

Bergs Chillers Installation Manual - The Double Chiller

Introduction

This manual provides detailed, standalone instructions for installing "The Double" Standalone Chiller, an integrated cooling system with both heat exchangers and compressors housed within a single consolidated unit. Designed for simplified installation and operation in situations where space consolidation is preferred or required, "The Double" delivers reliable performance when set up correctly. This document serves as a complete guide for licensed professionals, covering all aspects of setup from pre-installation to commissioning. Installation must comply with local, state, and national regulations and be performed by certified electricians to ensure safety, efficiency, and warranty validity. For technical support, contact the Bergs recovery office.

Current Date: March 24, 2025

1. Specifications

- **Description:** "The Double" is an integrated chiller system where the heat exchangers and compressors are contained within a single unit, optimized for straightforward installation and space efficiency.
- **Size and Dimensions:**
 - Length: 1500 mm
 - Width: 750 mm
 - Height: 750 mm
 - Weight (Net): 118 kg
- **Technical Information:**
 - Compressor Horsepower: 4
 - KW Rating: 9.29
 - Number of Fans: 2
 - Fan Diameter: 400 mm
 - Fan Air Flow: 7400 m³/h
 - Receiver Capacity @ 80%: 2x6 kg (12 kg total)
 - Refrigerant Type: R404a
 - Heat Exchanger: Titanium shell tube, 40 mm fitting
 - Flow Rate: 40-100 lpm (litres per minute)
- **Power Information:**
 - Compressor Phase: 1 or 3
 - Compressor Supply: 230V
 - Compressor MOC (Maximum Operating Current): 22.8 A

- Fan Phase: 1
 - Fan Electrical Supply: 240V
 - Fan Electrical Hertz: 50 Hz
 - Fan MOC: 1.64 A
 - Sound Power Level: 77 dBA
 - *Note: Specifications are approximate and subject to change. Refer to the unit's nameplate for final confirmation.*
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2. Pre-Installation Notes

Proper preparation is essential for a successful installation of "The Double." The following notes outline critical considerations to ensure the unit operates as intended:

- **Placement:** Position "The Double" on a level concrete pad in a designated outdoor area to facilitate proper ventilation and stability.
- **Ventilation:** Maintain minimum airflow clearances to prevent efficiency loss and overheating (detailed in Section 3.3).
- **Professional Installation:** Installation must be completed by:
 - A licensed electrician for all electrical connections.
 - No refrigeration mechanic is required, as "The Double" is a standalone unit with a precharged refrigeration system.
 - Compliance with local, state, and national regulations is mandatory; failure to use a certified electrician voids the warranty.
- **Inspection:** Upon delivery, thoroughly inspect the package for visible damage (e.g., dents, crushed corners). Contact Bergs immediately if signs of mishandling are present—do not proceed with installation until resolved.

2.1 Key Pre-Installation Considerations

- **Nitrogen Charge Verification:**
 - Check the nitrogen charge in the heat exchanger before any installation steps.
 - If no nitrogen charge is present, do not install—return the unit to Bergs immediately for replacement or recharge.
- **Refrigerant Precharge:**
 - "The Double" is factory-precharged with 2x6 kg (12 kg total) of R404a refrigerant (80% receiver capacity), fully contained within the integrated system.
 - Confirm this amount is labelled inside the unit; discrepancies require Bergs' attention.
- **Unit Condition:**
 - Inspect the unit for physical damage or manufacturing defects (e.g., bent fins, cracked casing) that could affect performance.
- **Airflow Clearances:**

- Minimum clearances: Rear: 300 mm, Sides: 750 mm each, Front: 1500 mm, Above: 500 mm.
 - These ensure adequate ventilation and prevent warm air recirculation.
 - **Plumbing Setup:**
 - Connect to the pool/spa return line using 40 mm or 50 mm PVC pressure-rated pipes.
 - Use barrel unions for maintenance access and support brackets to secure piping.
 - **Electrical Requirements:**
 - Requires a licensed electrician to connect power; a cable gland is provided for new cable entry.
 - Terminals are clearly labelled inside the unit for wiring.
 - Verify power supply matches specifications: 230V single or three-phase for the compressor, 240V single-phase for the fans.
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3. Installation Instructions

3.1 System Installation

- **Critical Requirement:** Installation of "The Double" must be performed by a licensed electrician. Unauthorized installation or repairs by unlicensed individuals are prohibited and will void the warranty, compromising both safety and performance.
- **Verification Steps Before Installation:**
 - Confirm nitrogen charge is present in the heat exchanger.
 - Verify the unit is precharged with 2x6 kg (12 kg) of R404a within the integrated system.
 - Inspect the unit for any damage or defects.
 - Ensure proper positioning, ventilation, water flow setup, and electrical connections are feasible at the chosen site.

