GRANT

Closed chamber refrigerated circulating bath

ORCA

Operating Manual

If you have any feedback on Grant's products or services, we would like to hear from you. Contact:

Legal manufacturer

Grant Instruments (Cambridge) Ltd
Evolution House
Unit 2, Durham Way
Royston Gateway
Royston
SG8 5GX UK

Tel: +44 (0) 1763 260 811
E-mail: salesdesk@grantinstruments.com

Representative in the European Union

SIA Biosan
Ratsupites iela 7 k-2,
Riga,
Latvia
LV-1067
Tel: +371 67 426137

Country of Origin: UK

Contents

1.0 Use of Product

The purpose of the ORCA system is to provide controlled cooling of a circulating liquid for the removal of heat from external equipment or processes.
The ORCA system operates as a closed-loop, recirculating chiller, maintaining a user-defined liquid temperature by continuously removing thermal energy from the circulating fluid and rejecting it to the surrounding environment.
The equipment is designed to:

- Provide stable, continuous cooling under steady-state operation
- Circulate an approved heat-transfer fluid through an external closed or open circuit
- Maintain temperature within specified operating limits

The ORCA system is cooling-only equipment. It is not intended to heat, warm, or raise the temperature of the circulating liquid.
The ORCA system is intended for professional use in laboratory, industrial, or technical environments where temperature controlled cooling of external loads is required.

The ORCA chiller can also be used for circulation to an open bath or container and closed external fluid circuit.

This operating manual applies to the following ORCA chiller models:

- ORCA UK – 230 V AC, 50/60Hz
- ORCA US – 120 V AC, 60 Hz
- ORCA EU – 230 V AC, 50/60 Hz

Unless otherwise stated, all instructions, safety information, and technical data apply equally to both models.

2.0 How to use this operating manual

This operating manual provides the information required to unpack, install, and operate the ORCA closed-loop recirculating chiller safely and correctly. It is intended for professional users familiar with refrigeration and liquid cooling equipment.
Important safety information, symbols, and warnings are identified throughout this manual and must be read and understood before installing or operating the product.

- Section 1 describes the intended use of the ORCA system and its operating limitations.
- Section 3 provides safety information, including compliance, symbols, and warnings.
- Section 4 describes the ORCA system, its main components, installation requirements, electrical supply, and recommended working liquids.
- Section 5 explains operating procedures, including preparation for use, temperature control, normal cooling operation, alarms, and protective functions.
- Section 6 provides technical specifications, operating conditions, performance data, and storage and transportation requirements.
- Section 7 offers technical guidance on liquid selection and methods to prevent corrosion, algae, and bacterial growth.
- Section 8 contains warranty information and registration details.

- Sections 9 to 10 cover maintenance, cleaning, service information, and troubleshooting guidance.
- Sections 11 and 12 provide contact details and regulatory compliance information.

The ORCA chiller is supplied with a three-year warranty. To activate the warranty, users should complete the online registration form available at www.grantinstruments.com. Full details of the warranty terms and conditions are provided in Section 8 of this manual.

3.0 Safety information

3.1 Safety compliance

The equipment meets the requirements of international safety standard IEC 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use.

3.2 Safety symbols

The symbols below are marked on the equipment and throughout this manual to indicate:


Read these instructions before installation or use of the ORCA *(the equipment*)


Warning, hazard: read these instructions before proceeding to ensure you understand the nature of the hazard.


Warning: equipment contains a flammable refrigerant.

3.3 Safety warnings


Use only as specified by the operating instructions: if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.


This equipment is only for indoor use by a professional user.


Use only water, or water-glycol (see section 4.7 for more details). Do not inhale the vapours given off as they may be toxic. Liquids should be safely discarded and replaced.


Do not use the equipment with any sample material that could cause a fire or any other kind of hazard.


Do not use the equipment in an area where there are aggressive or explosive chemical mixtures.


It is the user organisation’s responsibility to carry out appropriate decontamination if hazardous material is spilt on or inside the equipment.


Before moving, disconnect from the mains power supply.

It is the user organisation's responsibility to carry out a risk assessment when operating this product within their own operating environment.

WARNING: Do not use mechanical devices or other means to accelerate defrosting: either turn the equipment off or set it to ambient temperature and wait until all the ice has melted.

WARNING: Do not damage the refrigerant circuit.

4.0 Operating instructions

4.1 Unpacking instructions

Standard equipment includes:

- ORCA refrigerated closed loop circulator
- Mains cord with plug (UK,EU &US)
- Saftey information sheet

The equipment weighs **20kg**. Take necessary precautions when lifting.

Remove packing materials carefully and retain them for future shipment or storage of the equipment.

4.2 Product description

The ORCA is a closed-loop, refrigerated recirculating chiller designed to provide reliable and stable cooling and temperature control of a circulating liquid for use with external equipment or processes that generate heat.
ORCA operates as a cooling-only system. It removes heat from the circulating liquid using an internal refrigeration system and releases that heat to the surrounding air through an air-cooled condenser. The unit does not include a heater and cannot actively warm the circulating liquid.
The system is intended for applications where controlled temperature and cooling is required on a continuous basis, such as laboratory instruments, analytical equipment, and industrial processes that must be maintained within a defined temperature range.

