

CARDIOHELP SYSTEM
EXTRACORPOREAL SUPPORT SOLUTION

MAQUET
GETINGE GROUP





CARDIOHELP SYSTEM THE PORTABLE HEART-LUNG SUPPORT SYSTEM MAQUET – THE GOLD STANDARD



For many years, MAQUET Cardiovascular has been one of the world's leading manufacturers of heart-lung machines and components for extracorporeal circulation. Together with experienced doctors and perfusionists, MAQUET has developed the CARDIOHELP System, which can be deployed quickly in the fields of critical care, emergency medicine, cardiology and cardiac surgery. The compact and portable CARDIOHELP System is ideal for the treatment of patients who require circulatory and /or pulmonary support up to six hours.

Throughout the world, more people die of cardiovascular failure than any other illness. An estimated 17.5 million people die annually from CVD, representing 30% of all global deaths.* Many of these people experience cardiogenic shock because vital organs are not adequately supplied with oxygen. If patients could be connected quickly to a mechanical life support system, such as the CARDIOHELP System, clinicians may gain valuable time.

MAQUET – The Gold Standard.

*Source: World Health Organization.

MORE THAN PARTIAL SUPPORT MECHANICAL CIRCULATORY SUPPORT UP TO 7 LITERS RAPIDLY DEPLOYABLE

Smallest portable heart-lung support system:




It is ideal for use in critical care, cardiac catheterization laboratories, the operating room and trauma rooms. Furthermore, it is the perfect solution for safe, and effective patient transport. As a result, there are now new opportunities and treatment possibilities for extracorporeal circulation for cardiac and or pulmonary support up to six hours.

New possibilities:

- Within the hospital
- Outside of the hospital environment





Circulatory and or pulmonary support:

- **CARDIOHELP** provides oxygen and carbon dioxide removal.
- In circulatory failure, **CARDIOHELP** System can help protect against insufficient oxygen supply to vital organs.
- **CARDIOHELP**'s portability allows for patient transport for other therapeutic measures (e.g., critical care) and diagnostic investigations (e.g. CT scan).

CARDIOHELP System				
Application »	Respiratory Support	Respiratory & Cardiac Support	Cardiopulmonary Bypass	« Application
Disposable »	HLS Set Advanced 5.0* HLS Module Adv. 5.0 Tubes, Connectors BIOLINE Coating	HLS Set Advanced 7.0* HLS Module Adv. 7.0 Tubes, Connectors BIOLINE Coating	Custom Tubing Pack* QUADROX-iR Venous Bubble Trap Tubes, Connectors BIOLINE Coating	« Disposable
Cannulae »	HLS Cannulae	HLS Cannulae	venous multi stage catheter, arterial cannula	« Cannulae
Disposable approved for »	Up to 6 hours	Up to 6 hours	Up to 6 hours	Disposable « approved for
Flow »	0.5 - 5 l/min	0.5 - 7 l/min	0.5 - 7 l/min	« Flow
Temperature regulation »	33 - 40 °C	15 - 40 °C	15 - 40 °C	Temperature « regulation
Place »	Critical Care/ER	Critical Care/Cath Lab/ ER	OR	« Place
Transport »	Yes	Yes	No	« Transport
thApp »	 v-v ECLS	 v-a ECLS	 MECC	« thApp

*SOFTLINE coated versions available for HIT patients.

CARDIOHELP SYSTEM INTEGRATED PUMP AND MEMBRANE OXYGENATOR

HARDWARE			
CARDIOHELP System			
Sensors	CARDIOHELP-i	CARDIOHELP Emergency Drive	Accessories
			
SUITABLE DISPOSABLES			
HLS Set Advanced HLS Module Advanced Tubing, connectors BIOLINE Coating	HIT Set Advanced HLS Module Advanced Tubing, connectors SOFTLINE Coating	HLS Cannulae Arterial Venous BIOLINE Coating	

The Cardiohelp System uses specially developed disposables: In combination with the HLS Cannulae, HLS Set Advanced or the HIT Set Advanced creates the innovative CARDIOHELP System.

