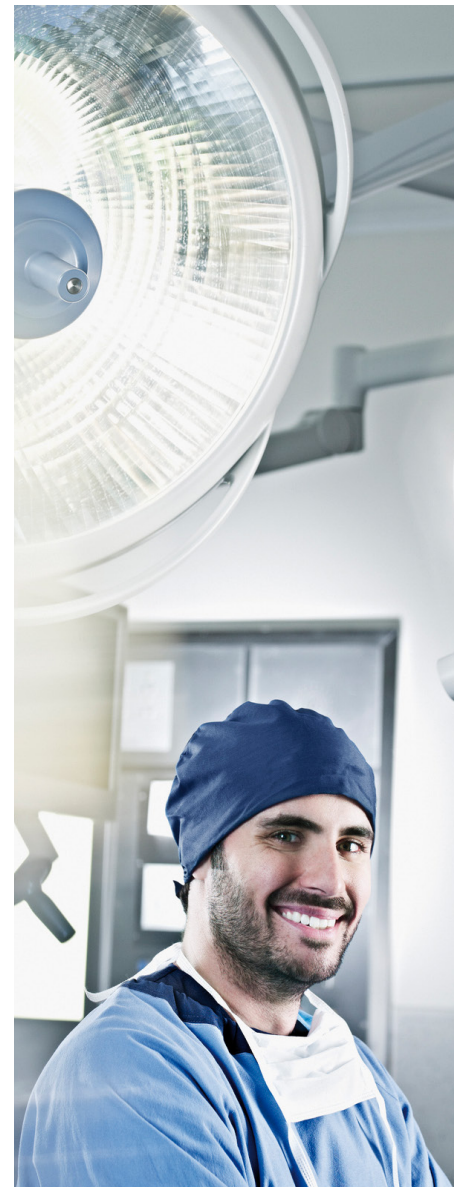


**LivaNova**

Health innovation that matters

# S5<sup>®</sup> Min.I. Mini Maxi Me



The proven safe and reliable, world-leading perfusion system,  
now optimized for minimally invasive and pediatric surgery

# Mini Maxi Me

**S5<sup>®</sup> Min.I.** isn't just another configuration of the S5 system. Optimized with the aim of improving outcomes during extra-corporeal circulation in minimally invasive and pediatric surgery, **S5 Min.I. is a global approach to minimally invasive perfusion.**

The world-leading perfusion system **just got better**

It's the maximum expression of over **40 years' experience and worldwide leadership** in heart-lung machine design and manufacture. All components derive from this heritage and are proven safe, flexible and modular.



