



## Neurosurgical Product Catalogue



Bıçakcılar, Turkey's leading disposable medical device and electro-medical device manufacturer, is a part of the Koç Group. The company was founded in 1959. Being an innovative and environmentally friendly company, Bıçakcılar not only offers single-use consumable products both in Turkey and globally but also brings its products used in operating rooms and intensive care units, along with various treatment, cardiovascular surgery, and neurosurgery therapy services, together with its business partners and patients. As Bıçakcılar, in collaboration with our business partners, we manufacture and supply innovative, reliable, and environmentally friendly medical devices, serving our customers. We take care of the benefits our brand provides to both society and the community.



**hpbio** was founded in 1985 by surgeon Prof Helio Pereira de Magalhães. As the first Brazilian company to produce shunt systems for hydrocephalus treatment, it has gained an important place in the market. Production is carried out according to quality policies that comply with International Standards, ISO, and CE certificates. Its neurosurgery portfolio offers a wide range of shunt and drainage systems that can meet all kinds of needs.

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# SPHERA DUO

HYDROCEPHALUS SHUNT SYSTEM



# SPHERA DUO

## HYDROCEPHALUS SHUNT SYSTEM

### HYDROCEPHALUS SHUNT SYSTEM SPHERA DUO

Sphera Duo valves were developed for a precise control of cerebral intraventricular pressure. The Adult, Infantile and Neonatal Plus sizes design present low profile of implant and flexible body with anatomical shape to contour the curvature of the cranium.

The valves are made of transparent medical grade silicone with internal structure in polysulfone. They have pumpable central reservoir with needle guard that protects against perforations on puncturing or sampling procedures.

The Neonatal size has no pumping chamber, as the design prioritizes low profile and minimum implant volume. The system can be combined to a reservoir connected to the ventricular catheter to enable puncturing and CSF sampling.

### SPHERA MECHANISM: PRECISE MANAGEMENT

The pressure control system is composed of ruby ball and conic seat and stainless steel spring. The perfect match between ball and seat can safely set the pressures of opening and closing of the system, providing precise control of intracranial pressure.

Adult, Infantile and Neonatal Plus sizes have a dual pressure control encased in the input and output occluders. The Neonatal model encases a single mechanism for pressure control.

All sizes are supplied in four pressure ranges: high, medium, low and extra low, to meet the individual requirements of patients. The indications of flow and pressure printed on the valve body are radiopaque and allow visualization imaging after implantation.

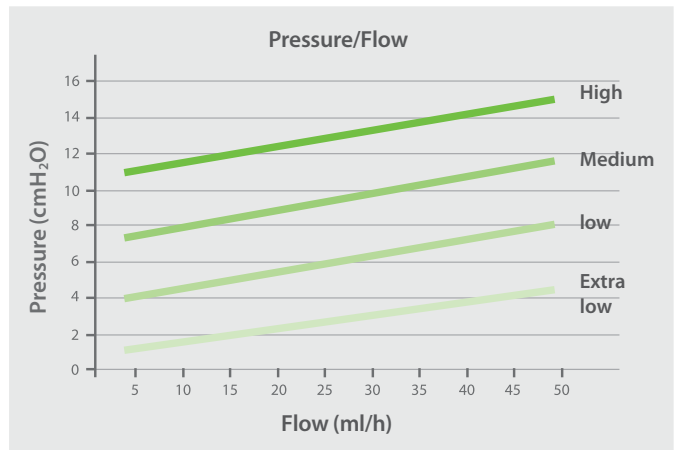




## CATHETER: FLEXIBILITY AND RADIOPACITY

The shunt system presents the valve accompanied by cerebral ventricular catheter and peritoneal catheter. These are made of soft transparent medical grade silicone with radiopaque stripe, which ensures catheter visualization in imaging exams.

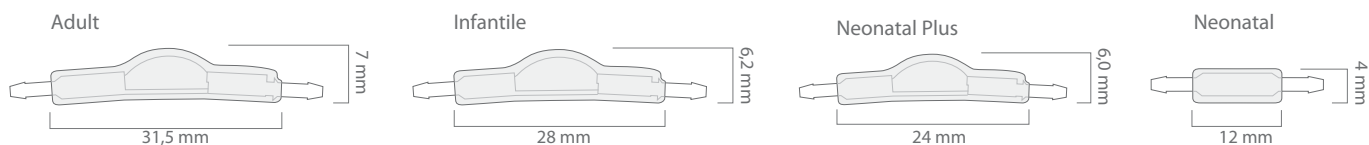
The hardness of the silicone used in the manufacture of catheters was tailored to allow adequate flexibility and at the same time, prevent the occurrence of unwanted kink in the subcutaneous route, which can cause obstruction or decrease the flow of drainage. For all valve sizes, the system can be supplied in different configurations of peritoneal and ventricular catheter with or without reservoir.



The graphic represents average rates. Consider a range + 1,5 cmH<sub>2</sub>O

MARKS		
Pressure	Marks	Values (Flow 21ml/h)
Extra low	○ ○ ○ ▶	1 to 3 cmH <sub>2</sub> O
Low	● ○ ○ ▶	3 to 7 cmH <sub>2</sub> O
Medium	● ● ○ ▶	7 to 11 cmH <sub>2</sub> O
High	● ● ● ▶	11 to 14 cmH <sub>2</sub> O

	Model	Pressure	Content
ADULT	ADE10215D ADB10215D ADM10215D ADA10215D	Extra low Low Medium High	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 102 cm 01 90° Angle Former, 01 irrigation tubing
	ADE10223D ADB10223D ADM10223D ADA10223D	Extra low Low Medium High	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 23,5 cm with stainless steel guide 01 Peritoneal Catheter 102 cm 01 90° Angle Former, 01 irrigation tubing
INFANTILE	INE9015D INB9015D INM9015D INA9015D	Extra low Low Medium High	01 Hydrocephalus Valve Infantile size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 90° Angle Former, 01 irrigation tubing
	INE9023D INB9023D INM9023D INA9023D	Extra low Low Medium High	01 Hydrocephalus Valve Infantile size 01 Straight Ventricular Cerebral Catheter 23,5 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 90° Angle Former, 01 irrigation tubing
NEONATAL PLUS	NPE9015D NPB9015D NPM9015D NPA9015D	Extra low Low Medium High	01 Hydrocephalus Valve Neonatal Plus size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 Angle former, 01 irrigation tubing
NEONATAL	NNE9015D NNB9015D NNM9015D NNA9015D	Extra low Low Medium High	01 Hydrocephalus Valve Neonatal size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 90° Angle Former, 01 irrigation tubing
	NNE9015RD NNB9015RD NNM9015RD NNA9015RD	Extra low Low Medium High	01 Hydrocephalus Valve Neonatal size with reservoir 01 Straight Ventricular Cerebral Catheter 15 cm and stainless steel guide 01 Peritoneal Catheter 90 cm; 01 90° Angle Former, 01 irrigation tubing



The technical information for these products is not limited to the characteristics presented in this catalog. For complete information, request the Instructions for Use at [info@hpbio.com.br](mailto:info@hpbio.com.br)



# SPHERA ANTI-SIPHON

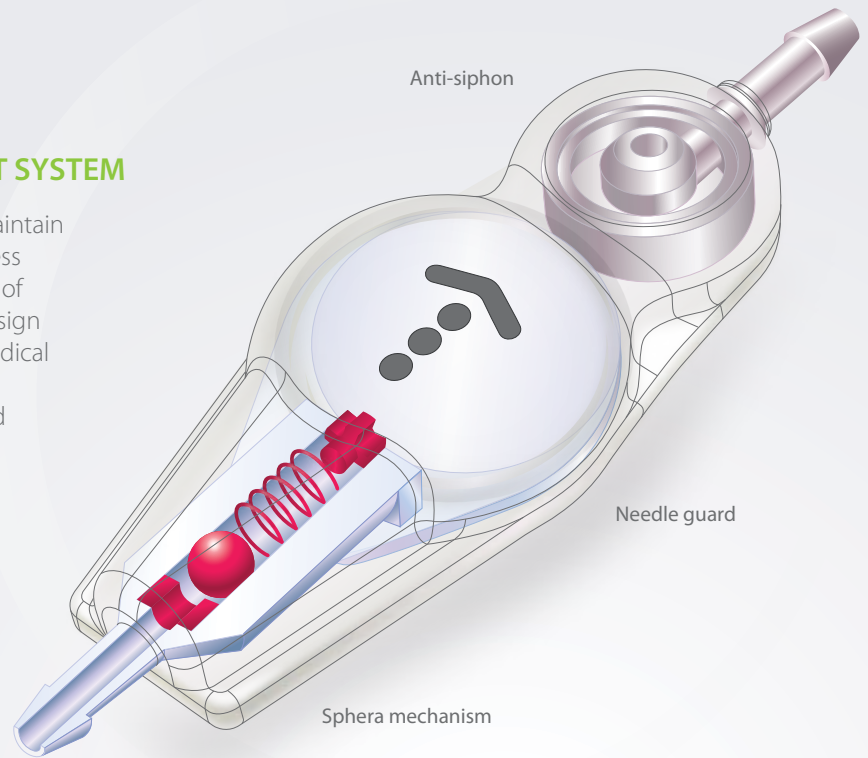
SELF-REGULATING DRAINAGE  
PRESSURE IN POSTURAL CHANGE



# SPHERA ANTI-SIPHON

## SPHERA ANTI-SIPHON CEREBRAL SHUNT SYSTEM

The Sphera Valve with Anti-siphon is designed to maintain the Cerebral Intraventricular pressure stable regardless the position of the patient, reducing the occurrence of overdrainage. The valve is flexible, with anatomic design and low implant profile. It is made in transparent medical grade silicone with internal structure in polysulfone. It has a central pumping chamber with needle guard to protect against excessive penetration during puncture.



### SPHERA MECHANISM: PRECISE PERFORMANCE

The pressure control system is encased in the input connector. The mechanism is composed of ruby ball, stainless steel spring and conic seat. The perfect match between ball and seat can safely set the opening and closing pressure of the system, providing precise control of intracranial pressure.

The valve is provided in four pressure ranges: high, medium, low and extra low to meet individual needs of patients. The input connector, manufactured in polysulfone, has radiopaque markings of flow and pressure that allow viewing in x-ray image.

### CATHETERS: FLEXIBILITY AND RADIOCAPACITY

The valve is supplied with a cerebral ventricular catheter and a peritoneal catheter. These are made of soft transparent medical grade silicone with radiopaque fillet, which allows the viewing of catheters in x-ray image. The hardness of the silicone used in the manufacture of catheters was tailored to allow adequate flexibility and at the same time to prevent the occurrence of unwanted kink in the subcutaneous route, which can cause obstruction or decrease of drainage flow.

The standard model comes with a straight ventricular catheter 15 or 23.5 cm length with 90° Angle former, and the peritoneal catheter with 102 or 120 cm length, but may be replaced by different configurations as needed (see list of components for hpbio shunts).

## ANTI-SIPHON MECHANISM: AVOIDING OVERDRAINAGE

Encased in the output connector, the mechanism prevents ventricular overdrainage caused by siphoning in the distal catheter when the patient moves from horizontal to vertical position.

The mechanism is composed of a flexible silicone membrane that when attracted by the negative pressure of the distal catheter prevents or reduces the flow of excessive fluid (fig.2).

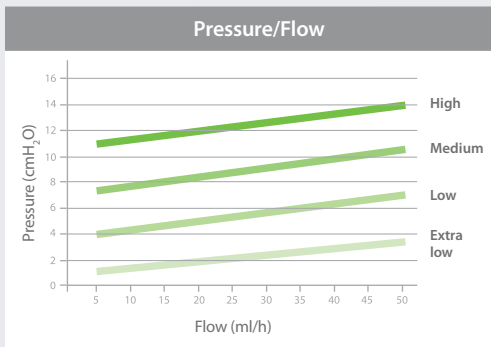
When the patient is upright, the combination of the mechanisms Anti-siphon and Sphera provides the dynamic

balance of the system, keeping the valve operating on a stable flow/pressure rate.

When the patient returns to the horizontal position, the Anti-siphon system stops to interfere in the control of flow and the valve returns to work in the initial condition (Fig.1).

