

→ Series Hygienic 4000

Hygienic 4000

Safety valve made of stainless steel, angle type, with stainless steel spring



■ MATERIAL



■ SPECIFICATION



DN 25 – DN 100



-40°C to + 200°C
depending on version



0,4 – 16 bar
depending on valve
pressure range and
service temperature

■ SUITABLE FOR

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

■ EXAMPLES OF USE

- For the protection of:
- processes, plants and containers in the food and pharmaceutical industry for air, neutral and non-neutral vapours and gases, steam and liquids
 - food industry
 - Dairy industry
 - breweries and beverage industry
 - pharmaceutical industry
 - Cosmetic industry
 - Medical technology
 - Clean Service applications

■ FEATURES

- Smooth and faultless surface finish optimized for cleaning process
- Minimal dead space in inlet area and no gaps in the valve
- Exposed and rinsed o-ring seals
- Shape of valve body avoids forming of puddles in the valve after it has opened
- Suitable for CIP/SIP due to pneumatic lifting device
- Gap-free installation of seals in contact with the medium
- Surface roughness in the primary area $R_a < 0.75\mu m$
- Optional: electropolished and/or mechanically polished
- Moulded diaphragm for separating the product space from the springhousing
- Dead space ratio L/D ~ 2,0

For explanation see chapter 1.1 General information on the hygienic valves. Definition of surface quality and options according to Chapter 1.1 Table V-301.

■ APPROVALS

TÜV-Type test approval 2095	D/G, F
EU type examination	S/G, L
ASME	S, G, L
CRN	S, G, L
TSG ZF001-2006	D/G (S/G), F (L)
TR ZU 032/2013 - TR ZU 010/2011	D/G (S/G), F (L)
KGS	G
Requirements	
DIN EN ISO 4126-1	VdTÜV Guideline SV 100
PED 2014/68/EU	ASME-Code Sec. XIII
TRD 421	KGS AA 319
AD 2000 Data sheet A2	
Classification society	
American Bureau of Shipping	ABS
Bureau Veritas	BV
Registro Italiano Navale	RINA

■ MATERIALS

Component	Material	DIN EN	ASME
Body	Stainless steel	1.4404	316 L
Inner parts, wetted	Stainless steel	1.4404	316 L
Upper section, other inner parts	Stainless steel	1.4404	316 L
Spring	Stainless steel	1.4310	302

Series 4000 ■ VALVE VERSION

t	Standard with diaphragm	for neutral and non-neutral media. Spring, moving parts and the environment are protected from being affected by the medium.
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Parts which are difficult to clean in the guide, the spring housing and the spindle / disc combination are protected against soiling by elastomer diaphragm.

■ MEDIUM

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

P	Pneumatic lifting device
L	with lifting lever
O	without lifting device, standard for gastight version

■ AVAILABLE NOMINAL DIAMETERS AND CONNECTION SIZES

Nominal diameter DN	25	40	50	65	80	100	
Inlet DN	Standard	25	40	50	65	80	100
	optional	40	65	80	100	125	150
Outlet DN	40	■					
	65		■				
	80			■			
	100				■		
	125					■	
	150						■

■ TYPE OF CONNECTION INLET / OUTLET

KLSDIN / KLS DIN	Standard	Clamp connection / Clamp connection	DIN 32676-A / DIN 32676-A	Pipe Standard DIN 11850-2 / 11866-A
KS1 / KS1		Taper nipple / Taper nipple	DIN 11851 / DIN 11851	Pipe Standard DIN 11850-2 / 11866-A
GS1 / GS1		Threaded ferrule connection / Threaded ferrule connection	DIN 11851 / DIN 11851	Pipe Standard DIN 11850-2 / 11866-A



■ SEALS / DIAPHRAGM

FKM	Fluorcarbon	Seals / diaphragms	FDA, USP	-20°C to +200°C
EPDM	Ethylene propylene diene	Seals / diaphragms	FDA, USP	-40°C to +170°C

■ NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS

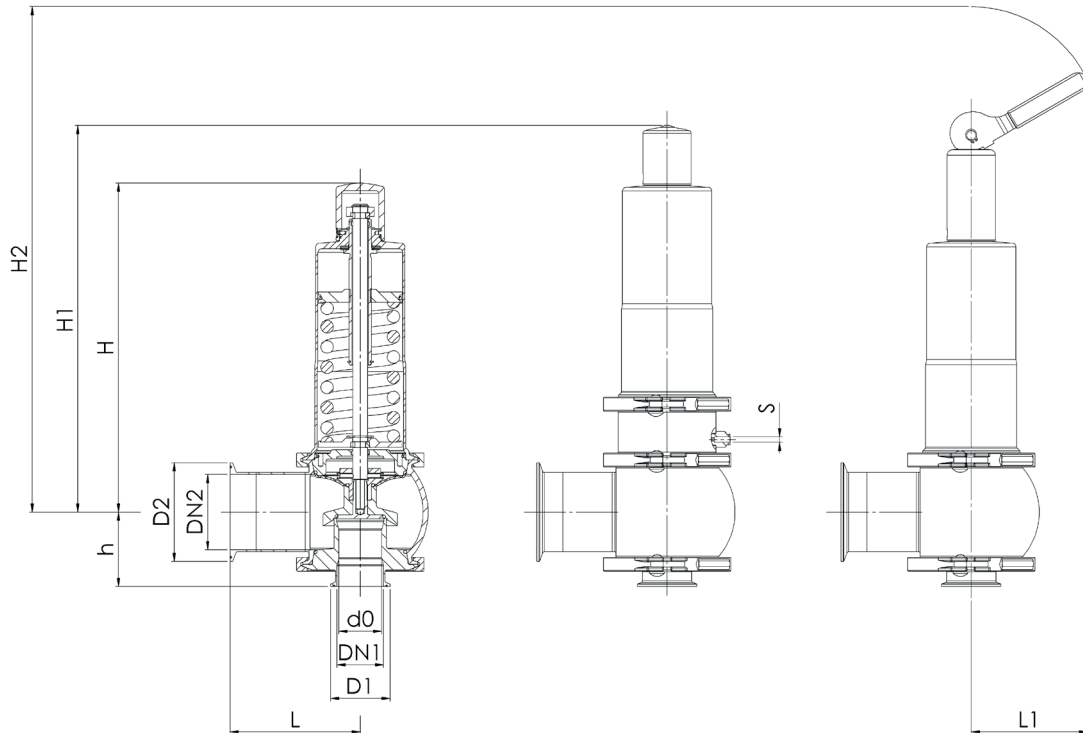
Series Hygienic 4000: Connection, installation dimensions, ranges of adjustment							
Nominal diameter	DN	25	40	50	65	80	100
Connection	Clamp connection DIN 32676						
Connection Inlet	DN1	25	40	50	65	80	100
Connection Outlet	DN2	40	65	80	100	125	150
Installation dimensions in mm	L	80	120	140	153	178	181
	L ³	132	166	200	125	140	140
	h	47	64	80	92	112	126
	D1	51	51	64	91	106	119
	D2	51	91	106	119	155	183
	H	183	285	354	445	513	586
	H1 ²	216	335	414	515	613	701
	H2 ³	359	496	614	642	755	830
Compressed air connection in mm	S	6	6	6	6	8	8
	do	23	37	46	60	74	92
Coefficients of flow ISO 4126-1	K _{dr} (F)	0,45	0,45	0,45	0,45	0,45	0,45
	K _{dr} (D/G) ¹	0,70	0,70	0,70	0,70	0,70	0,70
Coefficients of flow ASME Code Sec. VIII Div. 1	K _{dr} (F)	0,452	0,452	0,452	0,452	0,452	0,452
	K _{dr} (D/G)	0,680	0,680	0,680	0,680	0,680	0,680
Weight	kg	2,2	7,0	13,0	24,5	41,3	64,0
	kg ²	3,0	8,0	15,0	29,0	50,0	76,0
	kg ³	2,6	7,5	13,5	25,0	42,0	65,0
Range of adjustment	bar	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 10	0,4 - 8	0,4 - 8
Range of adjustment ASME	psi	15 - 232	15 - 232	15 - 232	15 - 232	15 - 145	15 - 145

¹Coefficient of flow for D/G valid for 6 bar or more, for smaller set pressures see values in capacity table.

