WE UNDERSTAND.

M.blue®
THE BALANCED WAY OF LIFE. INSPIRED BY YOU.
TREATMENT OF HYDROCEPHALUS

NEED FOR ACTION

WHY DOES IT NEED BETTER SOLUTIONS FOR THE TREATMENT OF HYDROCEPHALUS?

Since the 1960s, the main surgical strategy in managing hydrocephalus is the placement of shunts. However, conventional shunts have very high failure rates, and nearly every fourth patient is affected by complications (1, 2) with no difference between different conventional valves and programmable valves (4, 5).

Overdrainage-related complications can necessitate a variety of different revisions, which are burdensome for patients and are accompanied by unavoidable perioperative risks.

We believe that the current treatment situation for hydrocephalus is not acceptable and better solutions have to be found.

HIGH FAILURE RATES

40 %

Proportion of shunts failing within 2 years

98 %

Proportion of shunts failing within 10 years

» High failure rates overshadow the effectiveness of shunts (1).

COMPLICATIONS (3)

- Obstruction (46.9 %)
- Migration (14.0 %)
- Fracture (11.8 %)
- Improper placement (8.1 %)
- Overdrainage (6.3 %)
- Miscellaneous (4.0 %)
- No evidence of malfunction (8.8 %)

» About one in four patients experiences at least one complication (2).
MECHANICAL FAILURE

Mechanical failure is the most common cause of multiple shunt revisions (6), with catheter or valve obstruction being the predominant reason (3). However, failure of individual shunt components may also occur, e.g., at stress points or due to poor design (7).

- Catheter breakage
- Catheter fracture
- Obstruction
- Catheter separation
- Damaged housing
- Valve migration
ACCIDENTAL REPROGRAMMING

As the optimal pressure setting of adjustable valves is of great importance for the patient, the accidental reprogramming of adjustable valves by external magnetic fields, e.g., from smartphones, is a cause of concern and leads to great uncertainty among patients and doctors (8-12).
Active patients are exposed to gravity – for up to 16 hours, every day. Posture-dependent gravitational effects increase the potential for overdrainage. Overcoming these gravitational effects can help to improve patient outcomes.
NO TWO PATIENTS ARE ALIKE!

Every patient with hydrocephalus is unique and requires customized setting of the valve opening pressure.

ARE PATIENTS GETTING OPTIMAL INDIVIDUAL TREATMENT?

Determining the patient-individual setting of the valve opening pressure can be complex. Non-ideal pressure settings can lead to follow-up examinations and revisions, which are burdensome for patients and put an additional strain on physicians and surgeons with limited time and high workload (13, 14).

ARE ADJUSTABLE DIFFERENTIAL PRESSURE VALVES THE BEST AVAILABLE THERAPIE?

The pressure setting of conventional adjustable valves is always a compromise between the pressure requirements of the upright position and the supine position. Therefore, patients can never benefit from optimal opening pressures for both positions.
GRAVITATIONAL VALVES BY MIETHKE
DEVELOPED TO ENSURE SAFETY

BE CONFIDENT!

Gravitational shunts provide neurosurgeons with a possibility to address the posture-dependent effects of gravity, with positive clinical outcomes for the patient and a significant reduction of overdrainage events (15).

GRAVITATIONAL VALVES (GV) IMPROVE PATIENT OUTCOMES COMPARED TO DIFFERENTIAL PRESSURE VALVES (DP) (16).

Symptom improvement >2 points on Kiefer-Scale.

<table>
<thead>
<tr>
<th></th>
<th>GV</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>71 %</td>
<td></td>
<td>18 %</td>
</tr>
</tbody>
</table>

Daily improvement rated good/very good on Black-Scale.

<table>
<thead>
<tr>
<th></th>
<th>GV</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>62 %</td>
<td></td>
<td>25 %</td>
</tr>
</tbody>
</table>
REDUCE COMPLICATIONS! REDUCE REVISIONS!

Clinical studies have shown that MIETHKE gravitational devices reduce the risk of revisions (17-21) and overdrainage complications (18).

- Valve survival rates up to 90% at 12 months (19).

- Overdrainage rate with differential pressure valves: 43%.
- Overdrainage rate with gravitational valves: 7%.