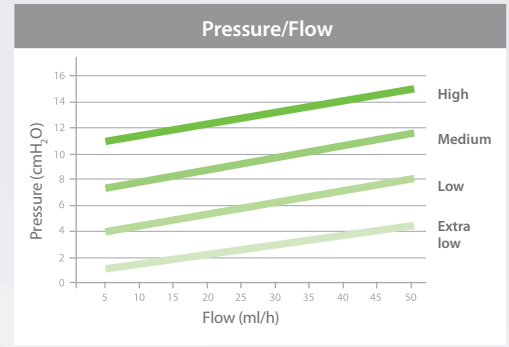
The bands in Graphic 1 and 2 represent the range where the pressure curve operates when submitted to a progressive increasing flow from 5 to 50 ml/hour. There results were obtained in "in vitro" tests.

### Horizontal Position (0 cmH<sub>2</sub>O)



Graphic 1

### Vertical Position (-50 cmH<sub>2</sub>O)



Graphic 2

The graphic represents average rates. Consider a range of  $\pm 1.5$  cmH<sub>2</sub>O.

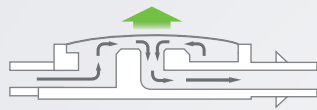
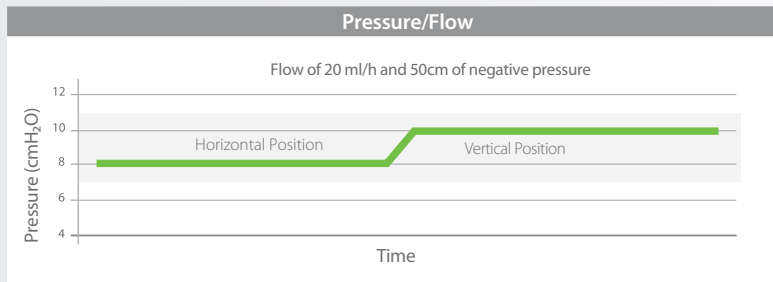


Fig. 1



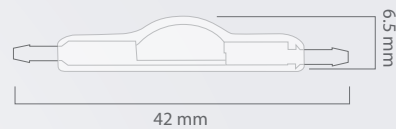
Fig. 2




Graphic 3

The graphic represents a valve operating within a range of medium pressure (7 to 11 cmH<sub>2</sub>O), initially with the patient in a horizontal position and the upright.

STANDARD MODEL Separated components		PRESSURE	CONTENT
ADE10223	Extra low	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 23,5 cm with stainless steel guide 01 Peritoneal Catheter 102 cm 01 90° Angle Former; 01 irrigation tubing	
ADB10223	Low		
ADM10223	Medium		
ADA10223	High		
ADE12015	Extra low	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 23,5 cm with stainless steel guide 01 Peritoneal Catheter 120 cm 01 90° Angle Former; 01 irrigation tubing	
ADB12015	Low		
ADM12015	Medium		
ADA12015	High		
ADE9010	Extra low	01 Hydrocephalus Valve Adult size 01 Right Angled Ventricular Cerebral Catheter 10 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 irrigation tubing	
ADB9010	Low		
ADM9010	Medium		
ADA9010	High		
ADE9015	Extra low	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 90 cm 01 90° Angle Former; 01 irrigation tubing	
ADB9015	Low		
ADM9015	Medium		
ADA9015	High		
ADE10210	Extra low	01 Hydrocephalus Valve Adult size 01 Right Angled Ventricular Cerebral Catheter 10 cm with stainless steel guide 01 Peritoneal Catheter 102 cm 01 irrigation tubing	
ADB10210	Low		
ADM10210	Medium		
ADA10210	High		
ADE10215	Extra low	01 Hydrocephalus Valve Adult size 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 Peritoneal Catheter 102 cm 01 90° Angle Former; 01 irrigation tubing	
ADB10215	Low		
ADM10215	Medium		
ADA10215	High		
UNISHUNT MODEL Peritoneal catheter pre assembled to valve	UADE9010	Extra low	01 Hydrocephalus Valve Adult size pre-assembled to 01 Peritoneal Catheter 90 cm; 01 Right Angled Ventricular Cerebral Catheter 10 cm with stainless steel guide 01 irrigation tubing
	UADB9010	Low	
	UADM9010	Medium	
	UADA9010	High	
	UADE9015	Extra low	01 Hydrocephalus Valve Adult size pre-assembled to 01 Peritoneal Catheter 90 cm; 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 90° Angle Former; 01 irrigation tubing
	UADB9015	Low	
	UADM9015	Medium	
	UADA9015	High	
	UADE10210	Extra low	01 Hydrocephalus Valve Adult size pre-assembled to 01 Peritoneal Catheter 102 cm; 01 Right Angled Ventricular Cerebral Catheter 10 cm with stainless steel guide 01 irrigation tubing
	UADB10210	Low	
	UADM10210	Medium	
	UADA10210	High	
UADE10215	Extra low	01 Hydrocephalus Valve Adult size pre-assembled to 01 Peritoneal Catheter 102 cm; 01 Straight Ventricular Cerebral Catheter 15 cm with stainless steel guide 01 90° Angle Former; 01 irrigation tubing	
UADB10215	Low		
UADM10215	Medium		
UADA10215	High		

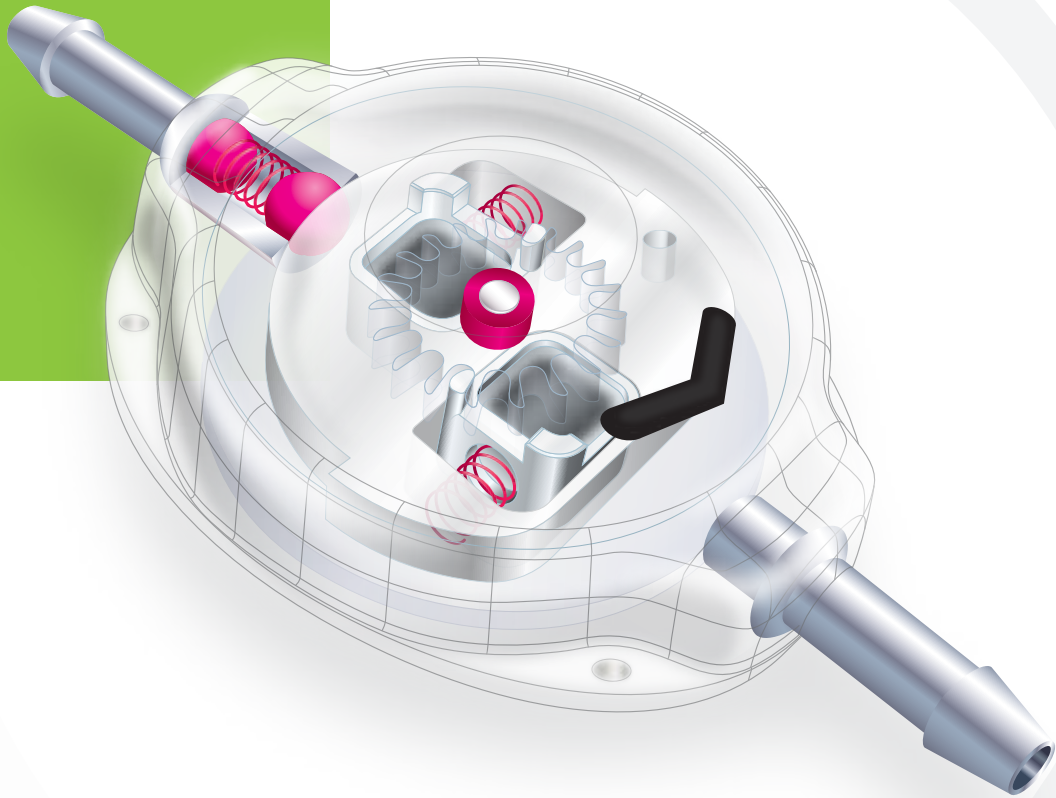


MARKS		
Pressure	Marks	Values (Flow 21 ml/h)
Extra low	○ ○ ○ >	1 to 3 cmH <sub>2</sub> O
Low	● ○ ○ >	3 to 7 cmH <sub>2</sub> O
Medium	● ● ○ >	7 to 11 cmH <sub>2</sub> O
High	● ● ● >	11 to 14 cmH <sub>2</sub> O

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# SPHERA PRO

## HYDROCEPHALUS PROGRAMMABLE SHUNT



# SPHERA PRO

## HYDROCEPHALUS PROGRAMMABLE SHUNT

Sphera Pro is a cerebral shunt system for intraventricular pressure control with a programmable valve. This product has been developed to provide ACCURACY on pressure control, SECURITY against deprogramming and EASY ADJUSTMENT procedure.

The valve has 08 different pressure settings, and pressure adjustment can be performed whenever necessary by a non-invasive device and painless to patients.

Safety against magnetic fields deprogramming is provided by an exclusive double locking system, which holds the valve at the chosen pressure even when the patient undergoes MR examinations of up to 3 teslas.

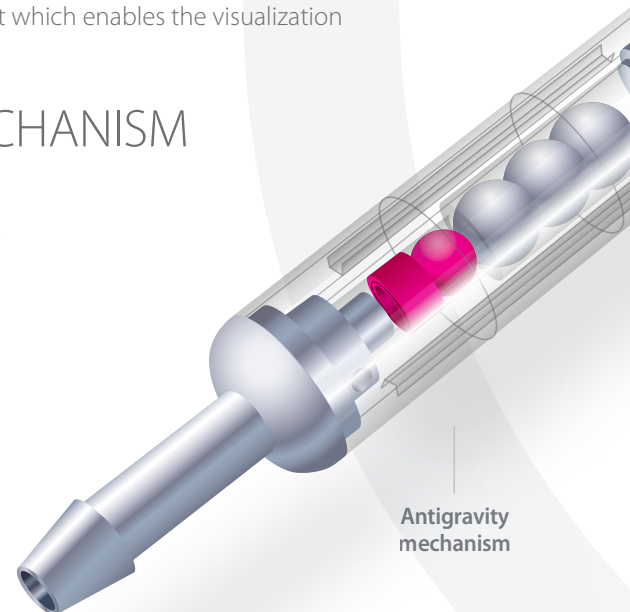
The Sphera Pro system can be supplied along with the Sphera Grav antigravity device which acts in intraventricular pressure control when the patient changes from the horizontal to the vertical position, preventing overdrainage especially for patients with Normal Pressure Hydrocephalus (NPH).

The valve and reservoir are made of polysulfone with a silicone coating and titanium connectors. The system's ventricular and peritoneal catheter are made of transparent silicone with a radiopaque fillet which enables the visualization in imaging tests and minimizes the occurrence of calcification in its path.

### ACCURACY WITH THE ADJUSTMENT MECHANISM

During the adjustment, the rotor movement changes the distance between the rotor axis and the Sphera mechanism (spring, sfera and conical ruby seat), increasing or decreasing the valve pressure.

