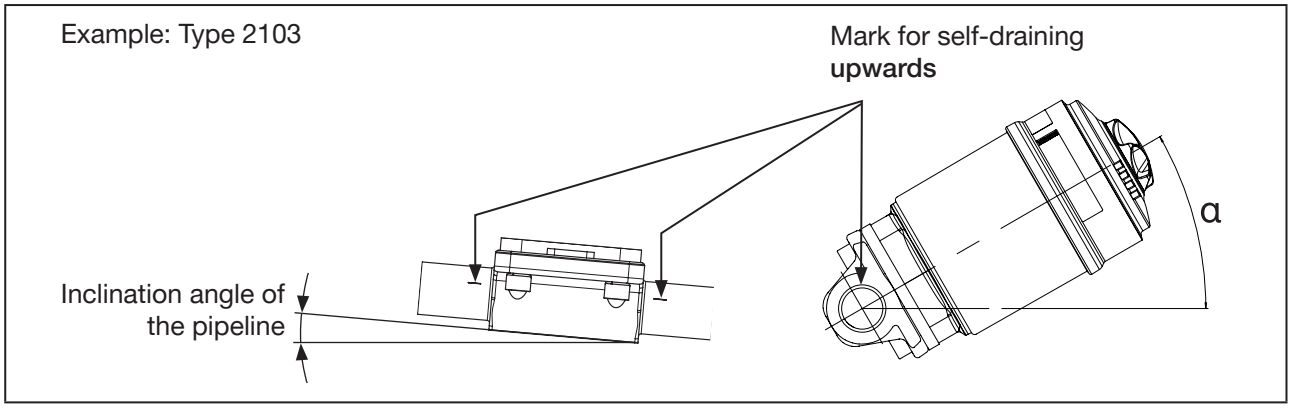
Angle for self-draining of diaphragm valves



Presentation: Installation for self-draining

Self-drainage-angle

Bürkert has determined self-drainage-angles for the optimum draining of diaphragm valve bodies.

The self-drainage-angle (α) depends on the body size (diaphragm size) and the inner diameter of the port connection (DN).

For optimum self-draining, the angles given in the following tables apply.

Mark on the valve body:
For cast valve bodies (VG) and forged steel valve bodies (VS) as well as for tube valve bodies (VP), a mark is provided at the port connection. The mark serves as an orientation aid and must point upwards (see image “Presentation: Installation for self-draining”).

Observe! The actual self-drainage-angle must be set with a suitable measuring tool.

For forged steel valve bodies, the drainage angle is engraved on the underside of the valve body.

The term self-draining suggests that the valve drains itself completely when installed properly. Due to the factors listed below, however, it cannot be assumed that the valve will drain itself without leaving any residue.

Draining is influenced by the following factors, among others:

- Inner diameter of the pipeline
- Surface quality
- Inclination angle to the line axis
- Medium (viscosity and adhesion)

The specified angles are to be understood as a guide value and may be subject to certain fluctuations due to permissible manufacturing tolerances.

The installer and the operator are responsible for ensuring that the system drains itself.

Inclination angle of the pipeline

The inclination angle of the diaphragm valves is the responsibility of the installer and operator and should correspond to the inclination angle of the pipeline.
For the pipeline, we recommend the inclination angle according to the valid ASME BPE.

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Tables for self-drainage-angles

The self-drainage-angles of the valve bodies with a welded connection also apply to the valve bodies with a clamp connection.

For diaphragm size 15 (forged steel valve body), the self-drainage-angle has changed due to body optimisations (October 2025). Therefore, please be sure to observe the information in the table and the engraving on the underside of the valve body during installation.

Please contact your Bürkert sales department to determine the self-drainage-angles of welded connections not listed in the tables.

The installer and the operator are responsible for ensuring that the system drains itself.

Valve body with a welded connection according to DIN EN ISO 1127 / ISO 4200 / DIN 11866 series B						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SA40	8	8	13.5 x 1.6	24	23	20
SA40	8	15	13.5 x 1.6	40	-	-
SA41	10	8	17.2 x 1.6	13	14	24
SA41	10	15	17.2 x 1.6	29[1)]	-	-
SA42	15	15	21.3 x 1.6	22[2)]	15	20
SA42	15	20	21.3 x 1.6	26	24	-
SA43	20	20	26.9 x 1.6	17	17	20
SA43	20	25	26.9 x 1.6	26	-	-
SA44	25	25	33.7 x 2.0	19	19	19
SA44	25	40	33.7 x 2.0	27	-	-
SA45	32	32	42.4 x 2.0	-	-	18
SA45	32	40	42.4 x 2.0	20	21	-
SA46	40	40	48.3 x 2.0	14	16	18
SA47	50	50	60.3 x 2.0	14	15	18
SA48	65	65	76.1 x 2.0	9	9	-
SA48	65	80	76.1 x 2.0	20	20	-
SA49	80	80	88.9 x 2.3	15	14	-
SA39	100	100	114.3 x 2.3	14	13	-

Table 1: Valve body with a welded connection according to DIN EN ISO 1127 / ISO 4200 / DIN 11866 series B

[1)] before body optimisation 25°

[2)] before body optimisation 18°

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Valve body with a welded connection according to DIN 11850 series 0						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SC40	4	8	6.0 x 1.0	49	37	-
SC41	6	8	8.0 x 1.0	44	32	-
SC42	8	8	10.0 x 1.0	39	28	-
SC43	15	15	18.0 x 1.5	27[3)]	20	-
SC44	20	20	22.0 x 1.5	25	23	-
SC45	25	25	28.0 x 1.5	24	25	-
SC46	32	25	34.0 x 1.5	-	18	-
SC46	32	40	34.0 x 1.5	27	-	-
SC47	40	40	40.0 x 1.5	21	22	-
SC48	50	50	52.0 x 1.5	19	20	-

