

MAQUET

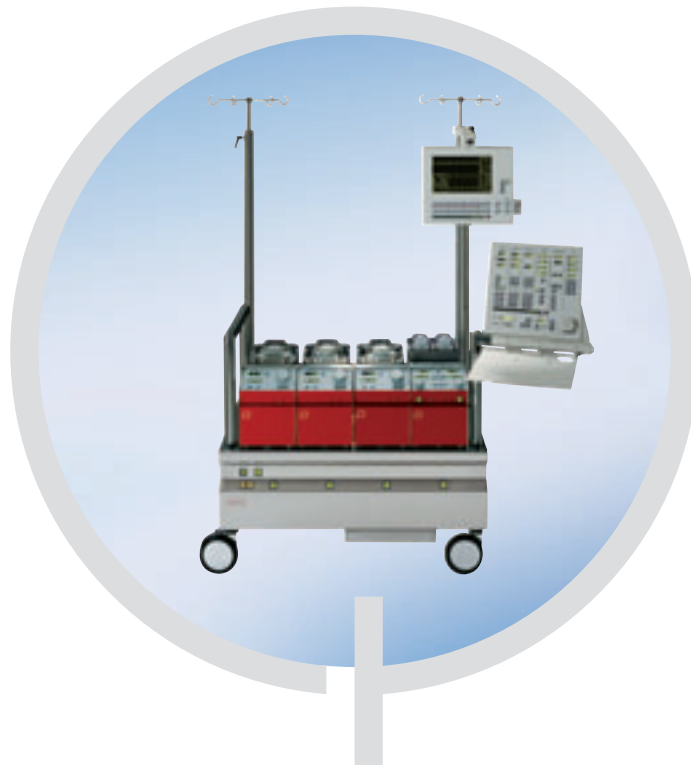
PERFUSION JOSTRA HL 20 HEART-LUNG MACHINE

CARDIOPULMONARY





WELL-PROVEN PERFUSION TECHNOLOGY MAQUET – THE GOLD STANDARD



Creating the best conditions for optimal medical care:

Maquet Cardiopulmonary develops, manufactures and distributes innovative medical devices that save lives by temporarily replacing and assisting vital organs. We are one of the world's leading suppliers of disposables and Heart-Lung Machines for open-heart surgery. Working closely together with our customers we combine our expertise with trends in cardiopulmonary surgery to develop new and innovative products.

A complete perfusion system: The JOSTRA HL 20® perfusion system features a new dimension of user-friendliness, safety, complexity and simplicity to meet the increasing demands imposed on a modern Heart-Lung Machine.

MAQUET – The Gold Standard.

THE JOSTRA HL 20

ADVANCED FUNCTIONALITY IN A SIMPLE FORM

A user-friendly Heart-Lung Machine: JOSTRA HL 20 provides the complex technology needed for modern heart-lung surgery while maintaining simplicity: All supervisory and warning functions are on one panel. One knob adjusts all settings except the pump speed. The pump function is dedicated by name, not by location, and the assigned function of the pump is displayed on its front panel. All alarms and errors are indicated both acoustically and visually. A single button is used to silence all alarms. A remote control for the Heater-Cooler Unit JOSTRA HCU 20 is built-in. Patient temperature can be monitored and controlled without diverting the operator's attention. A flat screen display monitor provides graphical and functional status information at a glance.

JOSTRA HL 20 utilises a unique memory card system, which automatically stores all data displayed or generated by the entire machine for subsequent analysis. In addition, the operator can define up to 24 different events and record these with a touch of a single button. JOSTRA HL 20 records all data, but the real power of the data collection lies in the JOCAP XL® (JOSTRA Computer Aided Perfusion) post-operative data processing and information retrieval.

Flexible and adaptable to every operation: JOSTRA HL 20 can be arranged in several configurations. All controls and monitors are run from a single panel, which can be mounted to the left of, right of, or over the pumps. Pump functions can be renamed or relocated instantly without reconnection of a single cable.

The flexibility within JOCAP XL allows, for example, each perfusionist to create individual event tables and vary them between the cases.