**Redefining** minimally invasive perfusion solutions

# Minimized configuration, Maximized benefits



OPTIMIZED AIR MANAGEMENT

MINIMAL HEMODILUTION

GOAL-DIRECTED PERFUSION

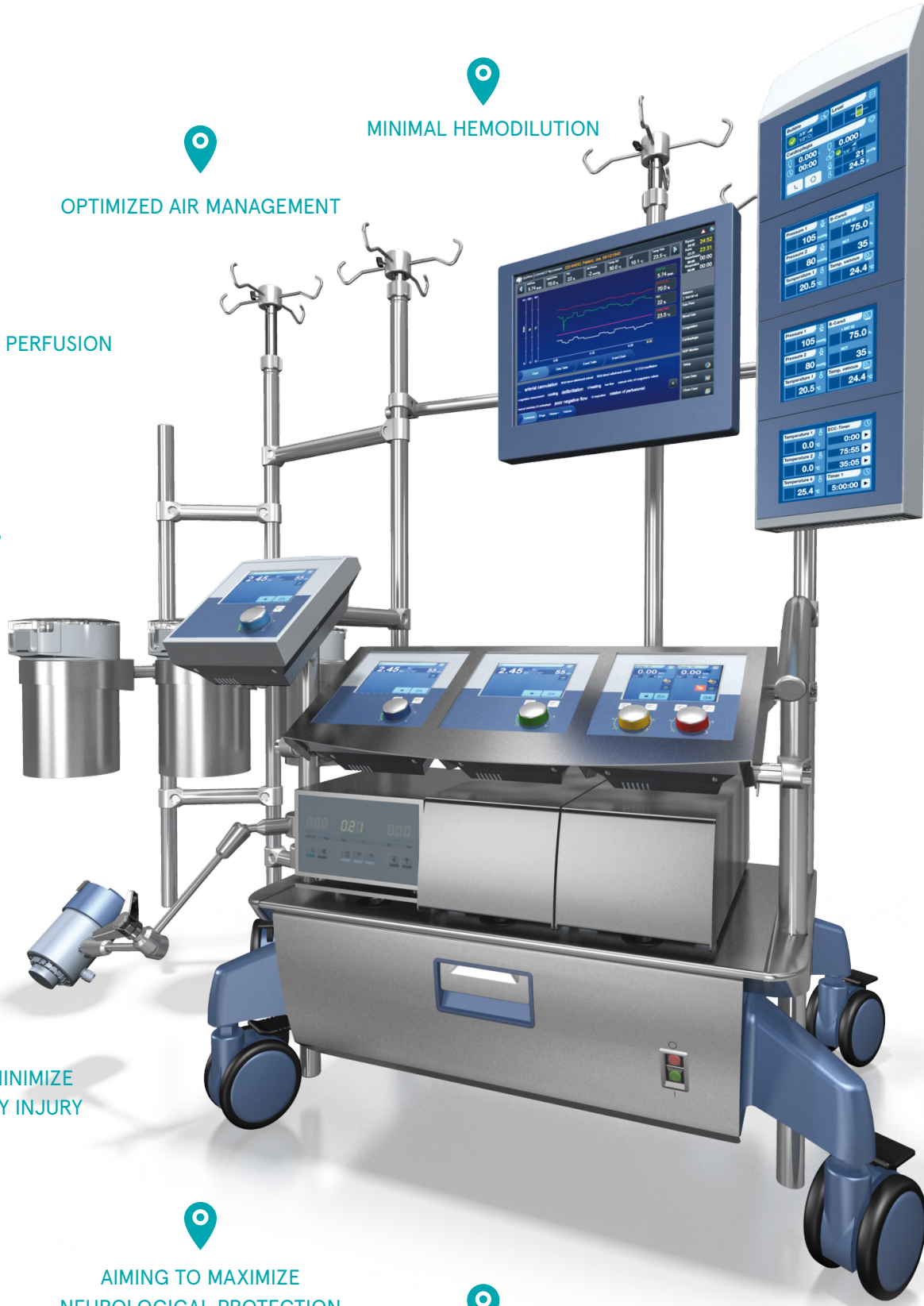
MAXIMIZED ERGONOMICS

AIMING TO MINIMIZE TRANSFUSIONS

AIMING TO MINIMIZE ACUTE KIDNEY INJURY

AIMING TO MAXIMIZE NEUROLOGICAL PROTECTION

AIMING TO MINIMIZE COMPLICATIONS





# Closer to you, Closer to your patients

Optimized ergonomics and console height with reduced footprint allow an easy interaction with the system by the operator. The gas blender is well protected during use and transport and is integrated within the central console together with handy storage drawers.



## OPTIMIZED CONSOLE

As all pump control panels are arranged in a linear, horizontal way within the shelf of the three size console, there is better visibility to the oxygenator and tubings as well as to the surgical field.



## LEAN AND CLEAN

Additional, newly designed cable guides enable a lean configuration and design with cables protected and clearly organized, allowing to optimize ergonomics and prevent interfering with accessories or disposables.

# Maxi ergonomics, flexibility and modularity

The S5 system design is fully modular, to be configured according to the specific clinical needs of the perfusionist, allowing to accommodate a large variety of clinical practices and applications. With its fully mast-mounted pumps architecture, S5 Min.I. represents the ideal configuration for pediatric and minimally invasive adult cardiac surgery.



## ADULT MINIMALLY INVASIVE CONFIGURATION

The adult minimally invasive configuration allows a centrifugal or a large roller pump to control arterial flow, and offers a flexible combination of integrated large and small double roller pumps for suction and cardioplegia delivery. Additional pumps with external control panels can be added, providing a total customization.