4.3 Installation

After transportation, let the equipment stand in its intended working position for at least six hours. This is to allow the oil to drain to the bottom of the compressor. This is normal procedure for refrigeration compressors.

Allow at least 100mm clearance from obstructions at the front and rear so that there is free air flow through the equipment.

Place the equipment on a firm, level surface. Ensure that the mains plug and the switch at the rear of the equipment are easily accessible.

After transport or storage in humid conditions, always allow the equipment to stand for at least an hour at room temperature before operating.

Do not block or restrict ventilation slots. Allow at least 100mm clearance from obstructions

Do not connect to a power supply or switch on before filling the Reservoir.

4.6 Electrical supply

Connect the equipment to a grounded (earthed) electrical power supply with voltage and frequency within the range specified on the serial number plate.

The equipment must only be connected to the mains using the mains cord supplied or one with an identical rating (see section 9.4)

Ensure the mains switch and isolating device (power supply connector) is easily accessible during use.

4.7 Recommended liquids

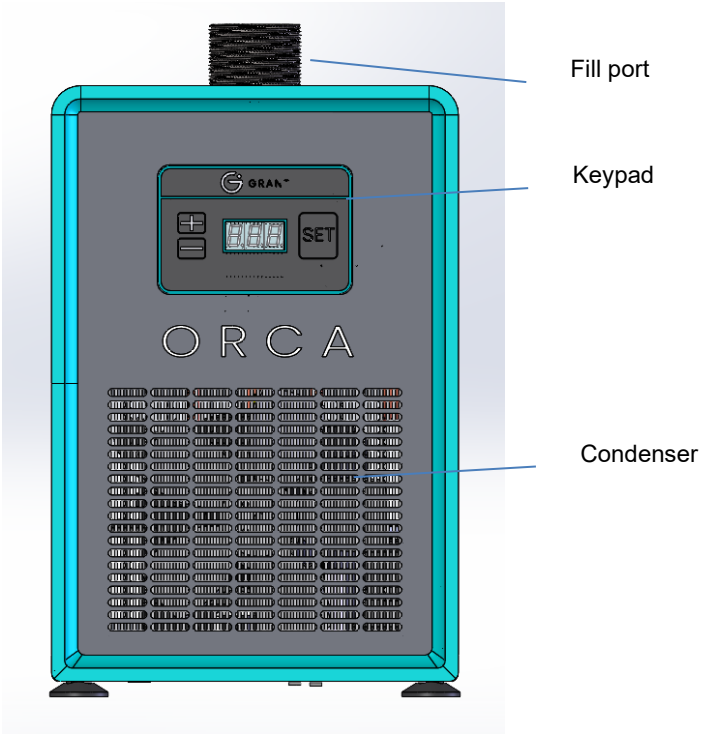
The following table lists the recommended liquids for different temperature ranges. Always ensure the liquid used is safe and suitable for your working temperature.

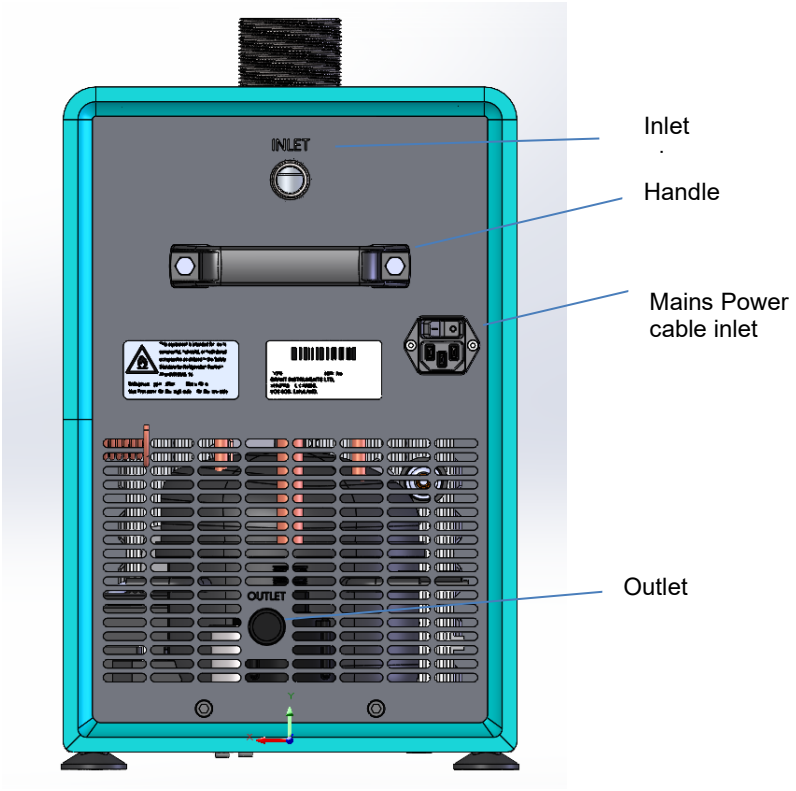
It is the user organisation's responsibility to assess the risks associated with the choice of heat transfer liquid chosen and to put in place safe working practises and appropriate protective equipment for personnel when considered necessary.

