

HLS Set Advanced

Integration meets innovation

MAQUET
GETINGE GROUP





HLS Set Advanced **circulatory and/or respiratory assist**

A trusted partner for hospitals and clinicians since 1838:

Maquet Cardiovascular is a leading manufacturer of products for the use in the fields of intensive care, emergency medicine, cardiology and cardiac surgery. With the launch of the CARDIOHELP System, the world's smallest heart-lung machine, Maquet has consolidated its position as the innovative leader in the field of ECLS (Extracorporeal Life Support) and has begun a new era in this sector.

The HLS Set Advanced, with the HLS Module Advanced as its core component, represents a state-of-the-art oxygenator for circulatory and/or respiratory ECLS. It expands therapy applications with a continuous use up to 30 days as well as inter- and intra-hospital transport. Furthermore all necessary equipment for a safe and effective patient care is available – including a wide range of cannulae.



HLS Set Advanced

Integration meets innovation

The HLS Set Advanced provides complete monitoring and is specially developed for veno-venous or veno-arterial extracorporeal support for up to 30 days continuous use.* Powered by CARDIOHELP, the world's smallest heart-lung machine, the system combines user-friendliness and patient safety. The system also has all the necessary approvals for the transport of patients on extracorporeal support within or between hospitals.

The HLS Set Advanced is available in two versions: HLS Set Advanced 5.0 with a blood flow of up to 5 l/min and HLS Set Advanced 7.0 with a blood flow of up to 7 l/min. Both sets have a biocompatible BIOLINE Coating. The HIT Set Advanced with SOFTLINE Coating is available for patients who are susceptible to heparin-induced thrombocytopenia.



HLS Module Advanced mounted on the CARDIOHELP

The core of the HLS Set Advanced, the HLS Module Advanced, is the world's first oxygenator with an incorporated low-trauma centrifugal pump and an infrared sensor to measure venous oxygen saturation (SvO₂), hematocrit (Hct), hemoglobin (Hb) and venous temperature (TVen). Previously these parameters could only be measured using an external blood gas analyzer or a sensor in the venous blood line. Sensors to measure three pressures and the arterial temperature are also integrated into the module, thus avoiding the need for external measurements, improving accuracy and reducing the risk of air emboli and thrombus formation.



HLS Module Advanced

*When used with HLS Cannulae with BIOLINE Coating.

HLS Set Advanced

Benefits at a glance

Benefits

- Fully monitored system for added patient safety which may lead to reduced bedside costs
- Due to the non-invasive integrated sensor technology there are no hazards of air embolism, stagnant zones, clotting and cavitation from external pressure sensors. There are no pressure lines that need flushing
- Precise and continuous monitoring of the patient's condition
- Rapid detection of cannulae misplacement and kinking by monitoring pressure changes
- Alarms and interventions can be set in order to avoid dangerous events such as cavitation or lesions/damage to vessel walls
- Having all the necessary system transport approvals ensures safe intra- and inter-hospital patient transport
- The sterile packaging contains all the necessary components and tubing
- Quick and easy set-up and priming for fast deployment in emergency situations
- Low priming volume for less hemodilution
- Color-coded tubing for safe patient connection
- Integrated heat exchanger for precise temperature management
- Special design features allow for up to 30 days continuous use reducing the risk to patients when conventional sets need to be exchanged during the support procedure
- The HLS Set Advanced 5.0/7.0 comes with the biocompatible BIOLINE Coating (HIT Set Advanced with SOFTLINE Coating is available)



HLS Set Advanced in an ICU environment

HLS Set Advanced & CARDIOHELP

Enlarging therapy options

The CARDIOHELP System represents a user-friendly platform for powering various extracorporeal circulatory and respiratory support applications:

- CARDIOHELP is ideal for use in intensive care units, operating rooms, catheter laboratories and emergency rooms
- The CARDIOHELP is a combined drive and control unit that comes with a compact, functional design and can be deployed rapidly
- With just a single rotary knob and a touch screen CARDIOHELP is very convenient to use
- CARDIOHELP is equipped with new software for more intuitive and user-friendly handling as a result of the “thApp” principle
- All available sets for CARDIOHELP are easily attached to the CARDIOHELP drive



CARDIOHELP – the multi-therapy solution

With a weight of about 10 kg CARDIOHELP is the perfect solution for intra- and inter-hospital patient transport:

