



CHRISTOPH MIETHKE GMBH & Co. KG

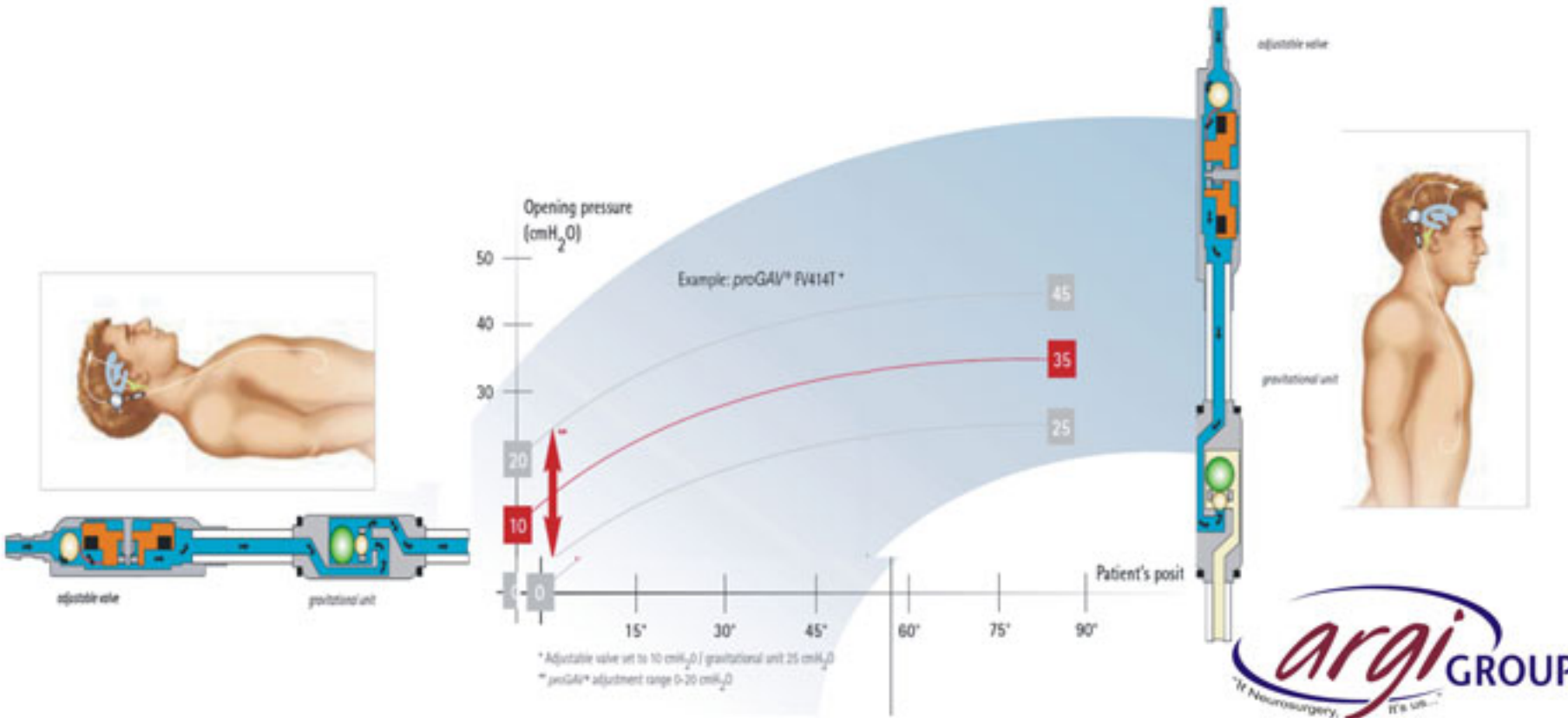
Neurosurgical Implants for the Treatment of Hydrocephalus from Berlin

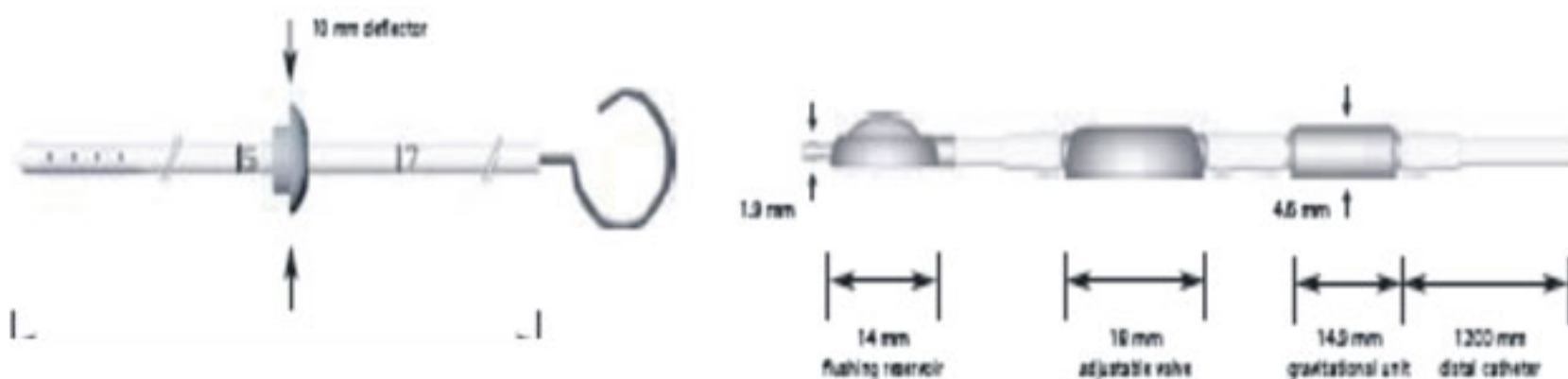
Germany



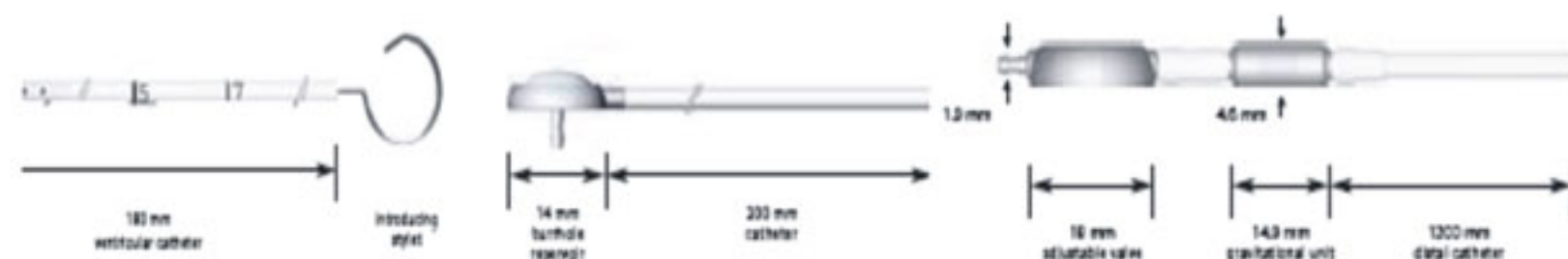
proGAV<sup>®</sup>

3 Tesla MRI Uyumlu 21 Basınç Aralıklı Kilit Mekanizmalı GRAVİTASYONLU PROGRAMLANIR SHUNT SİSTEMİ





Art. no.	Adjustable valve (cmH <sub>2</sub> O*)	Gravitational unit (cmH <sub>2</sub> O*)
FV438T	0 to 20	-
FV439T	0 to 20	10
FV440T	0 to 20	15
<b>FV441T **</b>	<b>0 to 20</b>	<b>20</b>
FV442T	0 to 20	25
FV443T	0 to 20	30
FV444T	0 to 20	35



Art. no.	Adjustable valve (cmH <sub>2</sub> O*)	Gravitational unit (cmH <sub>2</sub> O*)
FV445T	0 to 20	-
FV446T	0 to 20	10
FV447T	0 to 20	15
<b>FV448T **</b>	<b>0 to 20</b>	<b>20</b>
FV449T	0 to 20	25
FV450T	0 to 20	30
FV451T	0 to 20	35



Recommendation of pressure levels



Adjustable unit		Gravitational unit	
Standard (children and NPH-patients)	5 cmH <sub>2</sub> O	Children up to 5 years	20 cmH <sub>2</sub> O
Defensive (e.g. patients with extremely wide ventricles and highly elevated ICP or aqueductal stenosis)	10 cmH <sub>2</sub> O	Children over 5 years and adults up to 60 years	25 cmH <sub>2</sub> O
Special (e.g. patients with pseudotumor cerebri)	15 cmH <sub>2</sub> O	adults over 60 years	20 cmH <sub>2</sub> O

height in cm    Body-Mass-Index (BMI)    weight in kg

extremely adipose

adipose level I level II

overweight

normal

underweight

$BMI = \frac{kg}{m^2}$

Draw a line between height on left side and weight on right side. In the middle you can read the individual's BMI.