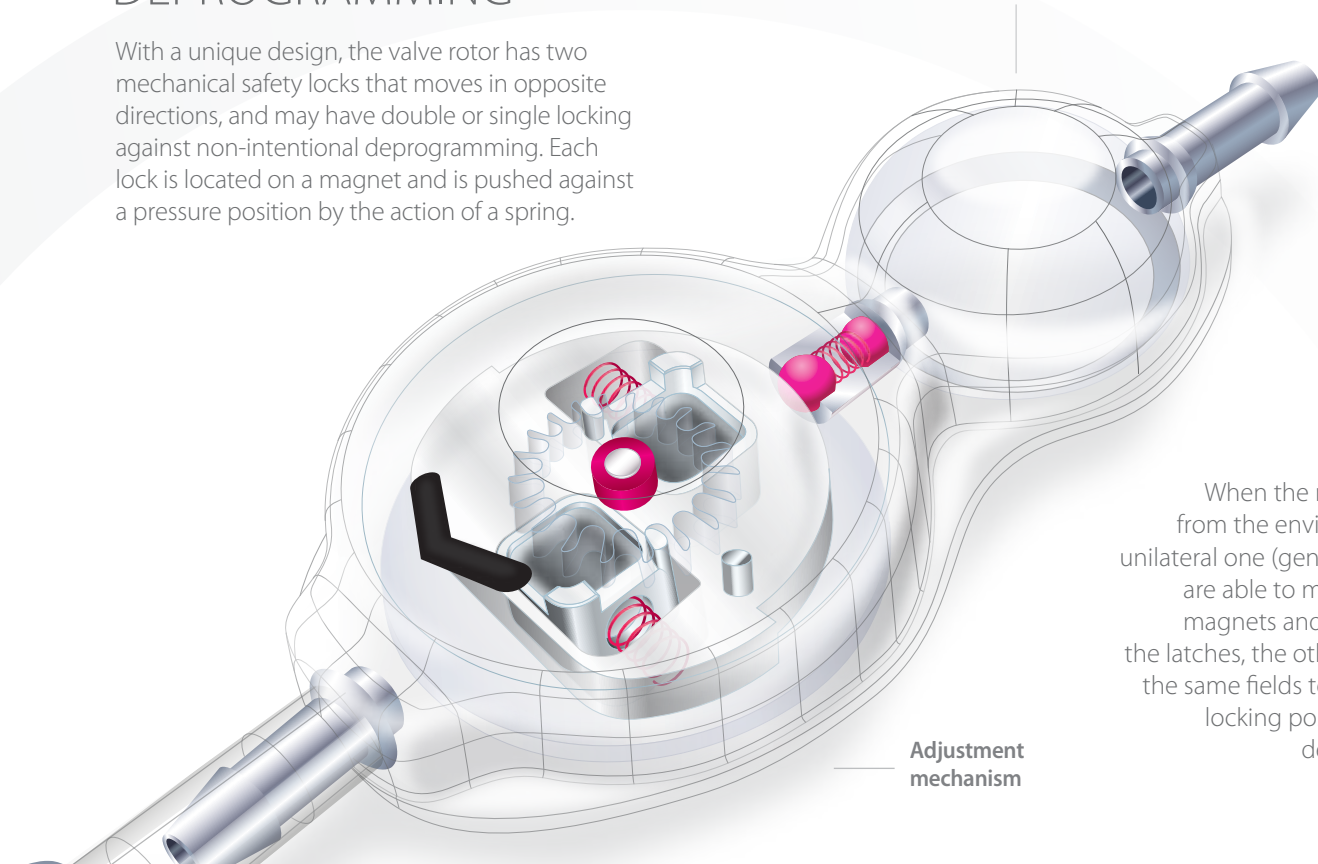
The precise rotor radius dimensional control allows the accurate definition of the 08 different levels of opening and closing pressures, providing a real intracranial pressure control when the pressure adjustment is performed.



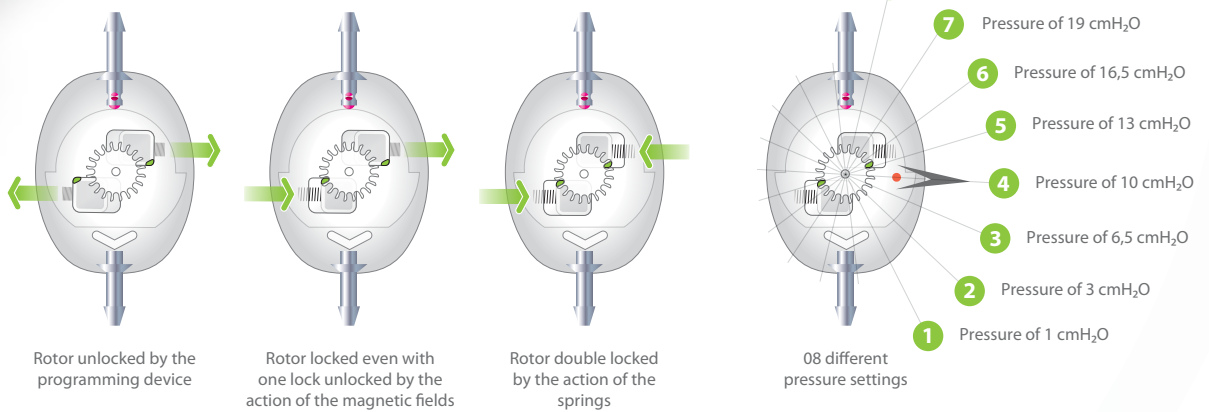
# SECURITY AGAINST DEPROGRAMMING

With a unique design, the valve rotor has two mechanical safety locks that moves in opposite directions, and may have double or single locking against non-intentional deprogramming. Each lock is located on a magnet and is pushed against a pressure position by the action of a spring.

**NEW INTEGRATED RESERVOIR**  
with base protection for puncturing



When the magnetic fields from the environment, or an unilateral one (generated by MRI), are able to move one of the magnets and release one of the latches, the other is forced by the same fields to remain in the locking position, avoiding deprogramming of the valve.

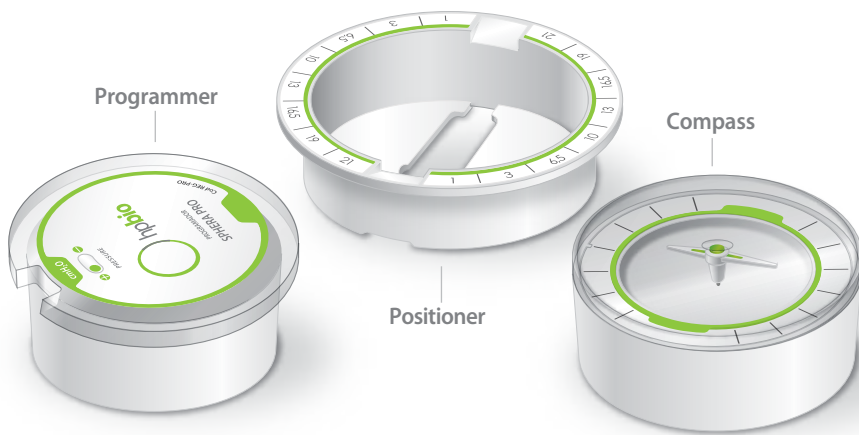


X-ray image of Sphera Pro for the 08 pressure settings, showing the inlet and outlet connectors, both magnets, the direction arrow, and the indicative mark for the valve laterality.

# EASY PRESSURE ADJUSTMENT

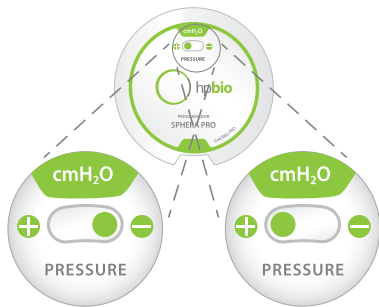
The programming device allows an easy pressure adjustment as it provides easy valve location, painless to the patient and immediate confirmation of the adjusted pressure, eliminating the necessity of image exams.

Since the correct programming device centralization upon the valve is essential to the unlocking and pressure adjustment, the reader has an indication alignment system that confirms the right position.



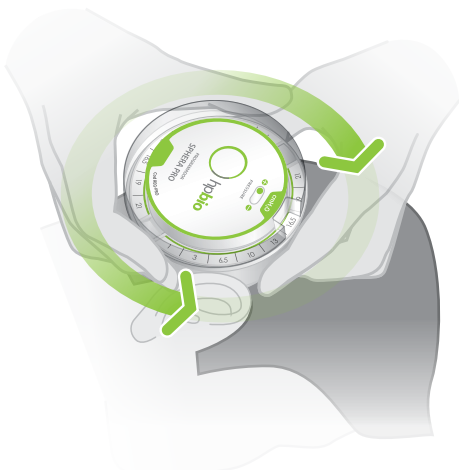
## STEP 01

Set whether to reduce or increase the pressure by turning the top of the programmer counterclockwise or clockwise, until the indicator pin is in the "-" or "+" position.



## STEP 03

Keep the positioner on the same site and insert the programmer on the place of the compass. Turn counterclockwise to increase the pressure and clockwise to decrease the pressure.



## STEP 02

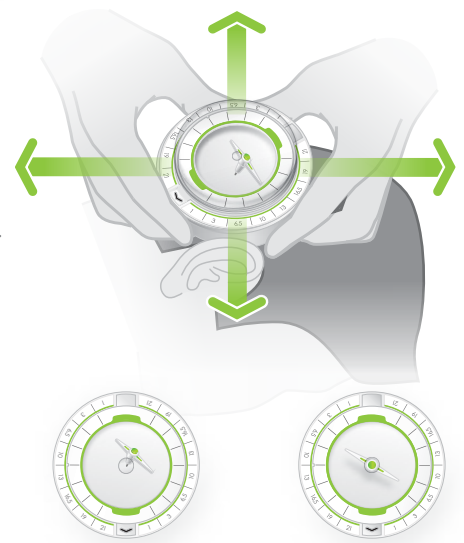
With the compass placed on the positioner, locate the valve.

Align the positioner flow indication arrow with the peritoneal catheter path.

By moving the positioner around the valve, align the center of the pointer with the center of the compass.

While moving the compass, in both directions, the pointer must remain still.

Perform the reading.

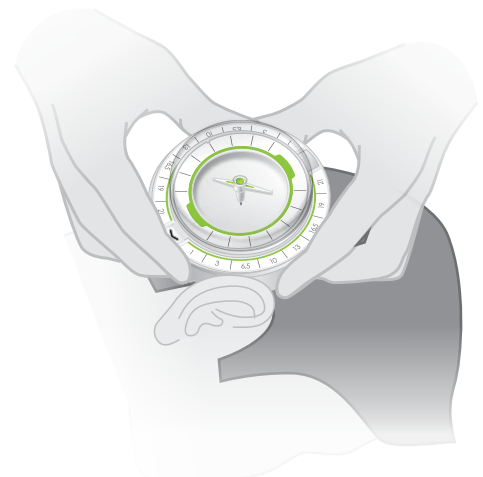


Out centered pointer: programming device on the incorrect position

Centered pointer: programming device on the correct position

## STEP 04

Replace the programmer for the compass. Perform the reading of the new pressure, keeping the pointer center aligned with the center of the compass.



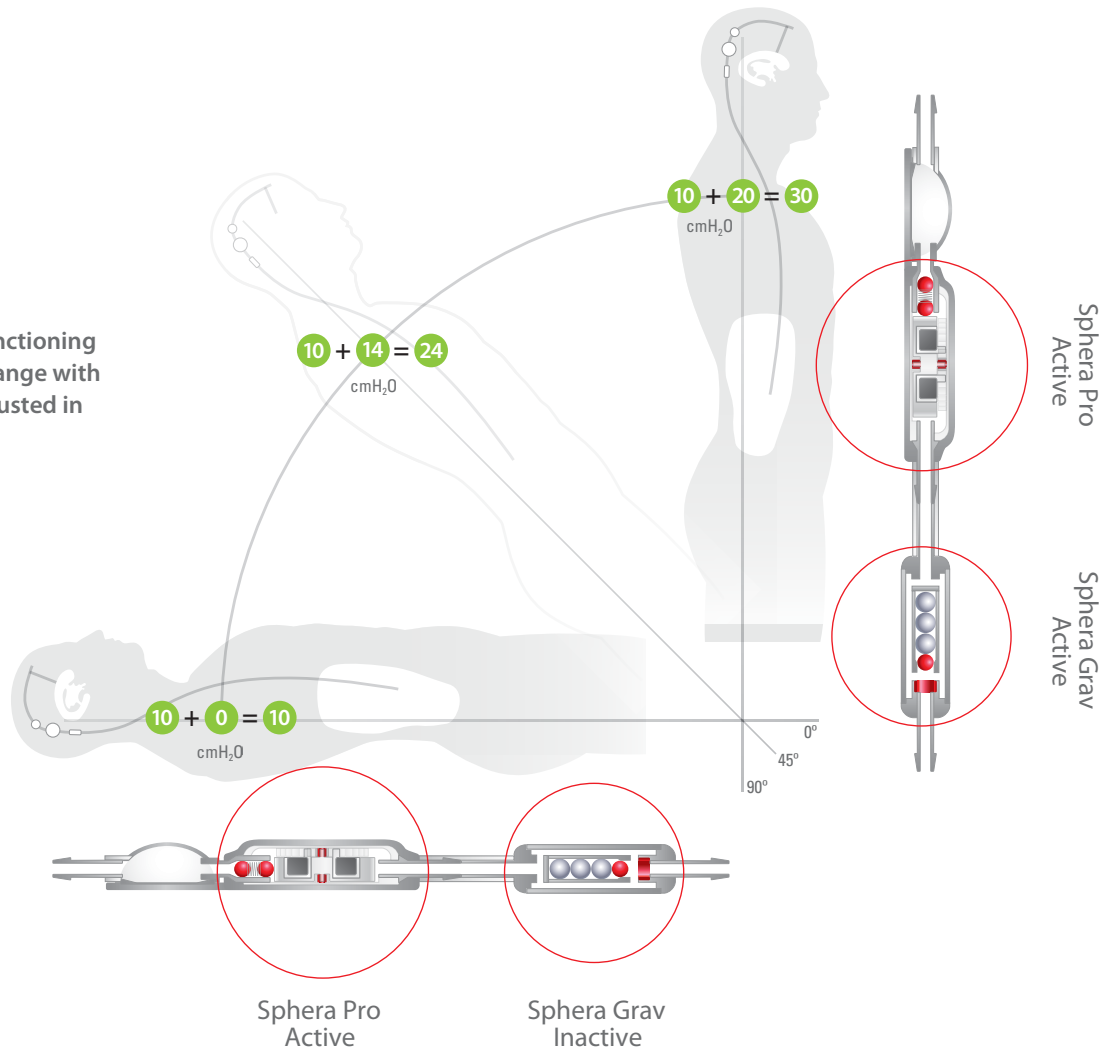
Access the QR Code and watch the video with the step by step programming tutorial.