The JOSTRA HL 20 system can communicate with most other digital or analogue devices. As an option, it can poll other devices (e.g. blood gas analysers and patient monitors) and import their data into the JOSTRA HL 20 data set.

Safe and reliable: If the power supply fails, a fully automatic battery backup system will cut in automatically and run the entire system for time sufficient to finish most surgical procedures. All pumps and modules operate on a low 24 Volt voltage for increased patient and operator safety. All electrical connections are inside JOSTRA HL 20; there are no protruding or interfering cables to be broken, tangled or inadvertently unplugged. The system performs an extensive self-test at power-up, then continuously monitors its vital functions during operation.



JOSTRA HL 20 PERFUSION SYSTEM OVERVIEW

USER-FRIENDLY, ADAPTABLE AND RELIABLE

The JOCAP XL Memory Card:
A small, robust and reusable data storage medium serves as an information-carrier and links the pre-, inter- and post-operative sessions of JOCAP XL.

Height Fixed Shelf: A height fixed shelf is an integral part of the console (except the left oriented and right oriented consoles).

System Monitor Unit: The JOSTRA HL 20 System Monitor Unit with its supporting electronic modules offers a comprehensive, logical and easy-to-use display of the vital patient and machine functions. The monitor incorporates the memory card read/write unit of the JOCAP XL data collection system.

The System Control Panel: This panel provides ergonomic integrated control for the entire heart-lung machine. A single knob adjusts all console settings, and a single button silences all acoustic alarms. Alternation of the vital functions demands a dual button safety setting procedure.

Mast System: Two stable masts with telescopic (height adjustable) infusion poles. The amount of masts depend on the type of console.

Side Guard: Side guard help manoeuvre the console. The consoles with three masts have a side guard as standard.

Roller Pump: The roller pumps are easily removed from and reinstalled onto the console simply by lifting or placing the module onto the guided position.

Twin Pump: The Twin Pump Module is suitable for applications where lower flow rates are required.

The Emergency Battery Unit: The emergency battery provides a fully automatic uninterruptible power supply for the entire machine system. Charging and switching over from mains to battery operation, or vice versa, does not require any action from the operator. The whole heart-lung machine, including all pumps, continues its operation without any stops.

Transformer and Power Supply Board: Mains power components are located inside the console, and in that way kept out of operator reach. Outside the console, only extra low (24 V) medical safety voltage connections are accessible.

Chassis for Electronic Modules:
The console is equipped with a rack for accommodation of the system electronic modules.

Drawer: To store accessories like tube inserts and hand cranks.



CONFIGURATIONS

A WIDE RANGE OF CONFIGURATIONS TO MATCH EVERY NEED

The JOSTRA HL 20 console is constructed of stainless steel and easily manoeuvred by means of a side guard and four stable castors, two with total lock and two with direction lock.



Left-oriented console (Also available in right-oriented console)

- Folding control panel and desk
- Swivel-mounted monitor on a mast mounted arm
- Three masts – two with height adjustable infusion poles
- Flexible arm spotlight on the monitor's side (see picture of middle panel left console)
- Side guard
- Four and five pump versions available



Middle/left console (Also available in middle/right console)

- Swivel-mounted control panel under a fixed shelf
- Swivel-mounted monitor on a mast mounted arm
- Three masts – two with height adjustable infusion poles
- Flexible arm spotlight on the monitor's side (see picture of middle panel left console)
- Side guard
- Two, four and five pump versions available



Middle panel left console (Also available in middle panel right console)

- Swivel-mounted control panel and monitor under a fixed shelf
- Four masts – two with height adjustable infusion poles
- Flexible arm spotlight on the monitor's side
- Four and five pump versions available

The flexible JOSTRA HL 20 is available in many configurations and may be applied to two or five pump machines as well. Note that the two pump machines can only have the middle/left or middle/right console.



JOSTRA HL 20 two pump machine

SUPERVISORY UNITS

COMPREHENSIVE AND SAFE CONTROL

Pressure Monitoring System: JOSTRA HL 20 allows accurate measurement of up to four pressures. Industry standard medical grade pressure transducers serve as system sensors. The range and accuracy of measurements are decided by the technical data of the transducer itself.

