tube clips. A temporary connection to an external cooling water supply is needed for filling of the system (attach to dedicated hose connector).

2.3. **Filling the unit with Cooling Water**

Figure 2.2: MB-ULK-1000 Operation panel



2.3.1. **The unit is filled with cooling water as follows:**

- 1) Ensure that the unit is properly connected to the external cooling circuit.
- 2) Connect a hose to an external cooling water supply to the dedicated filling connector of the unit (*see Figure 2.1*).
- 3) Open the filling valve slowly and watch the filling level at the level indicator. Allow water flowing into the unit until the filling level is between the "Min" and "Max" marks.
- 4) Close the filling valve.
- 5) Switch on the unit; the circulating water will fill the external cooling circuit.
- 6) Switch off the unit and check the level indicator. Add more water if necessary. (repeat steps 2 through 6)
- 7) Remove the hose to the external water supply.



Never fill the unit above the maximum filling level.

2.4. **Emptying the unit:**



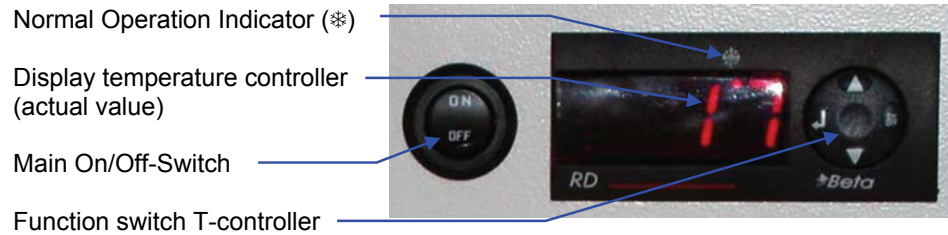
The unit must always be emptied before transport.

Before transportation the chiller must be emptied as follows:

- 1) Switch off the unit
- 2) Uncouple the chiller's outlet hose connector where it connects to the external device. Place the open end of the hose into an appropriate receptacle (volume min: 12l + volume of external device and piping).
- 3) Switch on the unit until no more water is pumped from the internal reservoir of the chiller and the cooling circuit. The pump will make noise when it runs dry, switch off the unit immediately after all water is removed to prevent damage to the pump.

3. Operation

Figure 3.3: Electronic temperature controller



3.1. Switching ON/OFF:

The chiller is switched on and off by means of the central ON/OFF switch, located at the front panel.

3.2. Adjusting set point of Temperature:

The set point for the temperature is adjusted using the function switch of the electronic temperature controller (Beta):

- 1) Press the arrow symbol ↵ (left side of function switch) and hold it until **SEt** is displayed
- 2) Press the arrow symbol ↵ again, now the set point is displayed (display point is flashing).
- 3) Adjust the desired temperature value by means of the ▲ and ▼ buttons
- 4) When no button is pressed for 10 seconds, the controller switches back to normal display (actual value). Alternatively "set"-mode can be exit by pressing the arrow symbol ↵ again for 2 seconds.

During normal operation, the actual cooling water temperature is displayed at the electronic temperature controller, also an operation indicator (*) is illuminated, at the top of the units display panel.



CAUTION

Ensure that the cooling water does not freeze.

When using water 5°C is the minimum setting for the chiller.

Information concerning operation at lower temperatures and required special cooling fluids is available from MBRAUN Service.



CAUTION

Ensure that the temperature setting is above the ambient dew point.

Setting the cooling water temperature according to the ambient relative humidity will prevent condensation forming in cold areas of the system (internal or external).

4. Maintenance and Service

During operation, the cooling water level has to be inspected regularly (level indicator at front panel). The level must be between the "Min" and "Max" markers. If necessary, fill in additional water (hose connection at back panel).



The pump must not be operated dry. When the connected external cooling water system is not de-aerated properly (all air must be removed from the system), the pump can run dry, although the cooling water level of the chiller is sufficient. This will lead to a very loud operation noise of the pump. In this case, switch off the unit immediately and de-aerate the system. Running the pump without water can damage the pump.

