




→ Series Hygienic 400.5

Hygienic 400.5

Overflow / Pressure control valve made of stainless steel, angle type
-External adjustment-

■ SUITABLE FOR

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

■ EXAMPLES OF USE

For the protection of:

- Pumps against overloading in closed circuits for neutral / non-neutral liquids

For the control 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
- 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
- Adjustable and settable during operation
- Possible to carry-out CIP/SIP by lifting the disc from the seat
- Gap-free installation of seals
- Surface roughness in the primary area $R_a < 0.75\mu\text{m}$
- Optional: electropolished and/or mechanically polished
- Moulded diaphragm for separating the product space from the springhousing
- Dead space ratio L/D ~ 1,5

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

TR ZU 032/2013 - TR ZU 010/2011

Requirements

DGR 2014/68/EU

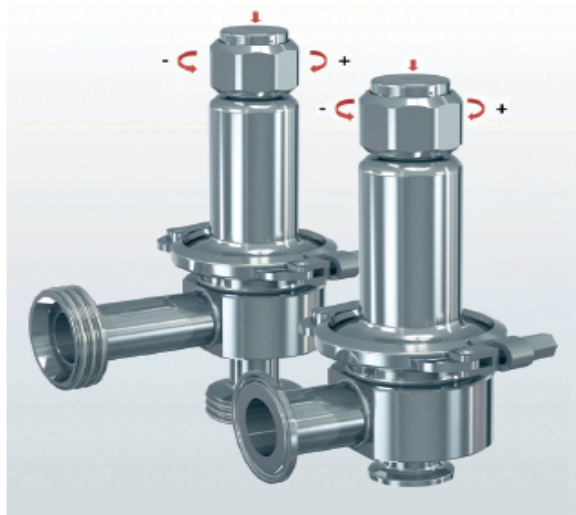
Additional hygienic requirements

EG No. 852/2004
DIN EN 1672-2

9. GPSGV
GS-NG 2 and 5

Klassifizierungsgesellschaften

Russian Maritime Register of Shipping RS
DNV DNV
Registro Italiano Navale RINA



■ MATERIAL



■ SPECIFICATION



DN 20 – DN 50



-40°C to +200°C
depending on version



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

■ MATERIALS

Component	Material	DIN EN	ASME
Body	Stainless steel	1.4435	316 L
Inner parts, wetted	Stainless steel	1.4435	316 L
Upper section, other inner parts	Stainless steel	1.4404	316 L
Spring	Stainless steel	1.4310	302
Bellows	Stainless steel	1.4571	316 Ti

Series 400.5 ■ VALVE VERSION

b	Standard with bellows	for neutral and non-neutral media and/or counter pressure up to 4 bar. 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 stainless steel bellows

Valves can be delivered unset within a pressure range or set and sealed at the factory (Option code: FE).
Can be adjusted by hand wheel under operating conditions without medium escaping into the environment.

■ 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

K	Standard with twist-type lifting mechanism
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■ AVAILABLE NOMINAL DIAMETERS AND CONNECTION SIZES

Nominal diameter DN		20								
Connection type		DIN				ISO			ASME	
Inlet DN (NPS)		DN 20	DN 25	DN 32	DN 40	DN 15	DN 20	DN 25	1"	1½"
Outlet DN (NPS)	25	■	■			■	■	■		
	32	■	■	■			■	■		
	40 (1½")			■	■			■	■	■
	50 (2")			■	■					■



■ TYPE OF CONNECTION INLET / OUTLET

KLSDIN / KLSIDIN	Standard	Clamp connection / Clamp connection	DIN 32676 -A/ DIN 32676-A	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
KS1 / KS1		Taper nipple / Taper nipple	DIN 11851 / DIN 11851	Pipe Standard DIN 11850-2 / 11866-A
A-BKS1 / A-BKS1		Aseptic collar clamp connection / Aseptic collar clamp connection	DIN 11864-3 / DIN 11864-3 DIN 11853-3 / DIN 11853-3	Pipe Standard DIN 11850-2 / 11866-A
A-GS1 / A-GS1		Aseptic threaded ferrule connection A/ Aseptic threaded ferrule connection A	DIN 11864-1 / DIN 11864-1 DIN 11853-1 / DIN 11853-1	Pipe Standard DIN 11850 / 11866
A-BF1 / A-BF1		Aseptic flanged connection / Aseptic flanged connection	DIN 11864-2 / DIN 11864-2 DIN 11853-2 / DIN 11853-2	Pipe Standard DIN 11850-2 / 11866-A

■ SEALS

FKM	Fluorocarbon	Elastomere moulded seal	FDA, USP, 3-A, ADI-free	-20°C to +200°C
EPDM	Ethylene propylene diene	Elastomere moulded seal	FDA	-40°C to +170°C

