HCU 40
Heater-Cooler Unit

MAQUET
GETINGE GROUP

This document is intended to provide information to an international audience outside of the US.


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HCU 40
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HCU 40 from Maquet
Excellence in heating and cooling

Maquet is an international synonym for innovative and technological advances in operating rooms and intensive care units. The new heater-cooler unit HCU 40 from Maquet is another current example of this innovation and modern design with features and functions that benefit both patient and user during increasingly complex cardiovascular surgical procedures.

Easy, rapid and precise temperature control are essential requirements for a hypo-/hyperthermia unit for use during extracorporeal circulation. Maquet's HCU 40 combines the latest proven technology with outstanding performance and unique usability. It delivers very precise, fast and independent regulation of both patient and cardioplegia circuit temperatures – intuitively controllable with a color touch screen display.

Maquet | The Gold Standard

Powerful and innovative
Temperature control in a new dimension

Independent temperature control for patient and cardioplegia with connectivity to three external water circuits: The HCU 40 from Maquet includes two independent water circuits. The first circuit can supply temperature controlled water to the oxygenator blood heat exchanger and to warming/ cooling blankets. The second circuit provides temperature controlled water to the cardioplegia heat exchanger. Temperature and water flow in both circuits are adjustable independently of each other.

Connectivity of three external water circuits for perfect temperature control.

Fast temperature change and high accuracy: The tank for the patient and cardioplegia water circuits is devided into two parts to ensure quick temperature adjustments at the outlets. It also ensures that cold cardioplegia is always available. The internal mixing valve allows very fast and accurate switching from cooling to heating, and back to cooling again. The HCU 40 can perform rapid water temperature changes with measurement accuracy of ± 0.3° C.

Exceptional cooling capacity and silent operation: The HCU 40 has exceptional cooling capacity through its fast ice-building technique using highly effective cooling plates and a powerful compressor. The ice provides an initial cooling effect, that is significantly higher than hypothermia units operating exclusively with a compressor for refrigeration (i.e. flow-through cooler). The ice-making method of the HCU 40 results in reduced patient cooling times, greater accuracy, and faster water temperature changes.

In most cases, the HCU 40 can be operated without a running compressor, thereby eliminating noise and draft from the compressor and the fan for silent operation.

Separated tank for the patient and cardioplegia water circuits for maximum cooling capabilities.

Efficient, safe and convenient
Application and operation

Very efficient heating and intelligent power management: The HCU 40 is equipped with extremely large capacity heaters and intelligent electronic management of the heating and cooling components. For example, when the ice-making compressor is not in use, it is automatically bypassed, and the majority of the power supply is used for the heaters. This promotes very efficient heating performance, minimized patient re-warming time, and contributes to more accurate and faster water temperature changes.

Sophisticated electrical safety: The use of an isolating transformer for all electrical components, precision sensors and a complete redundant safety system are the important features of the proven and sophisticated technology of the HCU 40. This helps promote both patient safety and operating reliability.

Fast priming and automatic de-airing: The intelligent internal circuit design allows air to be dispelled effectively from the external and internal circulation. By activating the priming function the external water tubes are primed and air is removed from the water circuit, resulting in an extremely short set-up time. The system also continuously eliminates air escaping from the heating process. This maximizes efficiency and results in more silent pump function.

Effective emptying of external devices: The HCU 40 allows effective emptying of any connected devices, such as heat exchangers, blankets and water supply tubing, by suctioning the water back into the unit. As a result, frequent filling of the tank is not necessary and water spillage is virtually eliminated promoting safety.

Unique usability
For an effective therapy

Unique usability through user-friendly and flexible Control Unit with VGA touch screen display: The HCU 40 is operated and controlled by an adjustable Control Unit. The Control Unit can be individually positioned on the HCU 40 or the mast of any heart-lung machine – no additional remote control is necessary.

The HCU 40 provides a comprehensive, color touchscreen display with logical, intuitive menus. Function, status, and system information can be monitored and controlled simply and conveniently by the touchscreen in combination with a rotary knob. Frequently used temperature settings can be saved to be immediately accessed at the beginning of surgery via hotkeys – a special feature to save time.

A CAN connection for future Maquet heart-lung machines is also ready in place.

Furthermore, it is possible to connect two external temperature sensors to the cooling and warming therapy units and the control unit. This allows operation with automatically controlled temperature gradients for physiologically optimized cooling and heating.

Individual positioning on the HCU 40 or extended as a remote control, the Control Unit ensures easy and accurate operation of the Heater-Cooler Unit.

The colored touch screen display with clear symbols and large figures.

Integrated UVC lamp to prevent the growth of algae, fungi, mould, bacteria and other micro-organisms in the internal water circuitry.