Temp range	Recommended liquid	Comments
-10°C to 40°C	50% water, 50% antifreeze (inhibited ethylene glycol)	 Ethylene glycol is toxic – follow the manufacturer's instructions. For safe disposal consult the local regulations. Use a lid to reduce the dilution of the mixture caused by condensing water vapour from the air, and to maintain the cool down rate.
0°C to 40°C	80% water, 20% antifreeze (inhibited ethylene glycol)	
5°C to 40°C	Water	 This unit is not equipped with a low-temperature thermostat to shut down the pump to prevent liquid freezing. External freeze protection must be provided where required.

* See section 7.1 for further details.

Use of fluids other than water or approved water–glycol mixtures may damage the system and affect warranty coverage





Mains power cable inlet

For connecting the equipment to a mains power supply. Use the mains cord supplied with the system. See Section 4.6 for instructions.

5.0 Operating procedures

5.1 Preparing the ORCA for use

5.1.1 Low Liquid Level / Float Protection

The ORCA incorporates an intelligent low liquid level protection system to prevent damage to internal components and ensure safe operation.
If a low liquid level is detected, an audible alarm will sound and the display will show “LLL” and the system will temporarily stop operation. The unit will automatically attempt to resume operation once the liquid level has recovered. This process may repeat if the liquid level fluctuates.
If a low liquid level condition persists or occurs repeatedly within a short period of time, the ORCA will shut down completely, display a “dry” warning, and sound an alarm. In this condition, cooling and circulation are disabled to protect the system.
Once the reservoir has been refilled to a safe level, the unit must be switched off and on again to reset the protection and resume normal operation.
This behaviour is intentional and prevents the system from operating continuously under unsafe or unstable liquid level conditions.

Remove the cap and fill the reservoir with a liquid suitable for your working temperature until it reaches the neck of the reservoir; see section 4.7 for recommended liquids.

5.1.2 Priming the Reservoir

Ensure that the reservoir is filled with the specified fluid up to the neck of the reservoir. When the external circulation connections are made, fluid may be drawn into the connected hoses and load, causing the fluid level in the reservoir to drop. During filling and initial operation, monitor the reservoir level closely and top up with additional fluid as required to maintain the level at the neck of the reservoir.
Once the fluid level has stabilised and all hoses are fully primed, securely refit the reservoir cap.


Always use pump connectors and hoses that are suitable for the operating temperature and liquid used. Check the pipe connections are secure.


Never disconnect any pipes or hoses while they contain very hot or very cold liquids or while the equipment is pumping.


Switch off the equipment when connecting and disconnecting hoses

Pumping heat transfer liquid around an external system can lead to hazards that are outside the control of Grant Instruments. It is essential that the user conducts a risk assessment of the entire equipment installation to ensure that correctly rated materials have been used throughout and that the system can be used safely.

5.1.3 Setting up and switching on

Connect the circulation hoses to the ORCA using the 1/2" BSP inlet and outlet connections. Use suitable fittings and hoses appropriate for the intended application and operating temperature. Before filling and switching on the unit, connect the free end of the hose(s) to the external application, ensuring that the inlet and outlet connections are correctly identified and connected.

Ensure all hoses are connected securely. Liquid will begin pumping immediately once the equipment is switched on.

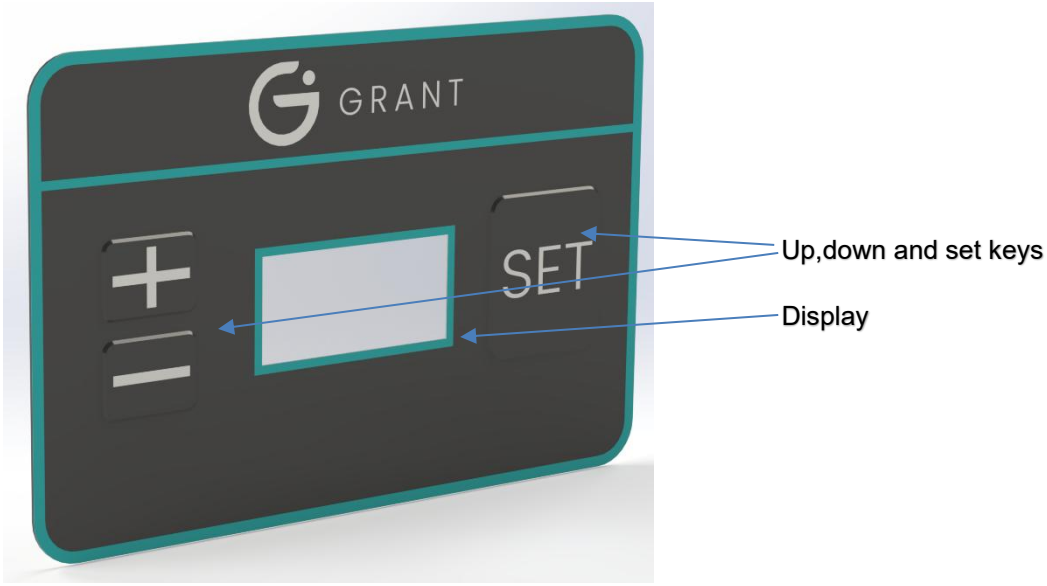
Fill the internal reservoir with the appropriate approved working liquid to at least the minimum recommended fill level. Ensure that the liquid level is no more than 10 mm below the reservoir filler neck and that the float level switch is fully raised before operating the unit.