■ NOMINAL DIAMETERS, CONNECTIONS, INSTALLATION DIMENSIONS

Series Hygienic 400.5: Connection, installation dimensions, ranges of adjustment

Nominal diameter	DN				20						
	Clamp connection DIN 32676-A				Threaded ferrule connection DIN 11851-SC						
Connection inlet	DN1	20	25, 32, 40	40	20	20	25	32	40	40	
	D1	34	50,5	50,5	-	-	-	-	-	-	
	G1	-	-	-	Rd 44 x 1/6	Rd 44 x 1/6	Rd 52 x 1/6	Rd 58 x 1/6	Rd 65 x 1/6	Rd 65 x 1/6	
	F1	-	-	-	-	-	-	-	-	-	
Connection outlet	DN2	25, 32	25, 32, 40	50	25	32	25	32	40	50	
	D2	50,5	50,5	64	-	-	-	-	-	-	
	G2	-	-	-	Rd 52 x 1/6	Rd 58 x 1/6	Rd 52 x 1/6	Rd 58 x 1/6	Rd 65 x 1/6	Rd 78 x 1/6	
	F2	-	-	-	-	-	-	-	-	-	
Installation dimensions in mm	L1	64	64	58	-	-	-	-	-	-	
	L2	-	-	-	99	102	99	102	103	105	
	L3	-	-	-	-	-	-	-	-	-	
	L4	-	-	-	-	-	-	-	-	-	
	h1	34	34	34	-	-	-	-	-	-	
	h2	-	-	-	58	58	63	66	67	67	
	h3	-	-	-	-	-	-	-	-	-	
	h4	-	-	-	-	-	-	-	-	-	
	H1	150	150	150	150	150	150	150	150	150	
	do	18	18	18	18	18	18	18	18	18	
	kg	1,8	1,8	2,0	1,9	1,9	2,0	2,0	2,2	2,3	
	Set pressure	bar	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16
	Pressure range	bar	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5
1,5 - 4,5			1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	
4,5 - 7			4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	
7 - 10			7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	
10 - 14			10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	

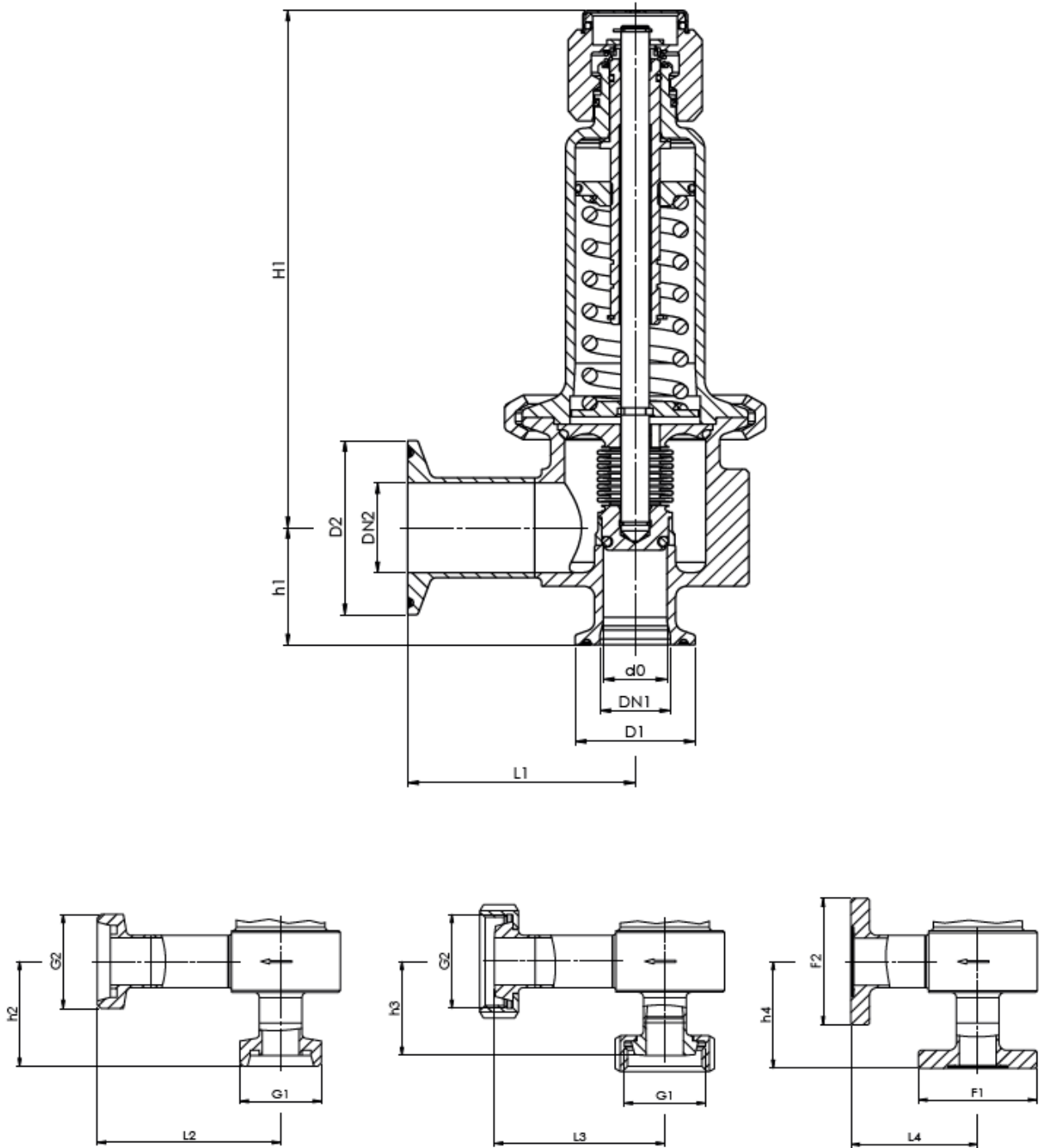
⁰ Other connection types / sizes possible, dimensioning according to separate dimensional drawing.

