Acute Therapy Systems

Xenios Console
Universal, Reliable, Effective

novalung | medos

**FRESENIUS
MEDICAL CARE**

Universal, Reliable, Effective

Wide spectrum of extracorporeal support ◄

XENIOS

LUNG ASSIST

ADVANCED MODE

Effective for neonates up to adults ◄

Safety techology, intuitive handling ►

Extracorporeal organ support for enhanced patient well-being

Xenios, a Fresenius Medical Care Company, is a pioneer in the field of extracorporeal heart and lung support – for new dimensions in patient well-being. In contrast to standard therapies in this field, patients can remain awake, mobile, and self-determined[1] with our extracorporeal therapies. They may then spend less time in the intensive care unit[2], which helps to improve their prognosis of treatment[3].

Dedicated technology combines both heart and lung support in one single platform here – a platform that

is universally usable, individual, safe, and compatible with applications of our parent company, Fresenius Medical Care. Together with Fresenius Medical Care, we stand for a paradigm shift in the field of intensive care and integrative multiorgan support with pioneering technologies.

We also support implementation of our therapies with high-grade premium products. Our customers benefit from unique and individual clinical support and application-oriented service excellence.

Universal
Wide spectrum of extracorporeal support

- Therapies for heart and lung assist on one single platform
- From neonates up to adults
- From partial CO_2 removal to full oxygenation
- VV-, VA-applications
  - ✓ ICU
  - ✓ Operating theater
  - ✓ Cardiac catheterization lab

Reliable
Reliable technology and intuitive handling

- Easy therapy-driven interface
- Integrated Pressure Sensors (IPS)
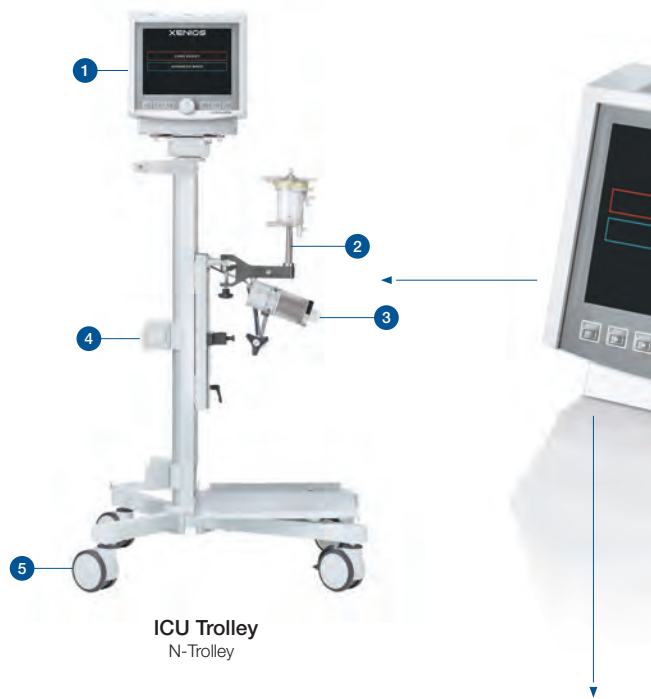- Dual power: AC power and battery pack
- Full alarm history on screen

Effective
Highly sophisticated pump technology

- Diagonal pump with broad flow range allows for individual settings
- Fine adjustments of flow rate even below 0.5 l/min
- Optional pulsatile flow
- More safety by p1-limiter monitoring, Zero-Flow mode and autopilot

The Technological Basis: Universal for All Needs

Xenios offers therapies for those suffering from cardiac and pulmonary insufficiency. It employs a standardized technology platform for extra-corporeal organ support. Physicians and caregivers therefore benefit from a pioneering technology concept. Versatile in application – from effective CO_2 removal, all the way to complete oxygenation. Easy to use and with comprehensive monitoring. Furthermore, the multifunctional usability of one platform provides economical benefits and reduced training expenses.