# ANTIGRAVITY DEVICE

Hiperdrainage control

Sphera Grav-20 functioning on the postural change with the Sphera Pro adjusted in 10 cmH<sub>2</sub>O



The antigravity device Sphera Grav provides overdrainage control by performing automatic compensation for the system's opening pressure as the patient postural changes.

When the patient is in the supine position, no resistance will be built by Sphera Grav, only the Sphera Pro valve will be active.

However, when the patient is in the orthostatic position, the maximum resistance of Sphera Grav will act along with the Sphera Pro adjustment pressure, making the shunt system more physiological and maintaining the intraventricular pressure more constant and with less risks of overdrainage.

Sphera Grav has 06 resistance options (10, 15, 20, 25, 30 or 35 cmH<sub>2</sub>O) to meet the different needs of pressure control for each patient. The device consists of tungsten and ruby spheres, polysulphone body, titanium connectors and silicone coating.

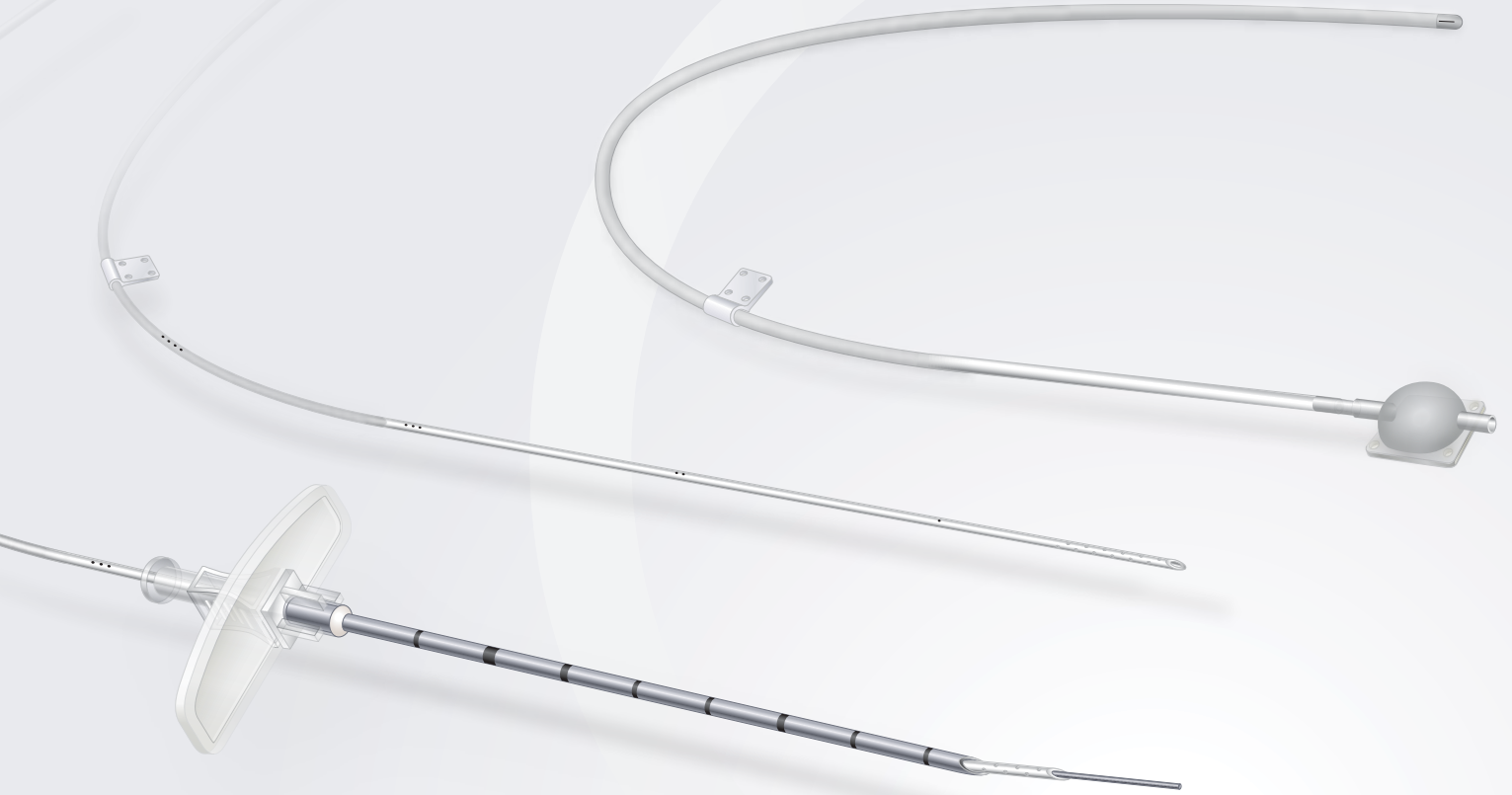
Technical information on this product is not limited to the features presented in this catalog. For more information, request the Instructions for Use at [info@hpbio.com.br](mailto:info@hpbio.com.br)

SPHERA PRO	Code			Content
	Valve and catheters separated	UNISHUNT Peritoneal catheter pre-attached to the valve	UNITIZED Ventricular and peritoneal catheter pre-assembled to the valve	
	PRO10215	UPRO10215	UNPRO10215	01 Hydrocephalus valve Sphera Pro; 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former; 01 Peritoneal catheter of 102 cm, 01 Test tube with adapter.
	PRO12015	UPRO12015	UNPRO12015	01 Hydrocephalus valve Sphera Pro; 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former; 01 Peritoneal catheter of 120 cm, 01 Test tube with adapter.
	PRO10223	UPRO10223	UNPRO10223	01 Hydrocephalus valve Sphera Pro; 01 Cerebral ventricular straight catheter of 23.5 cm with stainless steel stylet and angle former; 01 Peritoneal catheter of 102 cm, 01 Test tube with adapter.
	PRO12023	UPRO12023	UNPRO12023	01 Hydrocephalus valve Sphera Pro; 01 Cerebral ventricular straight catheter of 23.5 cm with stainless steel stylet and angle former; 01 Peritoneal catheter of 120 cm, 01 Test tube with adapter.
SPHERA PRO WITH RESERVOIR	Ref		Content	
	PRO10215R		01 Hydrocephalus valve Sphera Pro with reservoir; 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former; 01 Peritoneal catheter of 102 cm, 01 Test tube with adapter	
	PRO12015R		01 Hydrocephalus valve Sphera Pro with reservoir 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former 01 Peritoneal catheter of 120 cm, 01 Test tube with adapter	
	PRO10223R		01 Hydrocephalus valve Sphera Pro with reservoir 01 Cerebral ventricular straight catheter of 23.5 cm with stainless steel stylet and angle former 01 Peritoneal catheter of 102 cm, 01 Test tube with adapter	
	PRO12023R		01 Hydrocephalus valve Sphera Pro with reservoir 01 Cerebral ventricular straight catheter of 23.5 cm with stainless steel stylet and angle former 01 Peritoneal catheter of 120 cm, 01 Test tube with adapter	
SPHERA GRAV	SPHERAGRAV-10		01 Antigravity device with resistance equivalent to pressure of 10cmH <sub>2</sub> O	
	SPHERAGRAV-15		01 Antigravity device with equivalent resistance to pressure of 15cmH <sub>2</sub> O	
	SPHERAGRAV-20		01 Antigravity device with equivalent resistance to pressure of 20cmH <sub>2</sub> O	
	SPHERAGRAV-25		01 Antigravity device with equivalent resistance to pressure of 25cmH <sub>2</sub> O	
	SPHERAGRAV-30		01 Antigravity device with equivalent resistance to pressure of 30cmH <sub>2</sub> O	
	SPHERAGRAV-35		01 Antigravity device with equivalent resistance to pressure of 35cmH <sub>2</sub> O	
SPHERA PRO WITH RESERVOIR + SPHERA GRAV	UPRO10223-G10		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-10 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10223-G15		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-15 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 23 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10223-G20		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-20 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 23 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10223-G25		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-25 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 23 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10223-G30		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-30 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 23 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10223-G35		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-35 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 23 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
	UPRO10215-G15		01 Hydrocephalus valve Sphera Pro with reservoir pre-assembled to 01 Sphera Grav-15 device and 01 Peritoneal catheter of 102 cm. 01 Cerebral ventricular straight catheter of 15 cm with stainless steel stylet and angle former; 01 Test tube with adapter.	
PROGRAMMING DEVICE				
REG-PRO		01 Positioner; 01 Compass; 01 Programmer		



The available models of these products are not limited to the codes shown here. To get the complete list request the Instructions for Use at [info@hpbio.com.br](mailto:info@hpbio.com.br)

# LUMBAR-PERITONEAL SHUNT



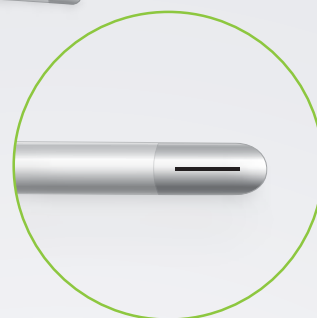
Available in high, medium, and low pressure  
Flexible catheter with silicone tip multiperforated  
Introduction by Tuohy needle with depth marking every 1cm

The Lumbar-peritoneal Shunt is indicated for intracranial pressure control, placed from the lumbar subarachnoid space (spinal) to the peritoneal cavity. It can be used for diagnosis, evaluation or treatment of the communicant normal pressure hydrocephalus, for monitoring persistent cerebral spinal fluid fistulas, cranial protuberance, sub occipital decompression and also in cases of transitory defective cerebral spinal fluid absorption (post meningitis or post hemorrhagic hydrocephalus).

# LUMBAR-PERITONEAL SHUNT

## PERITONIAL CATHETER WITH RESERVOIR

Silicone radiopaque, with outer diameter 1.6mm, with markings every 5 cm to guide the insertion depth. connection protector to prevent unintentional disconnection.



## CATHETER LUMBAR

Made in radiopaque silicone, with 1.6mm outer diameter, with markings every 5 cm to guide the insertion depth. Connection protector to prevent unintentional disconnection.

## TROCAR

Tuohy needle 14G stainless steel marking each 1cm for insertion depth control. Wire flexible guide wire to facilitate catheter insertion.

Lumbar-Peritoneal Shunt Models

Code	Pressure	CmH <sub>2</sub> O	Lumbar Catheter ø	Peritoneal Catheter ø
SLRB	Low	3 to 7	1,6 mm	2,5 mm
SLRM	Medium	7 to 11	1,6 mm	2,5 mm
SLRA	Hight	11 to 14	1,6 mm	2,5 mm

# COMPONENTS

## FOR HYDROCEPHALUS SHUNT SYSTEMS



Ventricular and peritoneal catheters made in transparent silicone with a radiopaque filet

Reservoirs for puncturing and ventricular drainage.

Y, straight and angled connectors.

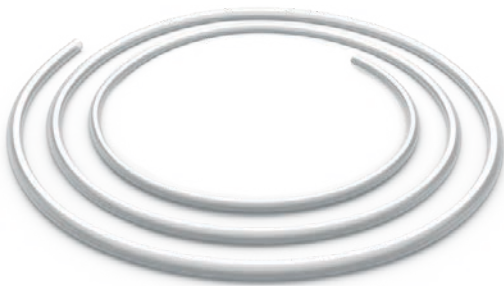
## VENTRICULAR CATHETER

These are made of soft transparent medical grade silicone with radiopaque stripe, which ensures catheter visualization in imaging exams. The hardness of the silicone used in the manufacture of catheters was tailored to allow adequate flexibility and at the same time, prevent the occurrence of unwanted kink in the subcutaneous route, which can cause obstruction or decrease the flow of drainage.