- Approvals conforming to RTCA DO 160*, EN 13718 Part 1, EASA Part 21, BK117 & EC145 (air ambulance) and EN 1789 (road ambulance)
- Transport approval for selective disposables including the HLS Set Advanced
- Secure installation in any ambulance and various helicopter types
- Connection to the electrical system on a helicopter or ground transport vehicle
- Integrated lithium-ion batteries guarantee 90 minutes of independent operation
- Necessary equipment such as the HKH 8860 Mobile Holder, HKH 8850 Base Plate and the CARDIOHELP Trolley System is available

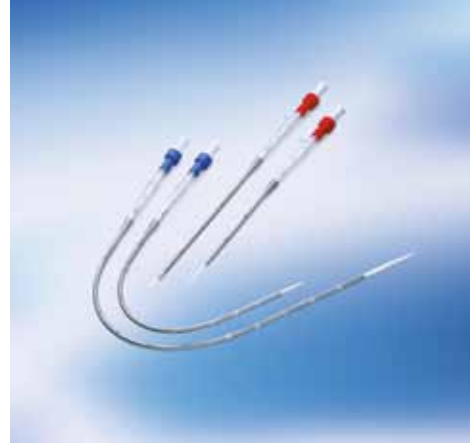


CARDIOHELP – a perfect solution for patient transport

Cannulae & Insertion Kit

For a less traumatic vessel access

Maquet offers a range of specially developed single lumen cannulae for both veno-venous and veno-arterial ECLS. The HLS Cannulae are made of highly biocompatible polyurethane with thin walls to give the highest flows at lowest pressure drop. They are available with various outer diameters (from 13 to 29 Fr.) and lengths (from 15 to 55 cm). Two special insertion kits for percutaneous cannula insertion are also available.



HLS Cannulae

The AVALON ELITE Bi-Caval Dual Lumen Catheter is the state-of-the-art catheter for veno-venous ECLS and is now part of the Maquet product range. It is the world's first percutaneous wire reinforced dual lumen catheter for extracorporeal life support and thus has superior kink resistance. The catheter is inserted into the internal jugular vein and matches the body's natural flow ratios by simultaneously removing blood from both, the superior vena cava (SVC) and inferior vena cava (IVC) and returning blood to the right atrium. A large family of sizes as well as the Avalon Elite Vascular Access Kits are available.



AVALON ELITE Bi-Caval Dual Lumen Catheter

Maquet also provides special insertion kits for gentle percutaneous vascular access. These kits are available with different guide wire lengths and fulfill the requirements for arterial and venous peripheral cannulation. The insertion kits also include dilators, a puncture needle, a scalpel as well as a syringe. This ensures that all the necessary cannulation components are readily available for both routine and emergency situations.