ICU Trolley
N-Trolley

Console

OR Trolley
M-Trolley

1 **Xenios Console**
Intuitive handling

2 **Holder for Gas Exchanger**
Flexible therapy options

3 **Pump Drive Unit**
High hydraulic performance[4]

4 **Holder for Gas Bottle**

5 **Trolley**
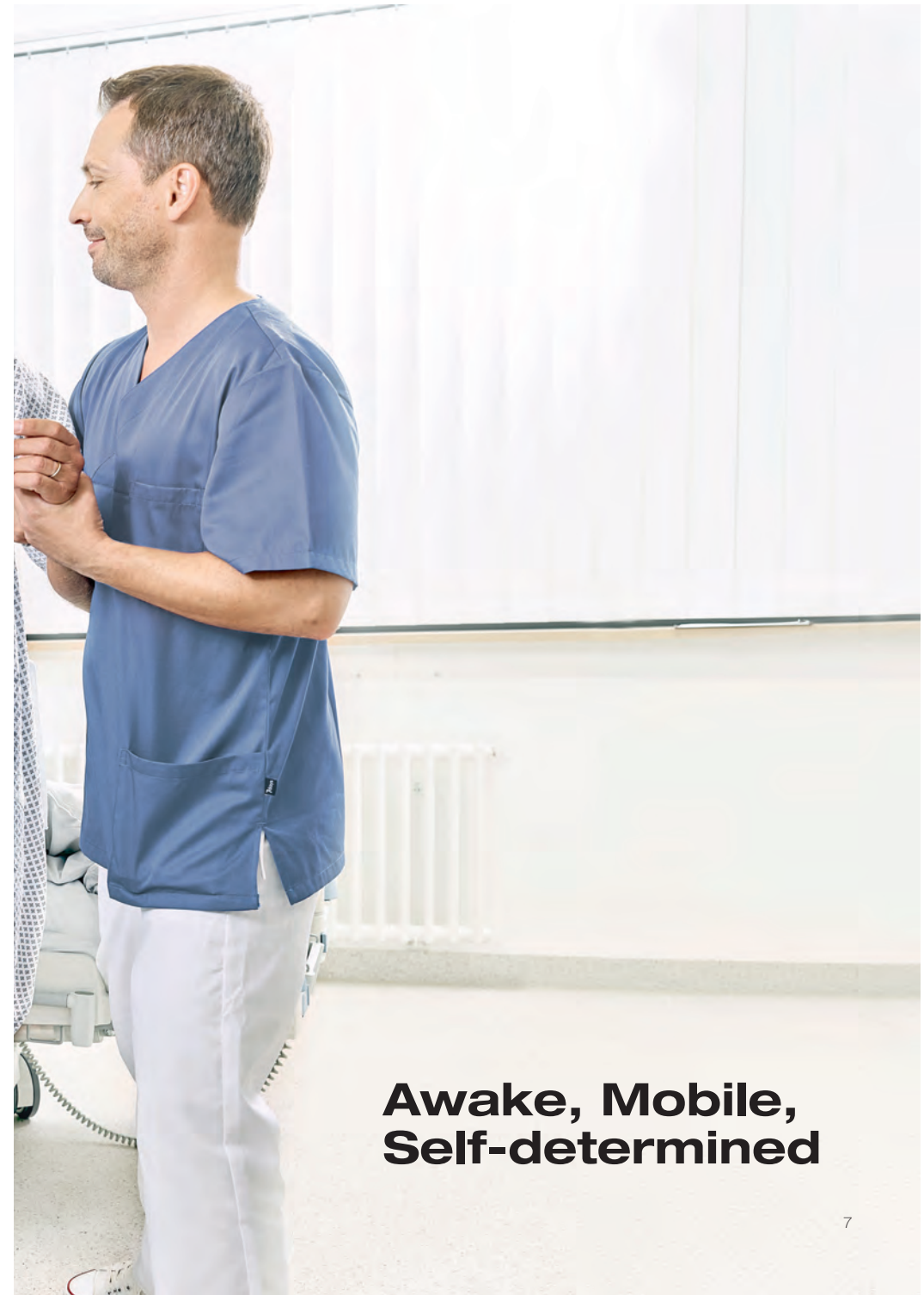Excellent solutions for OR and ICU

Console with compact holder

Console with iLA membrane lung and compact holder

Accessoires / Equipment

▶ Xenios compact holder – attached to the back of console enables a quick and easy in-house transport.