Table 2: Valve body with a welded connection according to DIN 11850 series 0

Valve body with a welded connection according to DIN 11850 series 1 / DIN EN 10357 series B						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SF40	10	8	12.0 x 1.0	24	24	-
SF41	15	15	18.0 x 1.0	25[4)]	19	-
SF42	20	20	22.0 x 1.0	22	22	-
SF43	25	25	28.0 x 1.0	23	23	-
SF45	40	40	40.0 x 1.0	20	21	-
SF46	50	50	52.0 x 1.0	18	19	-

Table 3: Valve body with a welded connection according to DIN 11850 series 1 / DIN EN 10357 series B

[3)] before body optimisation 23°

[4)] before body optimisation 22°

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Valve body with a welded connection according to DIN 11850 series 2 / DIN 11866 series A / DIN EN 10357 series A						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SD40	10	8	13.0 x 1.5	24	24	20
SD40	10	15	13.0 x 1.5	44[5)]	-	-
SD42	15	15	19.0 x 1.5	25[6)]	19	24
SD43	20	15	23.0 x 1.5	-	-	16
SD43	20	20	23.0 x 1.5	22	22	-
SD44	25	20	29.0 x 1.5	-	-	18
SD44	25	25	29.0 x 1.5	23	23	-
SD45	32	25	35.0 x 1.5	-	-	17
SD45	32	40	35.0 x 1.5	26	-	-
SD46	40	32	41.0 x 1.5	-	-	21
SD46	40	40	41.0 x 1.5	20	21	-
SD47	50	40	53.0 x 1.5	-	-	13
SD47	50	50	53.0 x 1.5	18	19	-
SD48	65	65	70.0 x 2.0	13	13	-
SD48	65	80	70.0 x 2.0	23	-	-
SD49	80	80	85.0 x 2.0	16	14	-
SD50	100	100	104.0 x 2.0	18	17	-

Table 4: Valve body with a welded connection according to DIN 11850 series 2 / DIN 11866 series A / DIN EN 10357 series A

Valve body with a welded connection according to DIN 11850 series 3						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SE40	10	8	14.0 x 2.0	24	24	-
SE42	15	15	20.0 x 2.0	25[7)]	19	-
SE43	20	20	24.0 x 2.0	22	22	-
SE44	25	25	30.0 x 2.0	23	23	-
SE46	40	40	42.0 x 2.0	20	21	-
SE47	50	50	54.0 x 2.0	18	19	-

Table 5: Valve body with a welded connection according to DIN 11850 series 3

[5)] before body optimisation 40°
[6)] before body optimisation 22°
[7)] before body optimisation 22°

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Valve body with a welded connection according to ASME BPE / DIN 11866 series C						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SA89	1/8“	8	3.17 x 0.56	53	-	-
SA90	1/4“	8	6.35 x 0.89	48	36	-
SA91	3/8“	8	9.53 x 0.89	39	29	-
SA92	1/2“	8	12.7 x 1.65	26	25	23
SA92	1/2“	15	12.7 x 1.65	45[8)]	-	-
SA93	3/4“	15	19.05 x 1.65	26[9)]	19	24
SA93	3/4“	20	19.05 x 1.65	29	27	-
SODF	1“	20	25.4 x 1.65	-	-	23
SODF	1“	25	25.4 x 1.65	27	27	-
SODH	1 1/2“	32	38.1 x 1.65	-	-	24
SODH	1 1/2“	40	38.1 x 1.65	24	23	-
SODI	2“	40	50.8 x 1.65	-	-	16
SODI	2“	50	50.8 x 1.65	20	21	-
SODJ	2 1/2“	50	63.5 x 1.65	11	12	15
SODJ	2 1/2“	65	63.5 x 1.65	16	16	-
SODJ	2 1/2“	80	63.5 x 1.65	25	-	-
SODK	3“	65	76.2 x 1.65	-	-	14
SODK	3“	80	76.2 x 1.65	19	19	-
SODL	4“	80	101.6 x 2.11	-	-	12
SODL	4“	100	101.6 x 2.11	19	18	-

Table 6: Valve body with a welded connection according to ASME BPE / DIN 11866 series C

Valve body with a welded connection according to BS 4825						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SODB	1/4“	8	6.35 x 1.2	50	37	-
SODC	3/8“	8	9.53 x 1.2	42	30	-
SODD	1/2“	8	12.7 x 1.2	24	23	-
SODD	1/2“	15	12.7 x 1.2	43[10)]	-	-
SODE	3/4“	15	19.05 x 1.2	-	16	-
SODE	3/4“	20	19.05 x 1.2	28	-	-

Table 7: Valve body with a welded connection according to BS 4825

[8)] *before body optimisation 41°*
[9)] *before body optimisation 22°*
[10)] *before body optimisation 40°*

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Valve body with a welded connection according to SMS 3008						
Port connection code	DN	Diaphragm size	Pipe dimension	Self-drainage-angle (α)		
				Forged steel valve body Type KB04 (VS/VH)	Cast valve body (VG)	Tube valve body (VP)
SA60	25	25	25.0 x 1.2	27	27	-
SA62	40	40	38.0 x 1.2	22	23	-
SA63	50	50	51.0 x 1.2	19	20	-
SA64	65	65	63.5 x 1.6	16	16	-
SA65	80	80	76.1 x 1.6	19	19	-
SA66	100	100	101.6 x 2.0	19	18	-

Table 8: Valve body with a welded connection according to SMS 3008

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