**Overweight**

The peritoneal pressure inhibits drainage. Therefore the gravitational unit should consider the following adjustments concerning adipose patients as a function of body-mass-index (BMI):

- 25-29 BMI    - 5 cmH<sub>2</sub>O below standard recommendation
- 30-34 BMI    -10 cmH<sub>2</sub>O below standard recommendation
- 35-39 BMI    -15 cmH<sub>2</sub>O below standard recommendation
- >40 BMI    only apply the adjustable unit (no gravitational unit necessary)

**Mobility**

Standard pressure levels are suitable for active people. Not very mobile patients should be treated with a maximum pressure of 20 cmH<sub>2</sub>O in the gravitational unit.

**Height**

The hydrostatic suction effect normally depends on the height. Therefore we recommend the following corrections for the gravitational unit:

- < 1,80m height:    - 5 cmH<sub>2</sub>O below standard recommendation
- > 1,80m height:    +5 cmH<sub>2</sub>O above standard recommendation

**Control**

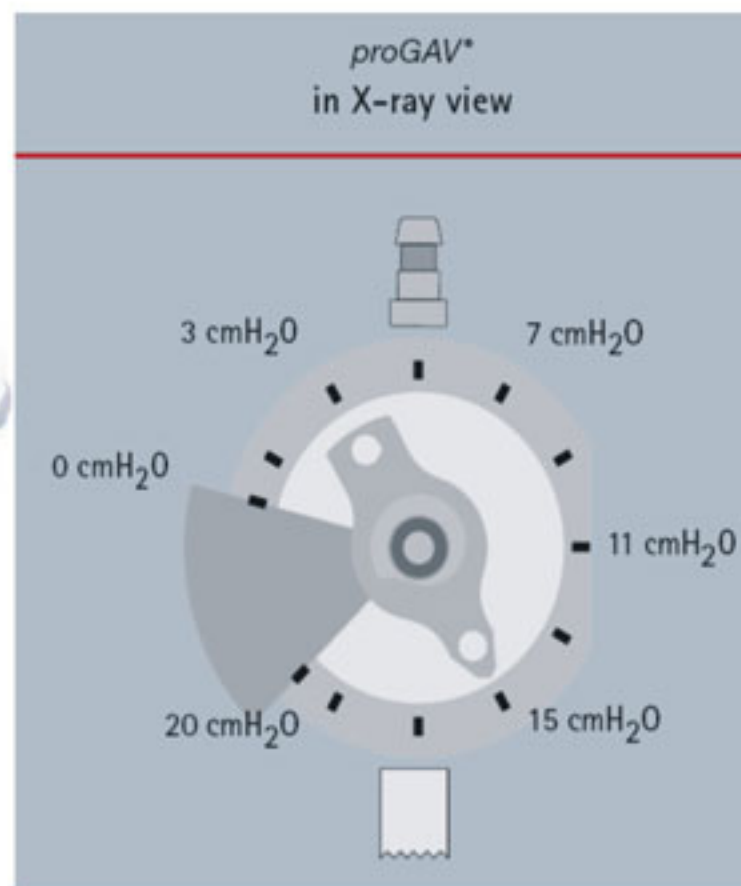
The adjustable unit is adjusted to 5 cmH<sub>2</sub>O by the manufacturer. Please control the pressure setting before use.

**Body position**

Only the adjustable unit determines the pressure level in the horizontal body position. The analogous pressure level for the vertical body position results from the addition of both - adjustable and gravitational unit.

**Adjustment**

Changing the adjustable unit also influences the opening pressure level in the vertical body position.



Adjustment instrument:



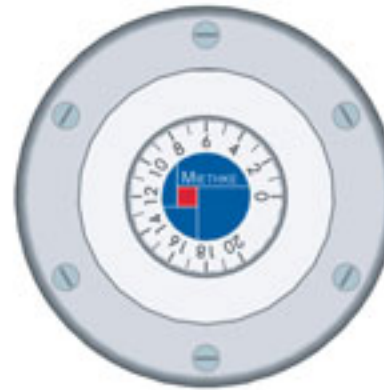
Verification instrument:



Masterdisc



Compass :



### Instruments for valve adjustment

- proGAV® adjustment instrument for setting the required opening pressure
- proGAV® verification instrument for reading the actual opening pressure setting
- proGAV® masterdisc for calibrating the verification instrument
- Compass for locating the proGAV®

Art. no.	Instruments
FV400T	proGAV® adjustment instrument
FV401T	proGAV® verification instrument
FV402T	proGAV® masterdisc
FV403T	proGAV® compass
FV404T	proGAV® instrument set (comprising FV400T-FV403T)





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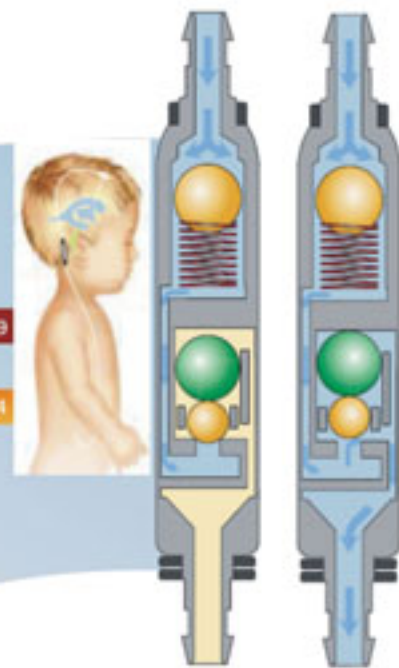
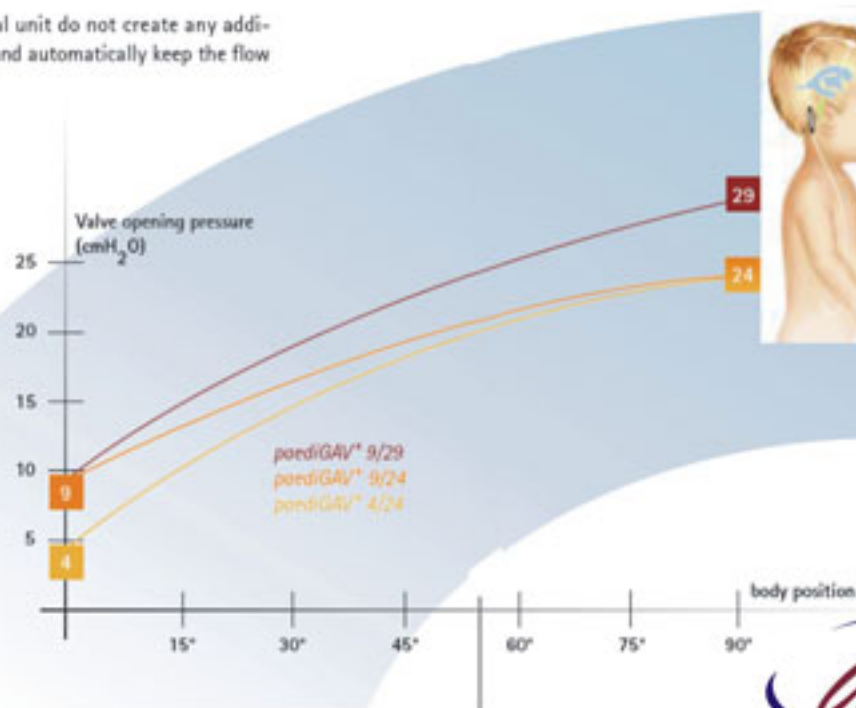
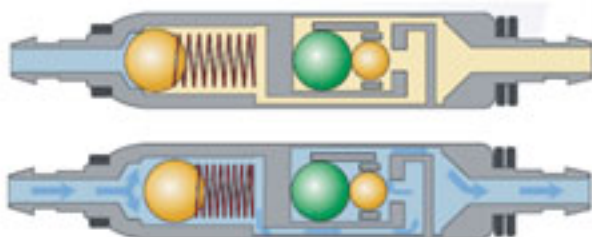
Germany