- Implanting a gravitational valve avoids one additional overdrainage complication in about every third patient (18).
AVOID MECHANICAL FAILURE!
All MIETHKE valves are manufactured with high precision from titanium. The extremely small valves have aligned flow paths, rigid housing unsusceptible to subcutaneous pressure and high MRI- and biocompatibility.

DON’T LET MAGNETIC FIELDS BOTHER YOU!
The "Active-Lock mechanism" protects programmable MIETHKE valves against reprogramming by magnetic fields of up to 3 Tesla (22).
GET IT RIGHT THE FIRST TIME!

Early treatment with the optimal therapy is important for patients with hydrocephalus (23, 24) and can also help to avoid shunt replacements and associated perioperative risks.

OPTIMIZE – DON’T COMPROMISE!

Gravitational shunts allow for the prevention of over-drainage in the standing position without compromising the pressure setting for the supine position. The optimal opening pressure for each patient can be set both for the upright and the supine position – without needing to compromise.

» With gravitational valves the optimal pressure for both supine and upright position can be set.

BENEFIT FROM PRIMARY IMPLANTATION (23)!

22 %
higher survival of gravitational valves after primary vs secondary implantation
M.blue®
OUR LATEST GENERATION OF VALVE TECHNOLOGY

- ONE valve for the special requirements of a life with hydrocephalus: mobility, growth, changes in the course of disease
- 2 in 1 technology: adjustable gravitational unit combined with fixed differential pressure unit in one valve
- Unique uncompromising pressure adaption to fulfill individual patient needs
- Smallest adjustable gravitational valve worldwide
- Efficient protection against overdrainage through individually and continuously adjustable opening pressure from 0-40 cmH₂O
- MRI-compatible up to 3 Tesla – no X-ray verification after MRI necessary, no additional radiation exposure for the patient
- Safe from unintentional adjustment by everyday magnets such as smartphones, toys, induction cookers and safety barriers at the airports
- Innovative M.blue plus® Instruments for M.blue® and proGAV® 2.0
- Intuitive, secure and comfortable adjustment
- Precision engineering
- Robust and durable: made of titanium
M.blue® is the essence of 26 years of experience with hydrocephalus and valve technology and the feedback of numerous physicians and patients worldwide.

M.blue® is a valve for all forms of hydrocephalus with a particularly high flexibility in therapy.
The functionality of M.blue® is illustrated interactively in the MIETHKE app.

APP DOWNLOAD
https://apps.apple.com/de/app/miethke/id450290015
"M.blue®" is a hydrocephalus valve operating in a position-dependent manner. It consists of an adjustable gravitational unit and a fixed differential pressure unit. The combination of these two units adjusts the opening pressure automatically depending on what position the patient is in, thus countering the risk of possible overdrainage complications, particularly when the patient is in an upright and active position.

EXAMPLE OF THE ADJUSTABLE GRADUATED PRESSURE RANGE OF A "M.blue®" WITH A DIFFERENTIAL PRESSURE UNIT OF 5 CMH₂O

Gravitational unit adjustment range

Valve opening pressure (cmH₂O)

40
30
20
10
0

Body position 15° 30° 45° 60° 75° 90°

Gravitational unit and differential pressure unit work together when the patient is standing

Only the differential pressure unit is active when the patient is supine
M.blue plus® INSTRUMENTS

SOFT TOUCH INSTRUMENT FUNCTIONALITY

USER-FRIENDLY ADJUSTMENT AND VERIFICATION

M.blue plus® instruments allow users to measure, verify, and adjust the pressure level on M.blue®’s adjustable gravitational unit (0–40 cmH₂O) as well as the pressure level on the adjustable differential pressure unit (proGAV® 2.0) of M.blue plus®. The instruments offer simple steps for the physician and make the adjustment process comfortable for patients.
LOCATE
Locate valve by palpating the area with your finger through the open M.blue plus® compass.

VERIFY
Close M.blue plus® compass and use the floater to lock location and read current valve opening pressure setting.

