MIETHKE

B|BRAUN
SHARING EXPERTISE


WE UNDERSTAND.

NEUROSURGERY

# M.blue®

THE BALANCED WAY OF LIFE. INSPIRED BY YOU.

# TREATMENT OF HYDROCEPHALUS

## NEED FOR ACTION

MIETHKE

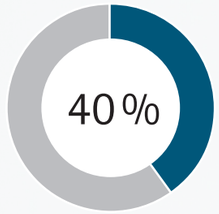
### WHY DOES IT NEED BETTER SOLUTIONS FOR THE TREATMENT OF HYDROCEPHALUS?

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).

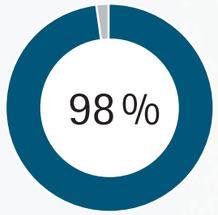
Overdrainage-related complications can necessitate a variety of different revisions, which are burdensome for patients and are accompanied by unavoidable perioperative risks.

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

HIGH FAILURE RATES



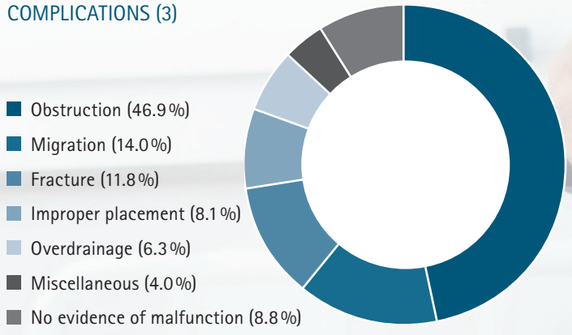

Proportion of shunts failing within **2 years**




Proportion of shunts failing within **10 years**

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

COMPLICATIONS (3)




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

# TREATMENT OF HYDROCEPHALUS

## NEED FOR ACTION

MIETHKE

## 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).

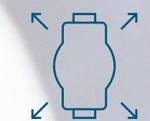
Catheter breakage

Catheter fracture

Obstruction

Catheter separation

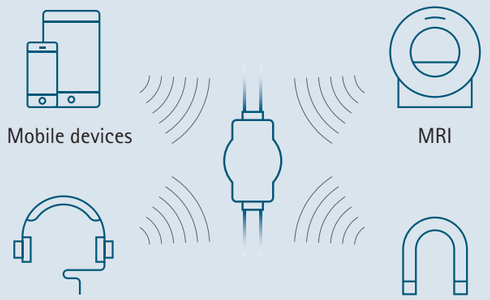
Damaged housing



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).



# TREATMENT OF HYDROCEPHALUS

## NEED FOR ACTION

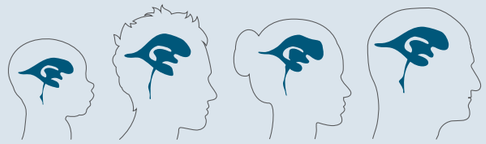
MIETHKE

## WHAT COULD BE BETTER?

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.

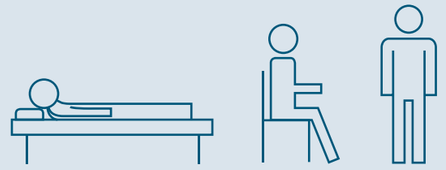
## NO TWO PATIENTS ARE ALIKE!

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

MIETHKE

## 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.

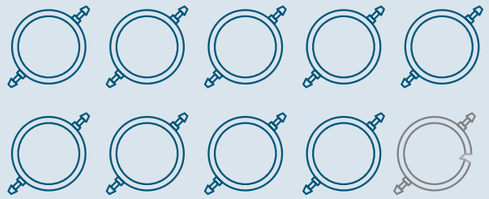



Daily improvement rated good / very good on Black-Scale.

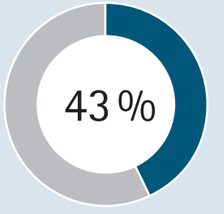



## REDUCE COMPLICATIONS! REDUCE REVISIONS!

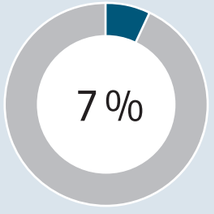
Clinical studies have shown that MIETHKE gravitational devices reduce the risk of revisions (17-21) and overdrainage complications (18).



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




Overdrainage rate with **differential pressure** valves




Overdrainage rate with **gravitational** valves

» Implanting a gravitational valve avoids one additional overdrainage complication in about every third patient (18).

# GRAVITATIONAL VALVES BY MIETHKE

## DEVELOPED TO ENSURE SAFETY

MIETHKE

### 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.

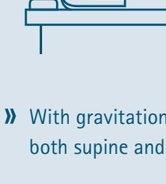
#### DON'T LET MAGNETIC FIELDS BOTHER YOU!

The "Active-Lock mechanism" protects programmable MIETHKE valves against reprogramming by magnetic fields of up to 3 Tesla (22).

