

# **SmartHDM**

Introducing the new SmartHDM System from Mesa Labs and IBP. The SmartHDM System is the first tablet-based meter system designed for service of medical instrumentation.



# **New Concept**

SmartHDM is a new approach combining a family of intelligent sensors, measuring modules and a smart handheld device for testing and quality control of medical devices. The product line combines more than 40 years of experience in innovative measuring device development.

## Customizable

The modular concept of the SmartHDM system allows the use of any combination of IBP and Mesa sensors and modules to fulfill a specific measuring application.

## Customizable

The SmartHDM System is modular and allows the use of any combination of IBP HDU and Mesa Laboratories sensors to measure Conductivity, Pressure, pH, Temperature and Flow.

The SmartHDM software is specially tailored to the requirements for the service and maintenance of medical devices.

The SmartHDM system was designed with the needs of a service technician in mind.

#### **APPLICATION INCLUDES**

## Conductivity

- » Hemodialysis machines
- » RO Water Systems
- » Water Treatment

#### **Pressure**

- » Hemodialysis machines
- » Opthamological lasers
- » Blood pressure meters
- » Automatic tourniquets
- » Drainage devices
- » IV pumps
- » Diagnostic, surgical suction
- » Ventilators
- » Pressure gauges

#### **Temperature**

- » Hemodialysis machines
- » Temperature monitors
- » Electronic thermometers
- » Humidifiers/nebulizers
- » Blood warmers
- » Hypo/hyperthermia machines
- » Infant incubator
- » Radiant warmers

#### Flow

- » Hemodialysis machines
- » RO Water Systems
- » Water Treatment

# **HDU- and 90XL-Sensors**



#### **Flexibility**

The HDU- and 90XL sensor families fulfills the need for high accuracy and reliability, whether it be for taking conductivity, temperature, pressure, pH or flow readings. For annual calibration, only the sensors are needed.

#### **Different Versions**

- » Conductivity
- » Temperature
- » Pressure
- » Flow
- » pH

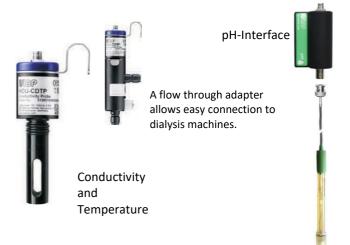
## **HDU-Sensors**





Different adapter such as Luer allows easy connection to any device.





# **HDU-Sensor Specifications**

#### PRESSURE HDU-PRS30

Range -13 to 30 psi

-672 to +1551 mmHg

Resolution 0.01 mmHg

Accuracy 0 to 300 mmHg ± 1 mmHg

Othewise ± 2 mmHg

Overpressure 2 x full scale Media compatibility Gasses and fluids

# CONDUCTIVITY HDU-CDTP

Conductivity

Range 0 to 200.00 mS/cm Accuracy 0 to 199 uS/cm  $\pm$  0.6 uS/cm

200 to 1999 uS/cm  $\pm$  6 uS/cm 2 to 11.99 mS/cm  $\pm$  0.06 mS/cm 12 to 19.99 mS/cm  $\pm$  0.03 mS/cm 20 to 200 mS/cm  $\pm$  0.6% of reading

Temperature Referenced to 25°C

Compensation Adjustable via multiple modes:

linear one value, dynamic two values, nLF-lso - nonlinear according to ISO7888

Temperature

Range 0 to 100  $^{\circ}$ C Resolution 0.01  $^{\circ}$ C Accuracy  $\pm$  0.1  $^{\circ}$ C

#### **FLOW**

#### HDU-FL100.2000

Measuring principle Turbine

Range 100 to 2000 ml/min Resolution 1 ml/min Accuracy  $\pm 2.0 \%$  of reading Repeatability better  $\pm 0.5\%$  Fluid temperature -20 % to +80 % C

рН

HDU-pH-I

Pressure

 $\begin{array}{ll} \mbox{Range} & \mbox{0 to 14 pH} \\ \mbox{Resolution} & \mbox{0.01 pH} \\ \mbox{Accuracy} & \pm \mbox{0.02 pH} \end{array}$ 

For more HDU-Sensors visit www.ibpmt.com

0 to 5 bar at 22°C

#### 90XL-Sensors

The 90XL-Sensors are part of the Mesa DialyGuard product family. The 90XL sensors can be connected to HDC systems with a special interface cable.