3.2 Location of Installation

- **Outdoor Installation Recommended:** "The Double" should be installed outdoors to ensure optimal air circulation around the unit. Indoor placement or confined spaces with poor ventilation will significantly reduce efficiency and may cause damage in severe cases. If outdoor installation isn't feasible, contact Bergs Technical Support for specialized guidance.
- **Positioning Requirements:**
 - **Distance from Pool/Spa Edge:** Minimum 3.5 m, maximum 7.5 m to minimize heat loss through piping.
 - **Height Relative to Water Surface:** No more than 5 m below the pool/spa water surface to maintain effective water flow.
 - **Avoid Roof Runoff:** Do not position where steep roofs without guttering could direct rainwater and debris through the unit; install a water deflector if necessary.

- **Chemical Exposure:** Keep the unit away from storage or use of corrosive or harsh pool chemicals to prevent corrosion or damage.
- **Mounting Surface:** Secure the unit on a level, stable concrete pad to prevent vibration or tipping.

3.3 Airflow Clearances

- **Minimum Clearances:**
 - Front: 1500 mm
 - Sides: 750 mm each
 - Above: 500 mm
 - Rear: 300 mm
- **Purpose:** These clearances ensure ample fresh airflow (7400 m³/h from two 400 mm fans) and prevent the unit from recycling discharged warm air, which reduces cooling performance and may lead to ice buildup on the coils.
- **Site Check:** Position "The Double" in a location free of obstructions (e.g., walls, plants, structures). If the proposed site cannot meet these requirements, consult Bergs Technical Support for alternative solutions.

3.4 Adequate Water Flow

- **Importance:** Maintaining a consistent flow rate of 40-100 lpm is crucial for efficient cooling and to avoid strain on the heat exchanger. Improper flow rates can reduce performance and potentially harm the system.
- **Setup Requirements:**
 - Install a bypass valve and plumbing setup OR a variable speed pump to regulate water flow precisely to 40-100 lpm.
 - Never connect a pump with excessive flow rates directly to the chiller, as this can overwhelm the system and trigger shutdowns.
- **Pipe Flushing:** Before connecting plumbing, thoroughly flush all pipes to remove debris (e.g., dirt, PVC shavings).
- **Pool Cleaning Note:** During pool/spa cleaning, switch off "The Double" to avoid low-flow faults caused by reduced circulation.

3.5 Plumbing

- **Location in System:** Install "The Double" in the pool/spa return line, positioned after all filters and pumps but before any chlorinators, ozonators, or chemical dosing systems to ensure clean water enters the heat exchanger.
- **Piping Specifications:**
 - Use 40 mm or 50 mm PVC pressure-rated pipes compatible with pool/spa filtration systems.
 - Standard slip glue fittings are provided; a 50NB to 40NB reducer can be used for 40NB plumbing if needed.
- **Fittings and Connections:**
 - Install barrel unions (hand-tighten only) at the inlet and outlet for easy maintenance access.

- Add quick-release couplings at the inlet (bottom) and outlet (top) for simplified drainage and servicing.
- **Sealing and Support:**
 - Apply plumber's tape to threaded connections and inspect O-rings to ensure a watertight seal.
 - Install support brackets where necessary to prevent pipe movement, which could squeeze and damage the rubber O-ring, causing leaks.
- **Pressure Drop:** The premium titanium heat exchanger maintains a maximum water pressure drop of less than 10 kPa at the 40-100 lpm flow rate, requiring only bypass plumbing to adjust flow as per nameplate specs.

