

Extracorporeal life support
PLS System

MAQUET
GETINGE GROUP





PLS Set and ROTAFLOW Console

A therapy option for critically ill patients

Maquet, a trusted partner for hospitals and physicians for over 175 years, is the global leader in providing medical systems that meet the needs of the most medically challenging patients, while exceeding the expectations of the hospital teams that care for them. Maquet designs, develops and distributes innovative therapy solutions and infrastructure capabilities for high-acuity areas within the hospital including the intensive care unit (ICU), the operating room (OR) and hybrid OR/cath lab as well as intra and inter hospital patient transport.

The Permanent Life Support (PLS) System from Maquet has been developed to support patients requiring prolonged respiratory and/or circulatory assistance with blood flows between 0.5 and 7 l/min. The PLS Set circuitry was designed, and is assembled with the minimum number of essential components in order to achieve unobstructed blood flow with less blood damage that contributes to better patient outcomes. Together with its reliable hardware as well as a wide range of cannulae the PLS System fulfills the extremely demanding requirements for prolonged extracorporeal life support.

Maquet | The Gold Standard



Extracorporeal heart-lung support system

Areas of application

The PLS System is an adult respiratory and/or circulatory support system for use in the intensive care unit, cardiac catheter laboratory as well as operating, trauma¹ and emergency rooms validated with a CE certification for 14 days continuous use.* It can also be used to maintain extracorporeal support of patients being transported between hospital departments.

In the intensive care unit the PLS System can provide appropriate extracorporeal support to adult patients with a wide range of life threatening conditions. These may include:

- Acute Respiratory Distress Syndrome (ARDS)^{1,2,3,4}
- Pulmonary Embolism²
- Septic Shock Syndrome¹
- Multiple Organ System Failure¹

In the catheter laboratory and cardiology department the PLS System can be used to provide urgent circulatory support with oxygenation in the event of sudden heart failure thus preventing organ damage.

Emergency medical situations can benefit from the availability and mobility of the PLS System. Certain patients can benefit from the rapid restoration and stabilization of cardiopulmonary functions that ECLS can offer. The following indications may be appropriate for using the PLS System:

- Anaphylactic shock¹
- Intoxication⁴
- Severe hypothermia¹
- Barotrauma^{3,4}

Areas of application may include:

- Cardiogenic shock^{1,4,5}
- Stand-by or prophylactic support during high-risk PCI
- Cardiopulmonary assist after right heart infarction⁴
- Bridge to recovery, bridge to bridge, bridge to decision, e.g. to treat myocarditis⁴

In the operating room patients who need post-surgery circulatory support can be transferred onto the PLS System and moved to the intensive care unit easily². Also patients from the emergency and trauma rooms who need treatment in other hospital departments, e.g. for revascularization or PTCA, can be placed on the PLS System and then moved to the operating room, catheter laboratory or intensive care unit. Areas of application may include:

- Cardiogenic shock^{1,4,5}
- Low cardiac output syndrome (LCOS)⁴
- Bridge to recovery, bridge to bridge, bridge to decision⁴

„PLS has made priming easier in reducing the volume, plus it is inexpensive.“

Hasse Karlsson,
Perfusionist, Sahlgrenska University Hospital,
Gothenburg, Sweden

¹ Arlt M. et al. Extracorporeal membrane oxygenation in severe trauma patients with bleeding shock. *Resuscitation* 2010; 81 (7): 804–809

² Schmid C. et al. Venovenous extracorporeal membrane oxygenation for acute lung failure in adults. *The Journal of Heart and Lung Transplantation* 2011; 31 (1): 9–15

³ Thiara APS. et al. Extracorporeal membrane oxygenation support for 59 days without changing the ECMO circuit: a case of Legionella pneumonia. *Perfusion* 2009; Vol. 24; (1): 45–47

⁴ Puehler T. et al. Extracorporeal membrane oxygenation. Old instrument with a new look? *Z Herz-ThoraxGefäßchir* (4) 2011; 25: 209–216

⁵ Yu K. et al. Clinical Evaluation of Two Different Extracorporeal Membrane Oxygenation Systems: A Single Center Report. *Artif. Organs* 2011; Vol. 35; (7): 736

The PLS System

Components at a glance

The PLS System consists of the following components:

- PLS Set/PLS Set Plus or HIT Set PLS Plus
- ROTAFLOW Console with ICU Kit RFC
- ROTAFLOW Drive Unit
- ROTAFLOW Emergency Drive
- Holder
- HLS Cannulae

The PLS Set consists of the PLS-i Oxygenator and the ROTAFLOW Centrifugal Pump both incorporated in a tip-to-tip tubing set with BIOLINE Coating. The high performance of the oxygenator and pump ensures safe and effective patient support and user management. The low resistance of the PLS-i Oxygenator and the high efficiency of the ROTAFLOW Centrifugal Pump reduce blood damage to a minimum⁵.

The PLS-i Oxygenator incorporates highly plasma-resistant polymethylpentene (PMP) fibers and a modified housing designed specifically for prolonged use. These tight PMP fibers eliminate plasma leaks. With an approval for 14 days continuous use, the need for oxygenator replacement is significantly reduced⁵.

The ROTAFLOW Centrifugal Pump with its high biocompatibility is responsible for improved blood handling and lower levels of pump-induced hemolysis^{5,6}. This centrifugal blood pump without any shaft or seals has a spinning rotor with flow channels that move the incoming blood in rotary motion, directing it through a spiral housing to the outflow port. The one-point sapphire bearing and the low priming volume combined with the spiral formed chamber ensures gentle blood handling^{5,6} and optimized blood flow.