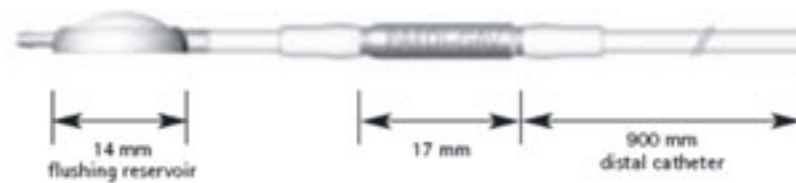
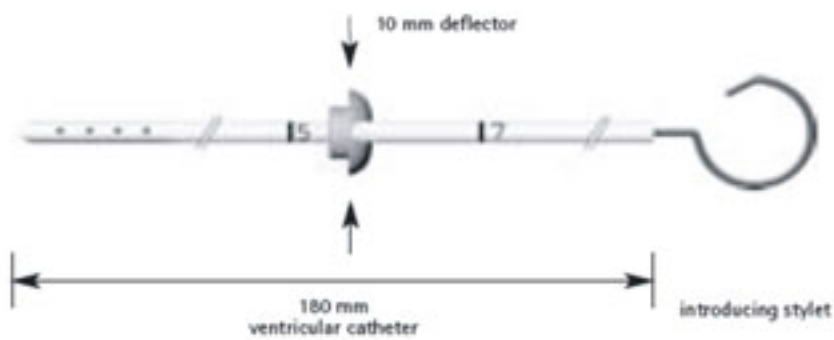


## PAEDI-GAV<sup>®</sup>

### PEDIATRİK ULTRA SMALL GRAVİTASYONLU SHUNT SİSTEMİ

iGAV<sup>®</sup> is in a horizontal position.  
 I-in-cone unit keeps the child's intraven-  
 tal limits.  
 ivitational unit do not create any addi-  
 supine, and automatically keep the flow



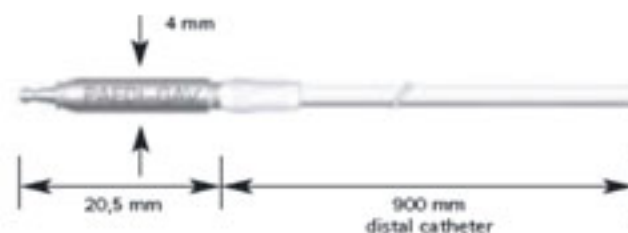
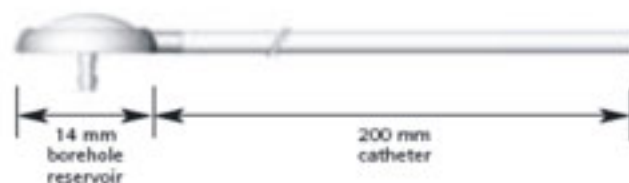
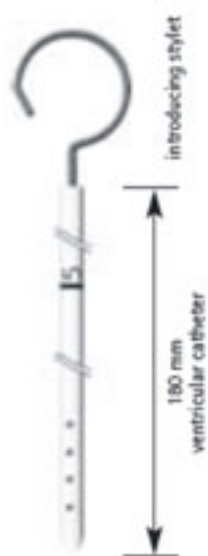


Valve pressure level (cmH<sub>2</sub>O\*)

Scale			
FV 302 T		4	14
FV 303 T		4	19
<b>FV 304 T</b>	<b>up to 6 months**</b>	<b>4</b>	<b>24</b>
FV 305 T		9	19
<b>FV 306 T</b>	<b>6 months – 5 years**</b>	<b>9</b>	<b>24</b>
<b>FV 307 T</b>	<b>over 5 years**</b>	<b>9</b>	<b>29</b>

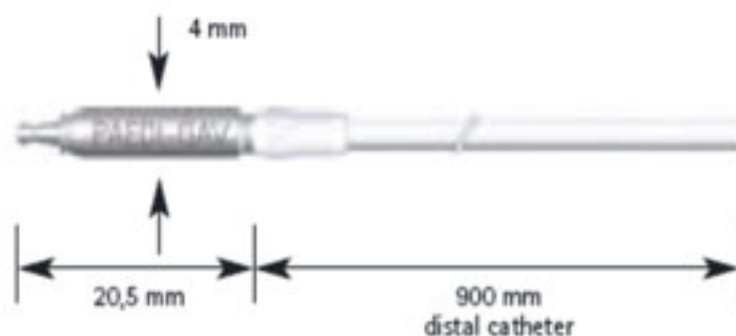
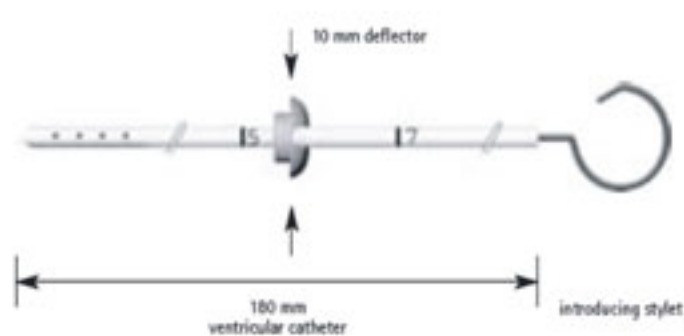
\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history



\* 1 cmH<sub>2</sub>O = 0,74 mmHg



Valve pressure level (cmH<sub>2</sub>O\*)

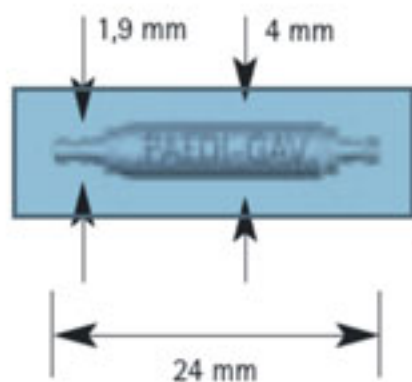
Cat. no.			
FV 296 T		4	14
FV 297 T		4	19
<b>FV 298 T</b>	<b>up to 6 months**</b>	<b>4</b>	<b>24</b>
FV 299 T		9	19
<b>FV 300 T</b>	<b>6 months – 5 years**</b>	<b>9</b>	<b>24</b>
<b>FV 301 T</b>	<b>over 5 years**</b>	<b>9</b>	<b>29</b>





Cat. no.	Valve pressure level (cmH <sub>2</sub> O*)	
		
FV 276 T	4	14
FV 277 T	4	19
<b>FV 278 T</b>	<b>4</b>	<b>24</b>
	up to 6 months**	
FV 279 T	9	19
<b>FV 280 T</b>	<b>9</b>	<b>24</b>
	6 months – 5 years**	
<b>FV 281 T</b>	<b>9</b>	<b>29</b>
	over 5 years**	

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg



Cat. no.	Valve pressure level (cmH <sub>2</sub> O*)	
		
FV 290 T	4	14
FV 291 T	4	19
<b>FV 292 T</b>	<b>4</b>	<b>24</b>
	up to 6 months**	
FV 293 T	9	19
<b>FV 294 T</b>	<b>9</b>	<b>24</b>
	6 months – 5 years**	
<b>FV 295 T</b>	<b>9</b>	<b>29</b>
	over 5 years**	

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg




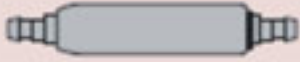
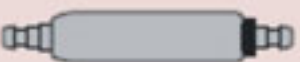
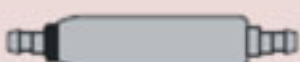
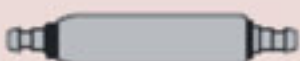
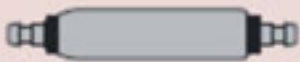
Our recommendation:\*\*

Age	Standard valve
up to 6 months	4 / 24 cmH <sub>2</sub> O
6 months – 5 years	9 / 24 cmH <sub>2</sub> O
over 5 years	9 / 29 cmH <sub>2</sub> O

\*\* Recommended settings only; may vary according to patient and medical history.

