Recommended Configuration

Model	Product Name	Product Image	Amount	Product Description
HP100G	Fluid Management System		1	Single Roller, Hysteroscopic Mode
HP200G	Fluid Management System		1	Double Roller, Hysteroscopic Mode
HP200L			1	Double Roller, Laparoscopic Mode
HP200D			1	Double Roller, Hysteroscopic Mode & Laparoscopic Mode
IR100R	Reusable Irrigation Tubing Set		1	Including 4 pcs pressure sensing membrane
SU100R	Reusable Suction Tubing Set		1	
FS200	Double pedal foot switch - for Fluid Management System		1	Suitable for Fluid Management System with Double Roller
TP100	Trolley - for Fluid Management System		1	Including 4 hooks for liquid bags

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Reason: MoldSign Signature
Location: Moldova
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www.mindray.com

P/N: ENG-HyPump Fluid Management System-210285X6P-20231218

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Product specifications are subject to change without notice. The latest technical information and inspection results shall prevail.

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HyPump

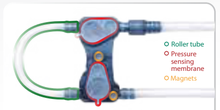
Fluid Management System

Reshape the operational safety with simplicity

More convenient Efficiency first

Easy assembly of the tubing by simple placing and locking

The innovative integrated tubing design removes the need to fix the pressure sensing membrane and Roller tube separately and saves you the trouble of winding tubes; animated navigation, magnetic guidance helps you assemble the tubing easily.



Smart integration of Roller tube, Pressure sensing membrane and magnets.

Exhaust + calibration combined

Rapid exhaust + automatic calibration takes just 25 seconds to complete in one go, realizing quicker start-ups.

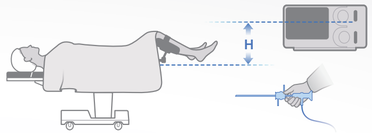
Rapid exhaust + automatic calibration

Take just 25 seconds

Graphic navigation, touch screen control

Graphic animation guides the operation for surgeons to take control freely and smoothly at will.

Safer Constant protection

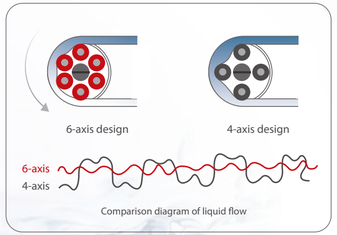


Precise pressure control

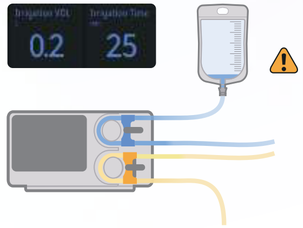
The exclusive intelligent algorithm automatically calibrates the patient-machine height differences and endoscopic sheath specifications, intelligently compensates for the differential pressure, and accurately feeds back the real-time pressure.

Stabilizing pressure and expanding the uterus

The 6-axis rolling pump ensures more stable liquid flow and fully avoids fluctuations in pressure.



Comparison diagram of liquid flow



Effective prevention of water poisoning and air embolisms

The main interface displays the deficit and irrigation time for real-time monitoring and early alerting, effectively preventing TURP syndrome.

The exclusive liquid bag emptying warning design monitors the remaining volume to effectively avoids air embolisms.

More Economical Durable design

360° waterproof design

Comprehensive protection more than IPX2 ensures long-term high-quality performance of precision components.

The tubing can withstand 50-time sterilizations

Made of silicone material, the roller tubes are strong and wear-resistant, ensuring the accuracy of the liquid flow.

Foto Test Uretronefroscop semirigid Karl Storz si pompa HP200D

Compatibilitatea cu ureteronefroscopul semirigid Karl Storz a fost demonstrată prin test funcțional, utilizând pompa Mindray HP200D și tubulatura standard de irigație și aspirație, conform fotografiei anexate.