CARDIOHELP-i device—the core piece: The combined drive and control unit boasts a compact, functional design and is ready for operation very quickly. The disposable Heart-Lung Support Set (HLS Set) can be easily primed, making the system rapidly deployable. The device is easy to use with just a single rotary knob, in combination with an intuitive touchscreen and touchpad interface.

The Cardiohelp System incorporates all the parameters necessary for use in operating rooms, critical care, cardiac catheterization laboratories and during patient transportation:

- Specific OR, ISM and TM software applications
- Venous Probe for the measurement of venous oxygen saturation, hemoglobin, hematocrit and venous temperature
- Connection cable for integrated sensors of the HLS Modules
- Flow/bubble sensor
- CARDIOHELP Emergency Drive
- Display brightness can be adjusted
- Nursing Station call system compatibility



The device can be connected to an AC or DC power supplies, including the electrical system on a helicopter or mobile intensive care ambulance. In addition, the integrated lithium ion batteries offer a minimum of 90 minutes of independent operation—e. g., during patient transportation.

HLS MODULE ADVANCED PERIPHERAL HLS CANNULAE INTEGRATION MEETS INNOVATION



HLS Module Advanced 7.0

The HLS Module Advanced, part of the HLS Set Advanced, is unique in the world: it integrates a gas ex-changer (equipped with a diffusion membrane), a highly efficient heat exchanger, and a cutting-edge centrifugal pump. In addition, the integrated measuring cell is used to measure the important blood parameters of venous oxygen saturation (S_{VO_2}), hematocrit (Hct) and hemoglobin (Hb), plus venous temperature (T_{Ven}). Until now, this was only possible using an external blood analysis device or a sensor in the blood-carrying tubes. Sensors for three pressure parameters and the arterial temperature are also integrated.

The HLS Module Advanced is available in two versions: for a blood flow of up to 5 l/min (HLS Module Advanced 5.0) and up to 7 l/min (HLS Module Advanced 7.0).

- For up to 6-hour use
- BIOLINE Coating (SOFTLINE in HIT Advanced Set)
- DEHP — Plasticizer free set
- Safety de-airing function
- 3 integrated pressure sensors
 - venous pressure at the module
 - arterial pressure at the module
 - internal pressure at the module
- Integrated arterial temperature sensor
- Integrated measuring cell for venous oxygen saturation hemoglobin, hematocrit, and venous temperature



HLS Cannulae

The HLS Cannulae from MAQUET connects the HLS Set to the patient's blood vessels. These specially developed cannulae can be gently inserted into the veins and arteries, either percutaneously or by surgical cut-down for use up to 6 hours. HLS Cannulae are made of biocompatible polyurethane and, like all other blood-carrying components of the HLS Set, are coated with BIOLINE Coating. Their thin walls ensure excellent flow with minimal pressure drop. In order to insure a high degree of flexibility and kink resistance, all cannulae are wire reinforced.

The HLS Cannulae are available in several outside diameters (from 15 to 29Fr) and lengths (from 15 to 55 cm), allowing individual selection based on the patient's needs.

MAQUET provides two special insertion kits for particularly gentle percutaneous vascular access. These kits are fitted with guide wires of different lengths and fulfill the requirements of arterial and venous cannulation. Further components of the insertion kit are multi-step dilators in four different sizes, a puncture needle, a scalpel and a syringe. This ensures that everything is at hand in an emergency.