▶ Gas blender – the Xenios system is ideally complemented by a gas blender (low-flow for neonates/pediatric and high-flow models for adults available).

**Awake, Mobile,
Self-determined**

Two Therapy Modes Cover a Broad Range of Applications

Two therapy modes take into account various usage scenarios and user requirements. Working to the maxim of "safe and simple", both modes are intuitive and can be used for neonates, children and adults. Lung Assist Mode is used for lung support, while Advanced Mode is intended for more extensive heart and lung support.

Both therapy modes offer a high degree of safety and transparency. The therapy data can be sent directly to an external monitoring system*. Parameters such as blood flow, the speed of the pump head, pressure, and temperature as well as alarms on the console are transferred directly to the patient monitor.

* for compatible systems please refer to your local sales representative

Lung Assist
Lung failure therapies tailored to the individual clinical needs

ECCO$_2$R and Respiratory ECMO

- Intensive care
- Thoracic surgery

Advanced Mode
Full cardiopulmonary organ support

Cardiopulmonary ECMO

- Cardiac surgery
- Cardiac catheterization lab
- ICU

Patient Kits

▶ **The Xenios platform works with a wide range of patient kits – for a therapy that best meets the individual patient needs.**

▶ **For short- and long-term (29 days) application periods**

The Pump Drive DP3 – Accuracy from Low to High Flow

Highly sophisticated pump technology

- Flow-optimized diagonal pump, with up to 8 l/min of flow
- Accurate performance at all blood flows
- Broad flow range, fine adjustments of flow rate down to 0.1 l/min
- Long-term use via high-tech ceramic mount and magnetic coupling
- The design of blood pump unit DP3 reduces turbulent flow and dead spaces
- Optional pulsatile flow

DP3 Pump Drive

DP3 Pump Heads
DP3 – available in two sizes:

- DP3 ¼" with up to 2.4 l/min blood flow
- DP3 $^3/_8$" with up to 8 l/min blood flow

The Backup System:
Mastering Therapy Challenges

In challenging therapy situations the treatment can be continued via the battery-driven backup system:

Second pump drive

- No stress priming a second set
- Backup pump drive

Backup battery pack

- Hot-swappable batteries for operation without external power supply
- Easy to change

Safety features for your therapies

- Zero-Flow function – flow stops when air bubbles are detected – whilst slow running pump counter-balances possible backflow
- Flow control guarantees constant blood flow, e.g. for constant gas exchange level

- Automatic backflow compensation (especially for VA application mode)
- P1-limiter guarantees constant pressure at p1, e.g. for hemolysis prevention

Integrated Pressure Sensors – IPS*

IPS facilitating and securing therapy management

- Avoids leakage and air aspiration due to sealed/closed system
- Simple connection and no calibration during therapy necessary
- No hemodilution – especially for your neonate and pediatric patients
- Smooth inner surface for lower risk of clotting compared to conventional pressure measurement

*   not available in all patient kits
     or more information please refer to your local sales representative

Data Management

External Monitoring
Interface for therapy data to ICU monitors

Nurse Call System
Interface for alarm activation of internal intensive care unit nurse call system

USB
Anonymous logfiles can be transferred directly to an USB device

PMS Data Interface
Retrievable data protocol for a patient-related electronic documentation system

By Your Side

Clinical Support

Technical Service

We accompany excellent use of our technology and implementation of our therapies with far-reaching individual support and application-oriented services. This includes an international support hotline.

Our console is always accompanied by comprehensive support from our Clinical Support Team. Each of our application specialists has many years of real-world experience from specialists working in clinics. These highly qualified experts provide with on-site support – comprising instructions/training and help in implementing our technology in the day-to-day business of your clinic.