Your choice:

The *paediGAV*\* is available in different pressure level settings. Each pressure level is specially coded, enabling the valve to be identified on post-operative x-rays.

Opening pressure horizontal/vertical (cmH <sub>2</sub> O)	<i>paediGAV</i> * coding on x-ray
4 / 14	
4 / 19	
4 / 24	
9 / 19	
9 / 24	
9 / 29	





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Germany



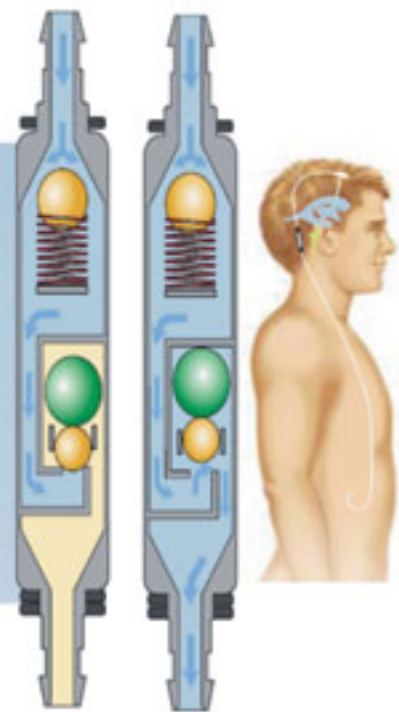
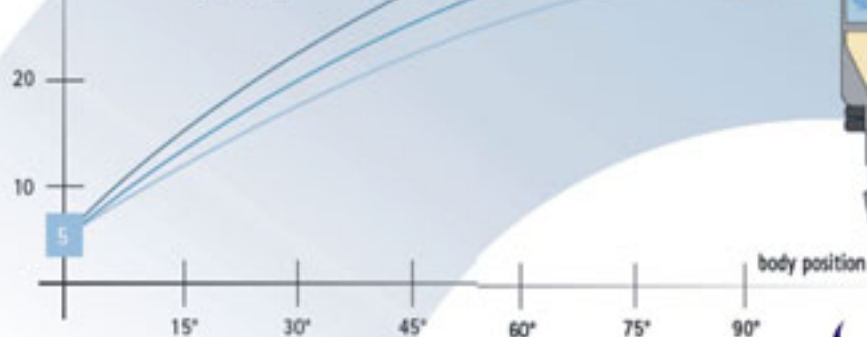
## GAV<sup>®</sup>

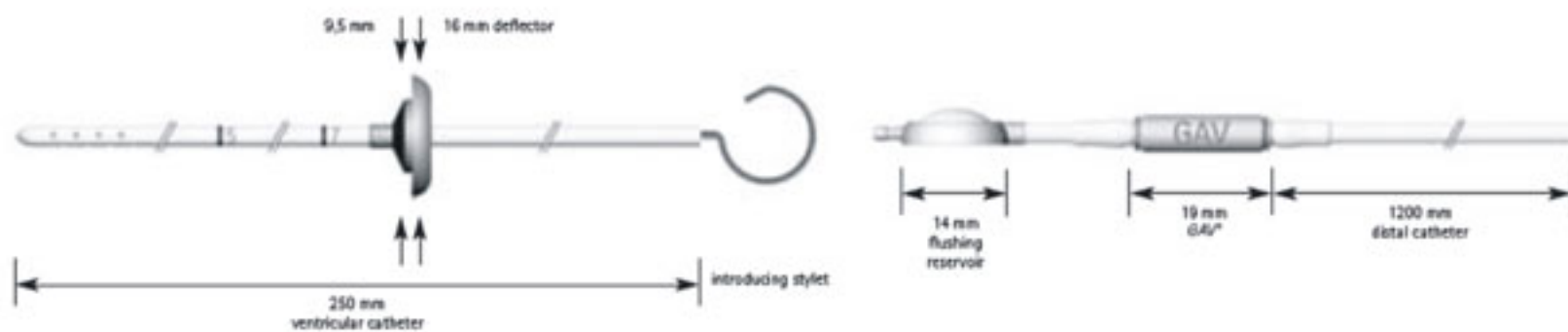
### ERİŞKİN GRAVİTASYONLU SHUNT SİSTEMİ




Valve opening pressure (cmH<sub>2</sub>O)

GAV<sup>®</sup> 5/40  
GAV<sup>®</sup> 5/35  
GAV<sup>®</sup> 5/30



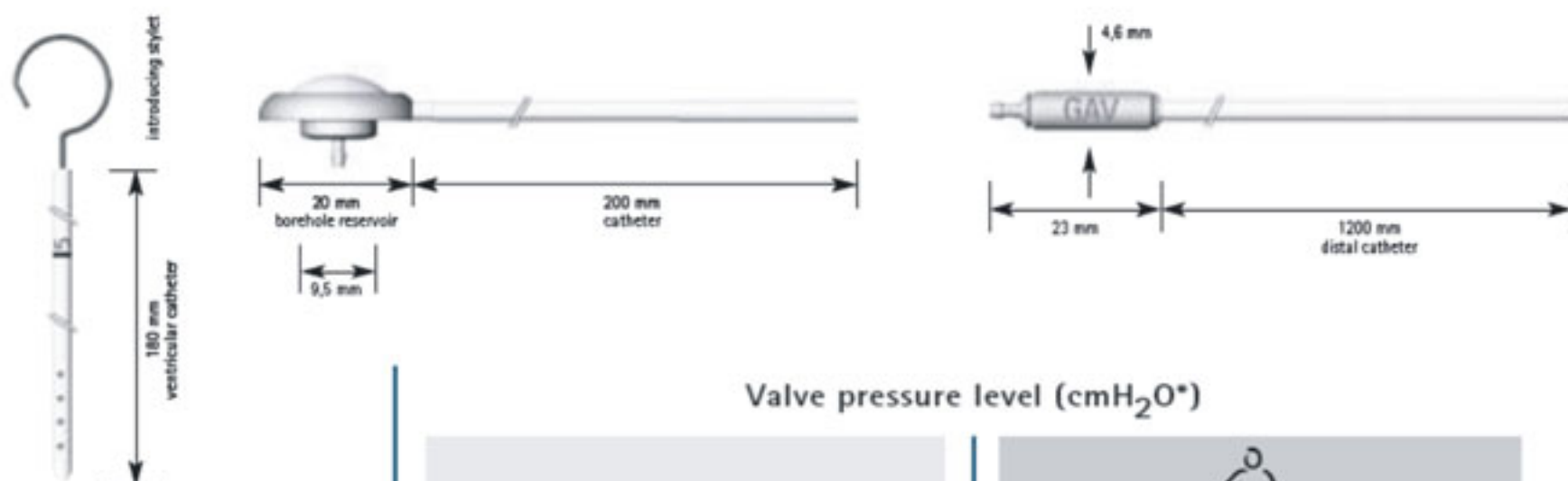


Valve pressure level (cmH<sub>2</sub>O\*)



Cat. no.			
FV 340 T	up to 160 cm**	5	30
FV 341 T	160 – 180 cm**	5	35
FV 342 T	over 180 cm**	5	40
FV 343 T		10	30
FV 344 T		10	40
FV 345 T		10	50

