

# Angles of rotation

EN Technical information



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## 1 Optimised draining of valves

In specialist literature and documents from valve manufacturers and plant constructors the term "self-draining" is often used in conjunction with valves and plants or plant sections. This term is to describe the residue-free and independent emptying of vessels and pipes through an opened valve. This draining depends on various factors. Even a vertical pipeline with open ends does not guarantee complete and residue-free draining.

The terms "free/unhindered outlet" or "optimised draining" is more realistic.

Optimum drainability of a valve depends on several factors:

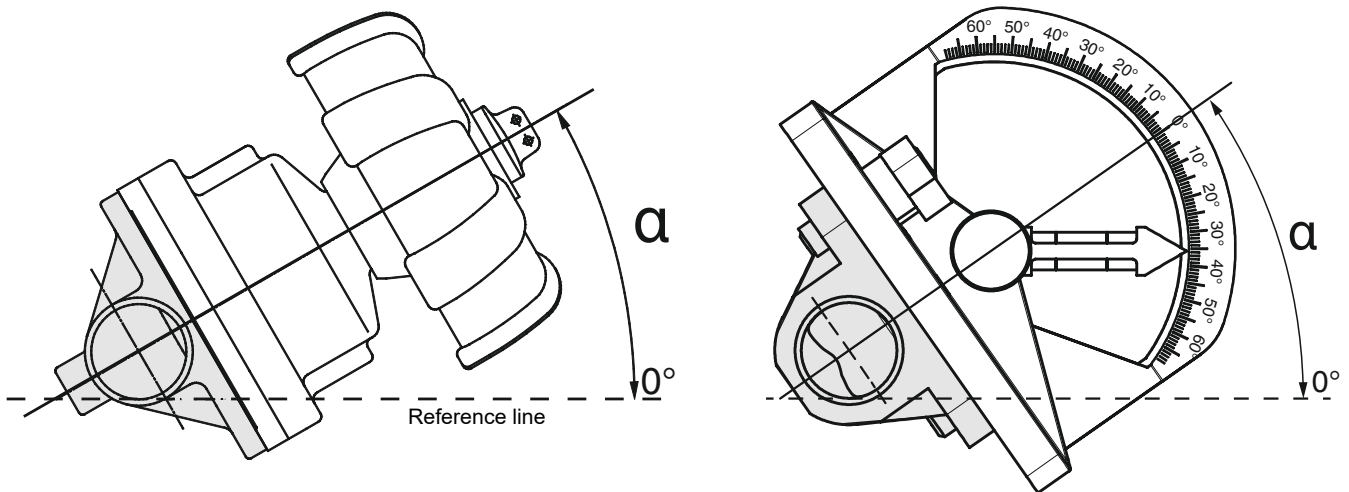
- Design of the internal geometry of the valve body
- Nominal pipe size
- Pipe standard (DIN, ISO, ASME BPE, etc.), as they have different inside diameters at the same nominal size
- Surface finish (topography, morphology and adhesive quality of the media wetted surfaces)
- Installation angle in the pipeline and valves with regard to horizontal rotation and angle of rotation of the valves
- Viscosity of medium

The angles of rotation given in the tables were calculated. Exact compliance is difficult to achieve when installing valves. A tolerance range of +/- 2° can be assumed as a rule of thumb for optimised emptying of the valves.

The residue-free drainability and emptying of a plant and its components is nevertheless the responsibility of the plant designer, constructor and operator and is essentially dependent on the design and layout of the plant.

## 2 Calculated angles of rotation for installation in horizontal pipelines

GEMÜ has calculated angles of rotation for the various nominal sizes and pipe standards in order to facilitate installation of valves for optimised draining. The angles of rotation  $\alpha$  mentioned are valid for installation in horizontal pipe systems. Please note the drawing. (Attention: Other manufacturers quote the angle using a horizontal weirplate from the vertical centreline downwards). Angle of rotation for block material bodies (e.g. made of special material) on request.



### 3 Angle of rotation tables

#### 3.1 Spigot DIN (connection code 0)

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
<b>8</b>	<b>4</b>	35	35
<b>10</b>	<b>15</b>	-	14
<b>25</b>	<b>15</b>	-	34
	<b>20</b>	-	30
	<b>25</b>	-	23
<b>40</b>	<b>32</b>	-	25
	<b>40</b>	-	20
<b>50</b>	<b>50</b>	-	19

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

#### 3.2 Spigot EN 10357 series B (connection code 16)

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
<b>8</b>	<b>10</b>	-	19
<b>10</b>	<b>10</b>	-	24
	<b>15</b>	-	12
<b>25</b>	<b>15</b>	-	33
	<b>20</b>	-	28
	<b>25</b>	-	21
<b>40</b>	<b>32</b>	-	25
	<b>40</b>	-	19
<b>50</b>	<b>50</b>	-	18

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.3 Spigot EN 10357 series A / DIN 11866 series A (connection code 17)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	30	30
	8	25	25
	10	19	19
10	10	28	24
	15	17	12
25	15	43	33
	20	34	28
	25	24	21
40	32	28	25
	40	21	19
50	50	21	18
80	65	-	18
	80	-	12
100	100	-	14

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.4 Spigot DIN 11850 series 3 (connection code 18)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	10	-	19
10	10	-	24
	15	-	12
25	15	-	33
	20	-	28
	25	-	21
40	32	-	25
	40	-	19
50	50	-	18

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.5 Spigot JIS-G 3459 Schedule 5s (connection code 32)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	-	24
	8	-	15
10	8	-	21
	10	-	14
	15	-	7
25	15	-	30
	20	-	24
	25	-	16
40	32	-	18
	40	-	13
50	50	-	13
80	65	-	16
	80	-	10
100	100	-	11