Conductivity and Temperature



Pressure



# HDM18/19 Measuring Module Family

Smart reference module family for the service and calibration of hemodialysis machines.

#### **Different Versions**

- » Flow-through measuring cell for Conductivity, Temperature and Pressure
- » Pressure sensor for external sources
- » Dialysate pressure relieve valve for the service of Fresenius dialysis machines
- » USB and Bluetooth Interfaces
- » Internal Battery

#### Multifunctional

The HDM18 and HDM19 sensor modules are specially designed for the service of hemodialysis machines. The modules can be used with any brand of dialysis machine.

The HDM18 module features a USB interface for easy connection to Android devices such as HDC64, HDC84 and HDC85. The HDM19 modules have an additional Bluetooth interface for convenient connection to any Android device and an internal rechargeable battery to be independent from the Android device battery.

## **Daily Use**

The HDM-Modules have been developed having the busy Biomed technician in mind. Helpful accessories such as the IVPole adapter and a pressure tubing set are included in the delivery.

# **SmartHDM-System**

The HDM-Module is part of the SmartHDM-System and fulfills the need for high accuracy and reliability, whether it be for taking conductivity, temperature or pressure readings. The sensors intelligently communicate via USB or Bluetooth with the HDC display unit.

All HDM modules have a connection for HDU sensors, allowing to connect sensors from the HDU family.

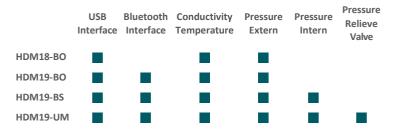


# HDM18 and HDM19



Smart Reference Module Family for the Service and Calibration of Hemodialysis Machines

#### **Different Versions**



## **Conductivity/Temperature**

The Conductivity, temperature sensors are integrated into the flow-through path of the device.

Years of experience with modern design and testing have proven that our 4-pole electrode in carbon plastic technology provides superior performance.

The SmartHDM software allows to select Conductivity/ Temperature compensation coefficients by brand name, ensuring high accuracy conductivity measurement.

# **Pressure Flow-Through**

The UM- and BS- module versions feature an internal pressure sensor integrated into the flow-through path for the dialysate. In combination with the external pressure sensor real transmembrane pressure can be measured. The software allows pressure change measurement.

#### **Pressure External**

The pressure sensor has an external connector. The software allows pressure change measurement.

## **Pressure Ventilation Valve**

The UM-Versions feature a pressure ventilation valve. This functionality can be used for special test procedures on dialysis machines to open the flow through path to the environment. The valve can be activated by the SmartHDM-Software. The valve outlet on the right side of the module.

# **USB-Interface**

With different interface cable, the module can be connected to USB with Type A or C connectors.

#### **Bluetooth-Interface**

The HDM19 version has a Bluetooth interface that allows wireless communication with the display unit.