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg

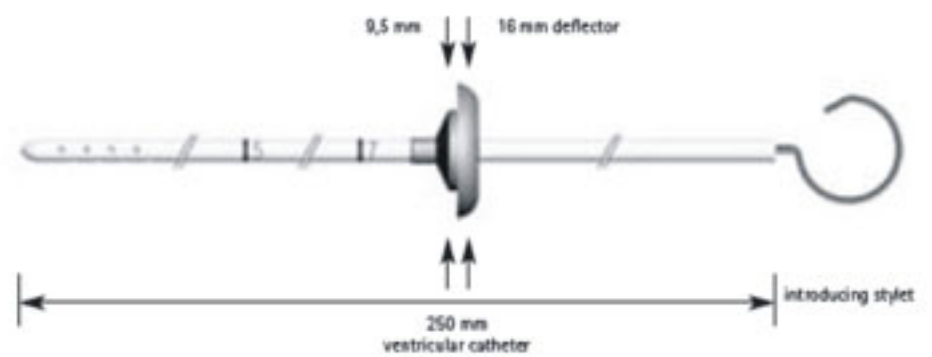
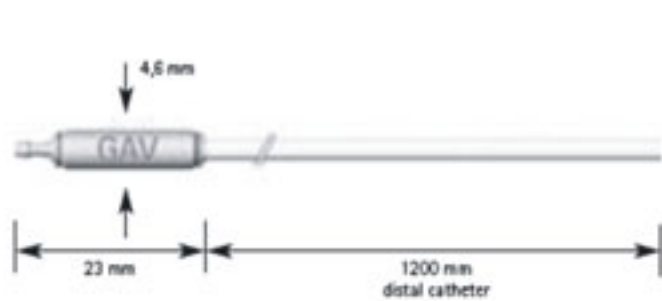




Valve pressure level (cmH<sub>2</sub>O\*)

Cat. no.			
FV 334 T	up to 160 cm**	5	30
FV 335 T	160 – 180 cm**	5	35
FV 336 T	over 180 cm**	5	40
FV 337 T		10	30
FV 338 T		10	40
FV 339 T		10	50

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg





Cat. no.	Valve pressure level (cmH <sub>2</sub> O*)		
			
FV 322 T	up to 160 cm**	5	30
FV 323 T	160 - 180 cm**	5	35
FV 324 T	over 180 cm**	5	40
FV 325 T		10	30
FV 326 T		10	40
FV 327 T		10	50

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg




Cat. no.	Valve pressure level (cmH <sub>2</sub> O*)		
			
FV 310 T	up to 160 cm**	5	30
FV 311 T	160 - 180 cm**	5	35
FV 312 T	over 180 cm**	5	40
FV 313 T		10	30
FV 314 T		10	40
FV 315 T		10	50

\*\*Standard pressure levels recommended levels only; may vary according to patient and medical history

\* 1 cmH<sub>2</sub>O = 0,74 mmHg



## GAV - GRAVITY ASSISTED VALVE



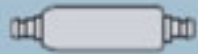
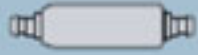
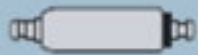



Age	Grade of activity	Height	Figure	Recommended pressure setting in cmH <sub>2</sub> O
over 60 years old	mobile	less than 1,60 m	adipose	4/24 paed/GAV
			slim	5/30
	over 1,60 m	adipose	5/30	
		slim	5/35	
	immobile	less than 1,60 m	adipose	4/24 paed/GAV
			slim	
over 1,60 m		adipose	4/24 paed/GAV	
		slim	5/30	
up to 60 years old	mobile	less than 1,60 m	adipose	4/24 paed/GAV
			slim	5/30
		1,60 m - 1,80 m	adipose	5/30
			slim	5/35
	over 1,80 m	adipose	5/30	
		slim	5/40	
	immobile	less than 1,60 m	adipose	4/24 paed/GAV
			slim	5/30
		over 1,60 m	adipose	4/24 paed/GAV
			slim	5/30

Our recommendation:\*\*

Height of patient	Standard valve
up to 160 cm	5 / 30 cmH <sub>2</sub> O
160 - 180 cm	5 / 35 cmH <sub>2</sub> O
over 180 cm	5 / 40 cmH <sub>2</sub> O

Your choice:

GAV\* is available in different pressure level settings. Each pressure level is specially coded, enabling the valve to be identified on post-operative x-rays.

Opening pressure horizontal/vertical (cmH <sub>2</sub> O)	coding GAV* on x-ray
5 / 30	
5 / 35	
5 / 40	
10 / 30	
10 / 40	
10 / 50	

\*\* Recommended settings only; may vary according to patient and medical history.



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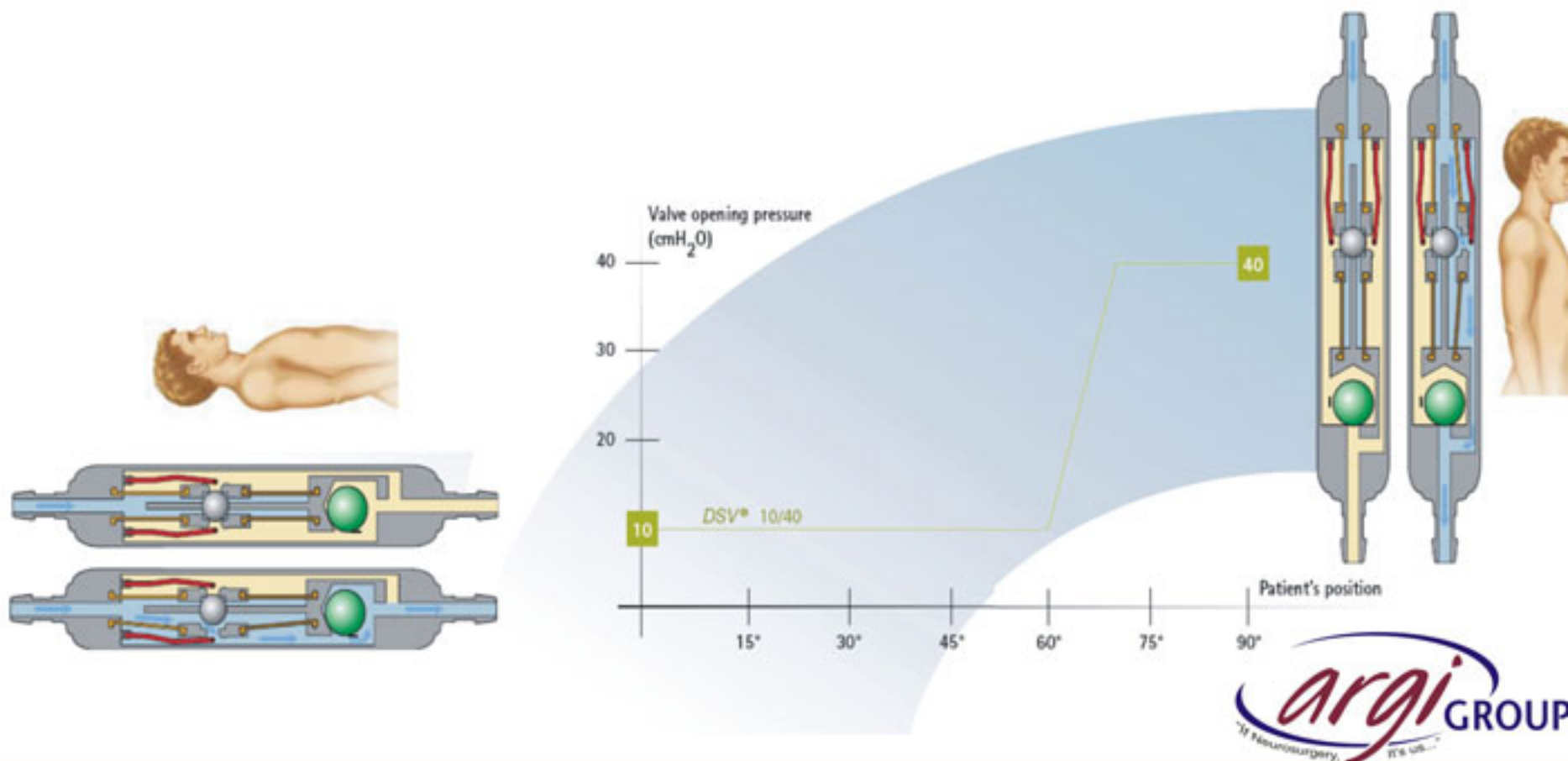
Neurosurgical Implants for the Treatment of Hydrocephalus from Berlin