Insertion Kit

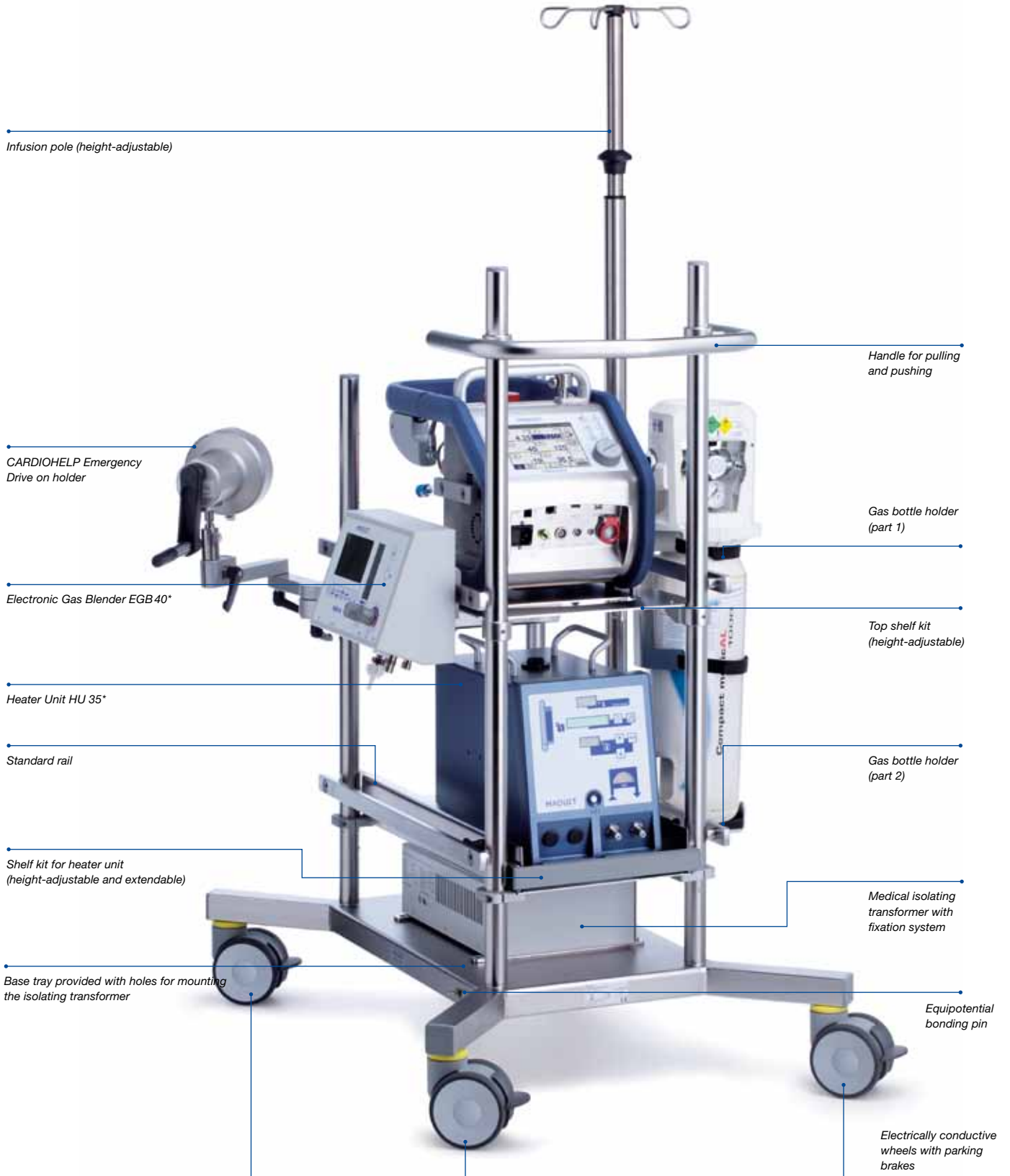
HLS Set Advanced & CARDIOHELP device

Technical data

Technical Data	HLS Set Advanced 5.0	HLS Set Advanced 7.0
Flow rates	0.5–5 l/min	0.5–7 l/min
Gas exchange surface area	1.3 m ²	1.8 m ²
Heat exchange surface area	0.3 m ²	0.4 m ²
Priming volume HLS Module Advanced	240 ml	273 ml
Priming volume HLS Set Advanced with 2 x 2.3 m tubing length	570 ml	600 ml
Gas exchange fibers	Diffusion membrane (PMP)	Diffusion membrane (PMP)
Duration of use with BIOLINE Coating	Max. 30 days	Max. 30 days
Duration of use with SOFTLINE Coating	Max. 5 days	Max. 5 days
Integrated venous measuring cell	<ul style="list-style-type: none"> – oxygen saturation SvO₂ – hemoglobin (Hb) – hematocrit (Hct) – temperature 	<ul style="list-style-type: none"> – oxygen saturation SvO₂ – hemoglobin (Hb) – hematocrit (Hct) – temperature
Integrated sensors	<ul style="list-style-type: none"> – 3 pressures (venous, arterial, internal) – arterial temperature 	<ul style="list-style-type: none"> – 3 pressures (venous, arterial, internal) – arterial temperature

Technical Data	CARDIOHELP-i
Dimensions (H x W x D) with guard closed	315 x 255 x 427 mm (without holder/disposable)
Weight	Approx. 10 kg
Display	5.7" LCD touchscreen
Sensors	<ul style="list-style-type: none"> 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/Bubble sensor 1 x Bubble sensor 1 x Level sensor
Operating voltage range	<ul style="list-style-type: none"> 11–28 Volt DC 100–240 Volt AC/50–60 Hz
Interfaces for	<ul style="list-style-type: none"> 1 x USB port type A (for data export on USB stick) 1 x USB port type B (for data recording system and service purposes) 1 x Connection for alarm output (ward call)
Battery operating time	Min. 90 min (fully charged batteries)

Fully equipped **Sprinter Cart XL** a stable, compact and multi-functional Workstation



*These products are currently pending CE certification

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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