## PEDIATRIC CONFIGURATION

The pediatric configuration can hold up to one large and two integrated small double roller pumps or alternatively three integrated small pumps, allowing the lowest possible priming circuit design for the benefit of the smallest patients. Additional pumps with external control panels can be added, providing a total customization.



*"I am using the S5 in various configurations according to the different weight of my patients. This helps me to achieve an optimum relation between the priming and blood volume of the patient. The flexible mast mounted pumps allow a very close positioning of the whole system to the patient"*

*Frank Münch, Chief perfusionist  
University hospital Erlangen, Germany*

# Mini hemodilution Maxi neurological protection

Outstanding flexibility with fully mast-mounted pumps allows S5 Min.I. to be positioned closer to the patient, reducing tubing lengths, thus minimizing priming volumes and blood contact surface area, helping reduce the risk of transfusions-related complications during and after cardiac surgery.



S5 offers advanced technology in terms of air bubble management systems, allowing perfusion optimization with the utmost safety, helping clinicians to protect their patients from neurological damage.



## EFFECTIVE PROTECTION FROM AIR BUBBLES

The S5 bubble module along with the bubble sensor allow for extremely fast detection of air bubbles in the tubing set.



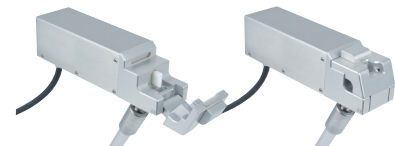
## INTEGRATED CONTROL

Using a dedicated sensor, the blood level in the reservoir is carefully controlled to prevent air from entering in the oxygenator.



## INTEGRATED MONITORING

The integrated B-Care 5 system B-Care 5 allows continuous monitoring for Hct, SvO2, and venous blood temperature. Accurate monitoring of Hct and blood flow is key to implement Goal-Directed Perfusion (GDP), which helps to reduce the risk of acute kidney injury (AKI) and red blood cells (RBC) transfusions.<sup>1,2</sup>



## ELECTRONIC REMOTE CLAMP FOR ULTIMATE EASE OF USE AND SAFETY

Available with the CP5 centrifugal pump, the electronic control clamp minimizes the risk of cerebral embolism. In combination with the air bubble sensor and blood level sensor, it allows to quickly occlude the arterial line if air bubbles or back-flow are detected.

# Maxi efficacy...

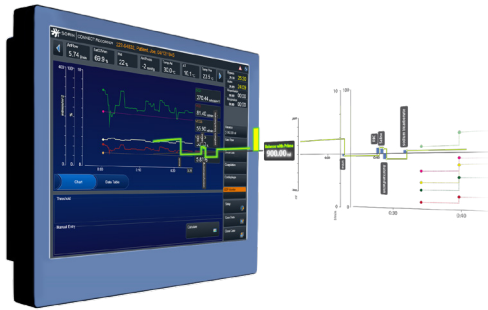
CONNECT is LivaNova's innovative and intuitive perfusion data management system designed to assist the clinician in minimizing transcription errors and bias<sup>3</sup>, focusing more on the patient and circuit<sup>3</sup>, maximizing traceability, liability and clinical practice<sup>4</sup> and implementing Goal-Directed Perfusion (GDP).