Germany

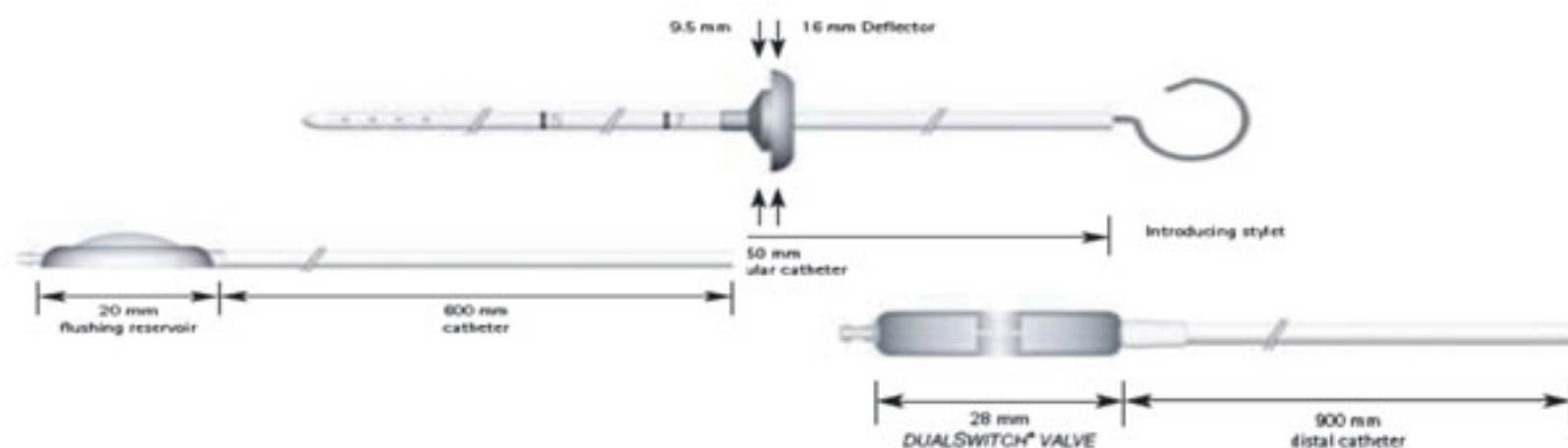


## Dual Switch Valve®

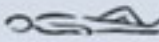

Yüksek Protein Konsantrasyonlarında Etkili Gravitasyonel Ventriküloperitoneal ve Lumboperitoneal Shunt Sistemleri



## DUALSWITCH-SHUNTSYSTEM with VP Flushing Reservoir



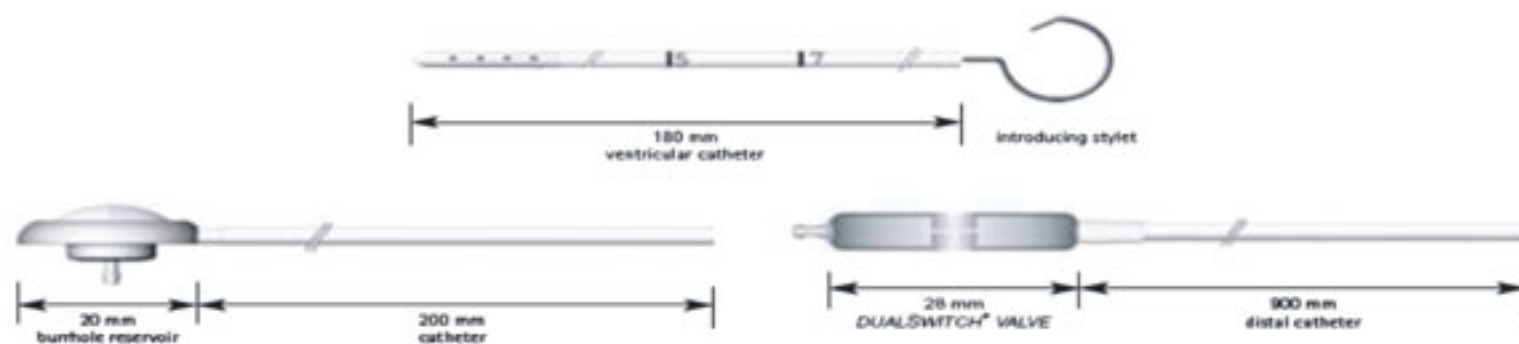
Valve pressure level (cmH<sub>2</sub>O\*)

Art. no.			
FV379T		5	30
FV380T		5	40
FV381T		5	50
FV172T	up to 160 cm**	10	30
FV173T	160 – 180 cm**	10	40
FV174T	above 180 cm**	10	50
FV175T		13	30
FV176T		13	40
FV177T		13	50



\*\*Standard pressure levels. These guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.

\* 1 cmH<sub>2</sub>O = 0.74 mmHg

## DUALSWITCH-SHUNTSYSTEM with VP Borehoie Reservoir



Valve pressure level (cmH<sub>2</sub>O\*)

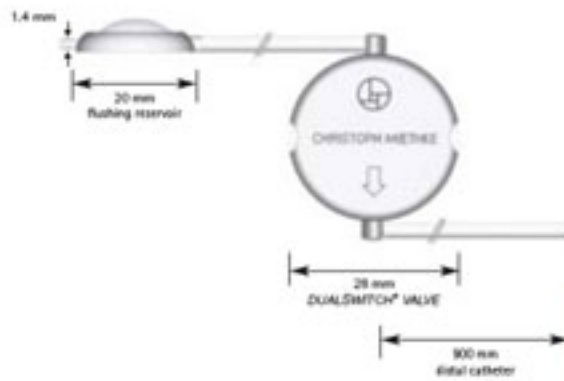
Art. no.			
FV376T		5	30
FV377T		5	40
FV378T		5	50
FV145T	up to 160 cm**	10	30
FV146T	160 – 180 cm**	10	40
FV147T	above 180 cm**	10	50
FV148T		13	30
FV149T		13	40
FV150T		13	50

\*\*Standard pressure levels. These guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.



\* 1 cmH<sub>2</sub>O = 0.74 mmHg



## DUALSWITCH-SHUNTSYSTEM for L-P-Derivation



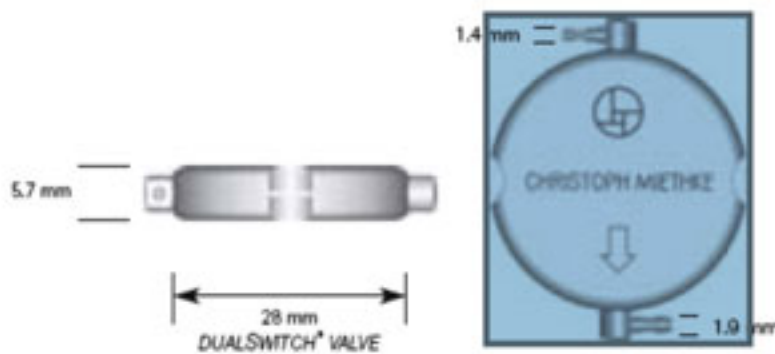
Valve pressure level (cmH<sub>2</sub>O\*)

			
FV382T		5	30
FV383T		5	40
FV384T		5	50
FV163T	up to 160 cm**	10	30
FV164T	160 - 180 cm**	10	40
FV165T	above 180 cm**	10	50
FV166T		13	30
FV167T		13	40
FV168T		13	50



\*\*Standard pressure levels. These guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.

\* 1 cmH<sub>2</sub>O = 0.74 mmHg

## DUALSWITCH® VALVE for L-P drainage



Valve pressure level (cmH<sub>2</sub>O\*)

Art. no.			
FV373T		5	30
FV374T		5	40
FV375T		5	50
FV127T	up to 160 cm**	10	30
FV128T	160 - 180 cm**	10	40
FV129T	above 180 cm**	10	50
FV130T		13	30
FV131T		13	40
FV132T		13	50

\*\*Standard pressure levels. These guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.

\* 1 cmH<sub>2</sub>O = 0.74 mmHg

**Our recommendation:\*\***










Patient's height	Standard valve	NPH valve
up to 160 cm	10 / 30 cmH <sub>2</sub> O	5 / 30 cmH <sub>2</sub> O
160 - 180 cm	10 / 40 cmH <sub>2</sub> O	5 / 40 cmH <sub>2</sub> O
above 180 cm	10 / 50 cmH <sub>2</sub> O	5 / 50 cmH <sub>2</sub> O

\*\* These guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.

