Polaris®
The first MRI-stable adjustable valve
The adjustable Polaris® valve is a major breakthrough for the safety of patients thanks to the patented self-locking system of the rotor. This magnetic lock has been designed to resist unintentional operating pressure changes due to knocks or exposure to magnetic fields, especially during MRI examinations. It offers the patient an unequalled security against the clinical risks associated with those dysadjustments.

**Magnetic rotor**
Drives flat spring position which allows direct pressure reading and pressure adjustment.

**Magnetic lock**
Avoids unintentional pressure changes due to knocks or magnetic fields.

**Polysulfone transparent body**
Direct visualization of the pressure level before implantation.

**Pressure range indicators**
X-ray identification of the pressure range among the 4 ranges available: 10-140, 30-200, 50-300, 80-400 mmH$_2$O.

**Ball-in-cone and flat spring mechanism**
Exceptional precision and proven reliability.

**Radiopaque dots**
Reliable and intuitive X-ray reading of the 5 pressure levels, without the need for a chart.

**Low profile valve**
Discreet and comfortable for both adults and children.
A proven efficiency

The Journal of Neurosurgery
“This study demonstrated that only the Sophy Polaris valve retained the pressure settings after exposure to 3-tesla static and radiofrequency magnetic field”.

Child’s Nervous System
“This new shunt device offers the diagnostic benefit of high field magnetic resonance imaging in shunt dependant patients who need an adjustable valve”.

Child’s Nervous System
“The Polaris valve […] offers the advantage of remaining unmodified during exposure to MRI machines or other external magnets as we observed”.

Cerebrospinal Fluid Research
“The Polaris valve is a reliable, adjustable valve. […] the Polaris cannot be accidentally re-adjusted by an external magnetic field”.

Child’s Nervous System
“The settings of the Polaris valve could not be altered by any magnetic toy at any distance, due to its architecture”.

Neurol. Med. Chir. (Tokyo)
“The Polaris valves […] were immune to unintentional reprogramming by the portable game machine”.
A unique self-locking system

The safety of adjustable valves has become a major concern for neurosurgeons because of the growing use of electromagnetic devices in daily life \(^1,2,3,4,5\) and the development of high power MRI (3-Tesla) \(^6,7\).

Indeed, these devices are liable to modify the selected pressure accidentally, with the risk of disrupting CSF drainage and causing serious complications for the patient.

The Polaris® valve is a major breakthrough for the safety of patients implanted with adjustable valves.

Its exclusive locking mechanism enables it to resist:

- Magnetic Resonance Imaging (MRI), up to 3-Tesla (3T-MRI tested)
- Direct knocks to the valve
- Everyday magnetic fields

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The Polaris® magnetic lock is based on the permanent reciprocal attraction of two mobile micro-magnets of opposite polarity.

This “magnetic lock” holds the rotor in the selected position, thus preventing any accidental change in operating pressure if the valve is exposed to magnetic fields.

In fact, in the presence of a standard magnetic field (unidirectional) the two micro-magnets are attracted in the same direction.

So only one of the two magnets moves in the direction of the field, while the other remains locked.

Changing the operating pressure of the valve first requires the simultaneous unlocking of the two micro-magnets in the valve by a specific magnetic key. The rotor can then turn freely on its central axis.

Polaris® Adjustment Kit

The Polaris® Adjustment Kit:
- allows easy, precise and fast procedure
- permits a painless adjustment
- offers a direct pressure reading with the Compass
- is provided in a shielded case
- includes a Polaris® demo valve

Locator
Choice of the pressure range
Able to display the 4 pressure ranges available thanks to a rotating ring graduated in mmH₂O.
Localization of the valve under the skin

Compass
Localization of the valve center (for Locator centering)
Due to its patented mechanism, it makes it possible to locate the valve center through the skin and thus fine-tune the positioning of the Locator.
Pressure reading
Allows a precise and reliable reading of the selected pressure.

Magnet
Unlocking of the valve
New pressure adjustment
A true “magnetic key”, it makes fast unlocking and precise valve adjustment possible due to the exclusive combination of several powerful magnets.
Direct pressure reading is obtained using the Adjustment Kit Compass: the Compass needle is aligned with the position of the magnetic rotor.

In addition to the standard model (30-200 mmH₂O), Polaris® also offers a unique special pressure range: one low pressure valve and two high pressure valves. Thus a choice is provided, depending on the experience of the practitioner, to meet very specific clinical needs.¹,²

The Polaris® valve can be associated with SiphonX®, an anti-siphon device, which adds 200mmH₂O in vertical position.

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<thead>
<tr>
<th>Reference</th>
<th>Designation</th>
<th>Position</th>
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<tbody>
<tr>
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<tr>
<td>SPV</td>
<td>Polaris® Adjustable Valve, 30-200</td>
<td>30 70 110 150 200</td>
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<td>SPV-140</td>
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<td>Valve with antechamber</td>
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<td>1 2 3 4 5</td>
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<td>Valve with SiphonX® antisiphon device</td>
<td>(= 200 mmH₂O in vertical position)</td>
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<td>Complete valve kits</td>
<td>Polaris® valve kits include a separated ventricular catheter and a preconnected distal catheter</td>
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<td>(includes Locator PAK2-LI, Compass PAK2-RI, Magnet PAK2-SI and a Polaris® demo valve SPV-DEMO-00)</td>
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