

→ Series 460

460

Safety valves made of
stainless steel, angle-type
with threaded 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 tanks and -systems for neutral / non-neutral vapours, gases and liquids
- steam boilers and steam plants

Please observe plant-specific regulations and use of appropriate valve version and sealing material.

- chemical plants, biogas plants
- desalination plants
- process equipment construction and medical technology
- shipbuilding industry and marine equipment
- secondary areas in the food-, beverage-, pharmaceutical- and cosmetics- industries
- offshore- applications

Safety valves are set and sealed at the factory.



■ MATERIAL



■ SPECIFICATION



3/8" – 1"

– 60°C to + 225°C
depending on version

0,2 – 25 bar
depending on version

■ APPROVALS

TÜV-Type test approval 2067	D/G, F
EU type examination	S/G, L
ASME	S, G, L
TSG ZF001-2006	D/G (S/G), F (L)
KGS	G
TR ZU 032/2013 - TR ZU 010/2011	D/G (S/G), F (L)
Requirements	
AD 2000 Data sheet A2	ASME-Code Sec. XIII
TRD 421	PED 2014/68/EU
DIN EN ISO 4126-1	KGS AA 319

Classification society

DNV	DNV
Lloyd's Register EMEA	LR EMEA
American Bureau of Shipping	ABS
Bureau Veritas	BV
Russian Maritime Register of Shipping	RS
Registro Italiano Navale	RINA

■ MATERIALS

Component	Material	DIN EN	ASME
Inlet body	Stainless steel	1.4408	CF8M
Outlet body	Stainless steel	1.4408	CF8M
Internal parts	Stainless steel	1.4404	316 L
Spring	Stainless steel	1.4310	302

Series 460 ■ VALVE VERSION

t	gastight version of spring housing	for neutral and non-neutral media, not counter pressure compensated. The environment is protected from being affected by the medium.
---	------------------------------------	---

■ MEDIUM

GF	gaseous and liquid	Air, vapours, gases, liquids and - depending on seal - also for steam
----	--------------------	---

■ TYPE OF LIFTING MECHANISM

L	Lifting lever
0	without lifting device

■ AVAILABLE NOMINAL DIAMETERS AND CONNECTION SIZES

Nominal diameter DN		10	15	20	25
Inlet		3/8" (10)	1/2" (15)	3/4" (20)	1" (25)
Outlet	3/8" (10)	■			
	1/2" (15)		■		
	3/4" (20)			■	
	1" (25)				■

■ TYPE OF CONNECTION INLET / OUTLET THREADED CONNECTIONS

m / f	Standard	Male thread BSP-P / Female thread BSP-P	DIN EN ISO 228-1 / DIN EN ISO 228-1
BSP-Tm / f		Male thread BSP-T / Female thread BSP-P	DIN EN 10226, ISO 7-1 / DIN EN ISO 228-1
NPT-m / f		Male thread NPT / Female thread BSP-P	ASME B1.20.1 / DIN EN ISO 228-1
NPT-m / NPT-f		Male thread NPT / Female thread NPT	ASME B1.20.1 / ASME B1.20.1

■ SEALS

NBR	Nitrile rubber	Elastomere flat seal	-30°C to +130°C
EPDM	Ethylene propylene diene	Elastomere flat seal	-50°C to +150°C
FKM	Fluorcarbon	Elastomere flat seal	-20°C to +200°C
PTFE ¹	Polytetrafluoroethylene	Flat seal from 0,5 bar	-60°C to +225°C

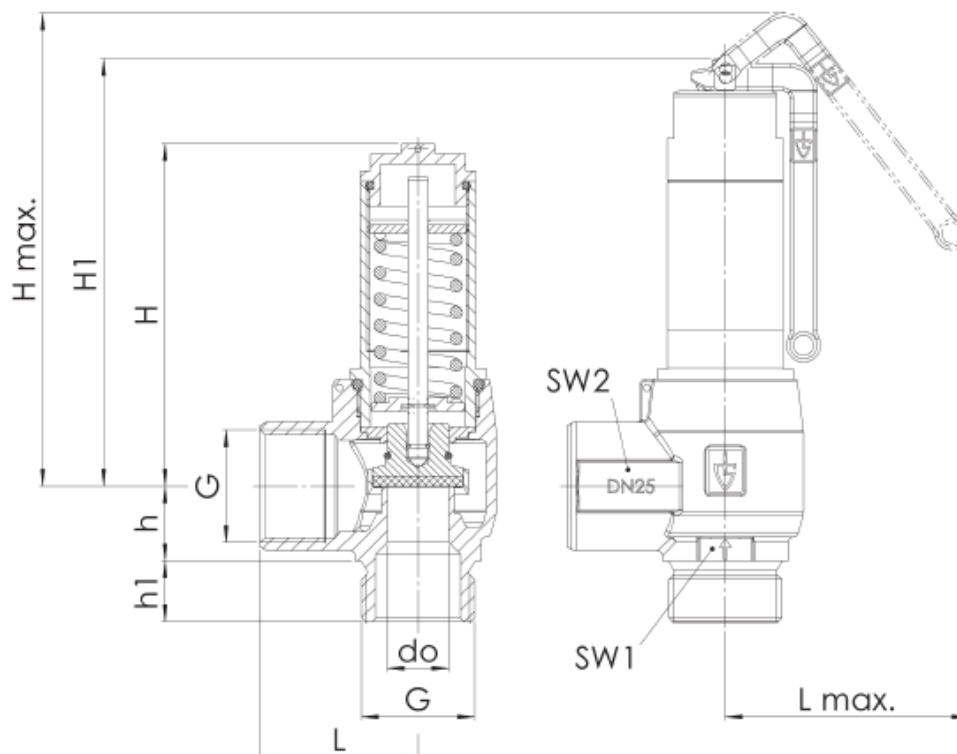
¹ With PTFE seat seals, the secondary seals are made of FKM as standard.