Switch on the ORCA unit using the power switch located at the rear of the unit. The system will start immediately. On power-up, the display will illuminate and briefly show the software version number, and it will also sound the alarm to show that is working confirming that the control system is operating correctly. After start-up, the display will show the current liquid temperature measured in the internal reservoir. The ORCA system will then begin controlling automatically at the current set temperature.

5.2 Using the equipment

5.2.1 Setting the control temperature

The ORCA chiller is equipped with a simple keypad consisting of **+ (Up)**, **- (Down)**, and **SET** buttons. These controls allow the user to set the desired cooling temperature quickly and easily.



1. When the ORCA system is switched on and the reservoir has been filled with liquid, the display shows the **actual liquid temperature**, which is the current temperature of the liquid in the in the circulation path. The operating temperature range of the ORCA chiller is **–10 °C to +40 °C**, and the control temperature must be set within this range.

2. To adjust the working temperature, press the **+** or the **− button to display the set point and then** hold the **+ button** to increase the temperature or the **− button** to decrease the temperature. While the button is held, the displayed value will change continuously.

3. Release the + or − button when the required temperature is shown; press SET to store the new temperature. If SET is not pressed the unit will revert to the original set temperature after a few seconds. The displayed value is automatically stored as the working temperature without the need for additional confirmation.

4. After the temperature is set, the display returns to showing the actual liquid temperature and the ORCA system begins cooling the circulating liquid until the set temperature is reached. Cooling output is adjusted automatically to maintain temperature stability. The ORCA system is **cooling-only** and cannot raise the temperature of the circulating liquid; if the actual temperature is below the set temperature, no heating will occur unless heat is generated by the load that the circulator is controlling.

5.2.2 Setting a high temperature warning alarm

1. The ORCA system continuously monitors the actual liquid temperature during operation. If the temperature exceeds normal operating limits, a high temperature warning alarm is automatically activated. This alarm is factory configured and does not require any user setting or adjustment.
2. When the high temperature warning is active, the ORCA system continues to operate and provide cooling while attempting to reduce the liquid temperature. The warning alarm “OtA” alerts the user to review operating conditions such as external heat load, liquid flow, ventilation, and liquid level.

3. If the temperature remains above 42 °C for an extended period (approximately up to 15 minutes) and does not return to within the normal operating range, the ORCA system will automatically shut down to protect internal components and connected equipment. After correcting the cause of the high temperature condition, the unit can be restarted in accordance with normal operating procedures.

5.2.3 Resetting the high-pressure safety switch

 WARNING – ELECTRICAL HAZARD

This procedure must only be carried out by a competent person who is familiar with refrigeration and electrical equipment and understands the associated risks. Failure to follow these instructions may result in electric shock, injury, or equipment damage.
The high-pressure safety switch protects the refrigeration system by shutting down the compressor if refrigerant pressure exceeds safe operating limits. Before attempting to reset the switch, the cause of the high-pressure condition (such as blocked airflow or condenser fan failure) must be identified and corrected.

Reset Procedure

1. Switch the ORCA unit off and disconnect it from the mains supply.
2. Remove the outer cover to gain access to the refrigeration components.
3. Locate the high-pressure safety switch in the refrigeration line. The switch is fitted with a red manual reset button.
4. Press the button firmly until a click is felt, indicating that the switch has reset.
5. Refit all protective covers securely. Reconnect the unit to the mains supply and switch it on. Verify that the compressor

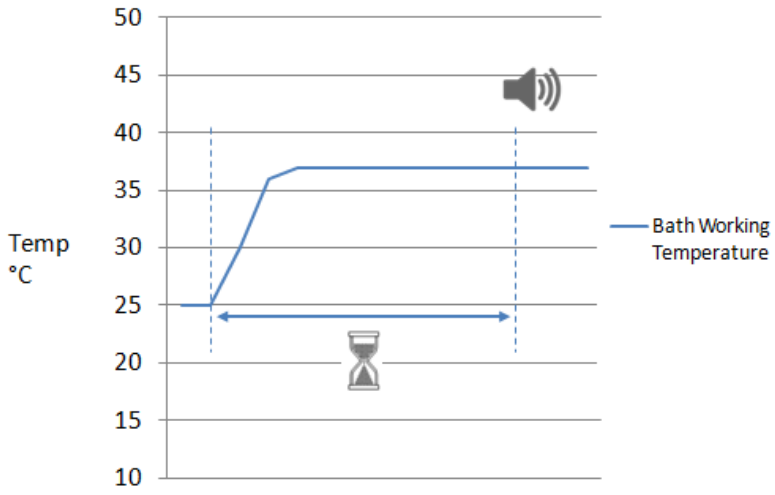
starts and that normal cooling operation resumes.

Important Safety Notes
Do not operate the unit with protective covers removed. Do not attempt to reset the high-pressure switch repeatedly. If the switch trips again after reset, do not continue operation. Contact Grant Instruments or an authorised service representative for further assistance.

5.2.4 Setting the countdown timer (CdE)

A countdown timer can be set in the range of 1 to 999 minutes. The countdown timer will sound an alarm at the end of a countdown period. It can be used to time experiments or remind you to take a further action.