²Values for version with pneumatic lifting device

³Values for version with lifting lever

■ MAIN DIMENSIONS, INSTALLATION DIMENSIONS



Series 4000 ■ INDIVIDUAL SELECTION / VALVE CONFIGURATION

Series	Valve version	Medium	Lifting device	Nominal diameter DN	Connection type		Connection type		Seal	Options	Set pressure	Quantity
					Inlet	Outlet	Inlet	Outlet				
4000	t	GF	P	25	KLSDIN	KLSDIN	25	40	EPDM	P07	3,2	1
4000	t	GF										
4000	t	GF										
4000	t	GF										
4000	t	GF										

■ TECHNICAL FINISHES, VARIANTS, ACCESSORIES

S62	Inductive proximity sensor, fitted, for indication of valve position, including connection cable 5m ¹	<input type="checkbox"/>
A05	Sealing wire / sealing on the fastening elements	<input type="checkbox"/>
		<input type="checkbox"/>

¹not available for version tGFL (with lifting lever)

■ PROPERTIES

DEFINITION OF SURFACE QUALITY AND OPTIONS ACCORDING TO CHAPTER 1.1 TABLE V-301

P01	Oil- and grease-free production	<input type="checkbox"/>	<input type="checkbox"/>
P05	Quality of surfaces in contact with media in inlet Ra <= 0,375	<input type="checkbox"/>	<input type="checkbox"/>
P07	Electropolished surfaces	<input type="checkbox"/>	<input type="checkbox"/>
P09	Surfaces mechanically and electropolished	<input type="checkbox"/>	<input type="checkbox"/>

■ CERTIFICATES / APPROVALS

C01	Factory certificate acc. DIN EN 10204 2.2 (WKZ 2.2)	<input type="checkbox"/>	C06	ATEX evaluation acc. to 2014/34/EU	<input type="checkbox"/>
C02	Test certificate acc. DIN EN 10204 3.1 (WPZ 3.1)	<input type="checkbox"/>	C07	SIL evaluation relating to IEC 61508-2	<input type="checkbox"/>
C03	Material test certificate acc. DIN EN 10204 3.1 (MPZ 3.1) (pressure retaining part)	<input type="checkbox"/>	C09	Seat tightness test with helium, leak detection method under vacuum incl. Factory Inspection Certificate 3.1 acc. to DIN EN 10204	<input type="checkbox"/>
C04	TÜV/DEKRA individual inspection acc. EN 10204 3.2 (TÜV/DEKRA-APZ)	<input type="checkbox"/>	C10	Certificate of oil- and grease free production	<input type="checkbox"/>
C05-1	Sealing material Manufacturer certification (FDA, USP,...), Please indicate description of certificate:	<input type="checkbox"/>			<input type="checkbox"/>

■ ADMISSIONS / ACCREDITATIONS

AA1	EC Type examination acc. to Directive 2014/68/EU	<input type="checkbox"/>	AK3	American Bureau of Shipping (ABS) type approval	<input type="checkbox"/>
AA2	TÜV component test acc. to VdTÜV specification sheet SV 100	<input type="checkbox"/>	AK4	Bureau Veritas (BV) type approval	<input type="checkbox"/>
AA3	Certification acc. to ASME Boiler and Pressure Vessel Code, Sec. XIII (ASME) ²	<input type="checkbox"/>	AK6	Registro Italiano Navale (RINA) type approval	<input type="checkbox"/>
AA4	EAC - certificate/declaration with passport for the valve and laser marking of the valve	<input type="checkbox"/>	AL	Individual inspection by notified body inspector – (body to be indicated):	<input type="checkbox"/>
AA5	Manufacture License of Special Equipment People's Republic of China (ML)	<input type="checkbox"/>			<input type="checkbox"/>
AA7	Registration according to Canadian Registration Number (CRN) ³	<input type="checkbox"/>			<input type="checkbox"/>