HCU 40
Benefits at a glance

- Independent temperature control of the patient and cardioplegia via separated water circuits
- Up to three external heat exchangers can be used simultaneously
- Fast and accurate temperature adjustment made possible by the split tank and automatically controlled mixing valve
- Reduced patient cooling times due to the exceptional cooling capacity of the effective ice-building system
- Silent operation – most surgeries can be performed without a running compressor
- Independent and precise flow control of the circuits allow the option of locating the unit outside the OR
- Minimized patient rewarming time due to the outstanding heating capacity and intelligent electronic management
- Gradient mode for physiologically optimized heating and cooling
- Proven patient safety and operating reliability ensured by the sophisticated electrical safety concept
- Simplified operation thanks to the user-friendly, flexible Control Unit with touch screen display
- Extremely short setup time required due to fast priming and automatic de-airing
- Effective UVC lamp fights against germs
- Polished stainless steel cabinet – easy to clean and damage resistant
- Easy to maneuvre using smooth running castor wheels with foot-lever operated brakes
- Hansen-quick couplings with icons facilitate fast and clear connection of oxygenator and cardioplegia heat exchangers
- Convenient and effective emptying of external devices

HCU 40
Technical specifications

Specifications	
Control range temperature	1.0 °C to 40.5 °C
Setting resolution temperature	0.1°C
Temperature measurement accuracy	± 0.3 °C
Temperature measuring range	-9.5 °C to 59.5 °C
Cooling system	Compression cooling system, ice-forming
Tank capacity	28 liters
Quantity of ice	15 kg
Initial cooling capacity	6350 kJ
Continuous cooling capacity of the compressor	4867 kJ/h (1352 W)
Heating system	Electrical heaters
Heating capacity	2 x 3000 W (200 … 240 V) 2 x 1500 W (110 … 120 V)
Circulation system	Pressure pumps
Flow capacity, patient water circuit	18.5 l/min (50 Hz), 22.0 l/min (60 Hz) at zero pressure head (adjustable)
Flow capacity, cardioplegia water circuit	9.5 l/min (50 Hz), 11.0 l/min (60 Hz) at zero pressure head (adjustable)
Maximum pressure, patient water circuit	1.5 bar (50 Hz), 2.0 bar (60 Hz) Pressure alarm limit (safety cut-off) adjustable 0.6 bar to 2.0 bar
Maximum pressure, cardioplegia water circuit	1.0 bar (50 Hz), 1.5 bar (60 Hz) Pressure alarm limit (safety cut-off) adjustable 0.4 bar to 1.5 bar
Mains voltage (set at the factory)	110/115/120/200/208/220/230/240 V
Frequency	50 / 60 Hz
Power tolerance	± 10%
Line fuse	25 A (110 … 240 V)
Current limitation options, 200 to 240 volt	10, 12, 14 and 16 A
Current limitation options, 110 to 120 volt	16 A
Maximum power consumption	1760 … 1920 VA (110 … 120 V, 16 A) 2760 … 2880 VA (230 … 240 V, 12 A) 2990 VA (230 V, 13 A) 3000 … 3600 VA (200 … 240 V, 15 A) 3200 … 3840 VA (200 … 240 V, 16 A)
Volume (at 3 m distance)	40.4 dB (at 50 Hz), 44.3 dB (at 60 Hz) (patient and cardioplegia pump turned on, compressor turned off) 44.8 dB (at 50 Hz), 46.8 dB (at 60 Hz); (patient and cardioplegia pump turned on, compressor turned on)
Dimensions (HxWxD)	1133 x 508 x 703 mm (880 x 508 x 688 mm without CU and holder)
Weight (incl. CU and holder, excl. tubes)	154 kg (340 lb)
Cabinet material	Polished stainless steel
Display of user interface	Touchscreen LCD, 115.2 x 86.4 mm, 640 x 480 pixels
Tube connections	6 metal connectors (Hansen coupling kit for patient water circuit: 1/2”, Hansen coupling kit for cardioplegia water circuit 3/8”)
UV lamp – operating current	425 mA
UV lamp – power	14 W
UV lamp – rated life	9000 h

Maquet MCare
your service partner

In addition to the standard warranty, Maquet offers different levels of service contracts for the heater-cooler unit HCU 40 through the MCare service. If a service need arises during the initial standard warranty period (excl. maintenance and expendable items), Maquet will provide repair services as necessary at no charge. After the standard warranty period, the MCare program offers additional service contract options for additional protection.

For more details contact your local Maquet Service organization.

This brochure contains information about products which may be pending regulatory approval to be marketed in your country.
Contact your local Maquet representative for more information.

See instructions for use for full prescribing information, including indications, contraindications, warnings, precautions and adverse events.

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