**MIETHKE GRAVITATIONAL VALVES**

- Ti — Made from Titanium for high MRI- and biocompatibility
- Protected against reprogramming up to 3 Tesla
- Extremely small valve
- Rigid housing unsusceptible to subcutaneous pressure

### BENEFIT FROM PRIMARY IMPLANTATION (23)!



**22 %**

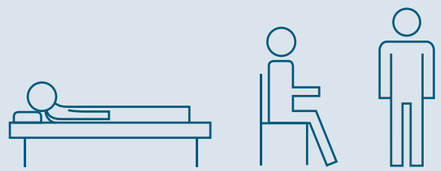
higher survival of gravitational valves after **primary** vs secondary implantation

#### 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.

# M.blue®

## OUR LATEST GENERATION OF VALVE TECHNOLOGY

MIETHKE

- 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 $cmH_2O$
- 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



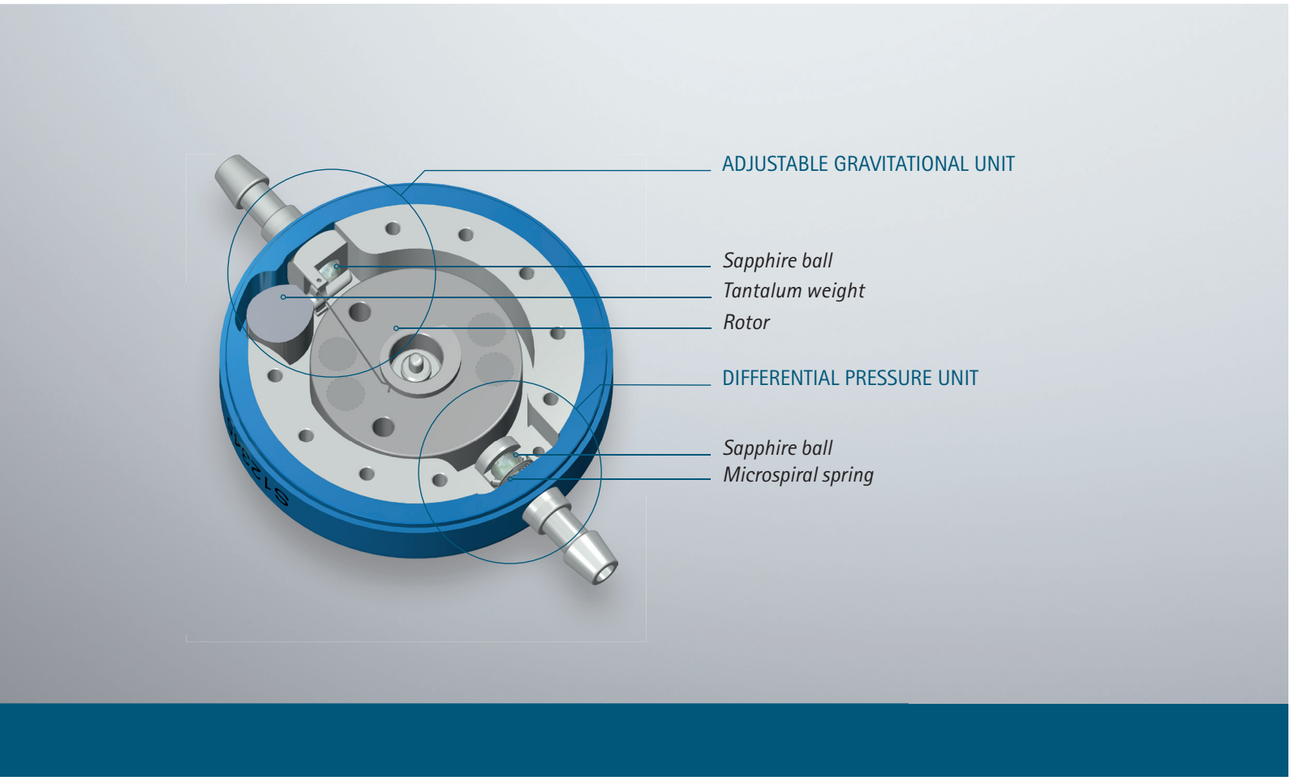
M.blue® & M.blue plus®

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.