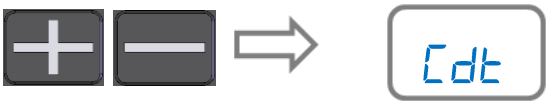
Note the countdown timer does not take into account if the bath has not reached the set temperature. If the bath has not reached the set temperature, this will need to be taken into account when starting the countdown timer



When the countdown timer expires the bath will sound an alarm and display End.
Press **set** to silence the alarm.

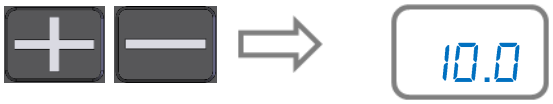
To set the countdown timer:

Select the menu option



Select the countdown timer menu option

If a countdown timer value has already been set the display will show the value and not off.



Set the value you require – in this case 10 minutes

Press the set key to start the timer. The remaining time will be displayed in minutes and seconds m.ss

CdE >10 mins

Or if the countdown period is greater than 10 minutes the bath with automatically return to displaying the water temperature. An extra dot at the end of the temperature will flash to show the timer is operating

6.0 Technical specifications

6.1 Operating conditions

Ambient temperature range	-10 to 40°C
Altitude above sea level	Up to 2,000m (6,500ft)
Operating environment	Indoor use only
Maximum relative humidity	80% RH up to 31°C decreasing to 50% RH at 40°C

6.2 Electrical details

Mains supply: 230V @ 50/60Hz or 120V @ 60Hz
Pollution degree: 2
Installation category: II

Mains supply voltage fluctuations are not to exceed ±10% of the nominal supply voltage.

6.3 Performance

Specification		**ORCA UK & EU**	**ORCA US**
Typical cooling power at an ambient temperature of 20°C	@ 20°C	300W	
	@ 10°C	180W	
	@ 0°C	80W	
Stability (DIN 12876) @ 10°C		±0.1°C	
Settable temperature range		-10°C to 40°C	
Reservoir capacity		1.6L	
Liquid depth min/max		120/130mm	
Weight		20Kg	
Max pump head pressure		450mBar	
Max pump flow rate		15L/min	
Max current consumption		1A	3.1A

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6.4 Storage and transportation

The ORCA should be stored and transported in its original packaging to protect the unit from damage. The permitted temperature range during storage and transportation is –10 °C to +40 °C, and the unit must always be kept in an upright position. ORCA should be protected from moisture, condensation, and mechanical impact at all times. Before long-term storage or transportation, it is recommended that the circulating liquid is drained from the system. After transportation, allow the unit to stand upright for at least 6 hours before switching on to ensure safe and reliable operation.

7.0 Technical Tips

7.1 Which water/water-glycol should you use in your equipment?

For long-term reliability and correct operation of the ORCA closed-loop recirculating chiller, and to maintain warranty coverage, the use of an approved water–glycol mixture is recommended. A water–glycol coolant provides improved corrosion protection, freeze protection, and long-term system reliability, particularly in continuous or demanding operating conditions.

Where permitted by the application and operating temperature range, water alone may also be used. When operating with water only, the water must be clean, oxygenated, and free from dissolved minerals or ions that could cause corrosion, scaling, or reduced performance.

The use of distilled water or de-ionised water produced using modern ion-exchange systems with replaceable cartridges is recommended. Water that has been boiled, de-oxygenated, softened, or chemically treated is not recommended, as it may increase the risk of corrosion or fouling of internal components.

De-ionised water must only be sourced from systems that do not use salt back-flushing to regenerate the resin, as residual sodium ions may be corrosive to system components.

ORCA incorporates an internal reservoir within a closed-loop circulation system, and the circulating liquid remains contained within the reservoir and connected external equipment during operation. If the ORCA system has been unused for an extended period, it is recommended that the circulating liquid is drained from the reservoir and external circuit and replaced with fresh water or an approved water–glycol mixture before operation.

Use of unsuitable liquids or incorrect coolant preparation may result in corrosion, reduced performance, or damage to internal components and may affect warranty coverage.

7.2 How to prevent rust in the equipment

Key internal components of the ORCA closed-loop recirculating chiller that come into contact with the circulating liquid are manufactured from type 304 stainless steel, selected for its corrosion resistance, heat resistance, and suitability for laboratory and industrial cooling applications.

ORCA incorporates an internal, fully enclosed reservoir within a sealed closed-loop circulation system. The circulating liquid remains contained within the reservoir and connected external equipment during operation. The reservoir and internal wetted components are not visible, accessible, or serviceable by the user.

Stainless steel provides good resistance to corrosion under normal operating conditions; however, corrosion may still occur if unsuitable coolants, poor water quality, or aggressive chemicals are used. For this reason, it is essential that only approved coolants and water quality, as specified in Section 7.1, are used.

Coolant Quality and System Protection

Because internal wetted components cannot be visually inspected or manually cleaned, maintaining correct coolant quality is critical to long-term reliability. Use of unsuitable liquids or incorrect coolant preparation may result in:

- corrosion of internal components,
- fouling or reduced heat transfer,
- degraded cooling performance, or
- damage to the ORCA system and connected equipment.

Important Notice

Users must not attempt to open the ORCA unit or access internal components. Any internal contamination, deposits, or corrosion resulting from the use of unsuitable coolants cannot be corrected by the user and may require factory service. Such conditions may affect warranty coverage.