²ASME not for gases in combination with liquids | ³CRN only in combination with ASME

■ ENQUIRY

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Series Hygienic 4000: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		25			40			50		
		d ₀ = 23 mm			d ₀ = 37 mm			d ₀ = 46 mm		
Set pressure bar		I	II	III	I	II	III	I	II	III
Air I Nm ³ /h	0,4	207,3	171,0	6,6	536,5	442,4	17,2	829,2	683,9	26,6
	0,7	278,8	223,7	8,5	721,4	579,0	21,9	1115,0	894,9	33,8
	1,0	348,1	277,1	9,9	900,8	717,1	25,7	1392,3	1108,5	39,7
	1,5	473,0	373,8	12,2	1224,1	967,5	31,5	1892,1	1495,4	48,8
	2,0	593,9	466,6	14,1	1536,9	1207,5	36,5	2375,5	1866,3	56,4
	2,5	709,2	554,5	15,8	1835,4	1435,0	40,8	2836,9	2218,1	63,0
	3,0	828,5	645,1	17,3	2144,0	1669,5	44,7	3313,9	2580,5	69,1
Steam II kg/h	3,5	941,3	730,4	18,7	2436,0	1890,1	48,3	3765,2	2921,4	74,6
	4,0	1055,7	816,6	20,0	2732,1	2113,3	51,6	4222,8	3266,5	79,8
Water III m ³ /h	4,5	1168,3	901,2	21,2	3023,4	2332,3	54,8	4673,2	3604,9	84,7
	5,0	1281,8	986,4	22,3	3317,2	2552,7	57,8	5127,2	3945,6	89,3
	5,5	1394,3	1070,6	23,4	3608,2	2770,6	60,6	5577,1	4282,3	93,6
	6,0	1507,3	1155,0	24,5	3900,9	2989,1	63,3	6029,4	4620,2	97,8
	6,5	1616,4	1236,5	25,5	4183,2	3200,0	65,9	6465,7	4946,1	101,8
	7,0	1725,5	1317,9	26,4	4465,5	3410,7	68,4	6902,0	5271,7	105,7
	7,5	1834,6	1399,2	27,3	4747,8	3621,0	70,8	7338,4	5596,8	109,4
	8,0	1943,7	1480,3	28,2	5030,0	3831,0	73,1	7774,7	5921,4	113,0
	8,5	2052,8	1561,4	29,1	5312,3	4040,8	75,3	8211,1	6245,7	116,4
	9,0	2161,8	1642,5	30,0	5594,6	4250,5	77,5	8647,4	6569,9	119,8
	9,5	2270,9	1723,6	30,8	5876,9	4460,4	79,7	9083,7	6894,3	123,1
	10,0	2380,0	1804,6	31,6	6159,2	4670,1	81,7	9520,1	7218,4	126,3
	11,0	2598,2	1966,8	33,1	6723,8	5089,8	85,7	10392,7	7867,1	132,5
12,0	2816,4	2128,6	34,6	7288,4	5508,7	89,5	11265,4	8514,5	138,4	
13,0	3034,5	2290,2	36,0	7853,0	5926,9	93,2	12138,1	9160,9	144,0	
14,0	3252,7	2452,5	37,4	8417,6	6346,9	96,7	13010,7	9810,2	149,5	
15,0	3470,9	2614,8	38,7	8982,2	6766,8	100,1	13883,4	10459,2	154,7	
16,0	3689,0	2776,4	40,0	9546,8	7185,0	103,4	14756,1	11105,6	159,8	