# M.blue®

## FUNCTIONALITY OF VALVE AND POSITION OF THE BODY



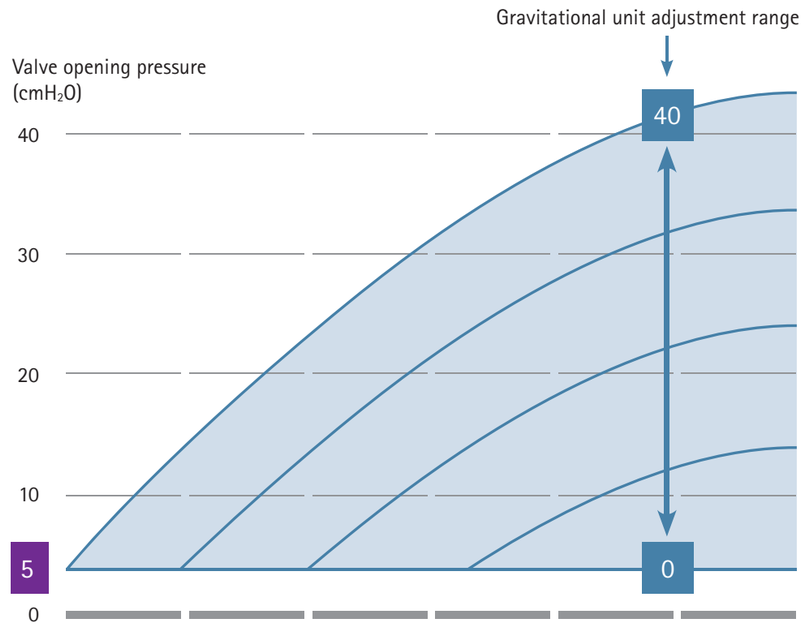

The functionality of M.blue® is illustrated interactively in the MIETHKE app.

APP DOWNLOAD

https://apps.apple.com/de/app/miethke/id450290015

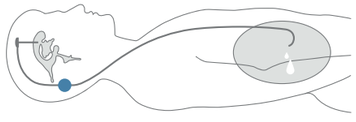
https://play.google.com/store/apps/details?id=com.miethke.graviton

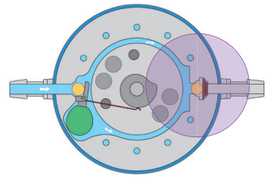

EXAMPLE OF THE ADJUSTABLE GRADUATED PRESSURE RANGE OF A M.blue® WITH A DIFFERENTIAL PRESSURE UNIT OF 5 $CMH_2O$




*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® 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.

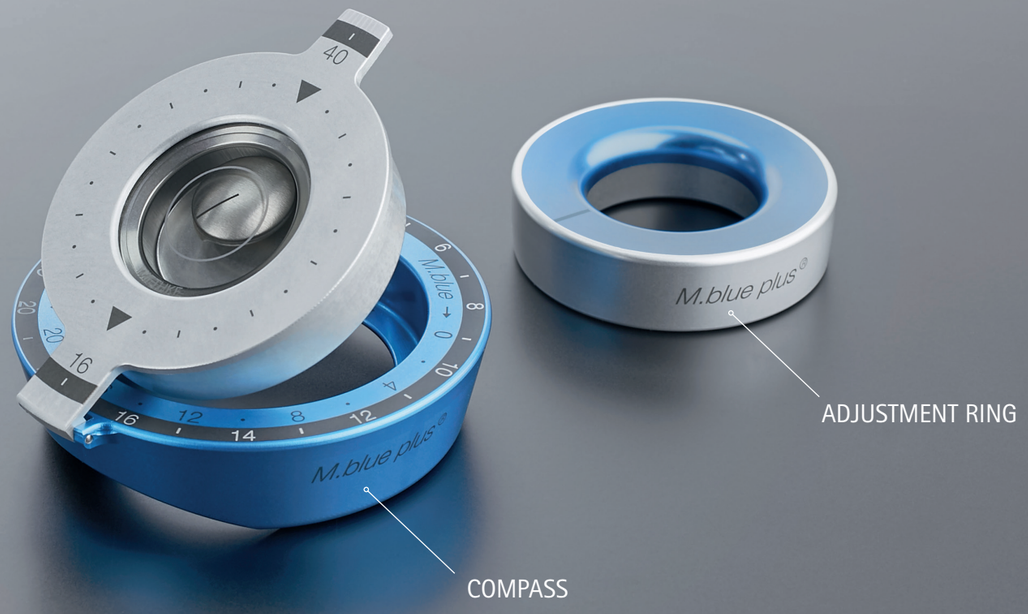
# M.blue plus® INSTRUMENTS

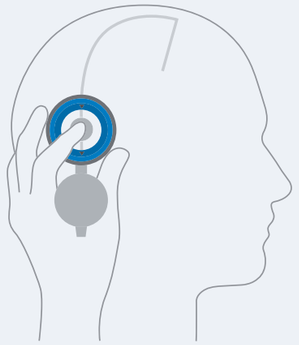
## SOFT TOUCH INSTRUMENT FUNCTIONALITY

MIETHKE

### USER-FRIENDLY ADJUSTMENT AND VERIFICATION

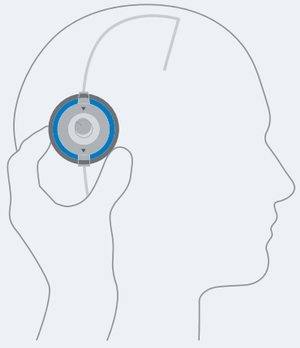
M.blue plus® instruments allow users to measure, verify, and adjust the pressure level on M.blue®'s adjustable gravitational unit (0-40 $cmH_2O$) as well as the pressure level on the adjustable differential pressure unit (proGAV® 2.0) of M.blue plus®.
The instruments offer simple steps for the physician 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.