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

Series 460: Connection, installation dimensions, ranges of adjustment					
Nominal diameter	DN	DN10	DN15	DN20	DN25
Connection DIN EN ISO 228	G	3/8" (10)	1/2" (15)	3/4" (20)	1" (25)
Outlet DIN EN ISO 228	G1	3/8" (10)	1/2" (15)	3/4" (20)	1" (25)
Installation dimensions in mm	L	30	26	43	47
	Lmax	72	72	72	72
	H	77,5	82	90,5	101
	H1	98	107	117	127
	h	17	19	20	22
	h1	12	15	16	18
	SW1	24	27	34	38
	SW2	22	26	32	38
	do	9	13	15	18
Coefficients of flow ISO 4126-1	$\alpha_w / K_{dr} (F)$	0,36	0,39	0,39	0,36
	$\alpha_w / K_{dr} (D/G)^{11}$	0,53	0,62	0,62	0,62
Coefficients of flow ASME Code Sec. VIII Div. 1	$\alpha_w / K_{dr} (L)$	-	0,41	0,41	0,41
	$\alpha_w / K_{dr} (G/S)$	0,549	0,549	0,549	0,549
Weight	kg	0,3	0,4	0,6	0,8
Range of adjustment	bar	0,2-25	0,2-25	0,2-25	0,2-25
Range of adjustment ASME Air / Gas / Steam	psi	30 - 362	30 - 362	30 - 362	30 - 362
Range of adjustment ASME Liquid	psi	-	43 - 362	43 - 362	43 - 362

¹¹ Flow coefficients for blow-off pressures > 4 bar. For lower pressures, see specifications in the capacity table.

■ **MAIN DIMENSIONS, INSTALLATION DIMENSIONS**



Series 460 ■ INDIVIDUAL SELECTION / VALVE CONFIGURATION

Series	Valve version	Medium	Lifting device	Nominal diameter DN	Connection type		Connection size		Seal	Options	Set pressure	Quantity
					Inlet	Outlet	Inlet	Outlet				
460	t	GF	L	15	BSP-Tm	f	15	15	EPDM		5,5	2
460	t	GF				f						
460	t	GF				f						
460	t	GF				f						

■ PROPERTIES

G0X	Especially for gaseous O2 applications by employment of specific materials including oil- and grease free production process	☐	☐
P01	Oil- and grease-free production	☐	☐
		☐	☐

■ CERTIFICATES / APPROVALS

C01	Factory certificate acc. DIN EN 10204 2.2 (WKZ 2.2)	☐	C06	ATEX evaluation acc. to 2014/34/EU	☐
C02	Test certificate acc. DIN EN 10204 3.1 (WPZ 3.1)	☐	C07	SIL evaluation relating to IEC 61508-2	☐
C03	Material test certificate acc. DIN EN 10204 3.1 (MPZ 3.1) (pressure retaining part)	☐	C09	Seat tightness test with helium, leak detection method under vacuum incl. Factory Inspection Certificate 3.1 acc. to DIN EN 10204	☐
C04	TÜV/DEKRA individual inspection acc. EN 10204 3.2 (TÜV/DEKRA-APZ)	☐	C10	Certificate of oil- and grease free production	☐
C05	Sealing material Manufacturer certification (FDA, USP 3, 3-A,...), Please indicate description of certificate:	☐	C11	Certification of the production process especially for gaseous oxygen applications by employment of specific materials	☐