CARDIOHELP DEVICE AND HLS MODULE ADVANCED TECHNICAL DATA



CARDIOHELP Device

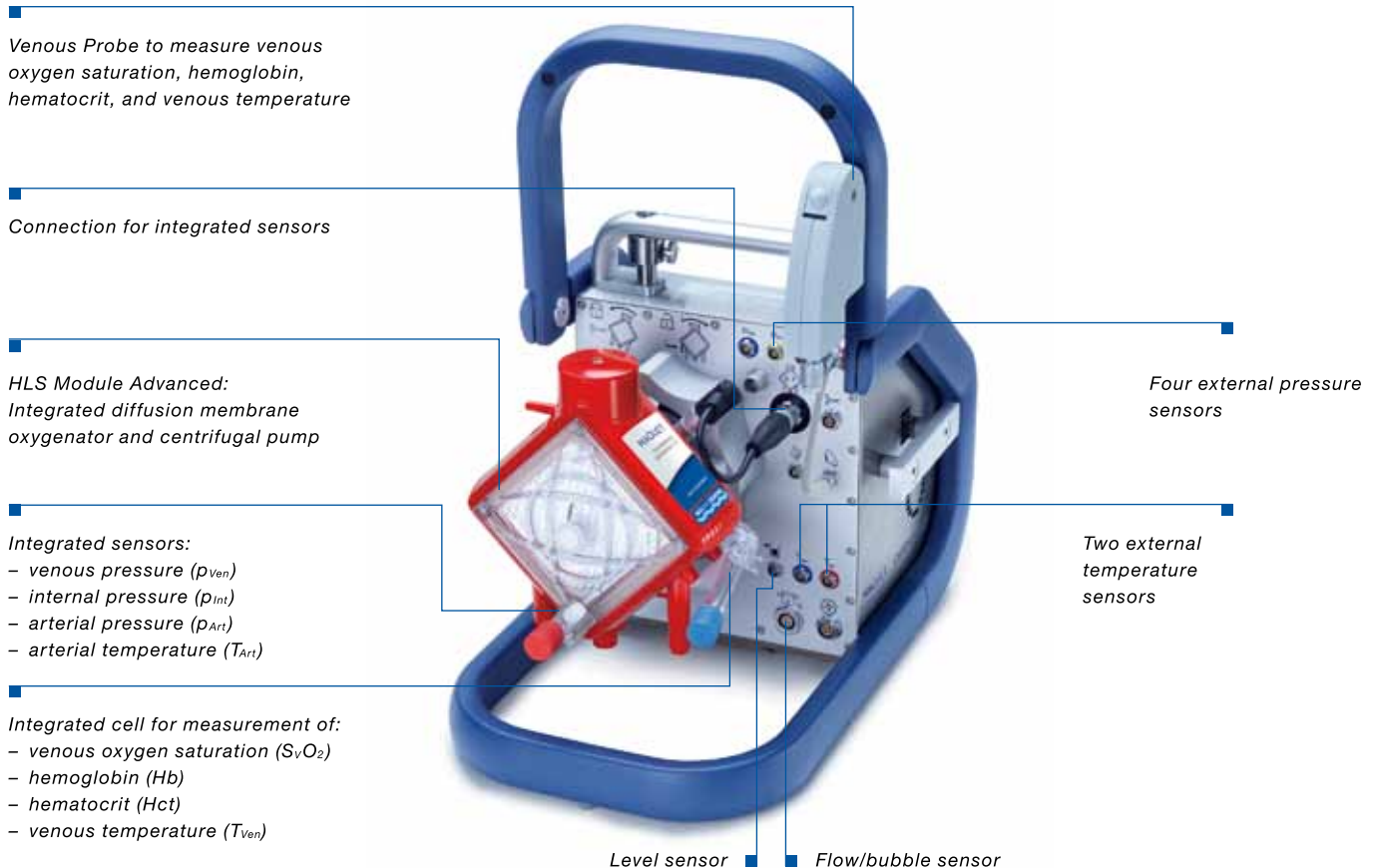
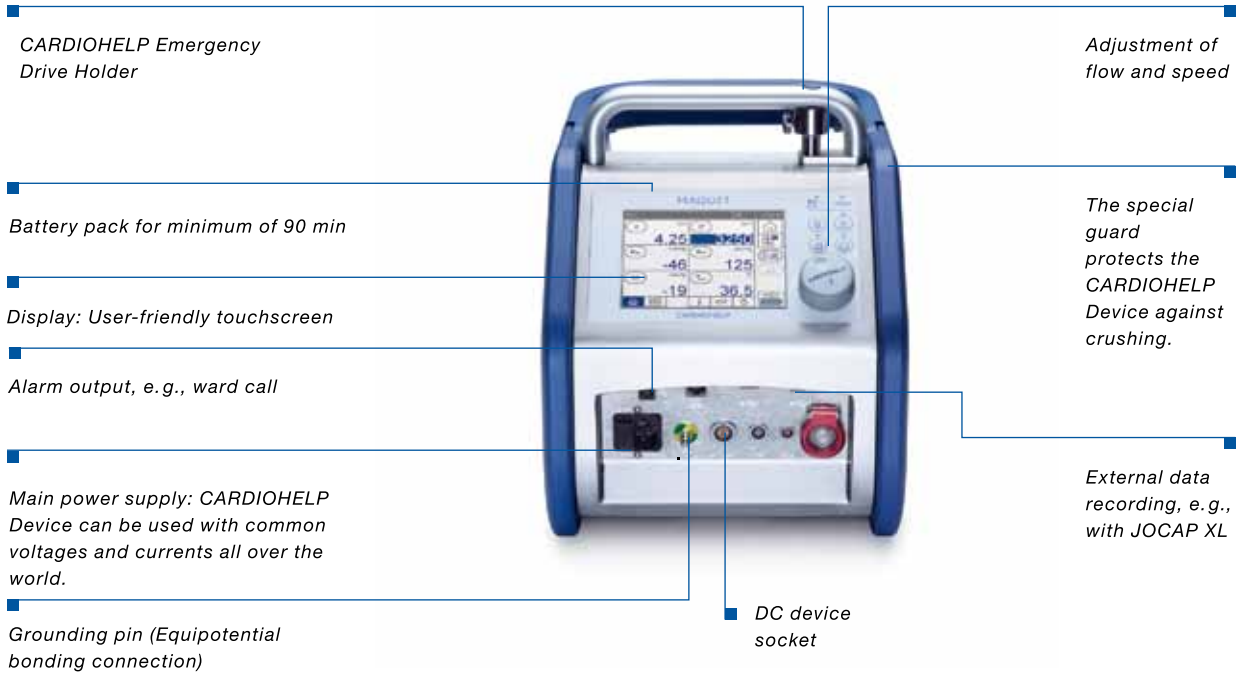