Series Hygienic 400.5: Connection, installation dimensions, ranges of adjustment

Nominal diameter	DN						20						
	Taper nipple DIN 11851-SD						Aseptic flanged connection DIN 11864-BF						
Connection inlet	DN1	20	20	25	32	40	40	20	20	25	32	40	40
	D1	-	-	-	-	-	-	-	-	-	-	-	-
	G1	Rd 44 x 1/8	Rd 44 x 1/8	Rd 52 x 1/8	Rd 58 x 1/8	Rd 65 x 1/8	Rd 65 x 1/8	-	-	-	-	-	-
	F1	-	-	-	-	-	-	64	64	70	76	82	82
Connection outlet	DN2	25	32	25	32	40	50	25	32	25	32	40	50
	D2	-	-	-	-	-	-	-	-	-	-	-	-
	G2	Rd 52 x 1/8	Rd 58 x 1/8	Rd 52 x 1/8	Rd 58 x 1/8	Rd 65 x 1/8	Rd 78 x 1/8	-	-	-	-	-	-
	F2	-	-	-	-	-	-	70	76	70	76	82	94
Installation dimensions in mm	L1	-	-	-	-	-	-	-	-	-	-	-	-
	L2	-	-	-	-	-	-	-	-	-	-	-	-
	L3	92	95	92	95	96	98	-	-	-	-	-	-
	L4	-	-	-	-	-	-	68	95	68	95	95	95
	h1	-	-	-	-	-	-	-	-	-	-	-	-
	h2	-	-	-	-	-	-	-	-	-	-	-	-
	h3	52	52	56	59	60	60	-	-	-	-	-	-
	h4	-	-	-	-	-	-	59	59	58	59	59	59
	H1	150	150	150	150	150	150	150	150	150	150	150	150
	do	18	18	18	18	18	18	18	18	18	18	18	18
	kg	2,0	2,0	2,1	2,3	2,4	2,6	2,2	2,3	2,3	2,4	2,5	2,6
	Set pressure	bar	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16	0,4 - 16
	Pressure range	bar	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5	0,4 - 1,5
1,5 - 4,5			1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5	1,5 - 4,5
4,5 - 7			4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7	4,5 - 7
7 - 10			7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10	7 - 10
10 - 14			10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14	10 - 14

⁰ Other connection types / sizes possible, dimensioning according to separate dimensional drawing.

■ MAIN DIMENSIONS, INSTALLATION DIMENSIONS



Series 400 ■ 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				
400.5	b	GF	K	20	GS1	GS1	25	25	FKM	P09	1,5-4,5	2
400.5	b	GF	K	20	KLSDIN	KLSDIN	25	25	EPDM	FE	3,5	1
400.5	b	GF	K	20								
400.5	b	GF	K	20								
400.5	b	GF	K	20								