# M.blue®

## PRESSURE LEVEL RECOMMENDATIONS AND RADIOGRAPHIC IDENTIFICATION

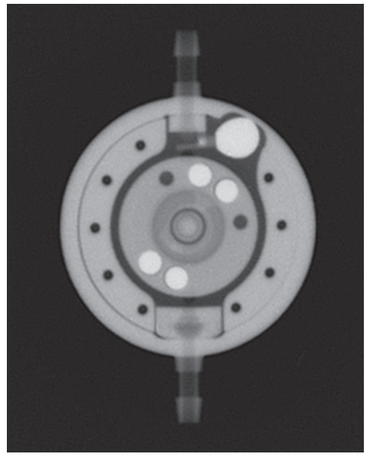
| Patient | Selection of pressure levels | | Combined opening pressure | |
|---|---|---|---|---|
| | ① Differential pressure unit | ② Adjustable gravitational unit | | |
| Newborns and children under 5 | 5 | 20 | 5 | 25 |
| Children ages 5 and up | | 25 | | 30 |
| Adults<br>< 1.60 m<br>> 1.80 m | | 25<br>20<br>30 | | 30<br>25<br>35 |
| Adults<br>> 65 years<br>< 1.60 m<br>> 1.80 m | | 20<br>15<br>25 | | 25<br>20<br>30 |

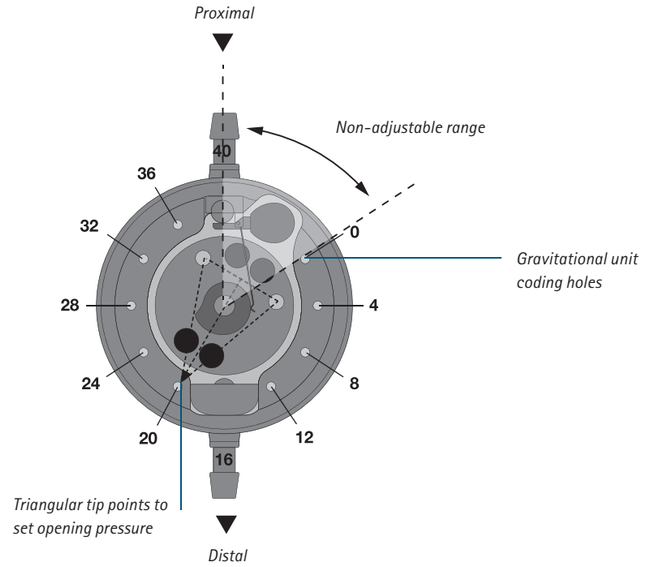
All of the pressure levels shown here are given in $cmH_2O$. These recommendations are non-binding. The treating physician will need to decide each case individually.

### 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.





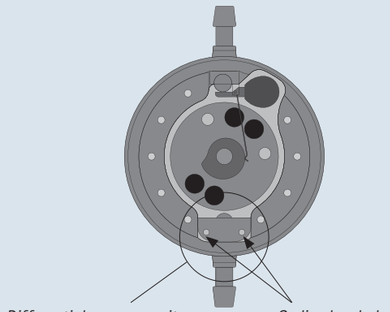


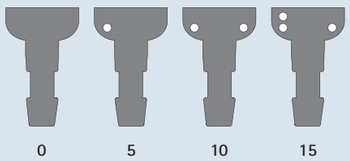

### USING RADIOGRAPHIC IMAGING TO DETERMINE PRESSURE LEVELS

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 $cmH_2O$.

X-ray recognition and product information can be found in the free MIETHKE App.

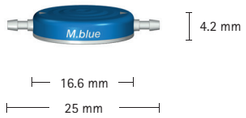


# M.blue®

## SINGLE VALVE

- M.blue® valve




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

M.blue®

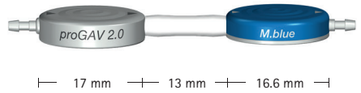
| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX800T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX801T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX802T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX803T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# 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

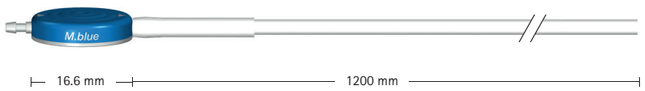
M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX804T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

# M.blue®

## INDIVIDUAL VALVE WITH CATHETER

- M.blue® valve with distal catheter




M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX805T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX806T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX807T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX808T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |

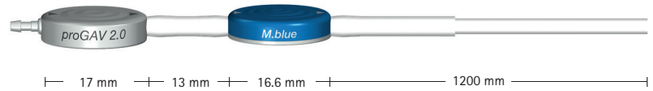


# M.blue plus®

## VALVE COMBINATION

MIETHKE

- M.blue plus® valve with distal catheter



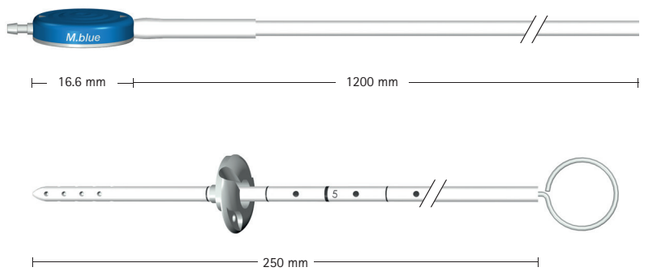

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX809T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

# M.blue®

## SHUNT SYSTEM

- M.blue® valve
  with distal catheter
- Ventricular catheter
  with introducing stylet and
  pediatric burrhole deflector
  (14 mm)




M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX810T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX811T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX812T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX813T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |

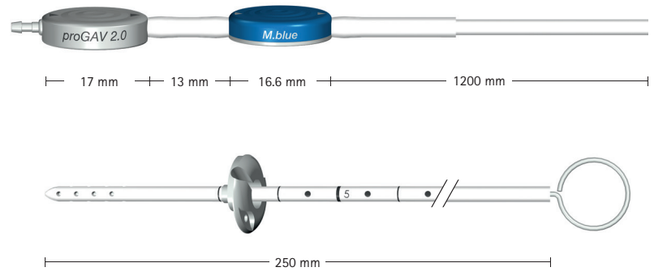


# M.blue plus®

## SHUNT SYSTEM

MIETHKE

- M.blue plus® valve
  with distal catheter
- Ventricular catheter
  with introducing stylet and
  pediatric burrhole deflector
  (14 mm)




M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX814T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

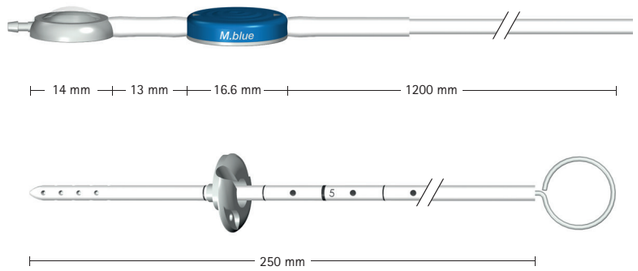
# M.blue®

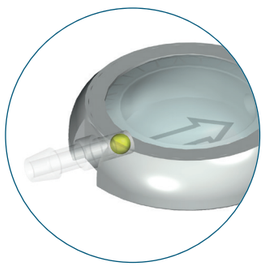
## SHUNT SYSTEM WITH PEDIATRIC CONTROL RESERVOIR

- 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)



*pediatric* CONTROL RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX815T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX816T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX817T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX818T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

## SHUNT SYSTEM WITH PEDIATRIC CONTROL RESERVOIR

MIETHKE

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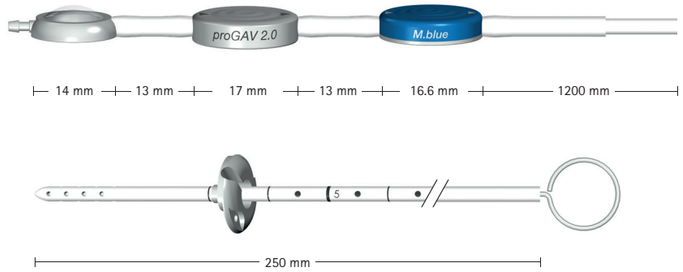
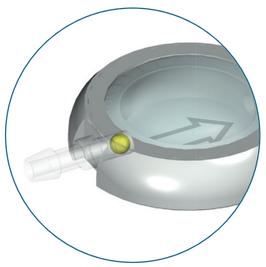
* An additional valve in the inlet of the pediatric CONTROL RESERVOIR makes it possible to pump cerebrospinal fluid in the direction of drainage only, allowing inspection of both the distal drainage section as well as the ventricular catheter.

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



*pediatric* CONTROL RESERVOIR*

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX819T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

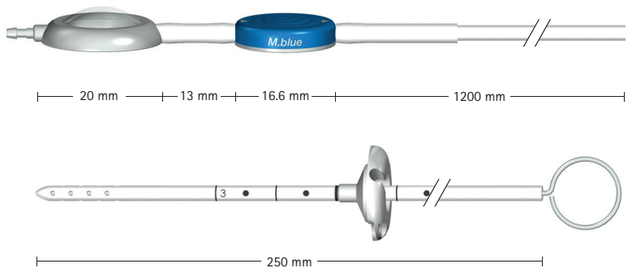
# M.blue®

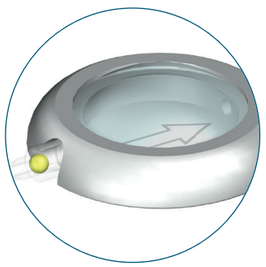
## SHUNT SYSTEM WITH CONTROL RESERVOIR

- 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)



CONTROL RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX820T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX821T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX822T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX823T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