7.3 How to prevent algae and bacteria?

Although the ORCA operates as a sealed, closed-loop system, the presence of water and suitable temperatures can still allow micro-organisms to develop if the circulating liquid is not properly maintained. Uncontrolled growth of algae or bacteria can lead to biofouling, which may reduce cooling performance, restrict liquid flow, and contribute to unpleasant odours.

Some micro-organisms produce acidic metabolic by-products, which can increase the risk of bio-corrosion by attacking metal surfaces and seals over time. To minimise these risks, it is important to use clean distilled or approved de-ionised water and to avoid introducing contamination when filling or topping up the system. The use of an approved inhibited water–glycol mixture is recommended for improved long-term system reliability. In addition to providing freeze and corrosion protection, many inhibited glycol formulations reduce the likelihood of microbial growth, although glycol does not eliminate the need for proper coolant maintenance.

The use of suitable biocides formulated for closed-loop liquid cooling systems may be considered where microbial growth is a concern. Only biocides that are compatible with stainless steel, and pump components (pump housing- PPS, Impeller- PPS) should be used, and the manufacturer’s instructions must be followed carefully. Regular inspection of the circulating liquid and periodic replacement, particularly after extended shutdown periods, will help maintain system performance and hygiene.

7.4 Low-temperature operation and Freeze Protection

The ORCA closed-loop recirculating chiller does not incorporate low-temperature freeze protection. The system will continue to cool the circulating liquid in accordance with the user-defined setpoint, regardless of the coolant type used.

Operation with Water
When water is used as the circulating liquid, the ORCA system must not be operated below 5°C. Water does not contain freeze protection, and operation at lower temperatures may result in freezing of the circulating liquid within the reservoir, internal pipework, or connected external equipment.

Important:
ORCA does not include a low-temperature safety thermostat or automatic freeze cut-out. If the temperature setpoint is reduced below the freezing point of the circulating liquid,

freezing may occur and can cause serious damage to the system and connected equipment.

Operation Below 5 °C
For operation at temperatures below 5 °C, the use of an approved water–glycol mixture is mandatory. The glycol component provides freeze protection and enables safe operation at reduced temperatures.
Failure to use a suitable water–glycol mixture for low-temperature operation may result in freezing, damage to internal components, damage to external equipment, and invalidates warranty coverage.

User Responsibility
It is the responsibility of the user to:

- Select a circulating liquid appropriate for the intended operating temperature.
- Ensure that minimum temperature limits are observed when using water.
- Verify that all connected external equipment is compatible with the selected coolant and operating conditions.

8.0 Warranty information

When used in laboratory conditions according to this manual, this product is guaranteed for THREE (3) YEARS against faulty materials or workmanship.

Extended warranty for up to FIVE (5) years can be purchased by contacting our sales department at salesdesk@grantinstruments.com.

9.0 Maintenance and service

9.1 Routine maintenance

The refrigerated circulator contains a flammable refrigerant:

- Do not use mechanical devices or other means to accelerate defrosting: either turn the equipment off or set it to ambient temperature and wait until all the ice has melted.
- Do not damage the refrigerant circuit.

The ORCA closed-loop recirculating chiller is designed to require minimal routine maintenance. The liquid level protection system should be checked periodically to ensure correct operation. This can be done by gradually lowering the liquid level in the reservoir and confirming that the unit automatically stops operation and signals a low liquid level condition before the reservoir is fully drained. This check confirms that the float level protection is functioning correctly and helps prevent damage due to insufficient liquid.

If external hoses are connected to the circulation pump, they should be inspected periodically for signs of wear, cracking, or leakage. Hoses must be replaced as necessary to prevent failure during operation. Only hoses rated for the operating pressure and temperature of the ORCA system should be used.

No other routine maintenance is required. Cleaning and servicing beyond these checks should only be carried out as described elsewhere in this manual or by authorised service personnel.

9.2 Cleaning

Regular maintenance of the ORCA closed-loop recirculating chiller is important to ensure that the equipment continues to perform within its specified limits and to maintain warranty coverage.

The ORCA unit uses an air-cooled condenser with fixed ventilation openings. Cooling performance may be reduced if dust or debris accumulates on the condenser fins or blocks airflow. The ventilation openings and condenser area should be inspected regularly, and any visible dust should be removed using a vacuum cleaner with a soft brush attachment. Care must be taken not to damage the condenser fins during cleaning.

Allow the equipment to cool before cleaning the condenser fins

Unplug the equipment from the mains supply before cleaning

The exterior surfaces of the ORCA unit should be cleaned using a soft, damp cloth and water only. Do not use chemical cleaning agents, solvents, or abrasive materials. Before using any alternative cleaning or decontamination methods, consult Grant Instruments or

your local representative to ensure that the proposed method will not damage the equipment or invalidate the warranty.

ORCA is a sealed, closed-loop system and does not contain user-removable heating, cooling, or circulation modules. Internal components are not user-serviceable and must not be accessed or removed by the user. Any internal servicing, cleaning, or de-scaling must only be carried out by authorised service personnel. The use of chemical de-scaling products inside the ORCA system is not recommended unless explicitly approved by Grant Instruments, as such products may be corrosive or toxic and may damage internal components.