Temperature Monitoring System: JOSTRA HL 20 allows accurate measurement of up to four temperatures. The system works with insulated temperature probes, which are fully compatible with the YSI 400 series (Yellow Springs Instruments) interchangeable thermistor probes.

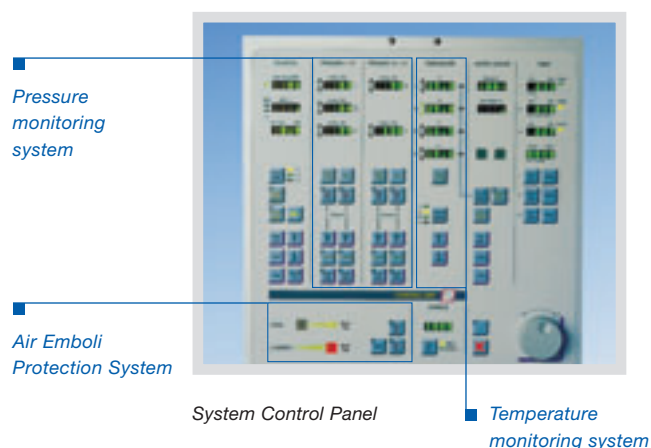
Air Emboli Protection System: The Air Emboli Protection system offers two safety protection systems to prevent air entering the extracorporeal circulation: Capacitive level sensor and Ultrasonic microbubble air detector.

Cardioplegia Monitor Unit (CMU): With the Cardioplegia Monitor Unit (CMU) essential Cardioplegia data is easily displayed. It displays volumes, ratio, timers, temperature and pressure for full control of cardioplegia delivery.

The CMU (Cardioplegia Monitor Unit) is an option and is mounted under the System Control Panel.

This compact Cardioplegia Monitor is a cost effective replacement of the System Monitor Unit.

System Monitor Unit: The System Monitor Unit is an accessory to JOSTRA HL 20. With its supporting electronic modules, the JOSTRA HL 20 System Monitor Unit offers a comprehensive, logical and easy-to-use display of the vital patient and machine functions. The monitor incorporates the memory card read/write unit of the JOCAP XL data collection system.



Cardioplegia Monitor UNIT (CMU)



The System Monitor Unit (accessory).

DATA COMMUNICATION FLEXIBLE DATA RECORDING SYSTEMS

JOCAP XL Offline version – convenient perfusion data

collection: The JOSTRA Computer Aided Perfusion system, JOCAP XL, offers unique, powerful and convenient perfusion data collection. No PC is required in the operating theatre.

The JOCAP XL Memory Card, a small, robust and reusable data storage medium, serves as an information-carrier and links the pre-, inter- and post-operative sessions of JOCAP XL.

With a regular PC equipped with the JOCAP XL Parallel Reader (drive unit for JOCAP XL Memory Card) and JOCAP XL License, the pre- and post-operative sessions allow the operator to prepare, enter and evaluate perfusion data in a convenient office environment. One PC can serve several heart-lung machines. During the operation, the JOCAP XL driver in the System Monitor Unit automatically performs data recording, meaning that a minimum of attention from the operator is required.

Some features of the JOCAP XL data recording system:

- Powerful pull-down menus facilitate pre-operative data entries and reduce the need of typing.
- Flexible event handling. Each perfusionist can have his/her own set of event tables for different cases.
- Consistent handling of emergency cases where there is no time for pre-op sessions.
- Optional Digital Input/Output module for the collection of data from up to four external devices such as gas analysers and patient monitors.
- Rich variety of software tools for post-op case analysis, evaluation and presentation.
- Enhanced statistics tool.
- Design of individual perfusion reports.
- Creation of a database.





JOCAP XL Online version – analyzing data in real-time:

The JOCAP XL Online version provides a direct line to the heart-lung machine for online data recording. The Online version includes the same features as the offline version, along with the following additional features:

- Review of registered data during perfusion.
- Unlimited number of events.
- Data collection from different Heart-Lung Machine brands.
- Easy network connection.