HLS Module Advanced 7.0

Technical Data	CARDIOHELP
Dimensions (H x W x D) Guard closed	14 x 10 x 17 in (315 x 255 x 427 mm)
Weight	Approx. 22 lbs (10 kg)
Display	5.7 in LCD Touchscreen
Sensor values	4 x External pressures 3 x Internal pressures 2 x External temperatures 2 x Internal temperatures 1 x Venous oxygen saturation 1 x Hemoglobin 1 x Hematocrit 1 x Flow sensor with integrated bubble sensor 1 x Bubble sensor 1 x Level sensor
Operating voltage range	11 – 28 Volt DC 100 – 240 Volt AC / 50 – 60 Hz
Interfaces for	1 x USB for memory stick 1 x USB for external data recording 1 x Connection for alarm output (ward call)
Battery operation time	Minimum 90 min (fully charged batteries)

Technical Data	HLS Set Advanced 5.0	HLS/HIT Set Advanced 7.0
Max. blood flow	0.5 – 5 l/min	0.5 – 7 l/min
Surface area gas exchange membrane	1.3 m ²	1.8 m ²
Surface area heat exchange	0.3 m ²	0.4 m ²
Priming volume HLS Module Advanced	240 ml	273 ml
Priming volume HLS Set	570 ml	600 ml
Membrane	Diffusion membrane (PMP)	Diffusion membrane (PMP)
Coating	BIOLINE Heparin Coating	BIOLINE and SOFTLINE (HIT)
Integrated sensors	- 3 pressures (venous, arterial, internal) - venous oxygen saturation S _v O ₂ - hemoglobin - hematocrit - venous and arterial temperature	- 3 pressures (venous, arterial, internal) - venous oxygen saturation S _v O ₂ - hemoglobin - hematocrit - venous and arterial temperature
Duration of use	Max. 6 hours	Max. 6 hours

SMALL, LIGHT AND COMPACT AN OVERVIEW OF THE CARDIOHELP DEVICE



FULLY EQUIPPED SPRINTER CART ACCESSORIES



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