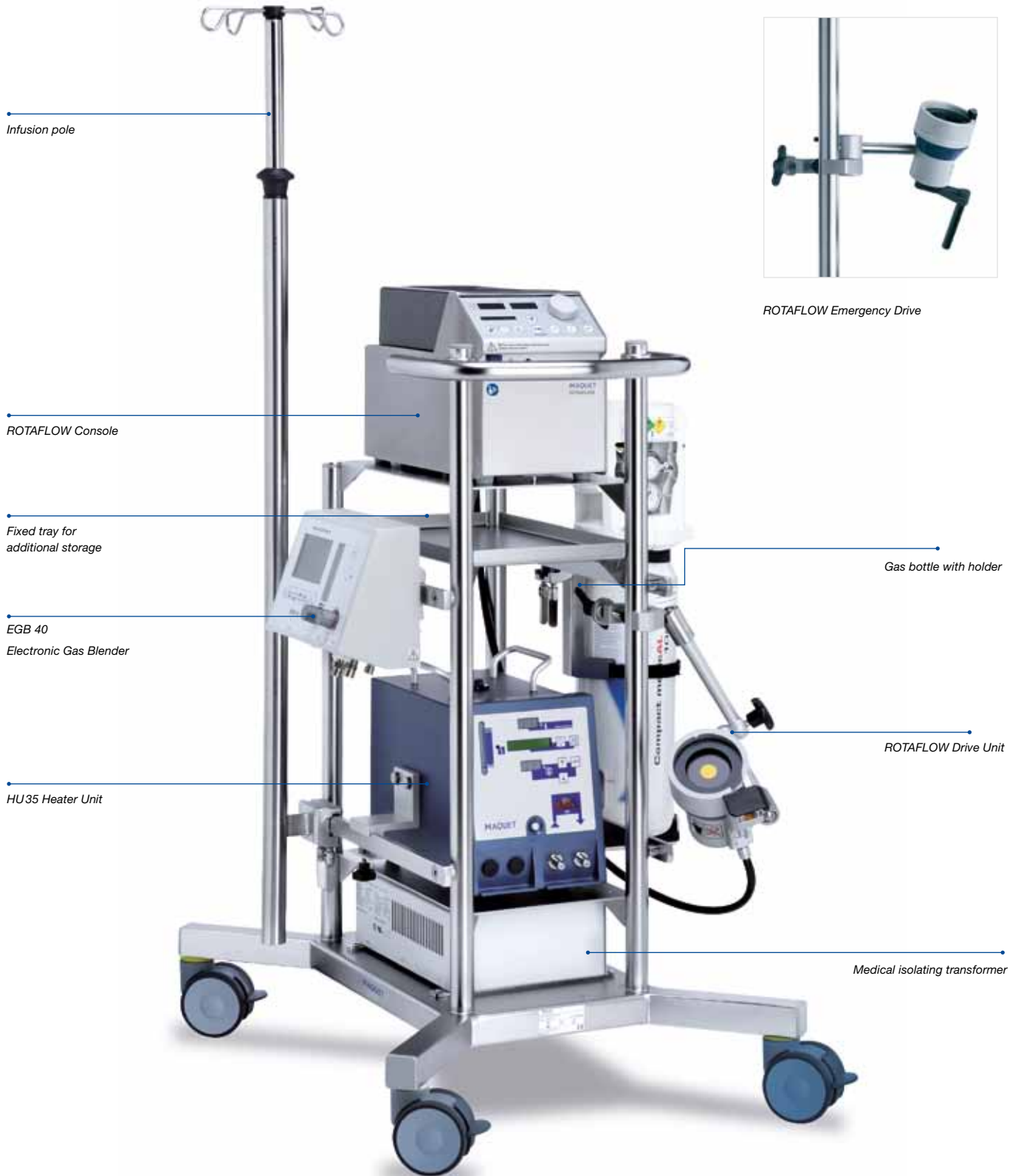


PLS Set

The PLS Set Plus includes two additional connectors with luer lock for hemofiltration or dialysis. The connectors have been incorporated between the oxygenator outlet and pump inlet so that a CRRT device can be attached to the extracorporeal circuit.

HIT Set PLS Plus is specially designed for use on patients who are susceptible to heparin-induced thrombocytopenia. HIT Set PLS Plus can be used for up to 5 days combined with SOFTLINE coated HLS Cannulae.

Fully equipped **Sprinter Cart XL** Hardware at a glance



Infusion pole

ROTAFLOW Console

Fixed tray for additional storage

EGB 40
Electronic Gas Blender

HU35 Heater Unit



ROTAFLOW Emergency Drive

Gas bottle with holder

ROTAFLOW Drive Unit

Medical isolating transformer

Technical Data

PLS System

PLS Set

Total priming volume	585 ml
Blood flow rate	0.5–7 l/min

PLS-i Oxygenator

Gas exchange surface area	1.8 m ²
Heat exchange surface area	0.4 m ²
Water connectors	1/2" Hansen coupling
Housing material	Polycarbonate (PC)
Fiber material for gas exchange	Polymethylpentene (PMP)
Fiber material for water flow	Polyurethane (TPU)

ROTAFLOW Centrifugal Pump

Surface	190 cm ²
Housing material	Polycarbonate (PC)

ROTAFLOW Console

RPM speed	0–5000 RPM
Resolution of display	0.01 l/min
Flow rates	0–9.9 l/min
Dimensions	179 x 385 x 243 mm
Weight	Approx. 15 kg



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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