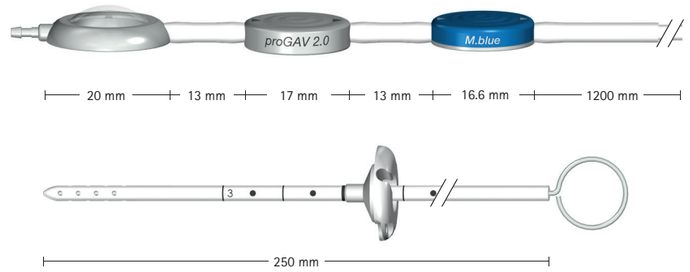
## SHUNT SYSTEM WITH CONTROL RESERVOIR

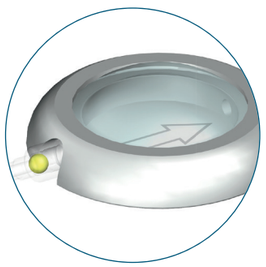
MIETHKE

- 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)



CONTROL RESERVOIR*

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX824T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

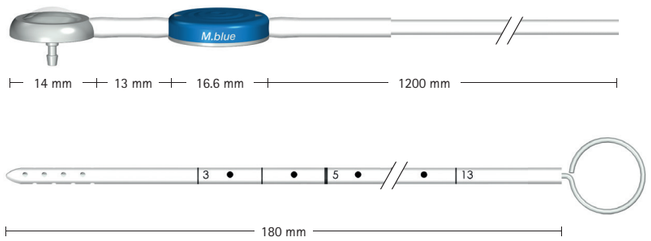
# M.blue®

## SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

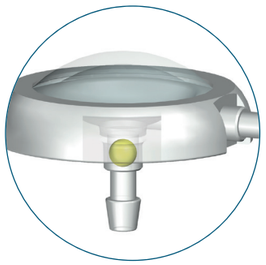
- M.blue® valve
  with integrated pediatric
  SPRUNG RESERVOIR
  and distal catheter

* 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



*pediatric* SPRUNG RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX825T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX826T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX827T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX828T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

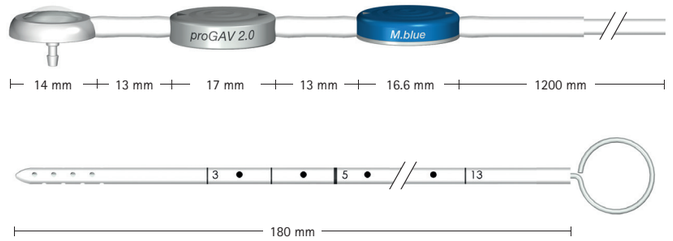
## SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

MIETHKE

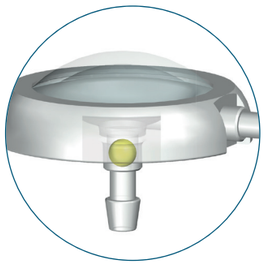
- M.blue plus® valve
  with integrated pediatric
  SPRUNG RESERVOIR
  and distal catheter

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

- Ventricular catheter
  with introducing stylet




OCCIPITAL ONLY



*pediatric* SPRUNG RESERVOIR*

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX829T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

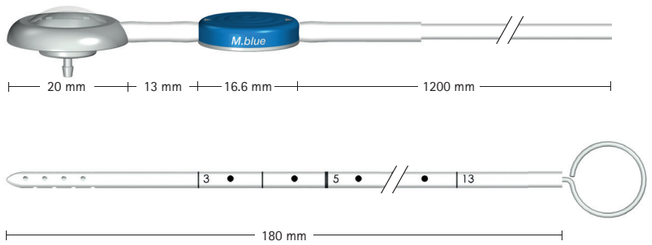
# M.blue®

## 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

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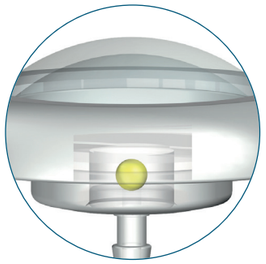


SPRUNG RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX830T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX831T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX832T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX833T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

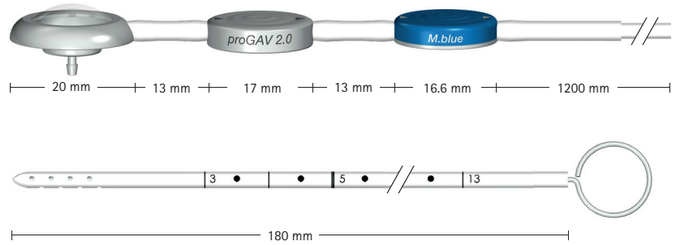
## SHUNT SYSTEM WITH SPRUNG RESERVOIR

MIETHKE

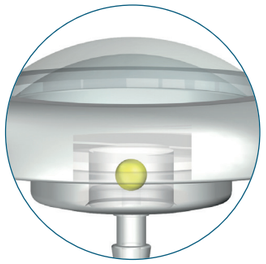
- M.blue plus® valve with integrated SPRUNG RESERVOIR and distal catheter