Our Technical Service Team is available to answer any and all technical questions you may have in and around the Xenios platform. In addition to this, the Academy offers you professional events for both basic and advanced training. The Xenios campus- our e-learning platform - offers divers study modules and videos tailored to your specific areas of interest.

References

1 Langer et al., (2016) "Awake" extracorporeal membraneoxygen-
ation (ECMO) : pathophyiology, technical considerations, and
clinical pioneering. Critical Care 20:150. doi: 10.1186/
s13054-016-1329-y

2 Braune S. et al. (2015) The use of extracorporeal carbon dioxide
removal to avoid intubation in patients failing non-invasive
ventilation--a cost analysis. BMC Anesthesiol 15:160. doi:
10.1186/s12871-015-0139-0

3 Teno JM et al., Decision - Making and outcomes of Prolonged
ICU Stays in Seriously Ill Patients. 2000, J Geriatr Soc.; 48(5
Suppl): 70-4.

4 Fleck et al. , (2013) First serial in vivo results of mechanical
circulatory support in children with a new diagonal pump.
European Journal of Cardio-Thoracic Surgery 44 (2013)
828--835. doi:10.1093/ejcts/ezt427

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Technical File

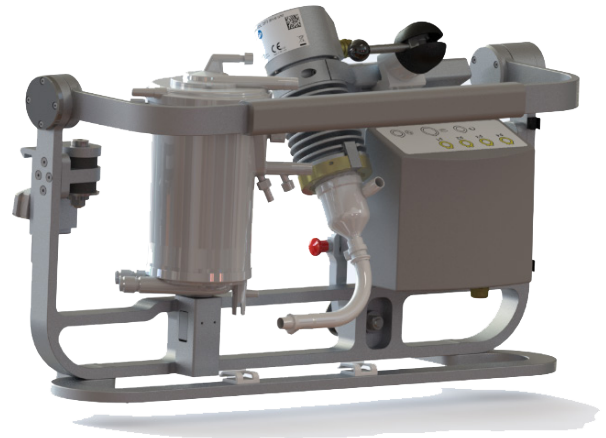|	
Product	Console for heart and lung assist Dedicated software options for different therapies
Software	Software with two different options for heart and lung failure: lung assist advanced mode
Battery operating time	120–420 min Depending on therapy and blood flow
Display	10.4" high resolution TFT touchscreen, detachable
Sensor technology	4x external pressure measurement 1x flow sensor / air bubble detector 2x external temperature measurement 1x level sensor + Integrated Pressure Sensors (IPS)
Operating voltage	100–240 VAC, 50–60 Hz 11–28 VDC
Interfaces	1x USB 1x PDMS (RS232) 1x Philips IVOI 1x Nurse call
Pump drive	External (1.45 kg)
Backup pump drive	Additional drive in conjunction with a power supply (e.g. battery pack)
Dimension (H x W x D)	290 x 300 x 369 mm
Weight	ca. 12 kg (incl. battery packs)

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MultiSupport GROUND
Transport of ECLS patients

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MultiSupport GROUND

The Xenios MultiSupport GROUND (MSG) is a system consisting of different components, designed to enable inner- and inter-hospital transport of severely ill patients undergoing life-saving extracorporeal heart and lung support. As a whole, the Xenios MultiSupport GROUND (MSG) system offers:

Setup for ground based transport

- Fixation in any intensive care transport vehicle with ground airline rails
- Holder system adds only 21 cm to the stretcher width
- Fixation to standard rails of a stretcher or Xenios trolley N

Power supply

- Battery packs included in the MSG Backup Module offer an additional operating time of up to 420 min
- MSG Battery Charger allows backup system to be fully charged for on-call transport
- Possibility of connection to the on-board mains of an intensive care transport vehicle

MSG Backup Module

- Offering space for battery-driven backup pump drive in mobile case[1]
- Fixation option of included battery pack by soft case with an adhesive belt to e.g. a stretcher IV pole
- One rain/dust cover for console
- Power cable for connection to on-board mains