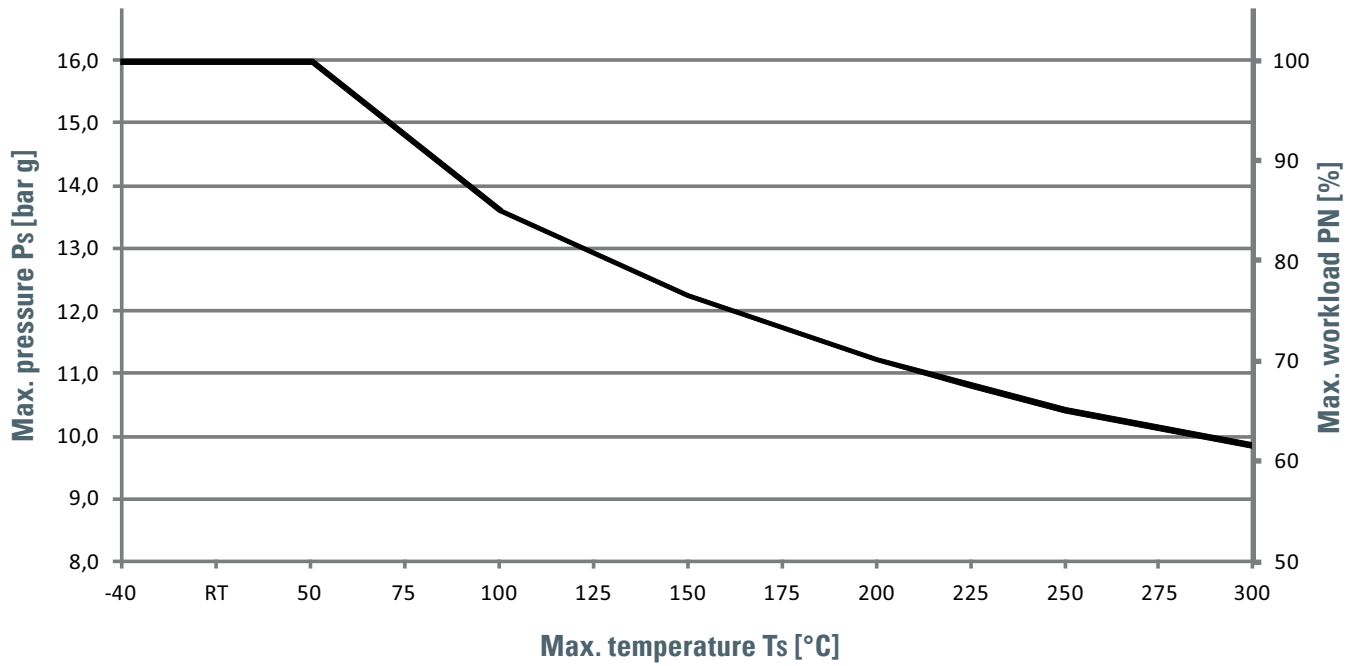
Series Hygienic 4000: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		65			80			100		
		d ₀ = 60 mm			d ₀ = 74 mm			d ₀ = 92 mm		
Set pressure bar		I	II	III	I	II	III	I	II	III
Air I Nm ³ /h	0,4	1410,8	1163,5	45,2	2146,0	1769,8	68,8	3316,9	2735,4	106,4
	0,7	1897,0	1522,5	57,5	2885,6	2315,9	87,5	4460,1	3579,5	135,2
	1,0	2368,8	1885,8	67,6	3603,2	2868,6	102,8	5569,2	4433,8	158,9
	1,5	3219,1	2544,1	82,9	4896,6	3869,9	126,2	7568,4	5981,5	195,0
	2,0	4041,5	3175,2	95,9	6147,5	4829,9	145,8	9501,9	7465,3	225,4
	2,5	5089,6	3979,3	107,3	7341,6	5740,1	163,2	11347,6	8872,2	252,2
	3,0	5638,0	4390,2	117,5	8576,0	6678,0	178,8	13255,5	10321,8	276,4
Steam II kg/h	3,5	6405,9	4970,3	127,0	9744,1	7560,4	193,2	15061,0	11685,8	298,6
	4,0	7184,4	5557,3	135,8	10928,3	8453,3	206,6	16891,3	13065,9	319,3
Water III m ³ /h	4,5	7950,6	6133,1	144,1	12093,7	9329,1	219,1	18692,6	14419,5	338,7
	5,0	8723,1	6712,7	151,9	13268,8	10210,8	231,0	20508,9	15782,4	357,1
	5,5	9488,4	7285,6	159,3	14432,9	11082,2	242,3	22308,2	17129,3	374,5
	6,0	10257,9	7860,4	166,4	15603,4	11956,5	253,1	24117,5	18480,6	391,2
	6,5	11000,3	8414,9	173,2	16732,6	12800,0	263,5	25862,8	19784,3	407,2
	7,0	11742,6	8968,9	179,8	17861,8	13642,7	273,4	27608,2	21086,9	422,6
	7,5	12485,0	9522,0	186,1	18991,0	14484,1	283,0	29353,5	22387,3	437,5
	8,0	13227,3	10074,2	192,2	20120,2	15323,9	292,3	31098,9	23685,5	451,9
	8,5	13969,7	10626,0	198,1						
	9,0	14712,0	11177,4	203,9						
9,5	15454,3	11729,5	209,5							
10,0	16196,7	12280,8	214,9							