## PERITONIAL CATHETER

Peritoneal Catheters are made of medical grade silicone, in Adult and Infantile sizes and different lengths. All catheters are marked every 10 cm to guide the introduction, and the distal tip catheter is opened or close with lateral slits.



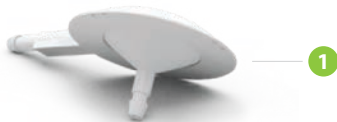
## ATRIAL CATHETER

Atrial Catheters are made of medical grade silicone, in five models combining two tubes of different diameter and length. Models C, E and H are assembled pre attached, model B come with a straight connector made of poliacetal to connect both tubes.



## RESERVOIRS

The reservoirs are made of medical grade silicone and rigid base poliacetal to protect against excessive needle penetration during puncturing. Bases can be sutured to the subcutaneous tissue and with no metal parts they are MRI safe. The reservoir sizes are designed to support several puncturing, its elevated profile can be easily located under the skin.



1



2



3

### MODELS:

#### 1 – RHM Model

RHM Model for drainage must be placed between the cerebral catheter and shunt valve.

#### 2 – RCO-V Model

RCO-V model with vertical output comes with cerebral catheter and is indicated to puncturing and medication administration.

#### 3 – RCO-L Model

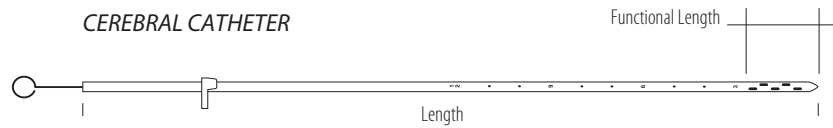
RCO-L model with lateral output comes with cerebral catheter and indicated to puncturing and medication administration.

## CONNECTORS

Manufactured in poliacetal in straight, Y and angled models. The external diameter of connectors is compatible with all cerebral and peritoneal catheters. Model B is to connect atrial catheters and model Y to connect two valves into one peritoneal catheter to drain two ventricles.



Product	Features				
	Length (mm)	Ø Internal (mm)	Ø External (mm)	Functional Length	Catalog no.
Neonatal Straight	70	1,0	2,0	23,5 mm ± 0,5 mm	VN7
	100	1,0	2,0		VN10
	150	1,0	2,0		VN15
	220	1,0	2,0		VN22
Infantile Straight	150	1,2	2,5	3,5 mm ± 0,5 mm	VI15
	200	1,2	2,5		VI20
	235	1,2	2,5		VI23.5
Adult Straight	150	1,4	2,7	3,5 mm ± 0,5 mm	VA15
	200	1,4	2,7		VA20
	235	1,4	2,7		VA23.5
Neonatal Right-Angled	50	1,0	2,0	20 mm ± 0,5 mm	VNG6
	60	1,0	2,0		VNG5
	70	1,0	2,0		VNG7
Neonatal Right-Angled with Reservoir	50	1,0	2,0	20 mm ± 0,5 mm	VNG5R
	60	1,0	2,0		VNG6R
	70	1,0	2,0		VNG7R
Infantile Right-Angled	50	1,2	2,5	20 mm ± 0,5 mm	VIG5
	60	1,2	2,5		VIG6
	70	1,2	2,5		VIG7
Infantile Right-Angled with Reservoir	50	1,2	2,5	20 mm ± 0,5 mm	VIG5R
	60	1,2	2,5		VIG6R
	70	1,2	2,5		VIG7R
Adult Right-Angled	70 x 30	1,4	2,7	23,5 mm ± 0,5 mm	VAG7
	70 x 20	1,4	2,7		VAG7.2
	90 x 30	1,4	2,7		VAG9
	90 x 20	1,4	2,7		VAG9.2
	100 x 30	1,4	2,7		VAG10
Adult Right-Angled with Reservoir	70 x 30	1,4	2,7	23,5 mm	VAG7R
	100 x 30	1,4	2,7	± 0,5 mm	VAG10R



Product	Features			
Peritoneal Catheter	Length (mm)	Ø Internal (mm)	Ø External (mm)	Catalog no.
Infantile Peritoneal Catheter	520	1,0	2,3	PI 52
	900	1,0	2,3	PI 90
	1.020	1,0	2,3	PI 102
	1.200	1,0	2,3	PI 120
Adult Peritoneal Catheter	900	1,2	2,6	PA 90
	1.020	1,2	2,6	PA 102
	1.200	1,2	2,6	PA 120
Cerebral Reservoir	Length (mm)	Height	Ø Burr hole	Catalog no.
Infantile Ventricular Drainage Reservoir	13	4	6	RHM-1
Adult Ventricular Drainage Reservoir Reserv.	17	5,5	9,5	RHM-3
Infantile Ventricular Drainage Reservoir Horizontal	18,75	4	-	RHH-1
Adult Ventricular Drainage Reservoir Horizontal	23	5	-	RHH-2
Small Cerebral Reservoir – Horizontal outlet	13	6	-	RCO-1L
Medium Cerebral Reservoir – Horizontal outlet	17	7	-	RCO-2L
Large Cerebral Reservoir – Horizontal outlet	21	7	-	RCO-3L
Small Cerebral Reservoir – Vertical outlet	13	6	6	RCO-1V
Medium Cerebral Reservoir – Vertical outlet	17	7	9,5	RCO-2V
Large Cerebral Reservoir – Vertical outlet	21	7	13,5	RCO-3V
Atrial Catheter (venous)	Length (mm) Tube of 2,5 x 1,2	Length (mm) Tube of 1,5 x 0,75		Catalog no.
Atrial Catheter Type A	450	-		AA
Atrial Catheter Type B	220	150		AB
Atrial Catheter Type C	380	30		AC
Atrial Catheter Type E	220	220		AE
Atrial Catheter Type H	30	380		AH
Conector	Length (mm)	Ø Internal (mm)	Ø External (mm)	Catalog no.
Straight A Short	11	1,0	1,8	CAC
Straight A Long	17	1,0	1,8	CAL
Straight B	08	0,8	1,4 / 1,8	CAB
90°	08	1,0	1,8	C90
Y Short	09	1,0	1,8	CYC
Y Long	12	1,0	1,8	CYL

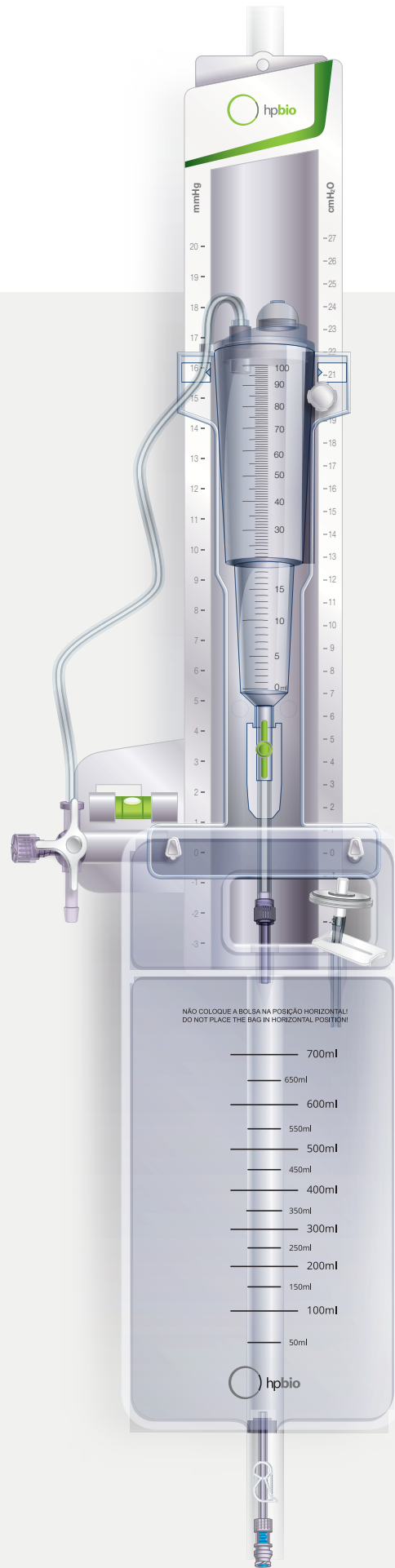


The available models of these products are not limited to the codes shown here. To get the complete list request the Instructions for Use at [info@hpbio.com.br](mailto:info@hpbio.com.br)



# External CSF Drainage

# FREE FLOW

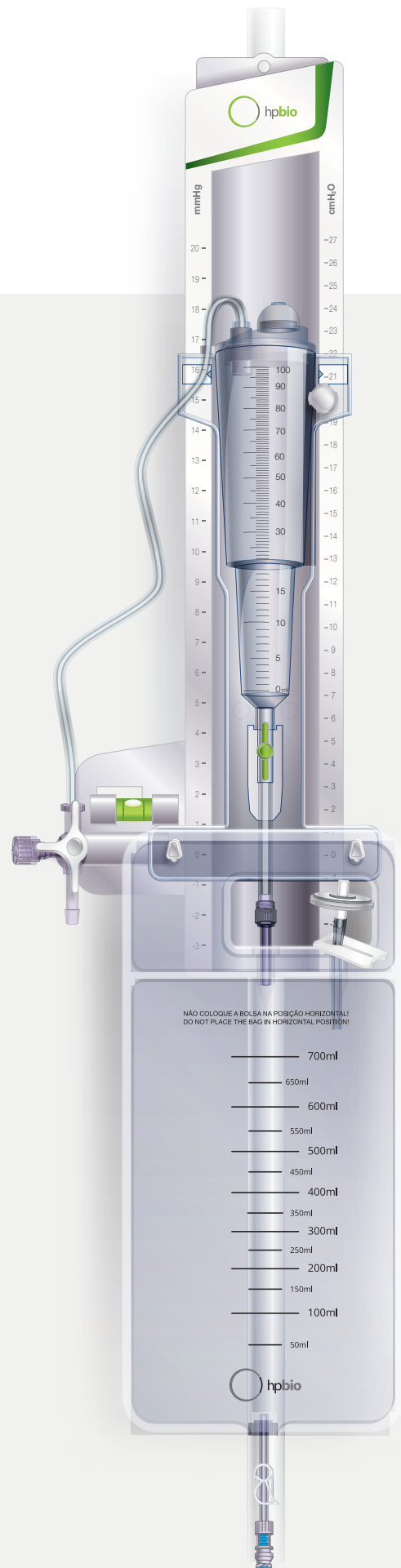


# EVD / ELD FREE FLOW

The External CSF Drainage is indicated to reduce and temporarily control the intracranial pressure by draining the accumulated CSF to an external collecting bag.

The system brings together all the necessary components for a safe and efficient drainage.

The mobile burette allows better precision in pressure control and measurement of drained volume.



