

Type test approved safety valves angle-type for industrial applications

→ Series 645

3.9

645

Safety valves made of gunmetal, angle-type with threaded or flange connections



■ SUITABLE FOR

Liquids	neutral and non-neutral	
Air, gases and vapours	neutral and non-neutral	
Steam		

■ EXAMPLES OF USE

For the protection of:

- Pressure-vessels/-systems for neutral / non-neutral vapours, gases and liquids
- Steam boilers and steam plants taking into account the plant-specific regulations and making use of the suitable valve versions and sealing materials.

- Mechanical engineering
- pump protection
- Pressure booster systems water- / air-side
- cooling-/chilling-systems
- Steam- and industrial-boiler systems

Safety valves are set and sealed at the factory.

■ APPROVALS

TÜV Type test approval 2073, 2102	D/G,F
EC type examination	S/G, L
ASME	S, G, L
CRN	S, G, L
KGS	G
Type approval WRAS	
Type approval ACS	
TR ZU 032/2013 - TR ZU 010/2011	D/G (S/G), F (L)
Requirements	
AD 2000 Data sheet A2 DIN EN ISO 4126-1 PED 2014/68/EU	TRD 421 ASME-Code Sec. VIII Div. 1 KGS AA 319
Classification society	
DNVGL	DNVGL
Bureau Veritas	BV
Lloyd's Register EMEA	LR EMEA
Russian Maritime Register of Shipping	RS
American Bureau of Shipping	ABS
Registro Italiano Navale	RINA



■ MATERIAL



■ SPECIFICATION



1/2" – 2"



– 50°C to + 205°C
depending on version



0,5 – 16 bar



DN 25 – DN 50

■ MATERIALS

Component	Material	DIN EN	ASME
Inlet body	Gunmetal	CC499K	CC499K
Outlet body	Gunmetal	CC499K	CC499K
Internal parts	Brass	CW617N	CW617N
Internal wetted parts	Dezincification resistant brass	CW602N	CW602N
	Stainless steel	1.4404	316L
Spring	Stainless steel	1.4310	302

Series 645 ■ VALVE VERSION

m	Standard with diaphragm	The diaphragm prevents the medium entering into the spring housing and protects moving parts from being affected by the medium.
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■ MEDIUM

GF	gaseous and liquid	Air, vapours, gases, liquids and - depending on seal - also for steam
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■ TYPE OF LIFTING MECHANISM

L	Lifting lever
0	without lifting device

■ AVAILABLE NOMINAL DIAMETERS AND CONNECTION SIZES

Nominal diameter DN	15	20	25	32	40	50
Inlet	1/2" (15)	3/4" (20)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)
Outlet	3/4" (20)	■				
	1" (25)		■			
	1 1/4" (32)			■		
	1 1/2" (40)				■	
	2" (50)					■
	2 1/2" (65)					

■ TYPE OF CONNECTION INLET / OUTLET

f / f	Standard	Female thread BSP-P / Female thread BSP-P	DIN EN ISO 228-1 / DIN EN ISO 228-1
FLDIN / f		Flange connection (from DN 25) / Female thread BSP-P	DIN EN ISO 228-1 / DIN EN ISO 228-1