JOCAP XL Statistics: JOCAP XL Statistics is the software module for statistical analysis of perfusion data.

Features of the JOCAP XL Statistics:

- Fully automatic access to the entire JOCAP XL database.
- User-friendly guidelines for generation of statistics.
- Wide range of selection criteria (time, type of operation, equipment, team members, etc.)
- Screen and printer presentation in graphic or table format.

◀ JOCAP XL – Offline Version data is evaluated using a reusable memory card. The memory card is inserted into the side of the System Monitor Unit.



Data can be displayed and analyzed in real-time by connecting a PC running JOCAP XL directly to JOSTRA HL 20.

THE PUMPS

SAFE AND VERSATILE PUMP SYSTEM

Roller Pump Modules: The design of the JOSTRA HL 20 peristaltic roller pumps offers precision, durability, versatility and convenience in handling. All pumps run quietly and smoothly on safe low-voltage power supplied by the console. There are no cables to connect. Due to their compact size and low weight, the pumps are easily removed from and reinstalled onto the console simply by lifting or placing the module onto the guided position.

The range of roller pumps consists of:

- Full-flow Roller Pump Module
- Twin Pump Module, which offers two small pumps, independent of each other, in a common standard size module housing. The Twin Pump Module is suitable for applications where lower flow rates are required, such as paediatric perfusion, cardioplegia delivery, suction or venting.

The pumps offer:

- Forward and reverse rotation.
- Central occlusion knob, lockable and precise in setting.
- Large four-digit alpha-numeric display for flow and speed.

