Heater-cooler unit HCU 40

Highest performance and safety in perfusion

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

GETINGE

M-LIFTING
MAQUET
37.0
10.0
37.0
10.0
HCU 40 MAQUET

Maquet's HCU 40

Excellence in heating and cooling

Under the brand Maquet, Getinge is offering innovative, technologically-advanced equipment for operating rooms and intensive care units.

Maquet's heater-cooler unit HCU 40 is another current example of this innovation. Combining proven temperature-control technology with outstanding performance and unique usability, the HCU 40 provides benefits for both the patient and clinician during complex cardiovascular surgery procedures.

Powerful and innovative

Reliable temperature control made easy

Easy, rapid and precise temperature control is essential for a hypo-/hyperthermia unit used during extracorporeal circulation. The heater-cooler unit HCU 40, with an intuitively controllable color touch screen display, delivers precise, fast and independent regulation of both patient and cardioplegia circuit temperatures.

The first water circuit of the HCU 40 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. Both temperature and water flow are independently adjustable in each circuit.

Fast temperature change and high accuracy

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

Connectivity of three external water circuits for perfect temperature control.

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

Proven hygienic safety

– ensured by design and optimized disinfection procedures

Exceptional cooling capacity and silent operation

The HCU 40 has exceptional cooling capacity through its fast ice-building technique, which uses 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 (e. g. flow-through cooler). The ice-making technology 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 fan for silent operation.

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, minimizes patient re-warming times, and contributes to more accurate and faster water temperature changes.

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. In addition, the system continuously eliminates air escaping from the heating process, maximizing the efficiency and resulting in a more silent pump function.

Unique usability for an effective therapy

Unique usability through the user-friendly and flexible control unit with touch screen display: The HCU 40 is operated and controlled by an adjustable control unit. It 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 touch screen display with logical, intuitive menus. Function, status, and system information can be monitored and controlled simply and conveniently by the touch screen 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.

The use of an isolating transformer for all electrical components, precision sensors and a complete redundant safety system, helps promote both patient safety and operating reliability.

Effective emptying of external devices

The HCU 40 allows effective emptying of all connected heat exchangers 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 patient safety.

The design of the HCU 40 prevents airborne transmission of potentially existing bacteria from the water system into the operating field. Heater-cooler unit HCU 40 has only one water tank, which operates at approximately 1–3 °C water temperature, reducing the potential for bacterial growth and aerosol formation. But the most important feature is the separation of the system's sealed tank from the inner compartment where the fan is contained. The air flow from or to the fans do not pass over the area with the water tank. Therefore the air flow cannot carry aerosols from the water tank into the operating field.

The system contains no stirring devices in the tank, which could generate air bubbles during operation. Test results from an independent institute provide evidence that HCU 40 does not emit any germs to the sterile OR field in any operation mode of the device – independent of the orientation (air outflow direction) of the unit.

New disinfection procedures fulfilling latest hygienic requirements

Maquet has introduced new disinfections procedures for its HCU 40. These new protocols include a routine disinfection as well as a highly effective disinfection – also effective against atypical mycobacteria in the water system. Naturally, an effective hygienic monitoring process in the HCU 40 production ensures 100% microbiological control of every produced unit before leaving the factory. Additionally, prior to customer handover, each HCU 40 is disinfected by Maquet authorized service engineers per the validated disinfection procedure.

A CAN connection for future Getinge heart-lung machines is already in place. It is also 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.

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
- Minimized patient rewarming time due to the outstanding heating capacity and intelligent electronic management
- Gradient mode for physiologically optimized heating and cooling
- Precise and independent flow control of the water circuits allow the option of locating the unit outside the OR
- 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
- Convenient and effective emptying of external devices after surgery
- Polished stainless steel cabinet – easy to clean and damage resistant
- Easy to maneuver using smooth running castor wheels with foot-lever operated brakes
- Proven patient safety and operating reliability ensured by the sophisticated electrical safety concept
- Safe design prevents an airborne transmission of any microorganisms from the system water into the operating field
- Optimized disinfection procedures, including a protocol for highly effective disinfection and biofilm reduction – also effective against atypical mycobacteria in the water system for hygienic safety

MSync

Connecting systems efficiently to create time for what's really important

MSync transfers complex clinical data from your Getinge point-of-care device and translates it to Health Level Seven (HL7). This data is added into your Patient Data Management System (PDMS). All information transfers are complete and safe, and they can occur within the hospitals firewalls. MSync is Getinge's own solution for data transfer, no need for third party systems.

The MSync system transfers patient data information from your Getinge point-of-care devices to the PDMS. MSync imports real-time clinical data from your device by using its respective communication protocol. It converts the information to HL7 compliant data by exporting the point of care data into a HL7 format; it is thereafter transferred to the PDMS.

MSync consists of the MSync box, RS232 cord, a mains power cord with a power supply unit, a USB cable and a mounting kit. The MSync system utilizes the Local Area Network (LAN) to transfer information between Getinge medical devices and PDMS. Each MSync needs to be connected to your Getinge device, and have a patient ID which is acquired from the HIS. These two will be connected via a web-based user interface. The user access is controlled and set up by the hospital's IT department.

The MSync is a network system which must be installed by the hospital's IT department. For Getinge technical support please contact your local representative.

MSync is designed to address key security concerns:

- User access is in the hands of the hospital's IT department
- All data transfer occurs within firewalls of the hospital
- Maintain integrity of network security
- Conceal data from unauthorized access
- Ensure authentication of system users

MSync is available for:

- Maquet Flow-I®
- The Servo ventilator family
- Maquet Cardiohelp
- HCU 40

HCU 40

Technical 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	6,350 kJ
Continuous cooling capacity of the compressor	4,867 kJ / h (1,352 W)
Heating system	Electrical heaters
Heating capacity	2 x 3,000 W (200 ... 240 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)	200 / 208 / 220 / 230 / 240 V
Frequency	50 / 60 Hz
Power tolerance	± 10 %
Line fuse	25 A (200 ... 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	2,760 ... 2,880 VA (230 ... 240 V, 12 A) 2,990 VA (230 V, 13 A) 3,000 ... 3,600 VA (200 ... 240 V, 15 A) 3,200 ... 3,840 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 (H x W x D)	1,133 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	Touch screen 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")

GETINGE

Getinge is a global provider of innovative solutions for operating rooms, intensive care units, sterilization departments and for life science companies and institutions. Based on our firsthand experience and close partnerships with clinical experts, healthcare professionals and medtech specialists, we are improving the everyday life for people – today and tomorrow.

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

Maquet Cardiopulmonary GmbH · Kehler Str. 31 · 76437 Rastatt · Germany · +49 7222 932-0

www.getinge.com

MCP_BR_10112_EN_2 (as of 2017-06-12) · Maquet is a registered Trademark · Copyright by Maquet Cardiopulmonary GmbH · Subject to modifications due to technical development.