9.3 Fuses

The ORCA closed-loop recirculating chiller does not contain any user-replaceable fuses. All electrical protection fuses are mounted internally on the control PCB as part of the system design and are not accessible to the user.

These internal fuses are factory specified and are designed to protect the equipment during normal operation. Under normal conditions, they should not require replacement.

If the ORCA system fails to operate due to a suspected fuse fault, the equipment must not be opened or serviced by the user. In such cases, please contact the Grant Instruments Service Department or an authorised service representative for inspection and repair.

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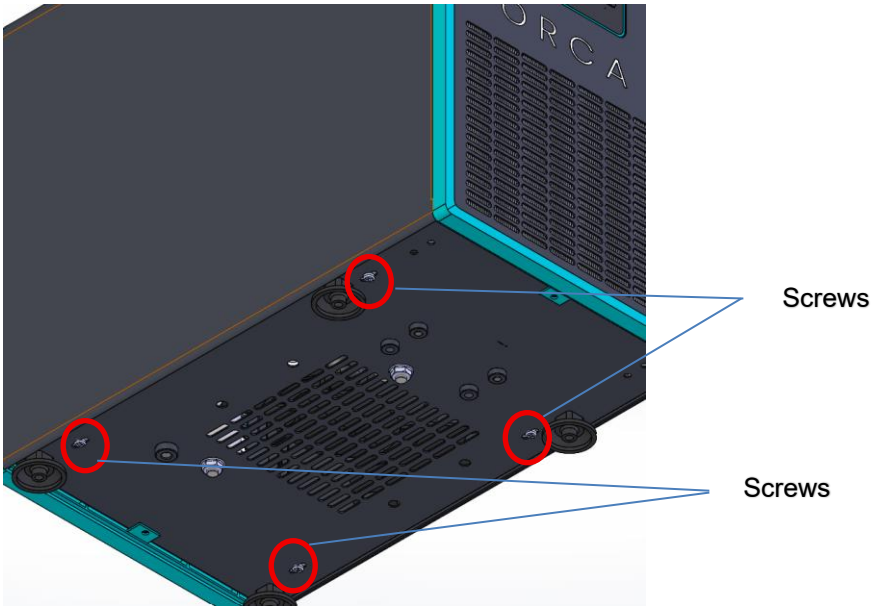
Fuse replacement should only be carried out by a competent person.

9.4 Removing Enclosure Panels

WARNING

Removal of enclosure panels exposes internal electrical and refrigeration components. This procedure must only be carried out by trained and authorised service personnel.



1. Switch the ORCA unit off and disconnect it from the mains supply.
2. Position the unit on a stable surface with sufficient clearance to allow access to the base of the enclosure.
3. Remove the reservoir cap from the top of the unit.

4. Unscrew and remove the retaining nut located beneath the reservoir cap to release the enclosure from the reservoir connection point.
5. Carefully move the unit towards the edge or corner of the work surface to allow access to the underside.
6. From the underside of the unit, locate and remove the four enclosure locating screws, one at each corner of the base. Retain the screws for reassembly.
7. Once all fixings have been removed, **carefully slide the enclosure off

9.4 Replacing the mains cord

This equipment must only be used with an appropriately approved cord set acceptable for the country in which the equipment is intended to be used.

The mains cord set must be suitably rated for the equipment it is intended to be used with, refer to the equipment rating label for further details.

No user replaceable parts, if the cord set is damaged do not operate the equipment, disconnect from the supply immediately and contact Grant Instruments or your authorised service agent for replacement.

Guidance information table

Country	Cord type	Mains Plug
US	NEMA 5-15: SVT 18AWG	C13 2m 10A 75C
UK	H05VV-F 3GX1mm²	C13 2m 10A 70C
EU		

9.5 Routine safety tests

If routine tests are to be made, we recommend a test of the integrity of the protective earth conductor and an insulation test at 500V DC. Routine flash tests are not recommended for any electrical equipment, because repeated high voltage tests degrade insulation materials.

9.6 Disposal

Warning: equipment contains a flammable refrigerant.

The refrigerated reservoir contains flammable refrigerant gas (R290) which must NOT be discharged into the atmosphere. At the end of the equipment's working life, either have the gas removed safely by using refrigerant recovery equipment or return the equipment to Grant Instruments for disposal.

9.7 Service

If servicing is required, switch off the equipment and contact Grant Instruments or your local representative for repairs.

Please note all returned equipment must be accompanied by a Return Materials Authorisation (RMA) number, obtainable by contacting the Grant service department (details below).