HP100G/

HP200G/HP200L/HP200D

Fluid Management System

Operator's Manual

CE 1639

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■ Release time: 2023-8

■ Revision: 3.0

- **Ensure that the equipment is supplied with continuous electric power during work. Sudden power failure may cause data loss or system failure.**
- **If the power supply is unstable, the system might not work properly. It is recommended to use uninterrupted power supply.**
- **The equipment shall only be connected to mains power with protective earth. Do not use multiple portable socket outlets, which might cause interference, electric shock or equipment damage. Do not use a power socket that is not grounded.**
- **The equipment can also be connected to a separate power supply. Ensure that the rated output of the power supply matches the input of the equipment. The power supply and this equipment constitute an ME SYSTEM together, meeting the requirements of IEC 60601-1.**
- **Before connecting the equipment to the AC mains, check that the voltage and frequency ratings of the power supply are the same as those indicated on the equipment's label or in this manual.**

3.8 Using the Touchscreen

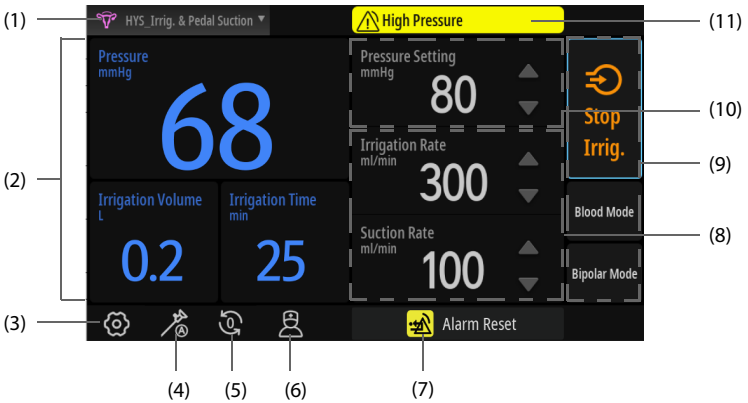
The equipment is configured with an LCD touchscreen on which you can operate and set the equipment, and view operation information.

NOTE

- **Dry the equipment immediately in case of rain or water spray.**

3.8.1 Screen Display

During irrigation, an example of the screen is as follows:



4.4.4.1 Selecting Sheath Model

If the **Choose Sheath** menu is displayed, select the application scenario and corresponding sheath model based on actual conditions. If the menu is not displayed, follow the procedure below to select the sheath model:

1. Select the sheath select button on the operation screen.
2. Select the application scenario.
3. Select the sheath model:
   - **Auto Mode**: When you start irrigation in the auto mode, the system starts auto purge calibration to eliminate the pressure difference. If the auto calibration is interrupted, default calibration parameters and the configured man-machine height difference are applied.
   - Any model from the list: Select the model of the sheath to be used. The equipment enters the manual mode.
4. Select **Confirm.**

By default, **Auto Mode** is selected. In the auto mode, if you replace the sheath during surgery, perform calibration again by following the procedure below:

1. After replacing the sheath, select **Alter Sheath** from the lower right of the screen.
2. Select **Start Irrig.** to start auto purge calibration.

WARNING

- **During purge calibration, hold the endoscope flat and steadily, as well as place it outside of the patient body and at the same height with the patient. Otherwise, equipment accuracy may be affected.**

CAUTION

- **When replacing the sheath during surgery, reconfirm that the selected sheath model is consistent with the actual model. In manual mode, selecting an inconsistent sheath model may cause the actual pressure to deviate from the configured pressure value.**

4.4.4.2 Managing Sheath Models

If the model of the sheath to be used cannot be identified or is not in the list, you can also add a sheath model. To add a sheath model, follow the procedure below:

1. Select the setup button to display the setup menu.
2. Select **Maintenance**.
3. Select **User Maintenance** → enter the maintenance password → select .

4.4.8.3 Setting Flow Rate In Sync. Mode

You can set the percentage of irrigation/suction flow rate to be increased in the blood mode activated under HYS_Irrig. & Suction Sync. mode. Follow the procedure below:

1. Select the setup button to display the setup menu.
2. Select **User Settings → Function Settings**.
3. Under **Blood Mode Parameter Setting,** set **Rate Increase Under Irrig. & Suction Sync. Mode**.

4.4.9 Applying Bipolar Mode

In a hysteroscopic surgery, if the bipolar mode is enabled, you can select **Bipolar Mode** to activate this mode while the system is in operation. To enable the bipolar mode, refer to ***3.9.5 Enabling Bipolar Mode***.

If it is necessary to increase the irrigation pressure, for example, if an HF instrument is inserted into the working channel of the endoscope, apply the bipolar mode. In this mode, the equipment compensates for the pressure difference caused by high-frequency instruments to maintain the pressure.

Not all hysteroscopes support the bipolar mode. Before the surgery, make sure that the hysteroscope supports bipolar instruments and the sheath model is correctly set.