■ ADMISSIONS / ACCREDITATIONS

AA1	EC Type examination acc. to Directive 2014/68/EU	☐	AK1	Det Norske Veritas (DNV) type approval	☐
AA2	TÜV component test acc. to VdTÜV specification sheet SV 100	☐	AK2	Lloyd's Register (LR) type approval	☐
AA3	Certification acc. to ASME Boiler and Pressure Vessel Code, Sec. XIII (ASME)	☐	AK3	American Bureau of Shipping (ABS) type approval	☐
AA4	EAC - certificate/declaration with passport for the valve and laser marking of the valve	☐	AK4	Bureau Veritas (BV) type approval	☐
AA5	Manufacture License of Special Equipment People's Republic of China (ML)	☐	AK5	Russian Maritime Register of Shipping (RMRS) type approval	☐
		☐	AK6	Registro Italiano Navale (RINA) type approval	☐
		☐	AL	Individual inspection by notified body inspector – (body to be indicated):	☐

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

Series 460: Blowing-off rates at 10% above set pressure													
Nominal diameter DN		10			15			20			25		
Set pressure bar		I	II	III	I	II	III	I	II	III	I	II	III
Air I	0,2	18	14	0,6	41	33	1,3	58	46	1,8	77	61	2,6
	0,5	25	20	0,8	62	50	1,9	81	65	2,5	111	89	3,7
	Nm³/h	0,8	34	27	1,0	82	65	2,3	107	85	3,1	145	115
Steam II	1	39	31	1,1	95	75	2,6	124	97	3,4	167	132	5,2
	1,5	53	41	1,4	127	99	3,3	169	132	4,2	243	191	6,3
	kg/h	2	65	51	1,6	159	124	3,8	212	165	4,8	310	243
Water III	2,5	80	62	1,8	190	147	4,3	257	200	5,4	370	288	7,7
	3	91	71	2,0	217	169	4,7	295	229	5,9	439	341	8,5
	m³/h	3,5	105	81	2,2	250	193	5,1	338	262	6,4	512	396
	4	119	92	2,3	278	214	5,5	383	296	7,0	570	440	9,8
	4,5	134	103	2,5	306	236	5,8	429	331	7,4	628	485	10,4
	5	146	113	2,7	340	263	6,1	469	362	7,8	687	530	10,9
	5,5	159	122	2,8	369	285	6,4	509	392	8,2	745	574	11,5
	6	174	135	2,9	398	307	6,7	557	430	8,6	804	620	12,0
	6,5	187	144	3,0	442	341	7,0	598	461	8,9	864	666	12,5
	7	200	154	3,1	471	364	7,2	638	492	9,7	934	721	12,9
	7,5	216	167	3,3	510	393	7,5	678	523	10,1	993	766	13,4
	8	246	190	3,4	549	423	7,7	719	555	10,4	1052	812	13,8
	8,5	260	200	3,6	580	447	8,0	759	586	10,7	1111	857	14,3
	9	274	211	3,7	610	471	8,2	799	617	11,0	1170	903	14,7
	9,5	287	222	3,8	641	495	8,4	840	648	11,3	1229	948	15,1
	10	301	232	3,9	672	518	8,6	880	679	11,6	1288	994	15,5
	11	329	254	4,1	734	566	9,1	961	741	12,2	1406	1085	16,2
	12	357	275	4,2	795	613	9,5	1042	803	12,7	1524	1176	16,9
	13	384	296	4,4	857	661	9,8	1122	866	13,3	1643	1267	17,6
	14	412	318	4,6	918	708	10,2	1203	928	13,8	1761	1358	18,3
	15	439	339	4,7	980	756	10,6	1284	990	14,3	1879	1449	18,9
	16	467	360	4,9	1042	803	10,9	1364	1052	14,7	1997	1540	19,6
	17	495	382	5,0	1103	851	11,3	1445	1115	15,2	2115	1632	20,2
	18	522	403	5,2	1165	899	11,6	1526	1177	15,6	2233	1723	20,8
	19	550	424	5,3	1226	946	11,9	1606	1239	16,0	2351	1814	21,3
	20	577	446	5,5	1288	994	12,2	1687	1301	16,5	2469	1905	21,9
	21	605	467	5,6	1350	1041	12,5	1768	1364	16,9	2587	1996	22,4
	22	633	488	5,7	1411	1089	12,8	1848	1426	17,3	2705	2087	22,9
23	660	509	5,9	1473	1136	13,1	1929	1488	17,6	2823	2178	23,5	
24	688	531	6,0	1534	1184	13,4	2010	1550	18,0	2942	2269	24,0	
25	716	552	6,1	1596	1231	13,6	2090	1613	18,4	3060	2360	24,5	