# Highlights

**Rear attachment**  
A type "C" rear attachment with fixing screw for the IV pole ensures total stability and safety to the EVD system

**Level marker**  
Together with the laser point, allows to precisely level the "zero point" to the patient's ear canal

**Laser point attachment**  
Allows the insertion of a class II laser point pen (not included in the product packaging) to perfectly level the "zero point" of the graduated scale with the line of the patient's ear canal

**Burette filter quick clearing dome**

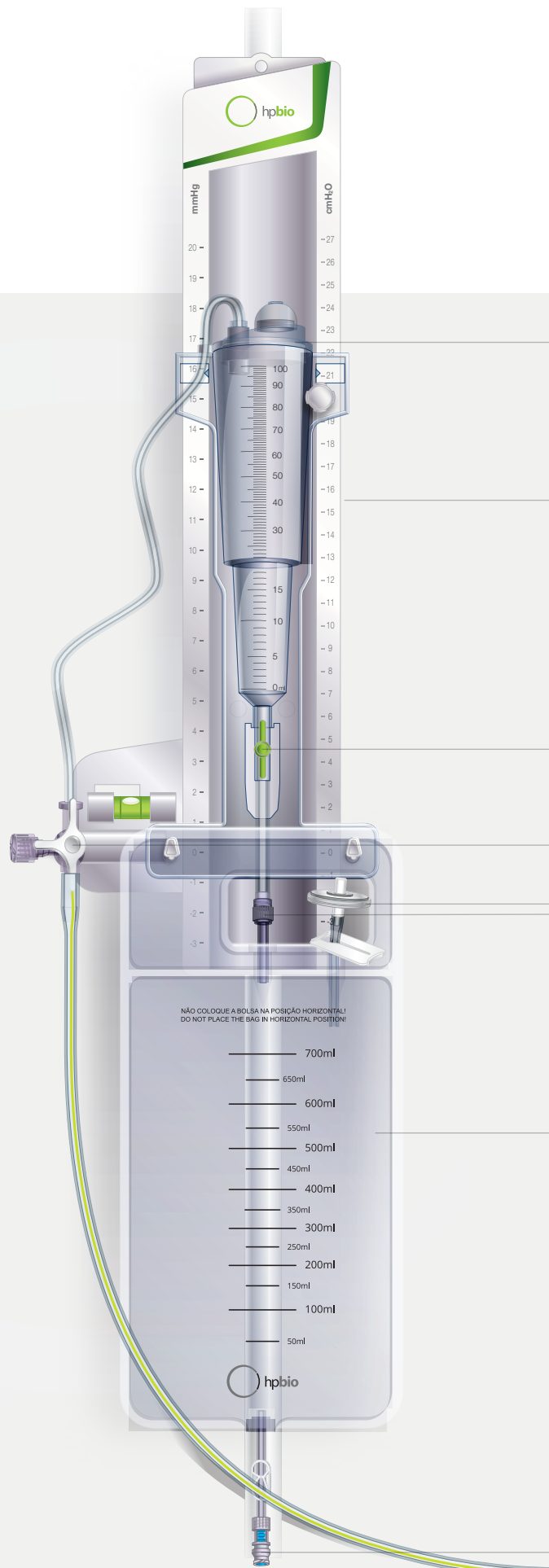
The clogging of the filter by wetting may occur when the system is temporarily positioned horizontally or when the burette is completely filled, beyond its capacity.

The wetting of the filter may interrupt the entry of air through the burette's vent, compromising the flow of the drained liquor into the collection bag.

With this innovative system, simply press the quick-release dome to immediately unblock the filter and resume drainage.



# EVD / ELD FREE FLOW



# System

## New burette with conical two-stage system

Allows you to easily monitor the drained volume, for both adult, infantile and neonatal patients in a single system

## Pressure scale with modern design

The pressure scale in mmHg on one side and cmH<sub>2</sub>O on the other, with a movable burette in the center, allows easy and safe control of the ICP and offers the possibility of performing drainage with negative pressure

## Flow Stopcock

For accurate measurement of the CSF drained volume by elapsed time

## Vent

Large hydrophobic antimicrobial filter with clamp to avoid wetting and obstruction of drainage

## Luer Connection

Male and female connectors enable the replacement of the drainage bag

## Drainage Bag

With a capacity of 700 ml and graduated every 50 ml

## Sampling Site

For emptying the bag without the use of needle, preventing leaks and contamination. It has a security clamp

## Connection Protector

Made of transparent silicone, prevents disconnection and kinking of the catheter in the connection with the drainage tubing

## ICP Monitoring Stopcock

With output for monitoring the ICP at the "zero point"

## Patient's Stopcock

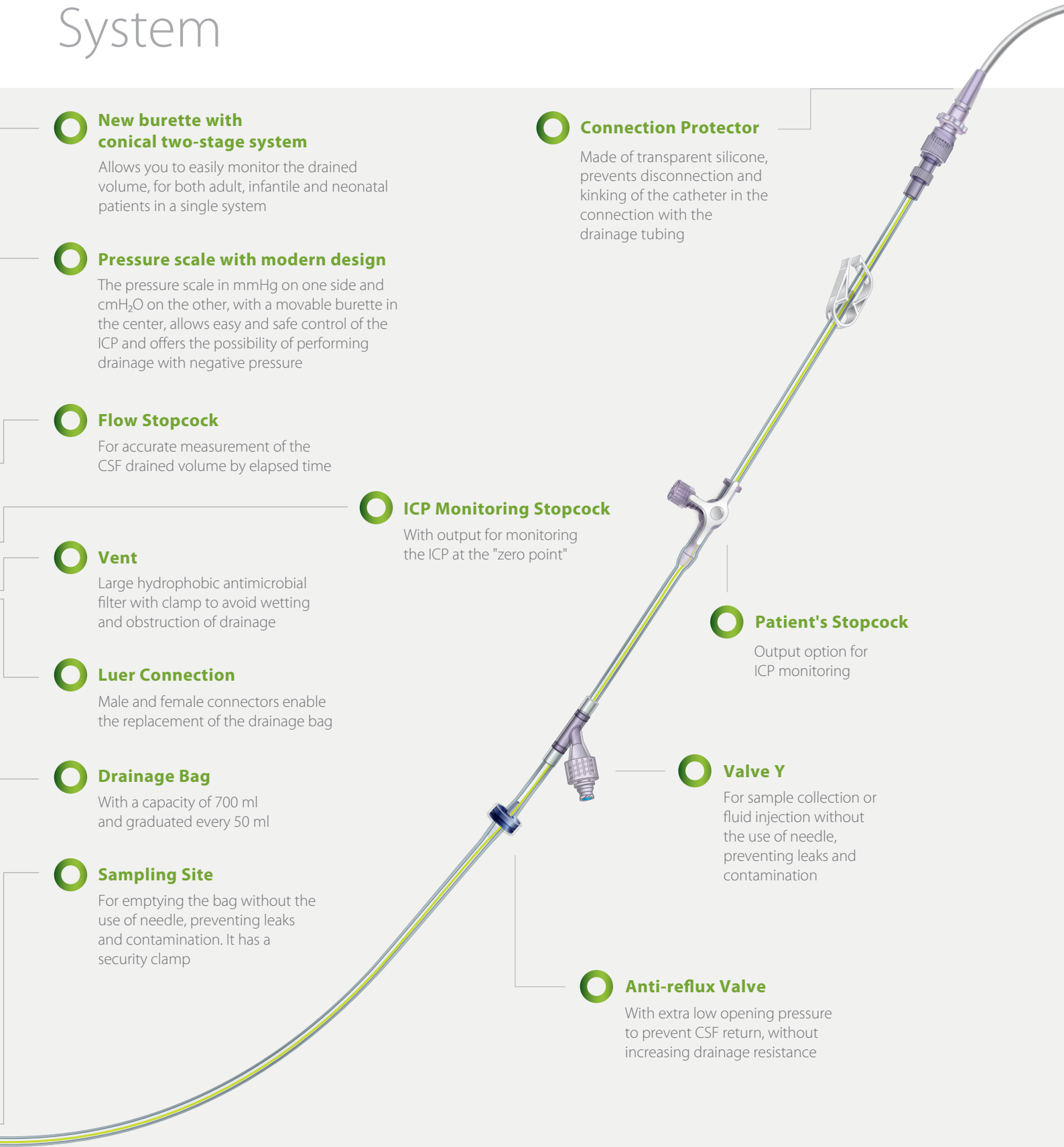
Output option for ICP monitoring

## Valve Y

For sample collection or fluid injection without the use of needle, preventing leaks and contamination

## Anti-reflux Valve

With extra low opening pressure to prevent CSF return, without increasing drainage resistance



# Catheters

## Lumbar Catheter

Made of flexible silicone with a multi-perforated tip and depth marking every 5 cm. Introduction by Tuohy needle, with marking every 1 cm

## Ventricular Catheters

Made of transparent silicone with radiopaque file, with 01 cm marking, and with oblong orifices preventing obstruction

### Neonatal

⊕ 2,2 x 1,1 mm  
6,6 x 3,3 Fr

### Infantile

⊕ 2,5 x 1,4 mm  
7,5 x 4,2 Fr

### Adult

⊕ 3,0 x 1,6 mm  
9,0 x 4,8 Fr

### Lumbar

⊕ 1,6 x 0,76 mm  
4,8 x 2,28 Fr

### Hemorrhagic

⊕ 3,7 x 2,1 mm  
11,1 x 6,3 Fr

## Hemorrhagic Cases Catheter

In transparent silicone with radiopaque file. The internal diameter of 2,1 mm / 6,3 Fr provides 72% gain in the drainage lumen (when compared to the Adult model), making the catheter special for drainage of cerebrospinal fluid with hemorrhagic content



### Models / Catheter Dimensions

Code	Application	Total Length	External Diameter	Internal Diameter
DVEAF25 DVEAF35	Ventricular Adult	250 mm 350 mm	3,0 mm / 9,0 Fr 3,0 mm / 9,0 Fr	1,6 mm / 4,8 Fr 1,6 mm / 4,8 Fr
DVEIF22 DVEIF35	Ventricular Infantil	220 mm 350 mm	2,5 mm / 7,5 Fr 2,5 mm / 7,5 Fr	1,4 mm / 4,2 Fr 1,4 mm / 4,2 Fr
DVENF22	Ventricular Neonatal	220 mm	2,2 mm / 6,6 Fr	1,1 mm / 3,3 Fr
DVEHF25 DVEHF35	Ventricular Hemorrhagic	250 mm 350 mm	3,7 mm / 11,1 Fr 3,7 mm / 11,1 Fr	2,1 mm / 6,3 Fr 2,1 mm / 6,3 Fr
DLE-FF	Lumbar	400 mm	1,6 mm / 4,8 Fr	0,76 mm / 2,28 Fr



The technical information for these products is not limited to the characteristics presented in this catalog. For complete information, request the Instructions for Use at [info@hpbio.com.br](mailto:info@hpbio.com.br)



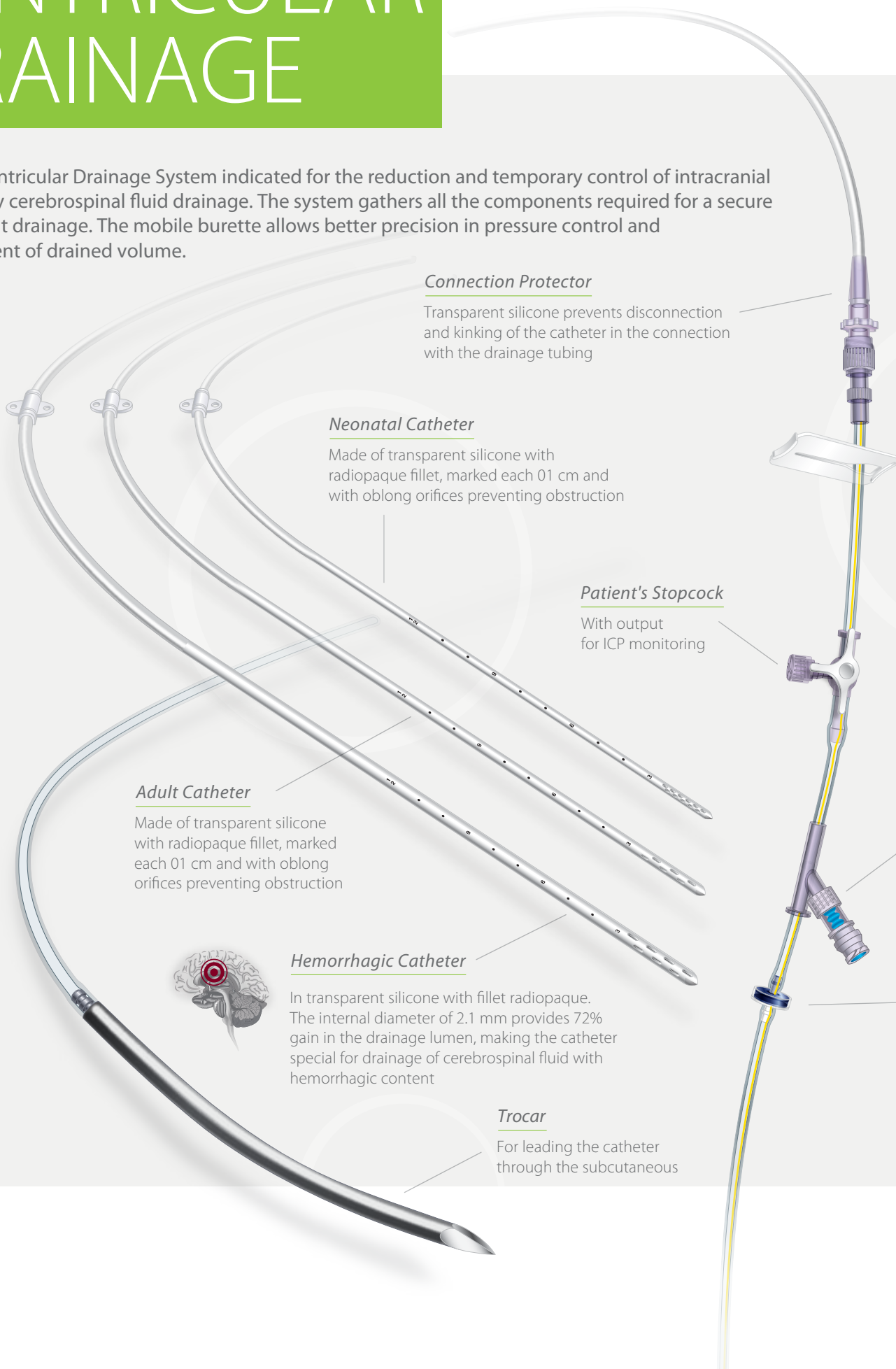


# EXTERNAL VENTRICULAR DRAINAGE



# EXTERNAL VENTRICULAR DRAINAGE

External Ventricular Drainage System indicated for the reduction and temporary control of intracranial pressure, by cerebrospinal fluid drainage. The system gathers all the components required for a secure and efficient drainage. The mobile burette allows better precision in pressure control and measurement of drained volume.