- We recommend implanting the *DUALSWITCH*<sup>®</sup> VALVE in the thoracic region. The implantation height of the implant does not affect its functionality in any way.

**Your choice:**

The *DUALSWITCH*<sup>®</sup> VALVE is available with various pressure levels. Each pressure level is identified by a special marker code, which can be read through postoperative radiography.

Opening pressure horizontal/vertical (cmH <sub>2</sub> O)	<i>DUALSWITCH</i> <sup>®</sup> -VALVE X-ray marker code	Opening pressure horizontal/vertical (cmH <sub>2</sub> O)	<i>DUALSWITCH</i> <sup>®</sup> -VALVE X-ray marker code
5 / 30		10 / 50	
5 / 40		13 / 30	
5 / 50		13 / 40	
10 / 30		13 / 50	
10 / 40			



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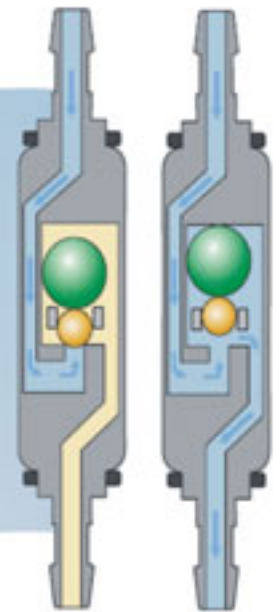
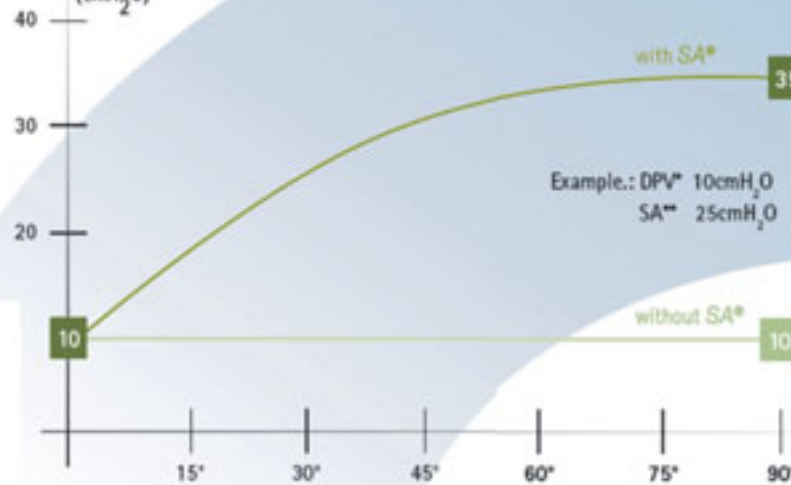
## SHUNTASISTANT®

Overdrenajın önlenmesinde antisifon sistemi

ure valve keeps the patient's intraventricular pressure limits.



Valve opening pressure (cmH<sub>2</sub>O)



\* Differential Pressure Valve  
\*\* SHUNTASISTANT®





# SHUNTASSISTANT®

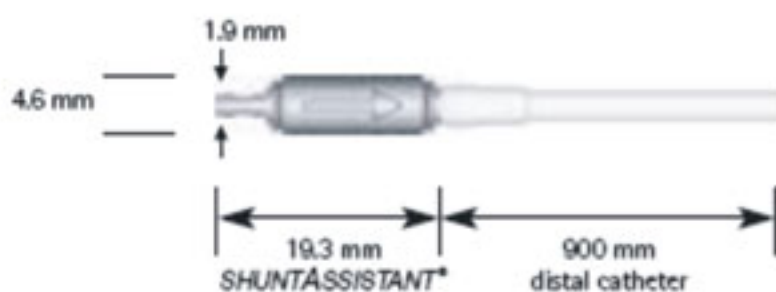


Opening pressure (cmH<sub>2</sub>O\*)

Art. no.	Opening pressure (cmH <sub>2</sub> O*)
FV250T	15
FV251T	20
FV252T	25
FV253T	30
FV254T	35

\* 1 cmH<sub>2</sub>O = 0.74 mmHg

# SHUNTASSISTANT & PERITONEAL CATHETER®



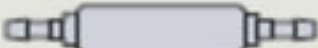
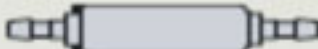
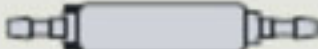
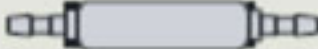
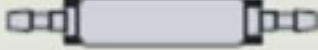
Opening pressure (cmH<sub>2</sub>O\*)

Art. no.	Opening pressure (cmH <sub>2</sub> O*)
FV260T	15
FV261T	20
FV262T	25
FV263T	30
FV264T	35

Distance between Foramen Monroi and diaphragm in cm	Opening pressure of the differential pressure valve in cmH <sub>2</sub> O				
	5	7	10	13	16
< 28	15	15	10	10	10
28 - 32	20	15	15	15	10
33 - 37	25	20	20	20	15
38 - 42	30	25	25	25	20
43 - 47	35	30	30	30	25
48 - 52	35	35	35	35	30
> 53	35	35	35	35	35

\*\* these guide values are not binding. Other specifications may be preferable for the individual patient and anamnesis.

Opening pressure (cmH <sub>2</sub> O)	X-ray marker code <i>PAEDI-SHUNTASSISTANT*</i>
10	

Opening pressure (cmH <sub>2</sub> O)	X-ray marker code <i>SHUNTASSISTANT*</i>
15	
20	
25	
30	
35	

## Horizontal position

In horizontal position the *SHUNTASSISTANT* doesn't have any influence on the opening pressure. Only the chosen valve (fix/constant or programmable) determines the opening pressure of the whole shunt system.

				<b>SHUNTASSISTANT</b>
opening pressure of the whole shunt system	=	opening pressure of the chosen valve	+	<b>0</b> cmH <sub>2</sub> O

## Vertical position

In vertical position the opening pressure of the complete shunt system is the sum of the opening pressure of the chosen valve and the opening pressure of the *SHUNTASSISTANT*.

In many cases this recommendation was useful:

<b>Recommendation:</b>		<b>SHUNTASSISTANT</b>	
opening pressure of the whole shunt system	=	opening pressure of the chosen valve	
		+	<b>children up to 5 years</b> <b>20</b> cmH <sub>2</sub> O
			<b>children over 5 years adults up to 60 years</b> <b>25</b> cmH <sub>2</sub> O
			<b>adults over 60 years</b> <b>20</b> cmH <sub>2</sub> O

### Mobility

Standard pressure levels are suitable for active people. Bedridden patients should be treated with a *SHUNTASSISTANT* of a maximum pressure of 20 cmH<sub>2</sub>O.

### Height

The hydrostatic suction effect normally depends on the height. Therefore we recommend the following corrections for the choice of the *SHUNTASSISTANT*:

- < 1,60m height: - 5 cmH<sub>2</sub>O
- > 1,80m height: +5 cmH<sub>2</sub>O

### Overweight

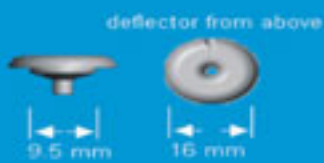
The peritoneal pressure inhibits drainage. Therefore the gravitational unit should consider the following adjustments concerning adipose patients as a function of body-mass-index (BMI):

- 25-29 BMI      - 5 cmH<sub>2</sub>O below standard recommendation
- 30-34 BMI      -10 cmH<sub>2</sub>O below standard recommendation
- 35-39 BMI      -15 cmH<sub>2</sub>O below standard recommendation
- >40 BMI        no *SHUNTASSISTANT* necessary





