HLS Set Advanced

Extracorporeal respiratory and/or cardiocirculatory support

This document is intended to provide information to an international audience outside of the US.
Cardiohelp System and HLS Set Advanced – the leading ECMO system

Extracorporeal membrane oxygenation (ECMO) provides cardiopulmonary support and reduces strain on vital organs. The Cardiohelp System with its state-of-the-art extracorporeal circuit – the HLS Set Advanced – is the leading ECMO system and has proven its effectiveness in thousands of patients.

The HLS Set Advanced includes a high performance oxygenator with integrated centrifugal pump, pressure and temperature sensors (HLS Module Advanced). Integrated non-invasive sensors help to increase the safety during the application and avoid the need for external measuring lines.

As a compact and lightweight system, the Cardiohelp System allows for versatile use, including transport of patients inside and outside the hospital.

Monitoring of critical blood parameters in combination with Cardiohelp
- Venous oxygen saturation ($S_vO_2$)
- Hematocrit (Hct)
- Hemoglobin (Hb)
- Venous temperature ($T_{ven}$)
- Venous line pressure
- Arterial line pressure
- Internal pressure (measured between centrifugal pump and gas module)
- Arterial temperature
- Flow-Bubble Sensor (FBS) for bubble detection
- A venous bubble sensor is optionally available
# HLS Set Advanced – Technical data

<table>
<thead>
<tr>
<th></th>
<th>HLS Set Advanced 5.0</th>
<th>HLS Set Advanced 7.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood flow rates</strong></td>
<td>0.5 – 5 l/min</td>
<td>0.5 – 7 l/min</td>
</tr>
<tr>
<td><strong>Tube size</strong></td>
<td>3/8” x 3/32&quot; (9.53 mm x 2.38 mm)</td>
<td>3/8” x 3/32&quot; (9.53 mm x 2.38 mm)</td>
</tr>
<tr>
<td><strong>Centrifugal pump speed</strong></td>
<td>0 – 5,000 rpm</td>
<td>0 – 5,000 rpm</td>
</tr>
<tr>
<td><strong>Oxygenation membrane surface area</strong></td>
<td>1.3 m²</td>
<td>1.8 m²</td>
</tr>
<tr>
<td><strong>Heat exchanger surface area</strong></td>
<td>0.3 m²</td>
<td>0.4 m²</td>
</tr>
<tr>
<td><strong>Gas exchange fibres</strong></td>
<td>Polymethylpentene (PMP)</td>
<td>Polymethylpentene (PMP)</td>
</tr>
<tr>
<td><strong>Priming volume HLS Set Advanced with 2 x 2.3 m tubing length</strong></td>
<td>570 ml</td>
<td>600 ml</td>
</tr>
<tr>
<td><strong>Priming volume HLS Module Advanced</strong></td>
<td>240 ml</td>
<td>273 ml</td>
</tr>
</tbody>
</table>

## Available in different versions

HLS Set Advanced 5.0 accommodates a blood flow of up to 5 l/min, HLS Set Advanced 7.0 accommodates a blood flow of up to 7 l/min. Both HLS Set Advanced sets have a biocompatible Bioline Coating, which ensures a homogenuous surface and minimizes the blood damaging effects of foreign surfaces. For HIT patients, there is a dedicated HIT Set Advanced with Softline Coating available.

<table>
<thead>
<tr>
<th>Version</th>
<th>REF</th>
<th>Coating</th>
<th>Blood flow rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLS Set Advanced 5.0</td>
<td>BE-HLS 5050</td>
<td>Bioline Coating</td>
<td>0.5–5 l/min</td>
</tr>
<tr>
<td>HLS Set Advanced 7.0</td>
<td>BE-HLS 7050</td>
<td>Bioline Coating</td>
<td>0.5–7 l/min</td>
</tr>
<tr>
<td>HIT Set Advanced 7.0</td>
<td>BO-HLS 7050</td>
<td>Softline Coating</td>
<td>0.5–7 l/min</td>
</tr>
</tbody>
</table>
Performance data

HLS Set Advanced 5.0

**O₂ transfer**
37 °C | Gas-blood flow ratio 1:1

![Graph showing O₂ transfer vs. Blood flow](image)

**Pressure drop oxygenator**

![Graph showing Pressure drop vs. Blood flow](image)

**Heat exchanger performance**
37 °C | ISO 7199 Standard

![Graph showing Performance factor vs. Blood flow](image)

**Water flow**
- 15 l/min
- 10 l/min
- 5 l/min
HLS Set Advanced 7.0 | HIT Set Advanced 7.0

**O₂ transfer**
37°C | Gas-blood flow ratio 1:1

**Pressure drop oxygenator**

**Heat exchanger performance**
37°C | ISO 7199 Standard

**Water flow**
15 l/min
10 l/min
5 l/min
Benefits at a glance

• Integrated non-invasive sensor technology helps to avoid the need for external measuring lines.
• Integrated pressure monitoring for increased safety during application.
• Quick and easy set-up and priming for routine and rapid deployment in emergency situations.
• An integrated heat exchanger helps to precisely manage temperature.
• Provided as a standard set, supporting routine handling in any situation and consistent training of users.
• The Cardiohelp System and HLS Set Advanced are approved for safe intra- and inter-hospital patient transport.
• Dedicated softline-coated set to treat patients who are sensitive to heparin-induced thrombocytopenia.
With a firm belief that every person and community should have access to the best possible care, Getinge provides hospitals and life science institutions with products and solutions aiming to improve clinical results and optimize workflows. The offering includes products and solutions for intensive care, cardiovascular procedures, operating rooms, sterile reprocessing and life science. Getinge employs over 10,000 people worldwide and the products are sold in more than 135 countries.

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All information presented in this brochure is either referenced by the below publications or is on file at Getinge.

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