Service Department
Grant Instruments (Cambridge) Ltd
Evolution House
Unit 2, Durham Way
Royston Gateway
Royston
SG8 5GX UK

Tel: +44 (0) 1763 260 811
E-mail: service@grantinstruments.com

10.0 Troubleshooting

Symptom	Possible cause	Action
Unit does not operate	Unit not switched on	Turn on at switch at rear of unit.
	Unit not plugged into mains supply	Plug in and switch on.
	Mains power supply failure	Check other appliances on the same circuit are working.
Temperature does not rise when expected	The ORCA can only provide cooling of a circulating liquid in an external equipment or processes that generates heat.	Check that the external process or equipment is generating heat.
Temperature continues to rise when not expected	Set temperature is higher than liquid temperature	Check that the set temperature is correct (see section 5.2.1).
	The external equipment or process is generating more heat than the ORCA can remove	Check the ratings of the ORCA are capable of controlling the external equipment.
Display shows dry	Insufficient liquid in the reservoir, unit stops	Remove the cap and fill the reservoir with a liquid suitable for the working temperature until it reaches the neck of the reservoir; see section 4.7 for recommended liquids.
Display shows LLL	Low liquid level in the reservoir, system continues to operate	Remove the cap and fill the reservoir with a liquid suitable for the working temperature until it reaches the neck of the reservoir; see section 4.7 for recommended liquids.
Display shows PSt	Unit has failed Power On Self Test	Remove the cap and check the liquid level, refill if required. There may be an existing overpressure fault, refer to PrS below. If the fault still exists then contact Grant Instruments.
Display shows OtA	Overtemperature alarm has activated	Unit has turned off as it has been unable to bring the temperature of the external equipment down to within its operating range. Check the ratings of

		the ORCA are capable of controlling the external equipment.
Display shows PrS	An overpressure fault has occurred in the cooling system	This cannot be reset by the user: have the unit checked by a competent person as described in 5.2.3.
Display shows Prb	The temperature probe is faulty	Contact Grant Instruments.
Display shows ELo	Displayed temperature is below -19.9°C	Remove the cause of the low temperature, the temperature will display correctly when it is above -20°C.
Display shows EH1	Displayed temperature is above 105°C	Turn the unit off, remove the cause of the high temperature, allow the unit to cool and then turn it on again. DO NOT OPEN THE RESEVOIR UNTIL THE UNIT HAS COOLED. If the problem persists then contact Grant Instruments.
Display shows OSC	Internal oscillator fault	Turn the unit off and on again. If the problem persists then contact Grant Instruments.
Display shows Hot	Unit has been shut down as the temperature exceeded 75°C	Turn the unit off, remove the cause of the high temperature, allow the unit to cool and then turn it on again.
Display shows CLd	Unit has been shut down as the temperature fell below -40°C	Turn the unit off, remove the cause of the low temperature, allow the unit to warm and then turn it on again.
Display shows ntr	Unit has been shut down due to a fault in the valve drive circuitry	Turn the unit off and on again. If the problem persists then contact Grant Instruments.

For any other errors or service requests, please contact Grant Instruments service department.

11.0 Contact Grant Instruments

At Grant we are continuously trying to improve the performance we offer our customers. If you have any feedback on Grant's products or services we would like to hear from you. Please send all feedback to:

Quality Manager
Grant Instruments (Cambridge) Ltd
Evolution House
Unit 2, Durham Way
Royston Gateway
Royston
SG8 5GX UK

Tel: +44 (0) 1763 260 811
E-mail: support@grantinstruments.com

12.0 Compliance

Waste Electrical and Electronic Equipment (WEEE)

This product marked with the crossed-out wheelie bin symbol indicating it must not be disposed of with unsorted waste. Safe recycling of WEEE helps conserve natural resources and protect human health.

Grant Instruments complies fully with the UK Waste Electrical & Electronic Equipment (WEEE) regulations 2013. We are a member of the B2B compliance scheme (Scheme Approval Number WEE/MP3338PT/SCH), which handle our WEEE obligations on our behalf. Grant Instruments have been issued with a unique registration number by the Environmental Agency, this reference number is WEE/GA0048TZ.
For information regarding WEEE collections in the UK please contact our B2B Compliance Scheme directly on 01691 676 124 or www.b2bcompliance.org.uk

In the EU, Grant Instruments complies with WEEE Directive 2012/19/EU.
Contact your local equipment supplier for WEEE collections.

Restriction of substances hazardous to health (RoHS)

This product complies with the requirements of the UK Restriction of the Use of Certain Substances in Electrical and Electronic equipment Regulations 2012 and the EU RoHS Directive (2011/65/EC including 2015/863). This means the products are free of Lead and other hazardous substances covered by the directive.

Electrical safety and electromagnetic compatibility

This product complies with the requirements of the UK Electrical Equipment (Safety) Regulations 2016 and the European Union Low Voltage Directive (2014/35/EC) for Electrical safety.

This product complies with the requirements of the UK Electromagnetic Compatibility Regulations 2016 and the European Union EMC directive (2014/30/EC).
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Refrigerant and F-Gas regulations

The ORCA is hermetically sealed equipment containing HC refrigerant R290

Refrigerant charge: 0.04 Kg
CO_2 equivalent: 0.0002 Tonnes
Refrigerant must be disposed of according to local regulations

REACH Regulation

This product does not contain any Substances of Very High Concern (SVHCs) at greater than 0.1% that have to be identified in accordance with Regulation (EC) No 1907/2006 and therefore does not have an entry in the SCIP database.

Notes

Grant Instruments (Cambridge) Ltd
Evolution House, Unit 2
Durham Way
Royston Gateway
SG8 5GX
UK

Tel: +44 (0) 1763 260811

salesdesk@grantinstruments.com
www.grantinstruments.com

Representative in the European Union

Grant Instruments Europe B
SIA Biosan
Ratsupites iela 7 K-2
Riga
Latvia
LV-1067

Tel: +371 67 426 137

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