3.6 Electrical Connection

- **Requirements:**
 - All electrical work must be performed by a licensed electrician who has reviewed this manual, adhering to Australian Standards and local laws.
 - Power supply: Compressor at 230V, single or three-phase; Fans at 240V, single-phase.
 - Acceptable voltage range for operation: 220-240V for single-phase units, 380-415V for three-phase units if applicable; operating outside these ranges will damage the unit and void the warranty.
- **Safety Components:**
 - Isolate the power supply during installation and maintenance to prevent electrical hazards.
 - Install a 30 mA Residual Current Device (RCD) to protect against leakage currents exceeding 10 mA.
 - Fit a double-pole isolation switch with minimum contact gaps of 3 mm across each pole, integrated into the fixed wiring setup per electrical regulations.
 - Include a circuit breaker if hard-wiring the water pump to the chiller for added protection.
 - Ensure proper earthing to avoid electrical shocks.
- **Wiring Procedure:**
 - Access electrical terminals by removing the right panel; refer to the wiring diagram located inside the front panel.
 - Use the provided cable gland for new cable entry.
 - Verify maximum current requirements: 22.8 A for the compressor, 1.64 A for the fans.
 - Connect as follows:
 - Active to the top of the circuit breaker.
 - Earth to the far left green terminal.
 - Neutral to the left blue terminal.

3.7 Initial Start-Up & Commissioning

- **Prerequisites:** The filter pump must be operational, circulating water through the heat exchanger at 40-100 lpm, for "The Double" to function.
- **Start-Up Sequence:**

- Activate the filter pump; check for leaks at all plumbing connections and confirm water circulation to and from the pool/spa at 40-100 lpm.
 - Connect the power supply to the unit, ensuring all electrical safety components (RCD, isolation switch) are in place.
 - Turn on "The Double" using the ON/OFF button.
 - Set the desired temperature on the controller (factory preset to 8°C; no additional programming required).
 - Run the unit and pool pump continuously (24 hours) until the desired water temperature is reached; initial cool-down time varies based on pool size, environmental conditions, and chiller capacity (may take several days).
 - **Operational Behavior:**
 - Once the target temperature is achieved, "The Double" reduces output and may shut off if the temperature remains stable for 45 minutes or more.
 - The system automatically restarts (assuming the pool pump is running) when the water temperature rises more than 1°C above the setpoint.
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4. Safety Instructions

- **Certified Personnel Only:** Installation, servicing, or movement of "The Double" must be performed by licensed electricians. Improper handling by unqualified persons risks electrical hazards, fire, water damage, or personal injury. No refrigeration mechanic is required due to the integrated design.
- **Electrical Safety:**
 - Install a 30 mA RCD to protect against electrical faults; leakage current may exceed 10 mA.
 - Use a double-pole isolation switch with 3 mm contact gaps, permanently integrated into the fixed wiring per national regulations.
 - Ensure proper earthing to prevent shocks; verify continuity before powering on.
 - Disconnect all supply circuits before accessing terminals.
 - If the supply cord is damaged, it must be replaced by a qualified service agent.
- **Refrigerant Safety:**
 - "The Double" uses R404a, a flammable refrigerant; be aware it may not have an odor.
 - Do not pierce or burn the unit, as this could release refrigerant and pose a fire hazard.
 - Install in a well-ventilated space exceeding 30 m² in floor area, free of continuously operating ignition sources (e.g., open flames, gas appliances).
- **General Safety:**
 - Not suitable for potable water applications—intended solely for pool/spa chilling.
 - Handle with care during transport to avoid damage and potential refrigerant escape; follow all transport regulations.

5. Installation Checklist

This checklist ensures every step of the installation process for "The Double" is completed thoroughly and correctly:

Pre-Installation:

- ☐ Inspect the package upon delivery for visible damage (e.g., dents, crushed corners); contact Bergs immediately if mishandling is evident.
- ☐ Verify the nitrogen charge in the heat exchanger before proceeding; return to Bergs if not charged—do not install.
- ☐ Confirm the unit is precharged with 2x6 kg (12 kg total) of R404a refrigerant (80% capacity, labelled inside) within the integrated system.
- ☐ Check the unit's physical condition for damage or defects (e.g., bent fins, cracked casing).