ADJUST
With the help of the inserted adjustment ring the valve opening pressure can easily be set to the desired level. After setting the valve opening pressure, it is advisable to double-check the pressure level settings.
PRESSURE LEVEL RECOMMENDATIONS AND RADIOGRAPHIC IDENTIFICATION

All of the pressure levels shown here are given in cmH2O. These recommendations are non-binding. The treating physician will need to decide each case individually.

PRESSURE LEVEL RECOMMENDATION

The choice of the appropriate pressure level of M.blue® depends on several other factors, including age, degree of activity, size and stature of the patient. The values given apply to mobile patients. For patients with little mobility or a high BMI, the pressure of the gravitational unit should be chosen lower than recommended above.

### Patient Selection of pressure levels

<table>
<thead>
<tr>
<th>Patient</th>
<th>Selection of pressure levels</th>
<th>Combined opening pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Differential pressure unit</td>
<td>Adjustable gravitational unit</td>
</tr>
<tr>
<td></td>
<td>Newborns and children under 5</td>
<td>20</td>
</tr>
<tr>
<td>Children ages 5 and up</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Adults</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>&lt; 1.60 m</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>&gt; 1.80 m</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Adults</td>
<td>65 years</td>
<td>15</td>
</tr>
<tr>
<td>&lt; 1.60 m</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>&gt; 1.80 m</td>
<td></td>
<td>20</td>
</tr>
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All of the pressure levels shown here are given in cmH2O. These recommendations are non-binding. The treating physician will need to decide each case individually.
USING RADIOGRAPHIC IMAGING TO DETERMINE PRESSURE LEVELS

Pressure settings on *M.blue* should always be checked using *M.blue plus* compass, but radiographic imaging can be used for verification as well.

All of the pressure levels shown here are given in cmH$_2$O.

X-ray recognition and product information can be found in the free MIETHKE App.
Diameter connector: 1.9 mm
Recommended catheter diameters:
Inner diameter: 1.2 mm
Outer diameter: 2.5 mm

\*M.blue\* valve

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### M.blue\* differential pressure units

<table>
<thead>
<tr>
<th>Art. no.</th>
<th>Differential pressure unit</th>
<th>Adjustable gravitational unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX800T</td>
<td>0 cmH(_2)O</td>
<td>0 - 40 cmH(_2)O</td>
</tr>
<tr>
<td>FX801T</td>
<td>5 cmH(_2)O</td>
<td>0 - 40 cmH(_2)O</td>
</tr>
<tr>
<td>FX802T</td>
<td>10 cmH(_2)O</td>
<td>0 - 40 cmH(_2)O</td>
</tr>
<tr>
<td>FX803T</td>
<td>15 cmH(_2)O</td>
<td>0 - 40 cmH(_2)O</td>
</tr>
</tbody>
</table>
**M.blue plus®**

VALVE COMBINATION

- **M.blue plus® valve**

Diameter connector: 1.9 mm
Recommended catheter diameters:
  - Internal diameter: 1.2 mm
  - Outer diameter: 2.5 mm

---

![Diagram](image)

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<tbody>
<tr>
<td>FX804T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</table>
M.blue®

INDIVIDUAL VALVE WITH CATHETER

- M.blue® valve with distal catheter

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<tr>
<td>FX805T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX806T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX807T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX808T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
M.blue plus®

VALVE COMBINATION

- M.blue plus® valve with distal catheter

M.blue plus®

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<tbody>
<tr>
<td>FX809T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
</table>
- **M.blue® valve**
  with distal catheter

- **Ventricular catheter**
  with introducing stylet and pediatric burrhole deflector (14 mm)

### Differential pressure unit

<table>
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<th>Adjustable gravitational unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX810T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX811T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX812T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX813T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
</table>
• *M.blue plus®* valve with distal catheter

• Ventricular catheter with introducing stylet and pediatric burrhole deflector (14 mm)

---

**M.blue plus®**

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<tr>
<td>FX814T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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**SHUNT SYSTEM WITH PEDIATRIC CONTROL RESERVOIR**

- **M.blue® valve**
  - with integrated pediatric CONTROL RESERVOIR and distal catheter
  - An additional valve in the inlet of the pediatric CONTROL RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

- **Ventricular catheter**
  - with introducing stylet and pediatric burrhole deflector (14 mm)