## Connection Protector

Transparent silicone prevents disconnection and kinking of the catheter in the connection with the drainage tubing

## Neonatal Catheter

Made of transparent silicone with radiopaque fillet, marked each 01 cm and with oblong orifices preventing obstruction

## Adult Catheter

Made of transparent silicone with radiopaque fillet, marked each 01 cm and with oblong orifices preventing obstruction

## Hemorrhagic Catheter

In transparent silicone with fillet radiopaque. The internal diameter of 2.1 mm provides 72% gain in the drainage lumen, making the catheter special for drainage of cerebrospinal fluid with hemorrhagic content

## Trocar

For leading the catheter through the subcutaneous

## Patient's Stopcock

With output for ICP monitoring

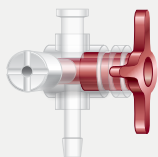


### Pressure Scale

Pressure scale in mmHg and cmH<sub>2</sub>O. Mobile graded burette for easy and safe adjustment of the ICP

### Stopcock

With output for ICP monitoring



### Vent

Antimicrobial hydrophobic

### Valve Y

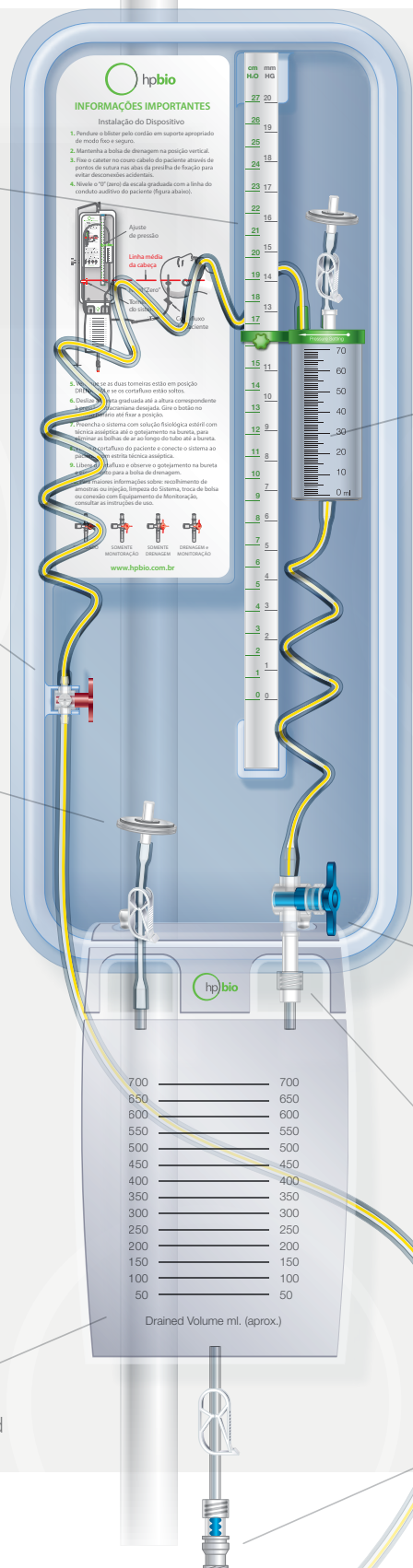
For sample collection or fluid injection without the use of needle, preventing leaks and contamination

### Anti-reflux Valve

Prevents the return of CSF

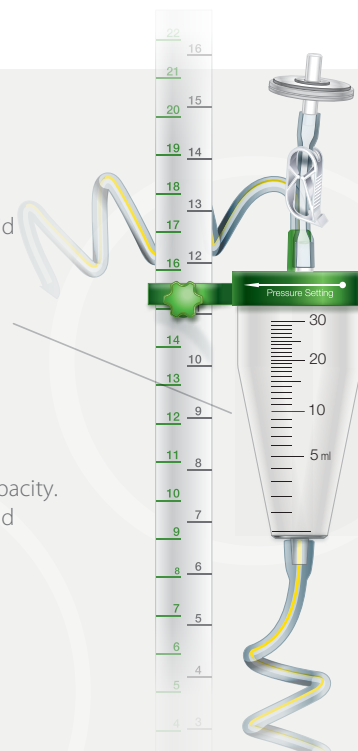
### Drainage Bag

With 700 ml and graduated each 50 ml



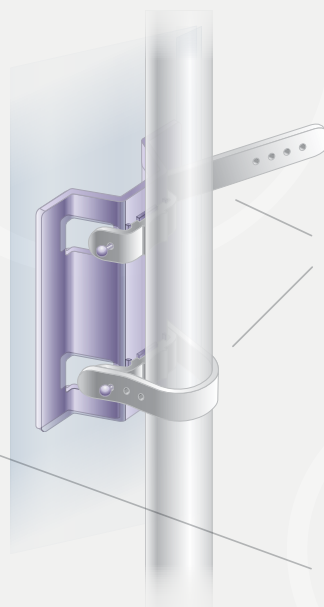
### Neonatal Burette

With 30 ml capacity. Presents a clamp to avoid wetting the filter, when positioning the system horizontally is necessary



### Adult Burette

With 75 ml or 100 ml capacity. Presents a clamp to avoid wetting the filter, when positioning the system horizontally is necessary



### Secure Rear Attachment

With double elastic band around IV pole

### Stopcock

For accurate measurement of the CSF drained volume by time

### Luer Connection

Male and female connectors enable the change of drainage bag

### Sampling Site

For emptying the bag without the use of needle, preventing leaks and contamination and with clamp to avoid leaking

Catalog Code	Size	Catheter Dimensions			Capacity of the Burette
		Length	External Diameter	Internal Diameter	
DVEA	Adult	220 mm	3,0 mm	1,6 mm	75 ml
DVEA1		250 mm	3,0 mm	1,6 mm	
DVEA2		350 mm	3,0 mm	1,6 mm	
DVEA3		250 mm	3,0 mm	1,6 mm	100 ml
DVEA4		350 mm	3,0 mm	1,6 mm	
DVEI		Pediatric	220 mm	2,5 mm	1,4 mm
DVEI1	350 mm		2,5 mm	1,4 mm	
DVEN	Neonatal	220 mm	2,2 mm	1,1 mm	30 ml
DVEN1		220 mm	2,2 mm	1,1 mm	75 ml
DVE1H	Hemorrhagic	250 mm	3,7 mm	2,1 mm	75 ml
DVE2H		350 mm	3,7 mm	2,1 mm	
DVE3H		250 mm	3,7 mm	2,1 mm	100 ml
DVE4H		350 mm	3,7 mm	2,1 mm	



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# EXTERNAL VENTRICULAR DRAINAGE