Location:

- ☐ Position "The Double" outdoors to ensure optimal air circulation around the unit (contact Bergs for indoor installation guidance if necessary).
- ☐ Ensure a minimum distance of 3.5 m and maximum of 7.5 m from the pool/spa edge to minimize pipe heat loss.
- ☐ Confirm the unit is no more than 5 m below the pool/spa water surface.
- ☐ Avoid locations where roof runoff might flood the unit; install a water deflector if steep roofs without guttering are present.
- ☐ Keep the unit away from storage or use of corrosive or harsh pool chemicals.
- ☐ Mount "The Double" on a level, stable concrete pad to prevent vibration or instability.

Airflow Clearances:

- ☐ Maintain a minimum clearance of 1500 mm at the front for unrestricted air circulation.
- ☐ Ensure 750 mm clearance on each side of the unit.
- ☐ Provide 500 mm clearance above the unit.
- ☐ Keep 300 mm clearance at the rear.
- ☐ Verify the installation site avoids confined spaces to prevent warm air recycling, ensuring 7400 m³/h airflow from two 400 mm fans.

Water Flow:

- ☐ Install a bypass valve and plumbing setup OR a variable speed pump to regulate water flow precisely to 40-100 lpm.
- ☐ Ensure no pump with excessive flow rates is connected directly to "The Double."
- ☐ Thoroughly flush all pipes before connection to remove debris.

Plumbing:

- ☐ Install "The Double" in the pool/spa return line, positioned after all filters and pumps but before chlorinators, ozonators, or chemical dosing systems.
- ☐ Use 40 mm or 50 mm PVC pressure-rated pipes with slip glue fittings (optional 50NB to 40NB reducer for 40NB plumbing).
- ☐ Install barrel unions at the inlet and outlet, hand-tightening for maintenance access.
- ☐ Add quick-release couplings at the inlet (bottom) and outlet (top) for simplified drainage and servicing.
- ☐ Apply plumber's tape to threaded connections and inspect O-rings to ensure a watertight seal.
- ☐ Install support brackets where necessary to prevent pipe movement and protect the O-ring from damage.
- ☐ Verify the maximum water pressure drop is less than 10 kPa at the 40-100 lpm flow rate.

Electrical Connection:

- ☐ Engage a licensed electrician to perform all electrical work, adhering to Australian Standards and local laws.
- ☐ Confirm power supply matches specifications: 230V single or three-phase for the compressor, 240V single-phase for the fans.
- ☐ Isolate the power supply during installation and maintenance.
- ☐ Install a 30 mA RCD to protect against leakage currents exceeding 10 mA.
- ☐ Fit a double-pole isolation switch with 3 mm contact gaps, integrated into the fixed wiring setup.
- ☐ Include a circuit breaker if hard-wiring the water pump to the chiller.
- ☐ Ensure proper earthing of the unit to prevent electrical shocks.
- ☐ Use the provided cable gland for new cable entry into the unit.
- ☐ Verify maximum current requirements: 22.8 A for the compressor, 1.64 A for the fans.
- ☐ Access electrical terminals by removing the right panel; refer to the wiring diagram inside the front panel.
- ☐ Connect terminals as follows: Active to the top of the circuit breaker, Earth to the far left green terminal, Neutral to the left blue terminal.

Initial Start-Up & Commissioning:

- ☐ Ensure the filter pump is operational and circulating water through the heat exchanger at 40-100 lpm before starting "The Double."
- ☐ Activate the filter pump; inspect all plumbing connections for leaks and confirm water circulation to and from the pool/spa at 40-100 lpm.
- ☐ Connect the power supply to the unit, ensuring all safety components (RCD, isolation switch) are installed and functional.
- ☐ Turn on "The Double" using the ON/OFF button on the controller.
- ☐ Set the desired temperature on the preset controller (factory default: 8°C; no additional programming needed).

- ☐ Run "The Double" and the pool pump continuously (24 hours) until the desired water temperature is reached, noting that cool-down time may take several days depending on pool size, environmental conditions, and chiller capacity.
- ☐ Verify that "The Double" reduces output and shuts off automatically if the temperature remains stable for 45 minutes or more.
- ☐ Confirm the unit restarts automatically (with the pool pump running) when the water temperature rises more than 1°C above the setpoint.