## ...through

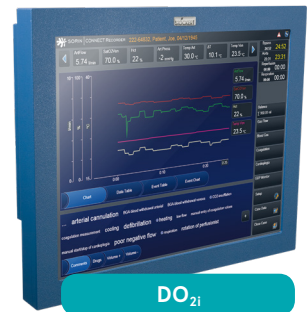
CENTRALIZING ALL PERFUSION DATA ON ONE SCREEN



REAL TIME MONITORING AND TRENDING



GDP MONITOR



$DO_{2i}$

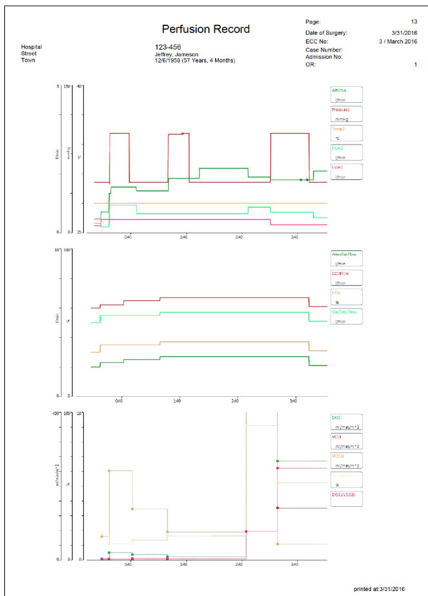
$VO_{2i}$

$VCO_{2i}$

$VO_{2i} / DO_{2i}$

$DO_{2i} / VCO_{2i}$

DATA ANALYSIS AND CUSTOMIZABLE QUALITY INDICATORS



COMPLETE ELECTRONIC PERFUSION RECORD

Perfusion Record				Page:	13	
Hospital:	123-456	Date of Surgery:	3/1/2016	ECC No:	3342046	
Street:	Jeffrey Avenue	Case Number:	3 / March 2016	Admission No:		
Town:	123456 (21 Years, 4 Months)	City:		ICD:		
<b>Patient Data</b>						
Gender:	Male	Transformed from:		Start of Surgery:	1:22 PM	
Title:		Match Name:		End of Surgery:	5:24 PM	
<b>Physique</b>						
Height (cm):	183	Body Surface Area (BSA) (m <sup>2</sup> ):	2	Blood Type:	A positive	
Weight (kg):	80	Calculated Flow (ml/min):	4.8	Flow Index (l/min/m <sup>2</sup> ):	2.4	
Risk Score:	1	CPK:	0.01	CP Injurious Fraction (%):	88	
Surgical Access:	minimally invasive surgery		URGENT:	elective		
<b>Clinical Data</b>						
Allergies: [Diagnoses] Infections: [Meds]						
Preoperative: [Diagnoses]						
Intraoperative product List: [Medication]						
Intraoperative product List: [Medication]						
<b>Surgery Team</b>						
Perfusionist:	Perfusionist 1	Cardiologist:	Cardiologist 1	CR Nurse:	CR nurse 1	
Surgeon:	Surgeon 1	Anesthetist:	Anesthetist 1	CR Nurse:	CR nurse 1	
Assistant:	Assistant 1	Nurse Anesthetist:	Nurse anesthetic 1	CR Nurse:	CR nurse 1	
<b>Instrumentation</b>						
BSL:	Soren CS					
Arterial Pump:	CPS					
Infusion Pump:	CPS					
Autotransfusion:	Viva					
BIA Console:	CPS 100					
BIA Console:	Resonator					
Arterial Monitor:	Phips					
ACT:						
Gas Monitor:						
Central Console:						
<b>Disposables</b>						
Type	Identification	Reference Number	LOT Number	Serial Number	Vendor	Expiry Date
Coring Kit	Blue Artery				Boon	
Oxygenator	Apex HP				Boon	
Reservoir	Apex				Boon	
Pre Bypass Filter	2 Microns 1x15				Boon	
Hemocoagulator	Defi 3.2				Boon	
Cardioplegia Heat Exchanger	Heat exchanger 1				Boon	

# Enabling Goal-Directed Perfusion Therapy to **reduce** Acute Kidney Injury

The HeartLink System is the first perfusion management system to assist with the implementation of Goal-Directed Perfusion, a perfusion therapy aimed at reducing the occurrence of acute kidney injury, shortening ICU and hospital length of stay, and potentially decreasing blood transfusions by respecting the metabolic needs of each patient during cardiac procedures.

## HEARTLINK® SYSTEM

The first integrated **Perfusion Management System** designed for **helping clinicians to improve patient outcomes, increase clinical efficacy and apply Goal-Directed Perfusion Therapy.**

### IMPROVING CLINICAL DATA ACCURACY

*"The use of an automated system provides the opportunity to minimize transcription errors and bias"<sup>5</sup>*

### BENEFITS INCLUDE:

- full LivaNova disposable traceability
- less transcription errors
- less manual operations for clinicians

### GDP MONITOR



### REDUCING AKI & BLOOD TRANSFUSIONS

*"The AKI rate started declining in our institution the year GDP was introduced. This suggests that GDP may actually be beneficial regarding renal protection"<sup>6</sup>*