Series Hygienic 4000: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		25			40			50		
		d ₀ = 0,9055 inch (23 mm)			d ₀ = 1,4566 inch (37 mm)			d ₀ = 1,8110 inch (46 mm)		
Set pressure psi(g)		I	II	III	I	II	III	I	II	III
Air I SCFM	15	262,7	737,5	46,9	679,7	1908,5	121,3	1050,6	2949,9	187,5
	30	383,1	1075,8	63,5	991,5	2783,9	164,2	1532,6	4303,0	253,8
	40	471,5	1323,8	73,3	1220,2	3425,9	189,6	1886,0	5295,3	293,1
	50	559,8	1571,9	81,9	1448,8	4067,9	212,0	2239,4	6287,6	327,7
	60	648,2	1820,0	89,7	1677,5	4709,9	232,2	2592,8	7279,9	359,0
	70	736,6	2068,1	96,9	1906,1	5351,9	250,8	2946,2	8272,2	387,7
	80	824,9	2316,1	103,6	2134,8	5993,9	268,2	3299,7	9264,6	414,5
	90	913,3	2564,2	109,9	2363,5	6635,9	284,4	3653,1	10256,9	439,6
Steam II PPH	100	1001,6	2812,3	115,9	2592,1	7277,9	299,8	4006,5	11249,2	463,4
	110	1090,0	3060,4	121,5	2820,8	7919,9	314,5	4359,9	12241,5	486,0
	120	1178,3	3308,4	126,9	3049,4	8561,9	328,4	4713,3	13233,8	507,6
Water III GPM	130	1266,7	3556,5	132,1	3278,1	9203,9	341,8	5066,8	14226,1	528,4
	140	1355,0	3804,6	137,1	3506,7	9845,9	354,7	5420,2	15218,4	548,3
	150	1443,4	4052,7	141,9	3735,4	10487,9	367,2	5773,6	16210,7	567,6
	160	1531,8	4300,8	146,5	3964,0	11129,9	379,2	6127,0	17203,0	586,2
	170	1620,1	4548,8	151,1	4192,7	11771,9	390,9	6480,4	18195,3	604,2
	180	1708,5	4796,9	155,4	4421,3	12413,9	402,2	6833,9	19187,6	621,7
	190	1796,8	5045,0	159,7	4650,0	13055,9	413,3	7187,3	20180,0	638,8
	200	1885,2	5293,1	163,8	4878,7	13697,9	424,0	7540,7	21172,3	655,4
	210	1973,5	5541,1	167,9	5107,3	14339,9	434,5	7894,1	22164,6	671,5
	220	2061,9	5789,2	171,8	5336,0	14981,9	444,7	8247,5	23156,9	687,4
	230	2150,2	6037,3	175,7	5564,6	15623,9	454,7	8601,0	24149,2	702,8
	232	2167,9	6086,9	176,5	5610,3	15752,3	456,7	8671,6	24347,7	705,8