Patient kit compatibility

- Regarding inter-hospital patient transport, MultiSupport GROUND is intended for use only in conjunction with Novalung kits
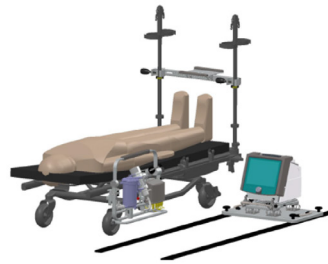

1   A pump drive is not included in the MSG scope of supply. Please use backup pump drive of console.

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MultiSupport GROUND
Transport of ECLS patients

The MSG consists of only 4 essential components that accommodate the console[2], patient kit, sensor box and DP3 pump.
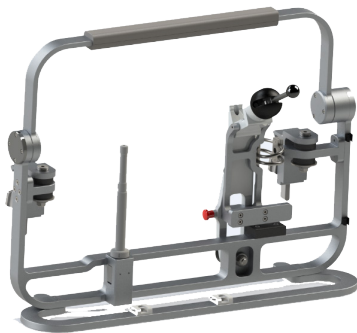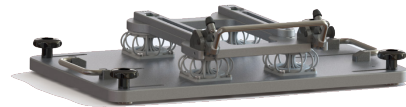
inside ambulance vehicle

in hospital environment

Only a few parts enable transport

MSG Holder – keeps the patient kit, pump drive and sensor box during transport. The MSG Holder is equipped with the MSG Pin 7000[3] ex works.

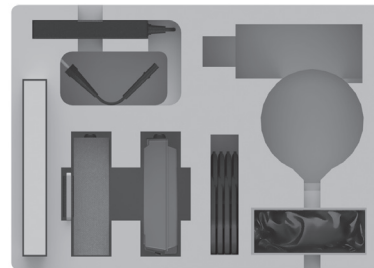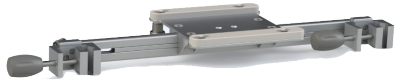MSG Crossbar – attachment of the console to the stretcher for inner-hospital transport.

MSG Base Plate – fixation of console onto airline rails in the intensive care transport vehicle.

MSG Backup Module – provides space for a pump drive[1] and battery packs in case of a challenge during therapy. Furthermore, it contains other components like a rain/dust cover that maybe relevant for transport.

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2 Only valid for consoles with serial number starting from (38350043): XEN0389; deltastream MDC console (MEMDC0021): MDC0366 and upwards. Installed base console (Linux-based) with SN < as above require installation of specific MSG upgrade kit by certified engineer. Please ask your sales representative for a quotation.

3 Please be aware that pin and iLA bracket of compact holder do not fit to the MSG Holder.

MultiSupport GROUND
Transport of ECLS patients

Basic equipment:

Product	Brief product description	Article number
MSG Holder	MSG Holder equipped with MSG Pin 7000Rail requirement: d 10 mm x h 25 mm and ≥ 470 mm in length[4]	30000285
MSG Base Plate	MSG Base Plate with all accessories for secure fixation on airline rails in an intensive care transport vehicle	30000286
MSG Crossbar	MSG Crossbar to put on stretcher IV poles	38350319
MSG Backup Module	MSG Backup case with emergency equipment, e.g. space for backup pump drive[1] and battery packs	38350318
MSG Battery Charger	2 x 1 piece for each battery pack	38350326
MSG Platform Adaption Kit[5]	MSG Adapter Pins	38350335
	MSG Console Socket	

Optional equipment:

Product	Article number
MSG Pin 2400	38350322
MSG Bracket[6]	38350320
MSG Medos Trolley Adaption[7]	38350324

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4   Coming soon: MSG Holder compatible to standard rail ≥ 410 mm in length.

5   Not required if applying specific MSG Upgrade Kit by certified service engineer.

6   The MSG Bracket is not intended for ground-based inter-hospital transport.

7   Includes only a new shelf for Trolley M (no support of MSG Holder).

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End of 2016, Xenios became a part of Fresenius Medical Care, the world's leading provider of products and services for people with chronic kidney failure.

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