* 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




## OCCIPITAL ONLY



SPRUNG RESERVOIR*

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX834T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

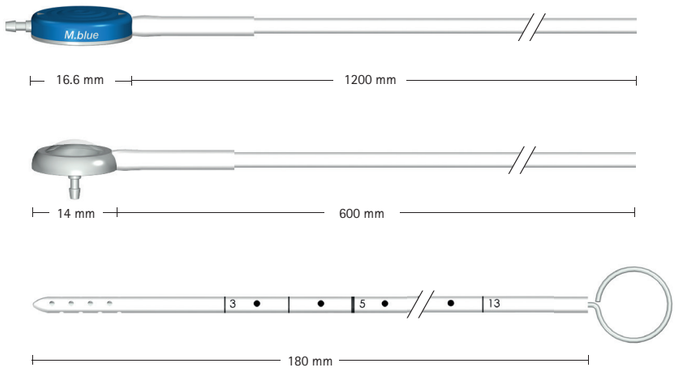
# M.blue®

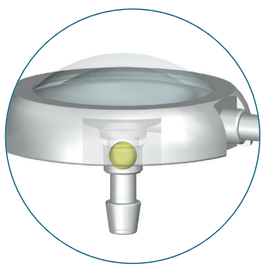
## SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

- 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



*pediatric* SPRUNG RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX835T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX836T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX837T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX838T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

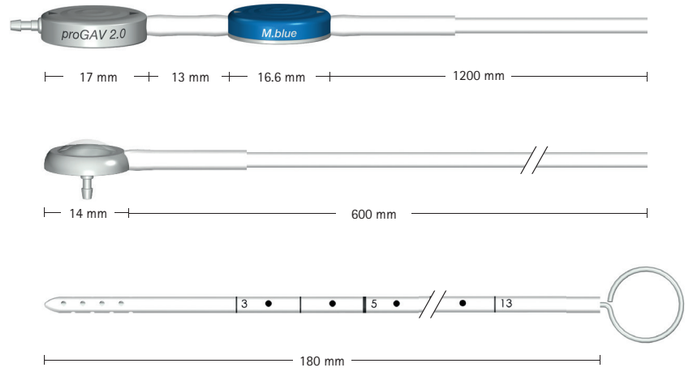
## SHUNT SYSTEM WITH PEDIATRIC SPRUNG RESERVOIR

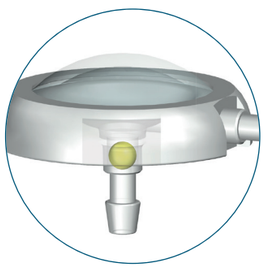
MIETHKE

- 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



*pediatric* SPRUNG RESERVOIR*

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX839T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

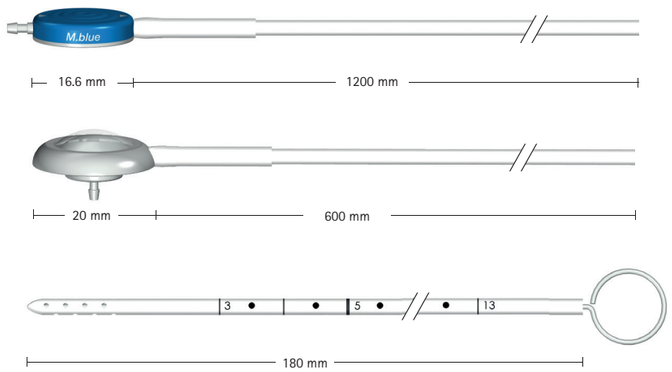
# M.blue®

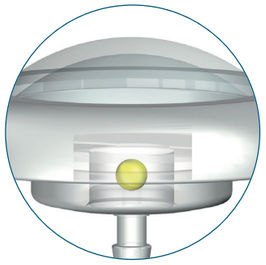
## SHUNT SYSTEM WITH SPRUNG RESERVOIR

- 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



SPRUNG RESERVOIR*

M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX840T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX841T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX842T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX843T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |



# M.blue plus®

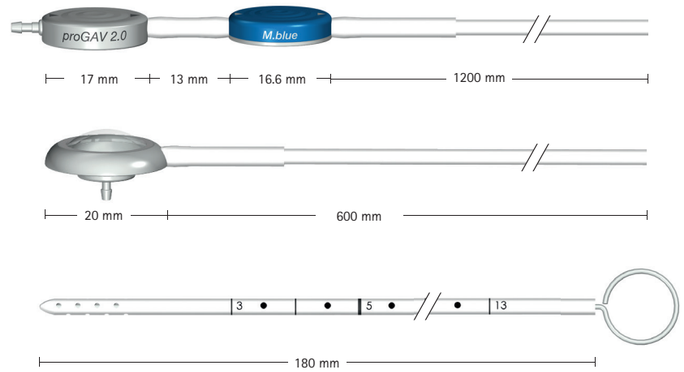
## SHUNT SYSTEM WITH SPRUNG RESERVOIR

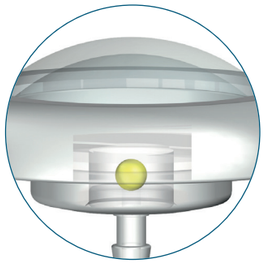
MIETHKE

- 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



SPRUNG RESERVOIR*

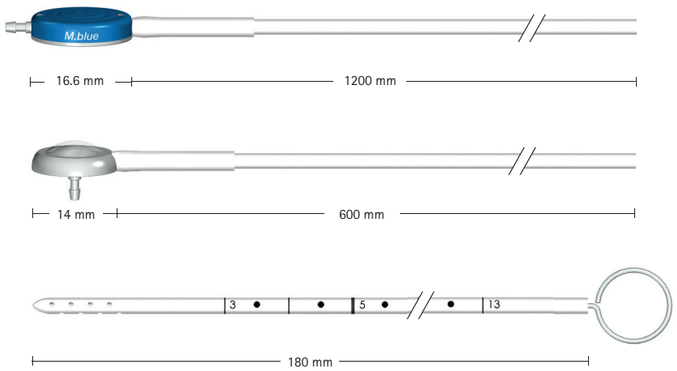
M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX844T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

# M.blue®

## SHUNT SYSTEM WITH PEDIATRIC BURRHOLE RESERVOIR

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




M.blue®

| Art. no. | Differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX845T | 0 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX846T | 5 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX847T | 10 $cmH_2O$ | 0 - 40 $cmH_2O$ |
| FX848T | 15 $cmH_2O$ | 0 - 40 $cmH_2O$ |

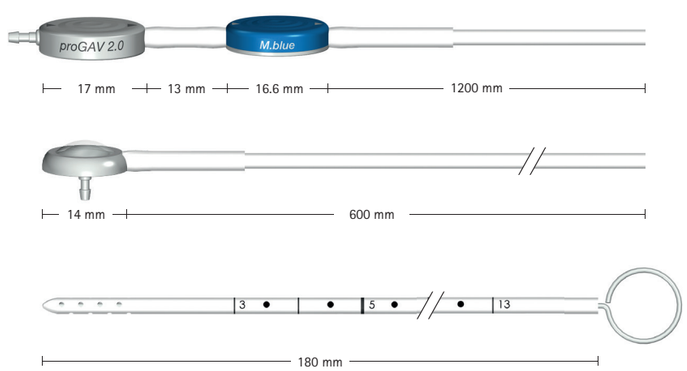


# M.blue plus®

## SHUNT SYSTEM WITH PEDIATRIC BURRHOLE RESERVOIR

MIETHKE

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



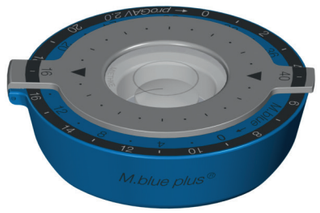

M.blue plus®

| Art. no. | Adj. differential pressure unit | Adjustable gravitational unit |
|---|---|---|
| FX849T | 0 - 20 $cmH_2O$ | 0 - 40 $cmH_2O$ |

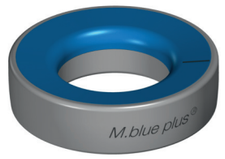
# M.blue plus® INSTRUMENTS

## 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




M.blue plus® compass




M.blue plus® adjustment ring

M.blue plus® adjustment assistant

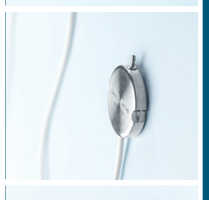
M.blue® adjustment check-mate

| Art. no. | Instruments |
|---|---|
| FX890T | M.blue plus® instrument set (includes FX891T and FX892T) |
| FX891T | M.blue plus® compass |
| FX892T | M.blue plus® adjustment ring |
| FX893T | M.blue plus® adjustment assistant |
| FX894T | M.blue® adjustment check-mate |



MIETHKE

## OUR PRODUCTS – YOUR SELECTION

| | | M.blue® | proGAV® 2.0 | GAV® 2.0 | SHUNTASSISTANT® 2.0 | DUALSWITCH VALVE | miniNAV® | Accessories |
|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  |  |  |  |
| **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** | | | | | | | | |
| | LP | | | ✓ | ✓ | ✓ | | |
| | NPH | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Ped. HC | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | Adult HC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Patient** | | | | | | | | |
| | Bed ridden | ✓ | | | ✓ | | ✓ | ✓ |
| | Active | ✓ | ✓ | ✓ | ✓ | ✓ | * | |
| **Characteristic** | | | | | | | | |
| | 3-Tesla MR Conditional | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Gravitational unit | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| | Adjustable | ✓ | ✓ | ✓ | ✓ | ✓ | | |

* in conjunction with SHUNTASSISTANT® 2.0 or proSA®

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