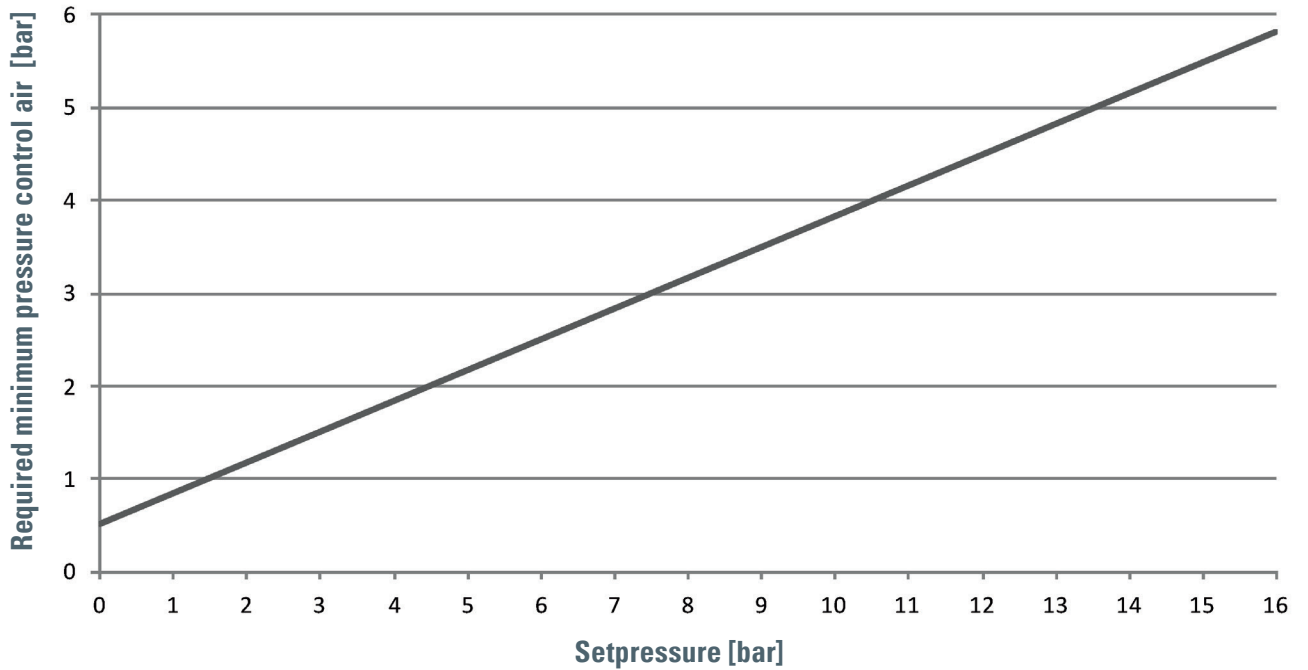
Series Hygienic 4000: Blowing-off rates at 10% above set pressure										
Nominal diameter DN		65			80			100		
		d ₀ = 2,3622 inch (60 mm)			d ₀ = 2,9133 inch (74 mm)			d ₀ = 3,6220 inch (92 mm)		
Set pressure psi(g)		I	II	III	I	II	III	I	II	III
Air I SCFM	15	1787,4	5018,7	318,9	2718,9	7634,0	485,1	4202,5	11799,5	749,8
	30	2607,4	7320,8	431,8	3966,1	11135,8	656,9	6130,2	17212,1	1015,3
	40	3208,7	9009,1	498,6	4880,7	13703,8	758,5	7543,9	21181,3	1172,4
	50	3809,9	10697,3	557,5	5795,3	16271,8	848,0	8957,6	25150,5	1310,7
	60	4411,2	12385,5	610,7	6710,0	18839,8	928,9	10371,3	29119,8	1435,8
	70	5012,5	14073,8	659,6	7624,6	21407,8	1003,4	11785,0	33089,0	1550,9
	80	5613,8	15762,0	705,2	8539,2	23975,8	1072,7	13198,6	37058,2	1658,0
	90	6215,1	17450,2	748,0	9453,8	26543,8	1137,7	14612,3	41027,5	1758,5
Steam II PPH	100	6816,4	19138,5	788,4	10368,4	29111,8	1199,3	16026,0	44996,7	1853,7
	110	7417,6	20826,7	826,9	11283,0	31679,8	1257,8	17439,7	48965,9	1944,1
	120	8018,9	22515,0	863,7	12197,7	34247,8	1313,7	18853,4	52935,2	2030,6
Water III GPM	130	8620,2	24203,2	898,9	13112,3	36815,8	1367,4	20267,0	56904,4	2113,5
	140	9221,5	25891,4	932,9	14026,9	39383,8	1419,0	21680,7	60873,6	2193,3
	150	9822,8	27579,7	965,6	14941,5	41951,8	1468,8	23094,4	64842,9	2270,2
	160	10424,0	29267,9	997,3						
	170	11025,3	30956,2	1028,0						
	180	11626,6	32644,4	1057,8						
	190	12227,9	34332,6	1086,8						
	200	12829,2	36020,9	1115,0						
	210	13430,5	37709,1	1142,5						
	220	14031,7	39397,3	1169,4						
	230	14633,0	41085,6	1195,7						
	232	14753,3	41423,2	1200,9						