WARNING

- **After a surgical instrument is inserted into the working channel of the endoscope, if the bipolar mode is activated, exit the mode in a timely manner after the instrument is pulled out. Otherwise, the actual pressure might be higher than the configured pressure value.**
- **Do not activate the bipolar mode without inserting a surgical instrument. Otherwise, the actual pressure might be higher than the configured pressure value.**

4.4.10 Responding to Prompt Messages

During irrigation/suction, the system monitors the real-time pressure, irrigation time, and deficit, and issues prompt messages when exceptions occur. Therefore, pay attention to the screen display and follow the instructions below to respond to the prompt messages:

Message	Possible Cause	Attemptable Solution
Bag Near Empty	The irrigation bag is nearly empty.	If necessary, stop irrigation, replace the irrigation bag, and set the correct irrigation bag size. Before restart irrigation, make sure that the prompt message is no longer displayed.

5.3.2 Alarm Indicators

When an alarm occurs, the equipment indicates it to you through visual or audible alarm indications. For details, see the following table:

Alarm Priority	Interval of Alarm Tone	Alarm Message	Symbol
High	5s ± 2s	White text and symbol inside a red box	
Low	20s ± 2s	Black text and symbol inside a yellow box	

NOTE

- **The alarm tone is different from the prompt tone.**
- **When multiple alarms of same priority levels occur simultaneously, alarm messages are displayed circularly in the alarm information area. When multiple alarms of different priority levels occur simultaneously, the system selects the alarm of the highest priority to issue the alarm tone.**

5.4 Alarm Screen

Alarm messages are displayed in the alarm information area. A high-priority alarm also provides a pop-up window that contains messages or pictures to help you identify the cause of the alarm.

5.5 Setting Alarm Threshold

You can set different alarm thresholds as needed. Follow the procedure below:

1. Select the setup button to display the setup menu.
2. Select **User Settings → Alarm Threshold**.
3. Set **Deficit Increases Fast**. After setting, if a weighing system is connected, the system generates an alarm if the deficit increase rate exceeds the set value. If **Off** is selected, the system will not generate an alarm in such case.
4. Set **Irrig. Volume Over Limit**. After setting, if no weighing system is connected, the system generates an alarm if the irrigation volume exceeds the set value. If **Off** is selected, the system will not generate an alarm in such case.
5. Set **Deficit Exceeds Limit**. After setting, if a weighing system is connected, the system generates an alarm if the deficit exceeds the set value. If **Off** is selected, the system will not generate an alarm in such case.
6. Set **High Pressure**. After setting, the system generates an alarm if the real-time pressure is higher than the preset pressure and exceeds the set high pressure value.
7. Set **Irrig. Time Over Limit**. After setting, the system generates an alarm if the total irrigation time exceeds the set value. If **Off** is selected, the system will not generate an alarm in such case.
8. Set **Bag Near Empty**. If a volume is selected, the system generates a prompt message if the fluid volume in the irrigation bag is lower than the set value. If **Off** is selected, the system will not generate any message when the irrigation bag is nearly empty. For detailed prompt message, refer to ***4.4.10 Responding to Prompt Messages***.

5.6 Resetting Alarms

After an alarm is generated, you can select the alarm reset button to acknowledge the alarm and reset the alarm system. When the alarm system is reset:

- The alarm sound is silenced and the alarm screen disappears.
- A √ appears before the alarm message, indicating that the alarm is acknowledged.
- The symbol is displayed next to the alarm message.

5.7 Setting Alarm Tone

5.7.1 Setting Alarm Volume

You can set the volume of alarm tone and prompt tone. Adjust the volume to a proper level based on the operating environment so that the tones can be clearly heard. For detailed setting method, refer to ***3.9.9 Adjusting System Volume***.

5.7.2 Setting Alarm Tone Pattern

The system provides two alarm tone patterns. To set the pattern, follow the procedure below:

1. Select the setup button to display the setup menu.

- **Maintain and inspect the cleaning machine regularly.**
- **Place the tubing sets in a special tray and connect the tubes to the spray nozzles of the cleaning machine to ensure all parts can be flushed.**

Put the disassembled tubing sets in a cleaning machine for cleaning. To set the cleaning parameters, follow the procedure below:

1. Refer to the instructions for use of the machine to set the cleaning parameters. Recommended parameters are as follows:

Procedure	Time	Temperature	Cleanser
Pretreating	2min	Room temperature	/
Cleaning	10min	50°C	2 mL/L enzymatic cleanser (neodisher® MediClean forte)
Rinsing 1	2min	Room temperature	/
Rinsing 2	1min	Room temperature	/

2. After cleaning, you are advised to dry the tubing sets under 65°C to 75°C for 30 minutes. You can also dry the outer surfaces of the tubing sets with a disinfected lint-free cloth or an air gun, and dry the residual water inside the tubing sets with the air gun.