## ACCESSORY



**DEFLECTOR**



scale 1:1



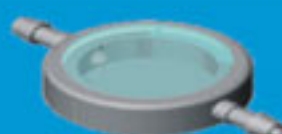
**DEFLECTOR for Pediatric Application**



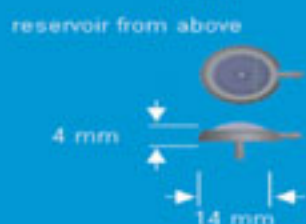
**TITANIUMCONNECTOR Y-formed**



**TITANIUMCONNECTOR straight**



**FLUSHINGRESERVOIR for Pediatric Application**



**NEW DESIGN**

**BOREHOLERESERVOIR for Pediatric Application**

■ Ventricular catheter with deflector



d = 2.5 mm



Art. no.	Set
FV075P	<ul style="list-style-type: none"> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> <li>- Deflector, large</li> </ul>
FV078P	<ul style="list-style-type: none"> <li>- Ventricular catheter, 250 mm, with stylet, graduated</li> <li>- Deflector, large</li> </ul>



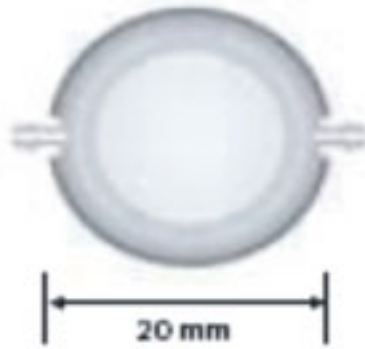
d = 1.2 mm



Art. no.	Set
FV076P	<ul style="list-style-type: none"> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> <li>- Deflector, small, for pediatric application</li> </ul>

■ Flushing reservoir

FV033T:



FV035T:



FV034T:



FV081T:



Art. no.	Flushing reservoir
FV033T	Large, 20 mm
FV035T	Small, 14mm, for pediatric application
FV034T	Large, 20 mm, with integrated catheter, 600 mm
FV081T	Small, 14 mm, with integrated catheter, 600 mm



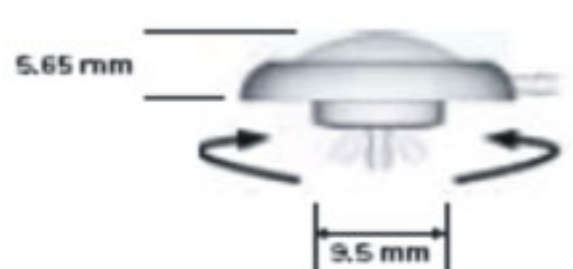
■ Burrhole reservoir



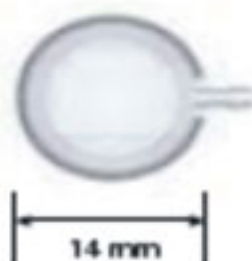
FV028T:



FV029T:



FV039T:



FV027T:



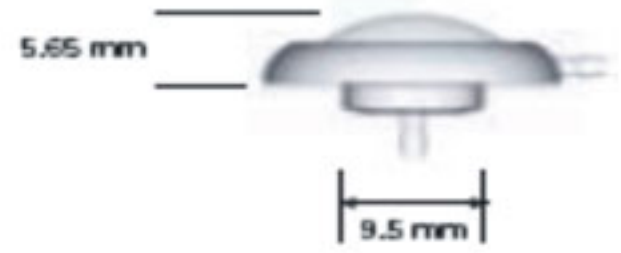
FV054T:



Art. no.	Burrhole reservoir
FV028T	Large, 20 mm
FV029T	ETOU, large, 20 mm, with adjustable connector
FV039T	Small, 14 mm, for pediatric application
FV027T	Large, 20mm, with integrated catheter, 600 mm
FV054T	Small, 14mm, with integrated catheter, 200 mm

■ Sprung reservoir

FV043T:



FV044T:



Art. no.

Sprung reservoir

FV043T

20 mm

FV044T

20mm, with integrated catheter, 600 mm

*Mechanism:*



■ Burrhole reservoir set

FV032T:



FV031T:



Art. no.	Set
FV032T	<ul style="list-style-type: none"> <li>- Burrhole reservoir, large, 20 mm</li> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> </ul>
FV031T	<ul style="list-style-type: none"> <li>- Burrhole reservoir, large, 20 mm, with catheter, 600 mm</li> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> </ul>

FV041T:



FV055T:

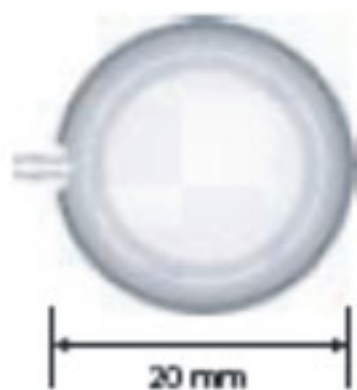


Art. no.	Set, for pediatric application
FV041T	<ul style="list-style-type: none"> <li>- Burrhole reservoir, small, 14mm</li> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> </ul>
FV055T	<ul style="list-style-type: none"> <li>- Burrhole reservoir, small, 14 mm, with catheter, 200 mm</li> <li>- Ventricular catheter, 180 mm, with stylet, graduated</li> </ul>



■ CSF port

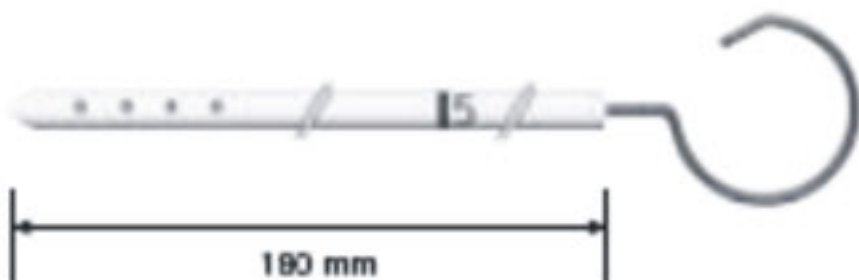
FV060T:



FV061T:



FV062T:



Art. no.	CSF port
FV060T	20 mm
FV061T	With integrated ventricular catheter, 85 mm
FV062T	Set incl. ventricular catheter, 180 mm, with stylet, graduated

■ Control reservoir



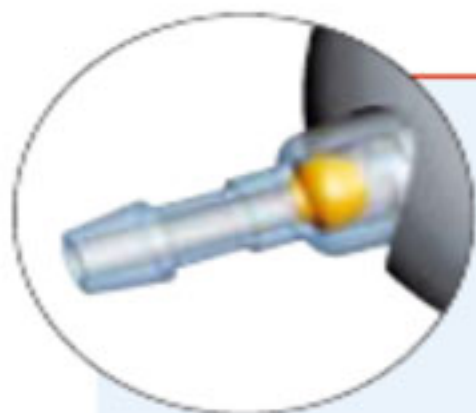
FV047T:



FV048T:




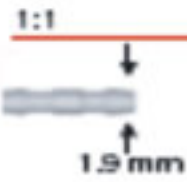



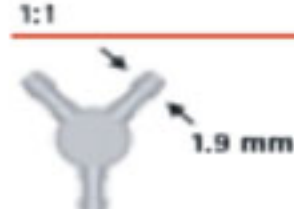

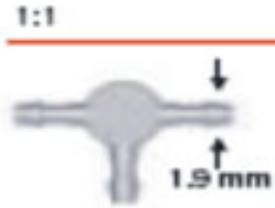

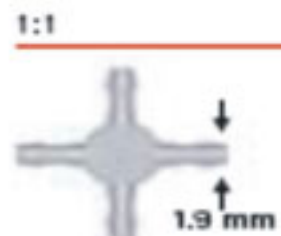
Art. no.	Control reservoir
FV047T	20 mm
FV048T	20mm, with integrated catheter, 600 mm



*Mechanism:*



■ Titanium connectors

		Art. no.	straight
		FV012T	1 pc.
		FV013T	5 pcs.
		Art. no.	L-shape
		FV051T	1 pc.
			
FV015T	1 pc.		
FV016T	5 pcs.		
		Art. no.	T-shape
		FV018T	1 pc.
		FV019T	5 pcs.
		Art. no.	X-Form
		FV021T	1 pc.
		FV022T	5 pcs.
		FV023T	10 pcs.



■ Tunneling instrument, reusable



Art. no.	Tunneling instrument, reusable
FV001R	curved

■ Single-use tunneling instrument



Art. no.	Single-use tunneling instrument, pack of ten instruments, each in individual sterile packaging
FV002R	300 mm, flexible
FV003R	450 mm, flexible
FV004R	600 mm, flexible