■ CAPACITY TABLE ACC. TO ASME-CODE SEC. VIII DIV. 1

Series 460: Blowing-off rates at 10% above set pressure													
Nominal diameter DN		10			15			20			25		
		d0 = 03543 inch (9,0 mm)			d0 = 0,5118 inch (13,0 mm)			d0 = 0,5906 inch (15,0 mm)			d0 = 0,7087 inch (18,0 mm)		
		Air	Steam	Water	Air	Steam	Water	Air	Steam	Water	Air	Steam	Water
Set pressure psi(g)		I	II	III	I	II	III	I	II	III	I	II	III
Air I	30	47,4	133,0	-	98,8	277,5	0,0	131,6	369,4	0,0	189,5	531,9	0,0
	43	61,6	172,9	-	128,4	360,6	22,0	171,0	480,1	29,3	246,3	691,4	42,2
	50	69,2	194,3	-	144,4	405,4	23,7	192,2	539,8	31,6	276,8	777,3	45,5
SCFM	60	80,1	225,0	-	167,2	469,4	26,0	222,6	625,0	34,6	320,5	900,0	49,9
	70	91,1	255,7	-	190,0	533,4	28,1	252,9	710,2	37,4	364,2	1022,6	53,9
	80	102,0	286,3	-	212,8	597,4	30,0	283,3	795,3	40,0	407,9	1145,3	57,6
Steam II	90	112,9	317,0	-	235,6	661,4	31,8	313,6	880,5	42,4	451,6	1268,0	61,1
	100	123,8	347,7	-	258,3	725,4	33,6	344,0	965,7	44,7	495,3	1390,6	64,4
	110	134,7	378,3	-	281,1	789,3	35,2	374,3	1050,9	46,9	539,0	1513,3	67,5
PPH	120	145,7	409,0	-	303,9	853,3	36,8	404,6	1136,1	49,0	582,7	1636,0	70,5
	130	156,6	439,7	-	326,7	917,3	38,3	435,0	1221,3	51,0	626,4	1758,6	73,4
	140	167,5	470,3	-	349,5	981,3	39,7	465,3	1306,5	52,9	670,0	1881,3	76,2
Water III	150	178,4	501,0	-	372,3	1045,3	41,1	495,7	1391,7	54,7	713,7	2004,0	78,8
	160	189,4	531,7	-	395,1	1109,3	42,5	526,0	1476,8	56,5	757,4	2126,7	81,4
	170	200,3	562,3	-	417,9	1173,3	43,8	556,3	1562,0	58,3	801,1	2249,3	83,9
GPM	180	211,2	593,0	-	440,7	1237,2	45,0	586,7	1647,2	60,0	844,8	2372,0	86,4
	190	222,1	623,7	-	463,4	1301,2	46,3	617,0	1732,4	61,6	888,5	2494,7	88,7
	200	233,0	654,3	-	486,2	1365,2	47,5	647,4	1817,6	63,2	932,2	2617,3	91,0
	210	244,0	685,0	-	509,0	1429,2	48,7	677,7	1902,8	64,8	975,9	2740,0	93,3
	220	254,9	715,7	-	531,8	1493,2	49,8	708,0	1988,0	66,3	1019,6	2862,7	95,5
	230	265,8	746,3	-	554,6	1557,2	50,9	738,4	2073,2	67,8	1063,3	2985,4	97,6
	240	276,7	777,0	-	577,4	1621,2	52,0	768,7	2158,3	69,2	1107,0	3108,0	99,7
	250	287,7	807,7	-	600,2	1685,1	53,1	799,1	2243,5	70,7	1150,6	3230,7	101,8
	260	298,6	838,3	-	623,0	1749,1	54,1	829,4	2328,7	72,1	1194,3	3353,4	103,8
	270	309,5	869,0	-	645,8	1813,1	55,2	859,7	2413,9	73,4	1238,0	3476,0	105,8
	280	320,4	899,7	-	668,5	1877,1	56,2	890,1	2499,1	74,8	1281,7	3598,7	107,7
	290	331,4	930,3	-	691,3	1941,1	57,2	920,4	2584,3	76,1	1325,4	3721,4	109,6
	300	342,3	961,0	-	714,1	2005,1	58,1	950,8	2669,5	77,4	1369,1	3844,0	111,5
	310	353,2	991,7	-	736,9	2069,1	59,1	981,1	2754,7	78,7	1412,8	3966,7	113,3
	320	364,1	1022,3	-	759,7	2133,0	60,1	1011,4	2839,9	80,0	1456,5	4089,4	115,1
	330	375,0	1053,0	-	782,5	2197,0	61,0	1041,8	2925,0	81,2	1500,2	4212,1	116,9
	340	386,0	1083,7	-	805,3	2261,0	61,9	1072,1	3010,2	82,4	1543,9	4334,7	118,7
	350	396,9	1114,3	-	828,1	2325,0	62,8	1102,5	3095,4	83,6	1587,5	4457,4	120,4
	362	410,0	1151,2	-	855,4	2401,8	63,9	1138,9	3197,6	85,0	1640,0	4604,6	122,5