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.6 Spigot JIS-G 3447 (connection code 35)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
25	25	-	25
40	32	-	27
	40	-	21
50	50	-	20
	65	-	10
80	65	-	21
	80	-	16
100	100	-	15

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.7 Spigot JIS-G 3459 Schedule 10s (connection code 36)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	-	25
	8	-	18
10	10	-	16
	15	-	9
25	15	-	31
	20	-	25
	25	-	18
40	32	-	20
	40	-	15
50	50	-	14
80	65	-	17
	80	-	11
100	100	-	12

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body  
 Code C3: 1.4435, investment casting  
 Code F4: 1.4539, forged body

**3.8 Spigot SMS 3008 (connection code 37)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
25	25	27	25
40	32	-	25
	40	23	21
50	50	22	19
	65	-	10
80	65	-	21
	80	-	16
100	100	-	15

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body  
 Code C3: 1.4435, investment casting  
 Code F4: 1.4539, forged body

**3.9 Spigot BS 4825, Part 1 (connection code 55)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
Draining angle $\alpha$			
8	8	-	35
	10	-	27
	15	-	19
10	10	-	29
	15	-	23
	20	-	11
25	15	-	39
	20	-	32

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

**3.10 Spigot ASME BPE / DIN 11866 series C (connection code 59)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
Draining angle $\alpha$			
8	8	34	34
	10	26	26
	15	21	21
10	10	-	28
	15	-	25
	20	17	13
25	15	-	40
	20	39	33
	25	28	26
40	40	24	22
50	50	22	20
50	65	-	10
80	65	-	21
	80	-	16
100	100	-	15

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body



**3.11 Spigot ISO 1127 / EN 10357 series C / DIN 11866 series B (connection code 60)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	-	28
	8	19	19
10	10	20	16
	15	12	7
25	15	40	31
	20	29	24
	25	19	17
40	32	22	19
	40	16	14
50	50	16	14
80	65	-	16
	80	-	11
100	100	-	11

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body  
 Code C3: 1.4435, investment casting  
 Code F4: 1.4539, forged body

**3.12 Spigot ANSI/ASME B36.19M Schedule 10s (connection code 63)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	-	25
	8	-	18
10	10	-	17
	15	-	10
25	15	-	32
	20	-	26
	25	-	19
40	32	-	21
	40	-	15
50	50	-	15
80	65	-	18
	80	-	11
100	100	-	12

**1) Valve body material**

Code 40: 1.4435 (F316L), forged body  
 Code C3: 1.4435, investment casting  
 Code F4: 1.4539, forged body

**3.13 Spigot ANSI/ASME B36.19M Schedule 40s (connection code 65)**

MG	DN	Valve body material <sup>1)</sup>	
		Investment cast body code C3	Forged body codes 40, F4
		Draining angle $\alpha$	
8	6	-	28
	8	-	22
10	10	-	19
	15	-	12
25	15	-	33
	20	-	27
	25	-	21
40	32	-	22
	40	-	17
50	50	-	16
80	65	-	20
	80	-	13
100	100	-	14

1) **Valve body material**

Code 40: 1.4435 (F316L), forged body

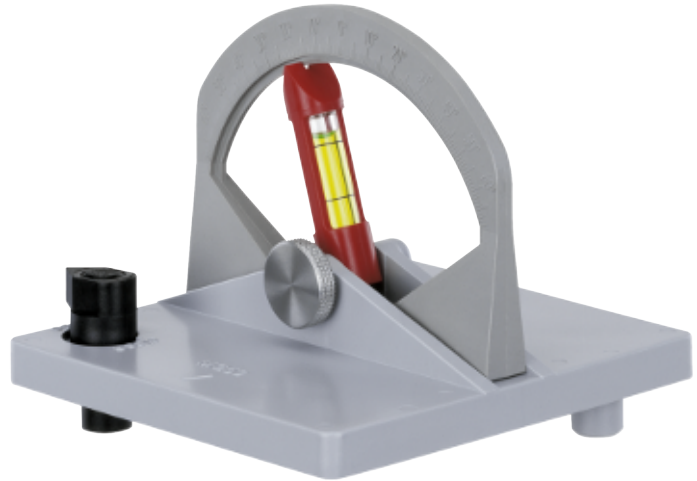
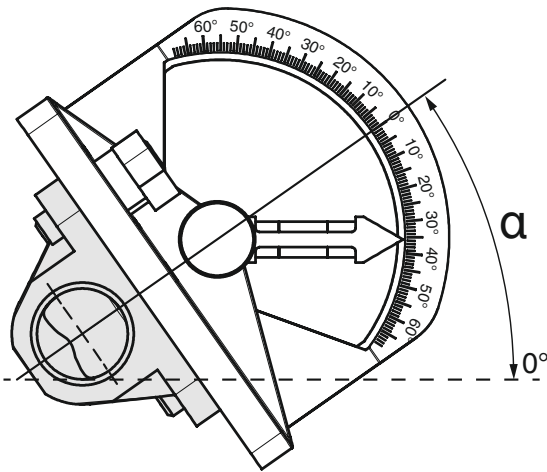
Code C3: 1.4435, investment casting

Code F4: 1.4539, forged body

#### 4 Angle gauge

For the optimized emptying of the valves GEMÜ offers angle gauges for different diaphragm sizes:

Diaphragm size (MG)	Designation	Item number
MG 8	WG600 8Z	88278996
MG 10	WG600 10Z	88277372
MG 25	WG600 25Z	88277373
MG 40	WG600 40Z	88277374
MG 50	WG600 50Z	88277375
MG 80	WG600 80Z	88277376
MG 100	WG600100Z	88379424





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Subject to alteration

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