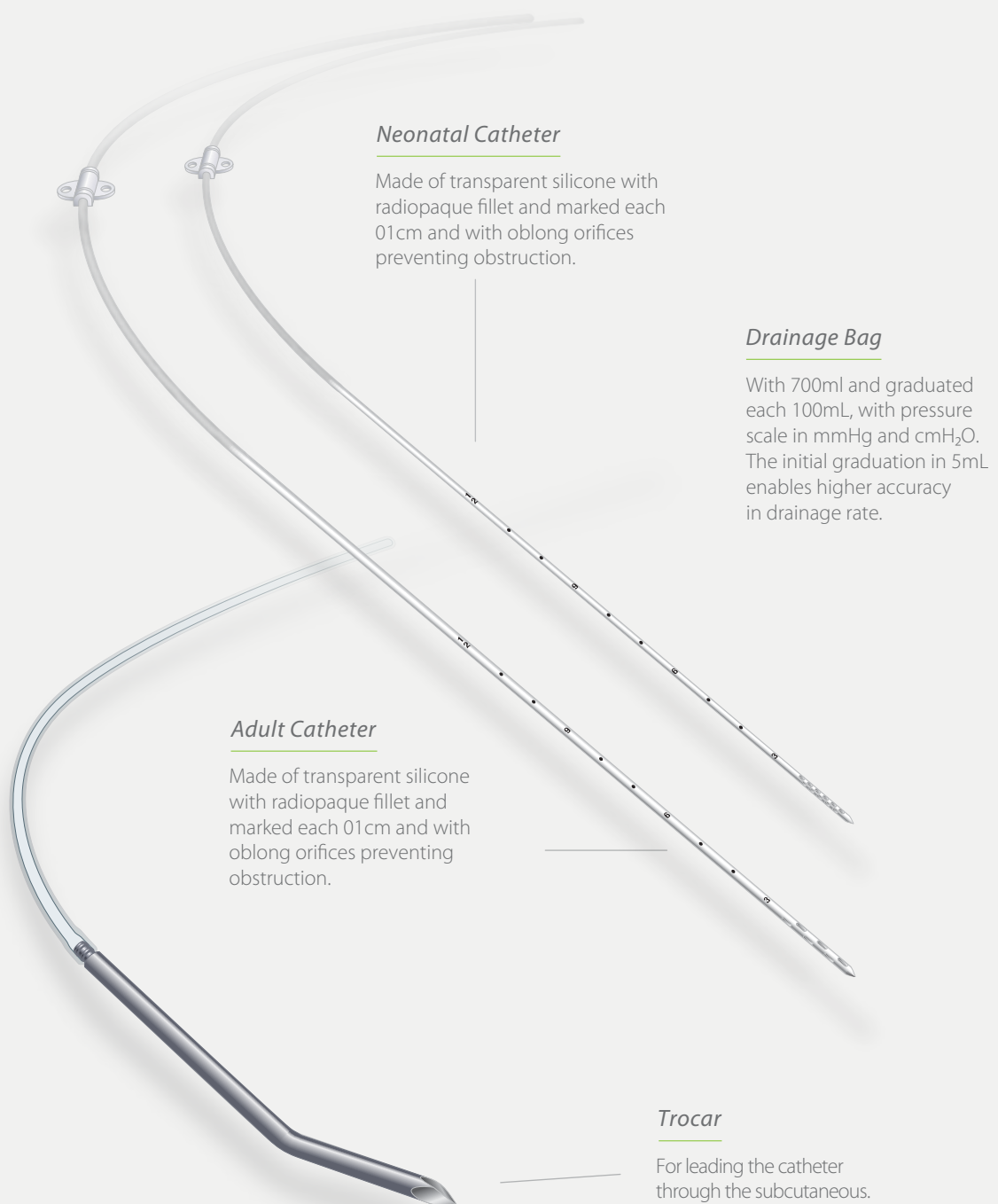
ECONOMIC

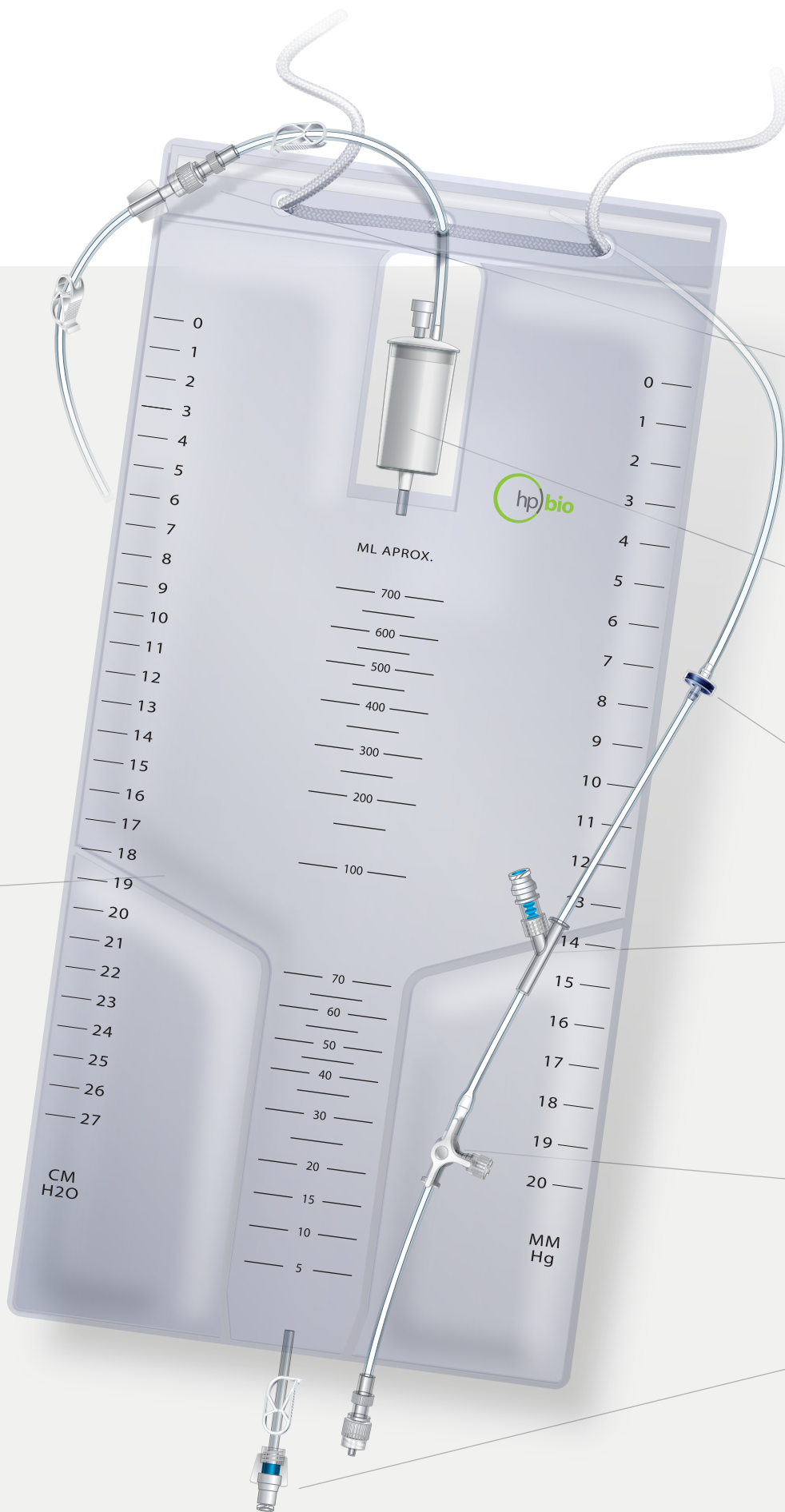


# EXTERNAL VENTRICULAR DRAINAGE

ECONOMIC

External Ventricular Drainage system indicated for the reduction and temporary control of intracranial pressure, by cerebrospinal fluid drainage. The system gathers all the components required for a secure and efficient drainage, at an affordable cost.





### Luer Connection

Male and female connectors enable the change of drainage bag.

### Drip Chamber

Transparent, with antimicrobial vent.

### Anti-reflux Valve

Prevents the return of CSF.

### Valve Y

For sample collection or fluid injection without the use of needle, preventing leaks and contamination.

### Stopcock

With output for ICP monitoring.

### Sampling Site

For emptying the bag without the use of needle, preventing leaks and contamination.

Code	Model	Length	External Diameter	Internal Diameter
DVEA1-EC	Adult	250 mm	3,0 mm	1,6 mm
DVEA2-EC	Adult	350 mm	3,0 mm	1,6 mm
DVEN-EC	Neonatal	220 mm	2,2 mm	1,1 mm

# EXTERNAL LUMBAR DRAINAGE



System with mobile burette

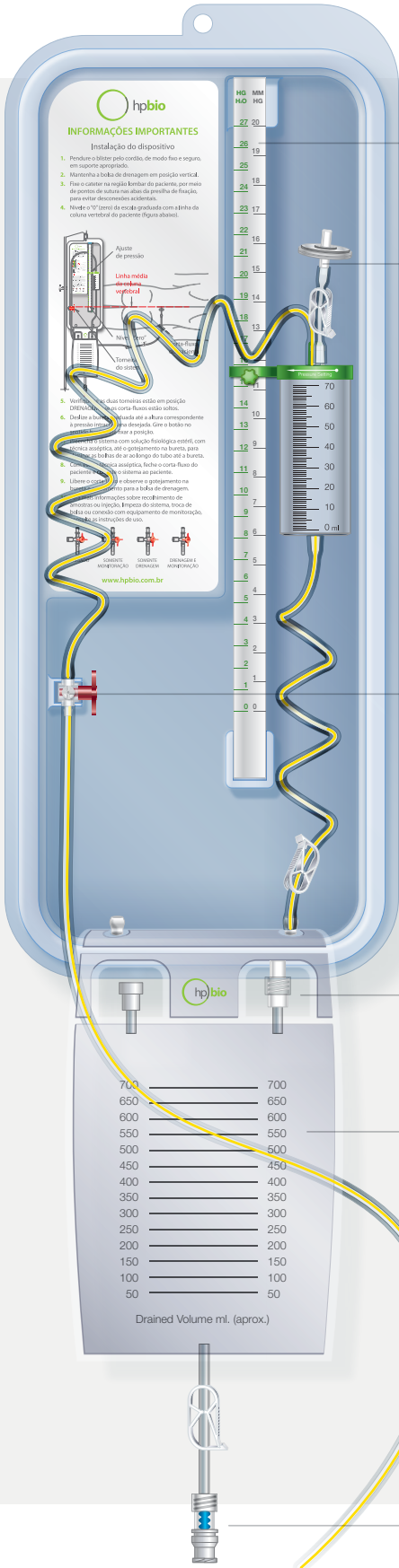
Flexible catheter in silicone with multiperforated tip

Introduction with a Tuohy needle that is depth marking every 1 cm

The External Drainage System is indicated for the reduction and temporary control of intracranial pressure (ICP) through the drainage of cerebrospinal fluid (CSF) from lumbar subarachnoid spaces into an external collector bag.



# SYSTEM COMPONENTS



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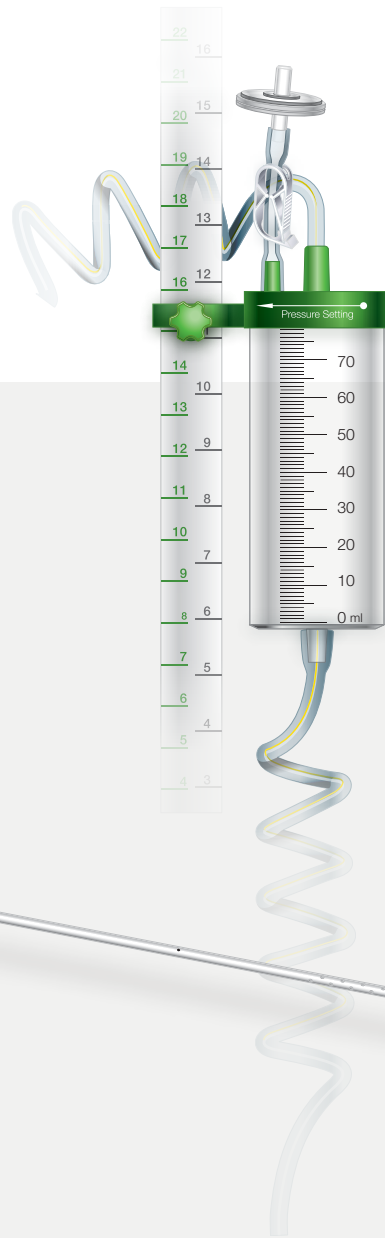
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- 1 - **Pressure Scale**  
Pressure scale in mmHg and cmH<sub>2</sub>O, mobile graded burette for more precise control on the drainage volume.
- 2 - **Filter**  
Hydrophobic antimicrobial resistant to wetting, preventing interruption of the drainage by place temporarily filter blockage. Accompanies clamp to be closed when it is necessary to position the system horizontally temporarily.
- 3 - **Patient's Stopcock**  
With output for ICP monitoring
- 4 - **Luer Connection**  
Male and female connectors enable the drainage bag replacement
- 5 - **Drainage Bag**  
With 700ml and graduated each 50mL.
- 6 - **Sampling Site**  
For emptying the bag without the use of needle, preventing leaks and contamination and with clamp to avoid leaking
- 7 - **Luer**
- 8 - **Slide clamp**  
For flow interruption
- 9 - **Patient's Stopcock**
- 10 - **Y Valve**  
For sample collection or fluid injection without the use of needle, preventing leaks and contamination
- 11 - **Anti-reflux Valve**  
Prevents the return of CSF

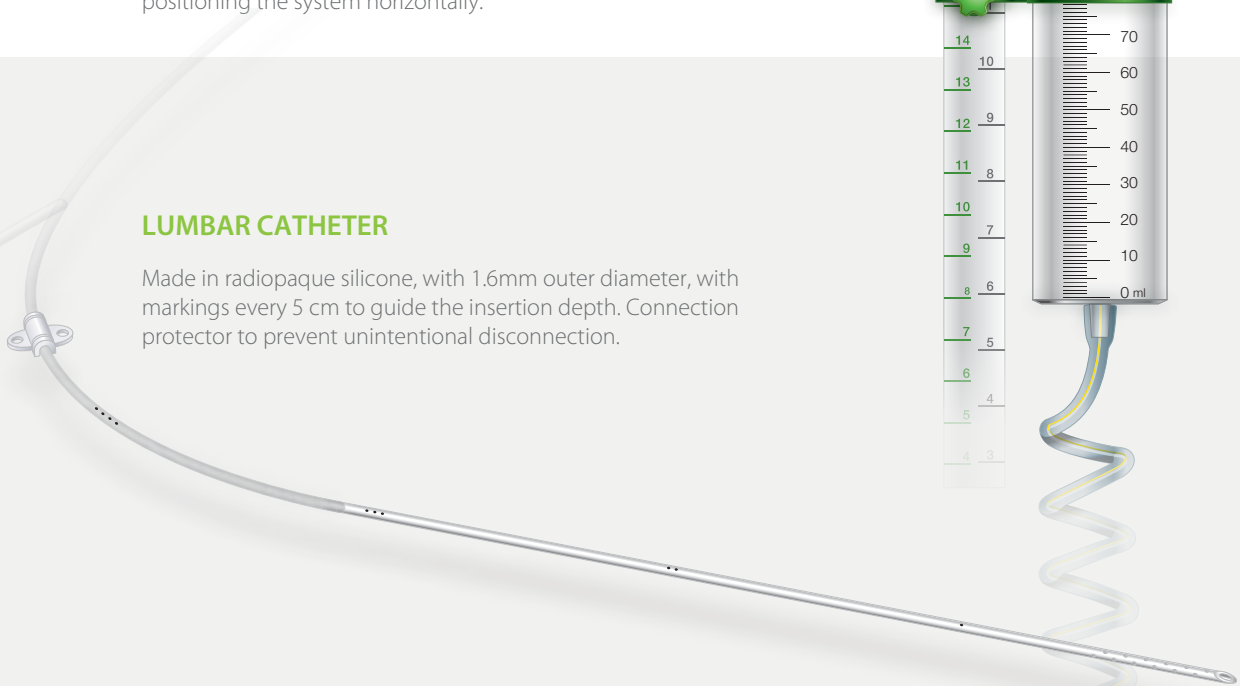
## BURETTE

Mobile burette with 75ml for precise calculation of the drainage volume. Clamp to avoid wetting the filter while positioning the system horizontally.



## LUMBAR CATHETER

Made in radiopaque silicone, with 1.6mm outer diameter, with markings every 5 cm to guide the insertion depth. Connection protector to prevent unintentional disconnection.



## TROCAR

14G tuohoy needle in stainless steel with markings every 1 cm for depth precision. Flexible wire guide to facilitate catheter introduction.



### DLE

Code	Lumbar Catheter ø	Lumbar Catheter Length	Drainage Bag	Burette
DLE	1,6 mm	400 mm	700 ml	70 ml