■ SEAT SEALS / DIAPHRAGMS

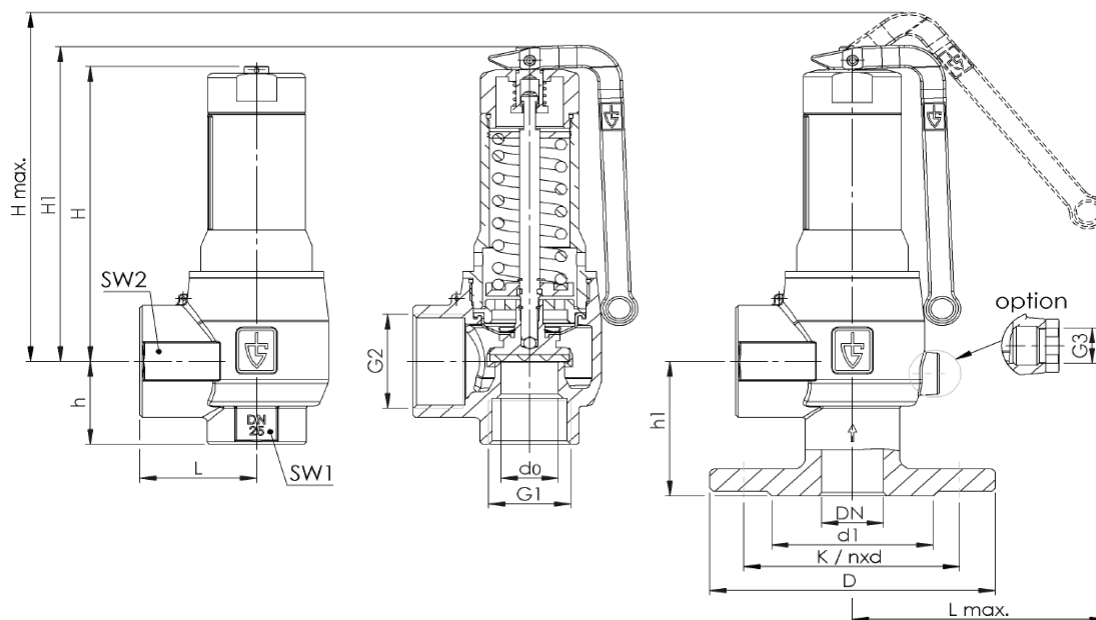
PTFE / EPDM	Polytetrafluorethylen / Ethylen-Propylene-Diene (Standard)	Flat seal and moulded diaphragm	-50°C to +205°C
EPDM / EPDM	Ethylen-Propylene-Diene / Ethylen-Propylene-Diene	Flat seal and moulded diaphragm	-50°C bis +150°C
PTFE / FKM	Polytetrafluorethylen / Fluorcarbon	Flat seal and moulded diaphragm	-30°C to +200°C
FKM / FKM	Fluorcarbon / Fluorcarbon	Elastomere seals and moulded diaphragm	-20°C to +200°C

■ **NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS**

Series 645: Connection, installation dimensions, ranges of adjustment								
Nominal diameter	DN	15	20	25	32	40	50	
Connection DIN EN ISO 228	G1	1/2" (15)	3/4" (20)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)	
Connection DIN EN 1092-3	DN / PN			25 / 16	32 / 16	40 / 16	50 / 16	
Connection ANSI B 16.24	NPS / CLASS			1" / 150	1 1/4" / 150	1 1/2" / 150	2" / 150	
Outlet DIN EN ISO 228	G2	3/4" (20)	1" (25)	1 1/4" (32)	1 1/2" (40)	2" (50)	2 1/2" (65)	
Installation dimensions in mm	L	35,5	42,5	48	58	68	80	
	Lmax	63	77	102	145	150	155	
	H	82	107	132	168	199	240	
	H1	90	115	146	192	229	276	
	Hmax	102	133	153	210	252	298	
	h	30	35	37	45	55	65	
	h1			60	66	73	83	
	D DIN / ANSI				115 / 110	140 / 115	150 / 125	165 / 150
	d1 DIN / ANSI				65 / 50,8	76 / 63,5	84 / 73	99 / 92,1
	SW1	27	34	41	55	65	80	
	SW2	34	41	50	60	70	90	
	do	13	18	23	30	39	48	
	G3				1/4"	1/4"	1/4"	1/4"
K / nxd (DIN)				85 / 4x14	100 / 4x18	110 / 4x18	125 / 4x18	
K / nxd (ANSI)				79,4 / 4x15,9	88,9 / 4x15,9	98,4 x 4x15,9	120,7 / 4x19,1	
Coefficients of flow ISO 4126-1	$\alpha_w / Kdr (F)$	0,43	0,43	0,4	0,38	0,38	0,38	
	$\alpha_w / Kdr (D/G)^1$	0,67	0,67	0,6	0,55	0,55	0,55	
Coefficients of flow ASME-Code Sec. VIII Div. 1	$\alpha_w / Kdr (F)$	0,43	0,43	0,43	0,36	0,36	0,36	
	$\alpha_w / Kdr (D/G)$	0,65	0,65	0,65	0,55	0,55	0,55	
Weight	kg	0,5	0,9	1,6	3,3	5,8	8,9	
	kg FLDIN / FLANSI			2,6 / 2,4	4,8 / 4,3	7,5 / 6,9	11,3 / 10,8	
Range of adjustment	bar	0,5 - 16	0,5 - 16	0,5 - 16	0,5 - 16	0,5 - 16	0,5 - 16	
Range of adjustment ASME	psi	15 - 232	15 - 232	15 - 232	15 - 232	15 - 232	15 - 232	