Pressure-/ temperature rating

PN 16 | Material: 1.4404 / 1.4435



Control air pneumatic lifting device (max. 6 bar)



HYGIENIC AND ASEPTIC CONNECTIONS

Connection type	Drawing	Description	Standard	Pipe standard	400	400.5	4000	4020	4040	4060
KLSDIN KLSISO KLSASME KLSIX		Clamp connection Clamp connection Clamp connection Clamp connection	DIN 32676-A DIN 32676-B DIN 32676-C ISO 2852	Pipe standard DIN 11850-2 / 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C Pipe standard ISO 2037			X		X	X
GS1		Threaded ferrule connection	DIN 11851-SC	Pipe standard DIN 11850-2 / 11866-A			X		X	X
KS1		Taper nipple with groove cap nut	DIN 11851-SD	Pipe standard DIN 11850-2 / 11866-A			X		X	X
A-NKS1 A-NKS2 A-NKS3		Aseptic groove clamp connection Aseptic groove clamp connection Aseptic groove clamp connection	DIN 11864-3-NKS DIN 11864-3-NKS DIN 11864-3-NKS	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
A-BKS1 A-BKS2 A-BKS3		Aseptic collar clamp connection Aseptic collar clamp connection Aseptic collar clamp connection	DIN 11864-3-BKS DIN 11864-3-BKS DIN 11864-3-BKS	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
A-GS1 A-GS2 A-GS3		Aseptic threaded ferrule connection Aseptic threaded ferrule connection Aseptic threaded ferrule connection	DIN 11864-1-GS DIN 11864-1-GS DIN 11864-1-GS	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
A-KS1 A-KS2 A-KS3		Aseptic collar connection with groove cap nut Aseptic collar connection with groove cap nut Aseptic collar connection with groove cap nut	DIN 11864-1-BS DIN 11864-1-BS DIN 11864-1-BS	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
A-BF1 A-BF2 A-BF3		Aseptic flanged connection Aseptic flanged connection Aseptic flanged connection	DIN 11864-2-BF DIN 11864-2-BF DIN 11864-2-BF	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
A-NF1 A-NF2 A-NF3		Aseptic grooved flanged connection Aseptic grooved flanged connection Aseptic grooved flanged connection	DIN 11864-2-NF DIN 11864-2-NF DIN 11864-2-NF	Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C			X		X	X
SE4 SE5 SE6		Butt weld Butt weld Butt weld		Pipe standard DIN 11850-2 / DIN 11866-A Pipe standard DIN EN ISO 1127 / DIN 11866-B Pipe standard BS 4825-1 / DIN 11866-C					X	X
VC		Container flange at valve inlet							X	

Other connection types such as flange connection according to DIN EN 1092 / ASME B16.5, APV plain / grooved flanges, NA Connect, SMS threaded / tapered connection pieces are available on request.