### M.blue®

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<tbody>
<tr>
<td>FX815T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX816T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX817T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX818T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
</table>
M.blue plus®
SHUNT SYSTEM WITH PEDIATRIC CONTROL RESERVOIR

- **M.blue plus®** valve with integrated pediatric CONTROL RESERVOIR and distal catheter
  - An additional valve in the inlet of the pediatric CONTROL RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

- Ventricular catheter with introducing stylet and pediatric burrhole deflector (14 mm)

<table>
<thead>
<tr>
<th>M.blue plus®</th>
<th>Art. no.</th>
<th>Adj. differential pressure unit</th>
<th>Adjustable gravitational unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FX819T</td>
<td>0 – 20 cmH₂O</td>
<td>0 – 40 cmH₂O</td>
</tr>
</tbody>
</table>
• M.blue® valve with integrated CONTROL RESERVOIR and distal catheter

* An additional valve in the inlet of the CONTROL RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

• Ventricular catheter with introducing stylet and burrhole deflector (20 mm)

---

**M.blue® SHUNT SYSTEM WITH CONTROL RESERVOIR**

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<th>Art. no.</th>
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<th>Adjustable gravitational unit</th>
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</thead>
<tbody>
<tr>
<td>FX820T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX821T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX822T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX823T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
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M.blue plus®

SHUNT SYSTEM WITH CONTROL RESERVOIR

- M.blue plus® valve with integrated CONTROL RESERVOIR and distal catheter
  - An additional valve in the inlet of the CONTROL RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

- Ventricular catheter with introducing stylet and burrhole deflector (20 mm)

<table>
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<tbody>
<tr>
<td></td>
<td>FX824T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
M.blue®
SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

- M.blue® valve
  with integrated pediatric SPRUNG RESERVOIR
  and distal catheter
  * An additional valve in the inlet of the pediatric SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage, allowing inspection of both the distal drainage section as well as the ventricular catheter.

- Ventricular catheter
  with introducing stylet

---

**OCCIPITAL ONLY**

---

*M.blue*

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<tr>
<th>Art. no.</th>
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<th>Adjustable gravitational unit</th>
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<tbody>
<tr>
<td>FX825T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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<tr>
<td>FX826T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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<tr>
<td>FX827T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX828T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
M.blue plus®
SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

- **M.blue plus® valve**
  with integrated pediatric SPRUNG RESERVOIR
  and distal catheter

- **Ventricular catheter**
  with introducing stylet

* An additional valve in the inlet of the pediatric SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

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**OCCIPITAL ONLY**

**M.blue plus®**

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<tr>
<td>FX829T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
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</table>

*pediatric SPRUNG RESERVOIR*
M.blue®
SHUNT SYSTEM WITH SPRUNG RESERVOIR

- M.blue® valve with integrated SPRUNG RESERVOIR and distal catheter
  * An additional valve in the inlet of the SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

- Ventricular catheter with introducing stylet

OCCIPITAL ONLY

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<tbody>
<tr>
<td>FX830T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX831T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX832T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX833T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
• **M.blue plus®** valve with integrated **SPRUNG RESERVOIR** and distal catheter

* An additional valve in the inlet of the **SPRUNG RESERVOIR** makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

• **Ventricular catheter** with introducing stylet

---

**M.blue plus®**

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<tbody>
<tr>
<td>FX834T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
• M.blue® valve with distal catheter

• Pediatric SPRUNG RESERVOIR with distal catheter

* An additional valve in the inlet of the pediatric SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

• Ventricular catheter with introducing stylet

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**M.blue®**

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</tr>
<tr>
<td>FX838T</td>
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<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
M.blue plus®

SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

- M.blue plus® valve with distal catheter
- Pediatric SPRUNG RESERVOIR with distal catheter
  * An additional valve in the inlet of the pediatric SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.
- Ventricular catheter with introducing stylet

**M.blue plus®**

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<tr>
<td>FX839T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
• **M.blue® valve**
  with distal catheter

• **SPRUNG RESERVOIR**
  with distal catheter

  * An additional valve in the inlet of the SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

• **Ventricular catheter**
  with introducing stylet

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**M.blue®**

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<tr>
<td>FX843T</td>
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M.blue plus®