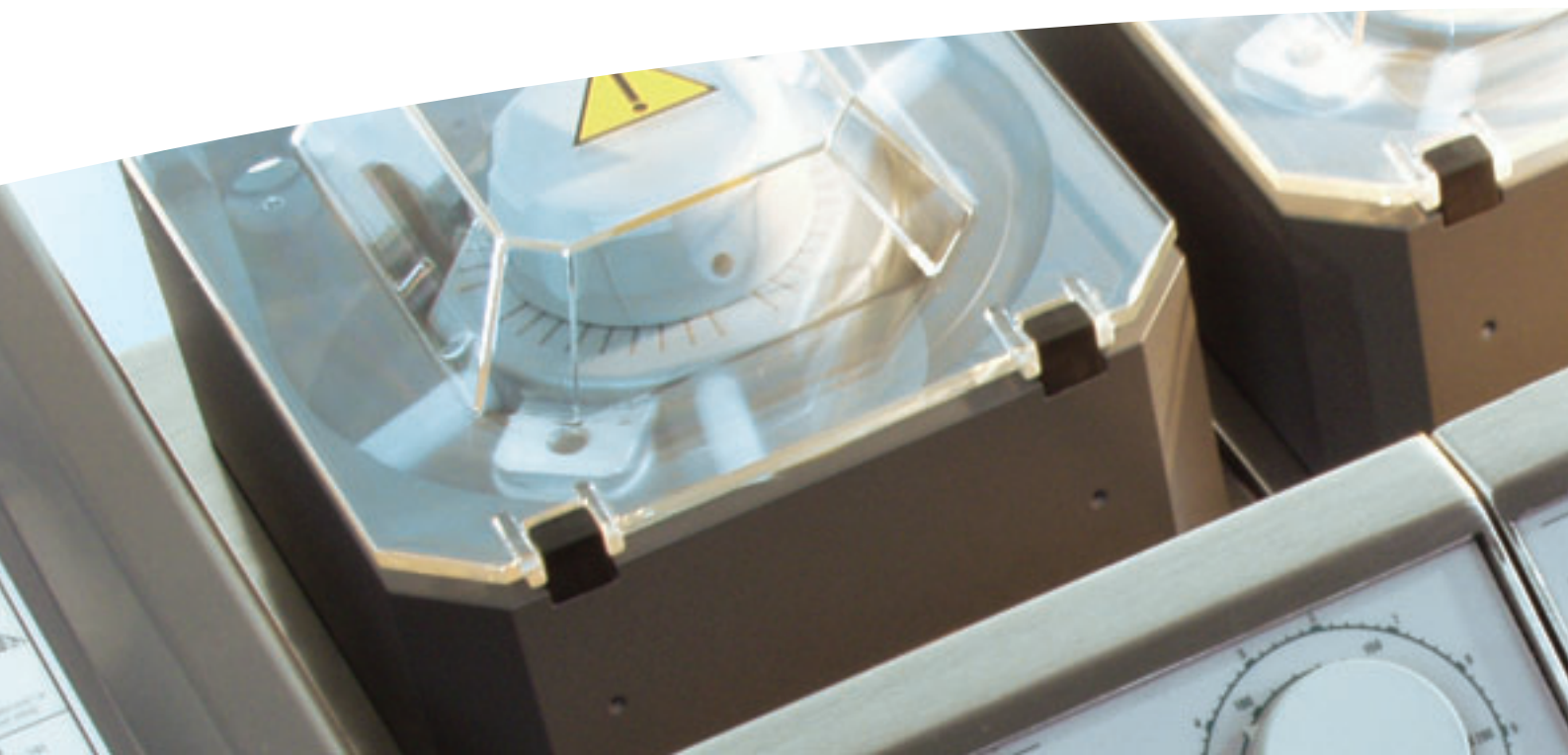


Full-flow Roller Pump Module



Twin Pump Module

- Eight-digit alpha-numeric display for mode of operation, tube size and status messages.
- Eight programmable modes of operation including slave and cardioplegia modes.
- Continuous and pulsatile operation.
- Calibration memory for up to four tubing sizes.
- Full control by supervising units.
- Full range of protection by monitoring of runaway, beltslip, overload, direction, heat generation, communication.
- Full communication with RotaFlow, the centrifugal pump system.



RotaFlow Centrifugal Pump: RotaFlow centrifugal pump system, a natural part of JOSTRA HL 20, can also be used as a fully independent stand-alone unit. The unique flow and bubble measuring function is an integral part of the RotaFlow system.

The RotaFlow system consists of:

- RotaFlow Console, a control module with triple power supplies: mains, JOSTRA HL 20 or own batteries.
- RotaFlow Drive with built in flow and bubble measurement. A multiple led hydraulic holder allows optimal positioning of the drive unit.
- RotaFlow Emergency drive, a manual drive (hand crank) with speed indicator.
- RotaFlow centrifugal pump, a disposable pump head with integrated flow probe connector.

The RotaFlow system offers:

- Completely independent stand alone application for direct mains power supply, built in battery back up, level and pressure measurements with external (optional) transducers.



The RotaFlow centrifugal pump system can also be used as a fully independent stand-alone unit.

- Integrated flow and bubble sensors.
- Separate flow and speed displays.
- Constant flow mode of operation.
- Suitability for pulsatile operation.
- Technologically advanced disposable pump head.



ACCESSORIES

A COMPLETE RANGE OF ACCESSORIES IS DEVELOPED FOR JOSTRA HL 20

Some of the most commonly used accessories for the JOSTRA HL 20 Heart-Lung Machine are:

Mast Top Shelf: The Mast Top Shelves for four and five pump consoles, respectively, are height adjustable along the console masts. The mounting does not require any tools.

Cross Mast: The Cross Masts for four and five pump consoles, respectively, consist of a round 25 mm bar and end holders. The Cross Masts are height adjustable along the console masts without any tools.

Vertical Mast: The Vertical Mast is a round 25 mm bar; the length is 500 mm.

Venous Clamps: The hard anodised aluminium Venous Clamp Standard is designed to allow precise regulation of the venous return flow by occluding the venous line. There is no need for any inserts, and the clamp is able to accommodate tubing up to 5/8" x 3/32".

The Venous Clamp Quick offers both precise and quick venous return adjustment by means of two separate knobs. An extension arm and ball-and-socket-joint facilitate optimal positioning of the clamp. The clamp accommodates tubing up to 1/2" x 3/32" in size.

Ice Box: The thermally insulated Ice Box can be used for example for the cooling of cardioplegia solution. The Ice Box fits the space of a pump module on the HL 20 console.