The chiller needs an unobstructed airflow through the unit. When operated in dusty environment, regularly clean the ventilation openings at both sides of the unit. It may be necessary to clean the internal heat exchanger from time to time with a vacuum cleaner too.

5. Spare parts

Spare Part	MBRAUN Part №	
	110v - 60hz	230v - 50/60hz
Electronic Temperature Controller	2600930	2600930
Main switch	2600931	2600931
Refrigeration unit	2600932	2600932
Fan	2600934	2600933
Water pump	2600936	2600935

MB-ULK-1000

6. Specifications

Cooling capacity	750W (continuous) 1000W (max. 30min, then 30min Pause)																														
Temperature range	5 – 25°C																														
Temperature stability	+/-2K (Hysteresis 3K)																														
Dimensions (LxWxH)	550 x 300 x 520																														
Operating voltage (depending on model)	230V (+/-10%) / 50Hz 200V (+/-10%) / 60Hz 110V (+/-10%) / 60Hz																														
Supply power rating	750W																														
Weight	approx. 30 kg (w/o cooling water)																														
Volume internal cooling water reservoir	12 l																														
Coolant (refrigerator)	340g R413a (FCKW-free)																														
Water connections	8mm hose connectors																														
Ambient temperature	15 – 30°C																														
Maximum differential pressure of connected system	3,5bar																														
Pump capacity	<table border="1"><thead><tr><th></th><th>50Hz- operation</th><th>60Hz- operation</th></tr></thead><tbody><tr><td>p [bar]</td><td>l/min</td><td>l/min</td></tr><tr><td>0,0</td><td>10,0</td><td>11,0</td></tr><tr><td>0,5</td><td>8,6</td><td>9,8</td></tr><tr><td>1,0</td><td>7,2</td><td>8,5</td></tr><tr><td>1,5</td><td>5,8</td><td>7,3</td></tr><tr><td>2,0</td><td>4,4</td><td>6,1</td></tr><tr><td>2,5</td><td>3,0</td><td>4,9</td></tr><tr><td>3,0</td><td>1,6</td><td>3,6</td></tr><tr><td>3,5</td><td>0,2</td><td>2,4</td></tr></tbody></table>		50Hz- operation	60Hz- operation	p [bar]	l/min	l/min	0,0	10,0	11,0	0,5	8,6	9,8	1,0	7,2	8,5	1,5	5,8	7,3	2,0	4,4	6,1	2,5	3,0	4,9	3,0	1,6	3,6	3,5	0,2	2,4
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3,5	0,2	2,4																													
Materials in contact with cooling media	Stainless steel (V2A) Brass Silver PVCU																														

7. Cooling water specification

MBRAUN strongly recommends the usage of de-mineralized water (ion exchanger) with additional biocide and corrosion inhibitor.

Parameter	Value	Method
Conductivity (@ 25°C)	< 1.0 mS /cm	DIN 38 404 T8
PH	7 – 8	DIN 38 404 T5
Acid capacity at pH 4.3	≥ 2.0 mmol / l	DIN 38 409 T7
Halogenide concentration (Sum of F ⁻ , Cl ⁻ , Br ⁻ , I ⁻)	< 50 mg/l	DIN EN ISO 10304-1-D19
Sulfate (SO ₄ ²⁻)	< 100 mg / l	DIN EN ISO 10304-1-D19
Nitrate (NO ₃ ³⁻)	< 5 mg / l	DIN EN ISO 10304-1-D19
Sum of Mg ²⁺ and Ca ²⁺	< 1.4 mmol / l	DIN EN ISO 11885-E22
Iron (Fe)	< 0.2 mg/l	DIN 38 406 T1
Water hardness	< 8°d (for reference purposes only)	
Oxygen	< 6 mg / l	ISO 5814:1990
Particulate contamination	filtered to a particle size (diameter) of ≤ 30 µm	
Micro-biologicals (total viable counts)	< 100 cfu/ml	DIN6222
Total dissolved solids	≤ 150 mg / l	EPA 160.1