NOTE

- **After machine cleaning and disinfection, check the equipment surface for stains. Repeat the cleaning procedure if necessary.**

8.4.6 Sterilizing the Tubing Sets

Sterilize the tubing sets as required in the local or your hospital's servicing schedule. You can perform autoclave sterilization to sterilize the tubing sets. Validate the sterilization procedure in accordance with the operating instructions of the sterilizer.

NOTE

- **Perform sterilization in accordance with the methods described in this chapter. Otherwise, the sterilization may fail.**
- **As the sterilizer and its operating conditions may affect sterilization, it is recommended that the sterilization process be reconfirmed and monitored before sterilization in accordance with the international standards (such as ISO 17665), national standards, or hospital sterilization management rules related to autoclave sterilization.**

- **The sterilizer must be certified in accordance with DIN EN 285 and tested in accordance with DIN EN ISO 17665.**
- **After autoclave sterilization, allow the product to naturally cool down to room temperature. A quick cooling down may damage the product.**
- **The product is very sensitive to impacts at high temperature. Therefore, avoid impacting and vibrating the product at high temperatures.**

To sterilize the tubing sets, follow this procedure:

1. Before sterilization, check whether the tubing sets are intact and perform cleaning and disinfection by referring to ***8.4.4 Manually Cleaning and Disinfecting Tubing Sets*** or ***8.4.5 Automatically Cleaning Tubing Sets***.
2. Before sterilization, place the tubing sets in a proper container and double wrap the container with sterile sheet or any other sterile packing materials, preventing tubing sets contamination during storage and transportation.
3. For autoclave sterilization, refer to the operating instructions of the corresponding sterilizer. The recommended sterilization parameters are as follows:

Device	Temperature	Required Minimum Time
Pre-vacuum	132°C - 134°C	4min

It has been tested that the tubing sets function well after 50 cycles of autoclave sterilization.

8.4.7 Storing the Tubing Sets

After sterilization and before next use, store the tubing sets in a pollution-free environment where bacteria are not easy to breed, for example, a dark, cool, and well ventilated room.

8.5 Consequences Caused by Inappropriate Cleaning, Disinfection and Sterilization

Using detergents or methods other than those recommended might cause the following consequences:

- Color change on the surface of the equipment
- Corrosion of metal parts
- Cracks or distortion of cords, connectors and the housing of the equipment
- Reduced service life of cords
- Degradation of performance
- Equipment malfunction

Data interfaces	USB connector: 1, USB 2.0 protocol. Fixed time synchronization pulse specified by the USB protocol
	Network connector: 1, standard RJ45 interface, supporting wired network 10/100Mbps, and complied with technical standard IEEE802.3. TCP/IP protocol Calibration protocol of TCP/IP The intended information flow is from the equipment to the server in the client site.
	CAN connector: 2, PS/2 interfaces, complied with CAN 2.0 standards.
Other interfaces	Foot switch connector (optional): 1, used for transmitting analog signal from Mindray specified foot switch, complied with Mindray internal standard
Signal output	Alarm tune volume: 45 dBA - 65 dBA (within 1m away from the main unit)

A.6 Product Performance

Irrigation flow rate in the hysteroscopic modes (for HP100G/HP200G/HP200D)	Adjustment range: ≥ 0 - 500 mL/min Adjustment step: ≥ 10 mL/min
Suction flow rate in the hysteroscopic modes (for HP100G/HP200G/HP200D)	Adjustment range: ≥ 0 - 200 mL/min Adjustment step: ≥ 10 mL/min
Irrigation/Suction flow rate in the laparoscopic modes (for/HP200L/HP200D)	Adjustment range: ≥ 100 - 1300 mL/min Adjustment step: ≥ 100 mL/min
Flow rate accuracy	Flow rate tolerance: ± 10% when flow rate ≥ 100 mL/min; ± 10 mL/min when flow rate < 100 mL/min
Pressure limit in the hysteroscopic modes	Adjustment range: ≥ 0 - 200 mmHg Adjustment step: 1,2,5, or 10 mmHg
Accuracy of preset pressure limit	Pressure limit tolerance: ± 5% when pressure limit ≥ 50mmHg; ± 2.5 mmHg when pressure limit < 50 mmHg