# **HDU-Sensor Specifications**

#### **CONDUCTIVITY**

Range 0 to 30.00 mS/cm

Accuracy 0 to 199 uS/cm  $0.3\% \pm 0.6$  uS/cm

200 to 1999 uS/cm  $\pm$  6 uS/cm 2 to 11.99 mS/cm  $\pm$  0.06 mS/cm 12 to 15.99 mS/cm  $\pm$  0.03 mS/cm 16 to 30 mS/cm  $\pm$  0.06 mS/cm

Temperature Referenced to 25°C

Compensation Adjustable via multiple modes:

linear 1 value,

dynamic 2 values, nLF-Iso - nonlinear

according ISO7888

**TEMPERATURE** 

Range 0 to 100 °C Resolution 0.01 °C Accuracy 0.1°C

#### PRESSURE INTERN - Flow through pass

Range - 13 to 30 psi

- 672 to + 1551 mmHg

 $\begin{array}{ll} \text{Resolution} & \quad \text{0.01 mmHg} \\ \text{Accuracy} & \quad \text{\pm 2 mmHg} \end{array}$ 

Selectable units mmHg, kPa Bar or PSI

Overpressure 2 x full scale

#### PRESSURE EXTERN - External connector

Range - 13 to 30 psi

- 672 to + 1551 mmHg

Resolution 0.01 mmHg

Accuracy 0 to 300 mmHg ± 1 mmHg

Otherwise ± 2 mmHg

Selectable units mmHg, kPa Bar or PSI

Overpressure 2 x full scale

#### **INTERFACES**

Communication USB 2.0, also charger connector

M8-Connector for HDU-Sensor HDM19 only: Bluetooth Low Energy (BLE) Bluetooth 4.2

Certified to:

FCC, IC, CE, KCC, NCC and SRRC  $\,$ 

General

Protection Class Ip64

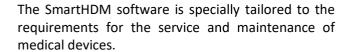
Dimensions 155 x 115 x 55 mm

Weight 0,8 Kg

Power Li-ion polymer battery

3,7 V / 5000 mAh, External charger

# **SmartHDM Software**



The SmartHDM software has amazing features that fundamentally will change your expectations about measuring instruments.

#### **Features Include**

- » Numerical and graphical readings of measuring values
- » Extensive options for the display of measured values
- » Display of statistical measuring data
- » Helpful functions such as pressure change measurement
- » Data acquisition
- » Data export
- » Supports different languages

# **Special Functions**

The user can add additional calculation channels. The calculation channels behave in the system like normal measurement channels and can be integrated both in the list and graphical display.



The formulas for the calculations can be easily edited and allow the insertion of measurement channels and any mathematical expressions.



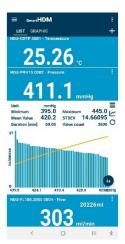
#### **Display Modes**

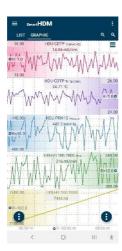
Various measured value displays always allow a perfect representation of the measured values.





One of the highlights of the APP is the representation of the Pareto distribution for measured values. It includes statistical values and allows the assessment of the stability of measured values.





The picture below shows a special landscape dark mode combining value and graphic readings.







The HDC-Devices are based on the popular Android operating system. This allows using all the features of a modern smart mobile device. Data handling was never so easy. Large batteries and robust mechanical design make the devices suitable for everyday use.

A clamp is included to attach the devices to an IV pole. This clamp also allows the user to set up the HDC device in a tilt position on a flat surface.



#### HDC84 not for sale in the USA

- » 8" Capacitive touch screen
- » Large 29.6 Wh battery for long continues work
- » 4 USB-A-Interfaces for sensor connection
- » Android operating system





#### HDC85

- » 8" Capacitive touch screen
- » 16.9 Wh battery
- >> 29.6 Wh integrated power bank battery for long continues work
- » 4 USB-A-Interfaces for sensor connection
- » Android operating system



#### HDC64

- » 5'7" Capacitive touch screen
- » Large 37 Wh battery for long continues work
- » 4 USB-A-Interfaces for sensor connection
- » Android operating system

# Quality

Our products are developed and produced under a certified quality management system, according to ISO 13485. We offer an annual sensor calibration service with certification following the ISO 17025 standard.

# www.ibpmedical.com

IBP Medical GmbH Ikarusalle 15 30179 Hannover Germany

Phone: +49 511 957 336 0 eMail: info@ibpmedical.com

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