Gas Flow Meters: The Gas Flow Meters consist of two or three individually calibrated rotameter tubes in an aluminium housing, which is easily attached to the oxygenator mast. The gas flow meters are fitted with precision regulating valves.

Sechrist Gas Blenders:

The Sechrist Air-Oxygen Mixer is a precision pressure regulation and proportioning device, which is designed

to accurately mix Medical Breathing Air (air) and Medical Breathing Oxygen (O₂) to any selected FIO₂ between 0.21 and 1.0, for delivery to a variety of respiratory care equipment.

Electronic Gas Blender: The Electronic Gas Blender combines the convenience of a built-in mechanical gas blender with the accuracy of electronic gas flow measurement. This compact unit is truly integrated with the JOSTRA HL 20 automatic data collection system and offers high measurement accuracy, easy gas connection and built-in pressure reducing valves.



Gas Flow Meters



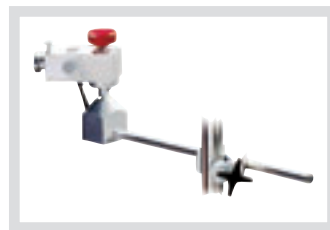
Sechrist Air-Oxygen Mixer



Electronic Gas Blender



Venous Clamp Standard



Venous Clamp Quick



Ice Box

HEATER-COOLER EQUIPMENT

TWO HEATER-COOLER SYSTEMS THAT PROVIDE PRECISE TEMPERATURE CONTROL

The Heater-Cooler Unit JOSTRA HCU 30: facilitates quick and independent regulation of both patient and cardioplegia temperature.

This heater-cooler system is the most advanced two-circuit heater-cooler system available today. JOSTRA HCU 30 offers exceptional cooling capacity through its fast ice building technique and powerful compressor. The ice accumulates an initial cooling effect that is almost three times as high as classic heater-cooler systems, resulting in reduced patient cooling times.

The large capacity heater incorporates smooth and precise electronic control. This technique optimizes the efficiency and minimises patient re-warming time. The automatically controlled mixing valve enables very fast switching from cooling to heating and back to cooling again.

JOSTRA HCU 30 can be controlled either via its display unit or via an optional remote control.

The Heater Cooler Unit JOSTRA HCU 20: (not available in USA) ensures fast and accurate control of patient temperature, independent of water supply, in the operation theatre.

The two-circuit method featuring a large cooling circuit and a smaller heating circuit ensures highly effective cooling and re-warming procedures. The large water container is continuously cooled, even if the unit re-warms the patient.

The JOSTRA HCU 20 can be directly controlled from the JOSTRA HL 20 System Control Panel. When used with the JOSTRA HL 20, all data is automatically recorded in the JOCAP data collecting system.

JOSTRA HCU 20 can also be remotely controlled, from any heart-lung machine, with the Remote Control Unit. This unit has a temperature probe input and allows JOSTRA HCU 20 to be controlled in external "patient" mode with adjustable maximum temperature gradients for heating and cooling.



JOSTRA HCU 30



JOSTRA HCU 20



Cooling Blanket



JOSTRA HCU 30 Remote Control

Cooling Blanket: The lightweight, reusable cooling blanket provides effective and safe heating or cooling to the patient.

Blanket Connection Kit: A Blanket Connection Kit is required for quick and safe water connection of one blanket to a Heater-Cooler Unit.

MAQUET

Maquet Cardiopulmonary AG
Hechinger Strasse 38
72145 Hirrlingen, Germany
Phone: +49 (0)7478 921-0
Fax: +49 (0)7478 921-100
info@maquet-cp.com
www.maquet.com

For local contact:

Please visit our website

GETINGE

GETINGE Group is a leading global provider of equipment and systems that contributes to quality enhancement and cost efficiency within healthcare and life sciences. Equipment, services and technologies are supplied under the brands ARJO for patient hygiene, patient handling and wound care, GETINGE for infection control and prevention within healthcare and life science and MAQUET for Surgical Workplaces, Cardiopulmonary and Critical Care.