### CONNECT®



### HEARTLINK® CARD



### INSPIRE®



### REDUCING AKI & BLOOD TRANSFUSIONS

*"It is of note that with the use of ultra low prime oxygenators, GDP actually exerted his potential"<sup>6</sup>*

### XTRA®



### FOCUSING ON NEUROLOGICAL PROTECTION

*"The new PFAT protocol featured in XTRA significantly increases fat elimination, yielding results comparable with continuous processing technology"<sup>7</sup>*

BENEFITS

*"GDP is providing us with a new opportunity to continually improve patient care in real-time during the critical period of CPB"*

Ian Johnson,  
Liverpool Heart and Chest Hospital NHS Foundation trust



# Maxi reliability and proven safety

that only a world-leading platform can guarantee



## TOP QUALITY TECHNICAL SERVICE

Our top quality technical service support is available in over 100 countries on all continents. LivaNova offers numerous training sessions that are divided into different levels to skillfully prepare the hundreds of technicians and trainers that participate every year. This guarantees fast and reliable service support all around the world.



## HIGHLY RELIABLE TECHNOLOGY

The direct drive technology ensures years of problem-free performance offering the advantages of very low noise and vibration, reliable, maintenance-free pumps without any belts and a gearbox.



## PERFUSION MANAGEMENT TRAININGS

As part of our Campus educational program, LivaNova collaborates with leading clinicians and institutions globally and offers several perfusion trainings on safe perfusion management, minimally invasive approach, Connect & GDP monitor.

## References:

1. Ranucci M, et al. Perfusion. 2014 May 19. [Epub ahead of print].
2. Initial Results of an Optimized Perfusion System. Starck CT, et al. Perfusion 2014;28(4):292-7
3. The future of the perfusion record: Automated data collection vs. manual recording. Ottens J et al., JECT 2005;37:355-359J Extra Corpor Technol. 2005 Dec;37(4):355-9
4. Continuous quality improvement of perfusion practice: the role of electronic data collection and statistical control charts. Baker RA, Newland RF: Perfusion 2008; 23:7-16
5. The future of the perfusion record: Automated data collection vs. manual recording. Ottens J et al., JECT 2005;37:355-359J Extra Corpor Technol. 2005 Dec;37(4):355-9.
6. Oxygen delivery during cardiopulmonary bypass and acute renal failure after coronary operations. Ranucci M, Romitti F, Isgró G, Cotza M, Brozzi S, Boncilli A, Ditta A; Ann Thorac Surg. 2005 Dec;80(6):2213-20
7. The impact of bowl size, program setup, and blood hematocrit on the performance of a discontinuous autotransfusion system. Seyfried T F et al., doi:10.1111/trf.13954; Transfusion 2017

## Order Guide

### The S5 Min.I. consists of console and 3 pump control panels:

- **48-35-00** S5 Min.I. includes:
  - 48-30-00 Console (3 position)
  - 50-45-00 S5 mast extension system
  - 48-31-61 S5 Min.I. shelf with power outlets to integrate pump control panels
  - 48-31-50 Vertical cable guide 300mm
  - 48-31-52 Vertical cable guide 500mm
  - 48-31-54 Vertical cable guide 700mm



In addition to **48-35-00**, 3 pumps out of the following pumps must be selected:

- **50-80-05** S5 Min.I. 1 big mast roller pump 150mm
- **50-80-65** S5 Min.I. 2 small mast roller pumps 85mm on single holders
- **50-80-66** S5 Min.I. 2 small mast roller pumps 85 on twin holders



Optional:

- **48-42-20** S5 Min.I. drawer module
- **48-42-30** S5 Min.I. adapter plate for electronic gas blender EGB



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Health innovation that matters

[www.livanova.com](http://www.livanova.com)



The LivaNova Deutschland Quality System complies with:  
**EN ISO 13485:2012**

**CE** 0123 According to Annex II (Full Quality System) of  
MDD 93/42/EEC as amended by directive 2007/47/EEC

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Please always refer to the Instructions For Use (IFU) manual provided with each product for detailed information, warnings, precautions and possible adverse side effects.

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