¹Coefficients of flow for blow-off pressures for blow-off pressures > 3,5 bar. For lower pressures refer to values in the capacity table.

■ **MAIN DIMENSIONS, INSTALLATION DIMENSIONS**



■ CAPACITY TABLE ACC. TO ISO 4126-1 / AD2000 A2

Series 645: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		15			20			25		
		d ₀ = 13 mm			d ₀ = 18 mm			d ₀ = 23 mm		
Set pressure bar		I	II	III	I	II	III	I	II	III
Air I Nm ³ /h	0,5	77	58	2,3	141	106	4,3	208	157	6,6
	1	114	91	3,0	222	177	5,8	315	251	8,9
	2	188	148	4,3	366	288	8,3	525	413	12,6
Steam II kg/h	3	256	200	5,3	499	390	10,1	729	570	15,4
	4	327	253	6,1	626	486	11,7	916	710	17,7
	5	393	303	6,8	754	582	13,1	1103	851	19,8
Water III m ³ /h	6	460	354	7,5	882	678	14,3	1289	992	21,7
	7	526	403	8,1	1009	773	15,5	1476	1130	23,5
	8	593	453	8,6	1137	868	16,5	1662	1269	25,1
	9	660	502	9,1	1265	963	17,5	1849	1408	26,6
	10	726	551	9,6	1392	1057	18,5	2036	1546	28,1
	11	793	601	10,1	1520	1151	19,4	2222	1683	29,4
	12	859	649	10,6	1647	1245	20,2	2409	1820	30,7
	13	926	698	11,0	1775	1339	21,1	2595	1958	32,0
	14	992	748	11,4	1903	1434	21,9	2782	2097	33,2
	15	1059	797	11,8	2030	1528	22,6	2969	2234	34,4
16	1126	846	12,2	2158	1622	23,4	3155	2372	35,5	

Series 645: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		32			40			50		
		d ₀ = 30 mm			d ₀ = 39 mm			d ₀ = 48 mm		
Set pressure bar		I	II	III	I	II	III	I	II	III
Air I Nm ³ /h	0,5	338	276	10,5	571	466	17,7	864	706	26,8
	1	491	392	14,3	831	662	24,1	1258	1003	36,5
	2	816	642	20,2	1379	1085	34,2	2089	1643	51,8
Steam II kg/h	3	1128	879	24,8	1907	1486	41,9	2888	2251	63,5
	4	1430	1107	28,7	2417	1872	48,4	3661	2835	73,4
	5	1721	1326	32,1	2909	2241	54,2	4407	3395	82,1
Water III m ³ /h	6	2013	1544	35,1	3402	2609	59,4	5153	3953	89,9
	7	2304	1762	37,9	3894	2977	64,1	5899	4510	97,1
	8	2595	1979	40,6	4386	3344	68,6	6644	5066	103,9
	9	2887	2196	43,0	4879	3711	72,7	7390	5621	110,2
	10	3178	2412	45,4	5371	4077	76,7	8136	6175	116,1
	11	3469	2629	47,6	5863	4443	80,4	8882	6730	121,8
	12	3761	2845	49,7	6356	4809	84,0	9627	7284	127,2
	13	4052	3061	51,7	6848	5174	87,4	10373	7837	132,4
	14	4343	3278	53,7	7340	5541	90,7	11119	8393	137,4
	15	4635	3495	55,6	7833	5907	93,9	11865	8948	142,3
16	4926	3711	57,4	8325	6272	97,0	12611	9501	146,9	