SHUNT SYSTEM WITH SPRUNG RESERVOIR

- M.blue plus® valve with distal catheter
- SPRUNG RESERVOIR with distal catheter
  - An additional valve in the inlet of the SPRUNG RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.
- Ventricular catheter with introducing stylet

<table>
<thead>
<tr>
<th>M.blue plus®</th>
<th>Adj. differential pressure unit</th>
<th>Adjustable gravitational unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX844T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
</table>
• *M.blue®* valve with distal catheter

• Pediatric burrhole reservoir with distal catheter

• Ventricular catheter with introducing stylet

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**M.blue® SHUNT SYSTEM WITH PEDIATRIC BURRHOLE RESERVOIR**

<table>
<thead>
<tr>
<th>Art. no.</th>
<th>Differential pressure unit</th>
<th>Adjustable gravitational unit</th>
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</thead>
<tbody>
<tr>
<td>FX845T</td>
<td>0 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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<tr>
<td>FX846T</td>
<td>5 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX847T</td>
<td>10 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
<tr>
<td>FX848T</td>
<td>15 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
</tr>
</tbody>
</table>

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*Image of the shunt system with pediatric burrhole reservoir and its components.*
M.blue plus®

SHUNT SYSTEM WITH PEDIATRIC BURRHOLE RESERVOIR

- M.blue plus® valve with distal catheter
- Pediatric burrhole reservoir with distal catheter
- Ventricular catheter with introducing stylet

<table>
<thead>
<tr>
<th>M.blue plus®</th>
<th>Art. no.</th>
<th>Adj. differential pressure unit</th>
<th>Adjustable gravitational unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FX849T</td>
<td>0 - 20 cmH₂O</td>
<td>0 - 40 cmH₂O</td>
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</tbody>
</table>
M.blue plus® INSTRUMENTS

SOFT TOUCH INSTRUMENTS

- M.blue plus® instrument set
- M.blue plus® compass
- M.blue plus® adjustment ring
- M.blue plus® adjustment assistant
- M.blue® adjustment check-mate

<table>
<thead>
<tr>
<th>Art. no.</th>
<th>Instruments</th>
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<tbody>
<tr>
<td>FX890T</td>
<td>M.blue plus® instrument set (includes FX891T and FX892T)</td>
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<tr>
<td>FX891T</td>
<td>M.blue plus® compass</td>
</tr>
<tr>
<td>FX892T</td>
<td>M.blue plus® adjustment ring</td>
</tr>
<tr>
<td>FX893T</td>
<td>M.blue plus® adjustment assistant</td>
</tr>
<tr>
<td>FX894T</td>
<td>M.blue® adjustment check-mate</td>
</tr>
</tbody>
</table>
## OUR PRODUCTS – YOUR SELECTION

<table>
<thead>
<tr>
<th>M.blue®</th>
<th>proGAV® 2.0</th>
<th>GAV® 2.0</th>
<th>SHUNT-ASSISTANT® 2.0</th>
<th>DUALSWITCH VALVE</th>
<th>miniNAV®</th>
<th>Accessories</th>
</tr>
</thead>
</table>

### Description

- **Adjustable gravitational unit with integrated differential pressure valve unit**
- **Adjustable differential pressure valve with gravitational unit**
- **Gravitational valve for treating hydrocephalus**
- **"Add-on" gravitational valve for preventing complications due to excess drainage**
- **Gravitational valve with large flow volumes for CSF**
- **Differential pressure valve, specifically for premature babies and newborns or bedridden, non-mobile patients**

### Indication

<table>
<thead>
<tr>
<th></th>
<th>LP</th>
<th>NPH</th>
<th>Ped. HC</th>
<th>Adult HC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NPH</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Ped. HC</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Adult HC</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

### Patient

- **Bed ridden**: ✔
- **Active**: ✔

### Characteristic

- **3-Tesla MR Conditional**: ✔
- **Gravitational unit**: ✔
- **Adjustable**: ✔

* in conjunction with SHUNTASSISTANT® 2.0 or proSA®
REFERENCES


WE UNDERSTAND THE GRAVITY OF THE SITUATION.

GRAVITATIONAL VALVES BY MIETHKE

AESCULAP® – a B. Braun brand