■ PROPERTIES

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

P01	Oil- and grease-free production	<input type="checkbox"/>	FE	Fixed setting and sealing	<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"/>
C02-1	Test certificate acc. DIN EN 10204 3.1 (WPZ 3.1) for non TÜV-CE valves marking of individual serial number is required	<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	Sealing material Manufacturer certification (FDA, USP 3, 3-A,...), 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"/>	AK1	Det Norske Veritas (DNV) type approval	<input type="checkbox"/>
AA4	EAC - certificate/declaration with passport for the valve and laser marking of the valve	<input type="checkbox"/>	AK2	Lloyd's Register (LR) type approval	<input type="checkbox"/>
	<input type="checkbox"/>		AK3	American Bureau of Shipping (ABS) type approval	<input type="checkbox"/>
	<input type="checkbox"/>		AK4	Bureau Veritas (BV) type approval	<input type="checkbox"/>
	<input type="checkbox"/>		AK5	Russian Maritime Register of Shipping (RMRS) type approval	<input type="checkbox"/>
	<input type="checkbox"/>		AK6	Registro Italiano Navale (RINA) type approval	<input type="checkbox"/>
	<input type="checkbox"/>		AL	Individual inspection by notified body inspector – (body to be indicated):	<input type="checkbox"/>

■ CAPACITY TABLE

Series Hygienic 400.5: Kv values at 1 bar overpressure

Nominal diameter DN	20					
	Air [Nm ³ /h]					
Pressure range bar	0,4 - 1,5	1,5 - 4,5	4,5 - 7	7 - 10	10 - 14	14 - 16
Set pressure bar						
0,4	215					
1,0	278					
1,5	318	330				
3,0		455				
4,5		596	398			
5,7			428			
7,0			482	424		
8,5				435		
10,0				444	442	
12,0					531	
14,0					619	415
15,0						433
16,0						510

Kv values at 1 bar overpressure

Nominal diameter DN	20					
	Water [m ³ /h]					
Pressure range bar	0,4 - 1,5	1,5 - 4,5	4,5 - 7	7 - 10	10 - 14	14 - 16
Set pressure bar						
0,4	7					
1,0	7,5					
1,5	8,1	6,7				
3,0		8,2				
4,5		9,9	7,0			
5,7			8,1			
7,0			9	7,5		
8,5				8,5		
10,0				9,1	6,9	
12,0					7,4	
14,0					8,8	4,9
15,0						6,0
16,0						6,3

Kv values at 1 bar overpressure

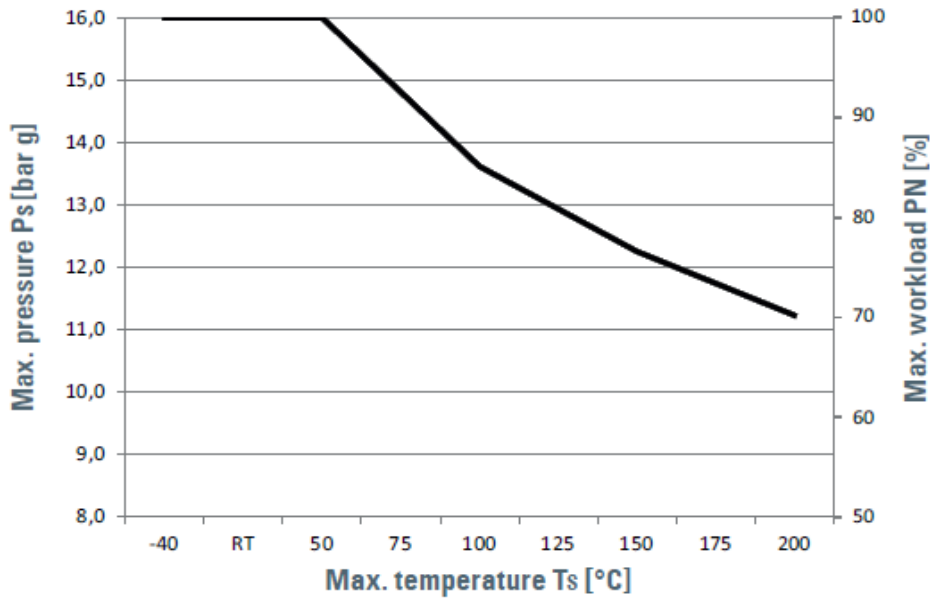
Nominal diameter DN	20					
	Steam [kg/h]					
Pressure range bar	0,4 - 1,5	1,5 - 4,5	4,5 - 7	7 - 10	10 - 14	14 - 16
Set pressure bar						
0,4	163					
1,0	224					
1,5	250	195				
3,0		360				
4,5		466	306			
5,7			331			
7,0			374	325		
8,5				336		
10,0				340	336	
12,0					408	
14,0					466	317
15,0						337
16,0						380

■ FLOW COEFFICIENTS CHART

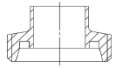

Series Hygienic 400.5

Pressure-/ temperature rating

PN 16 | Material: 1.4404 / 1.4435



HYGIENIC AND ASEPTIC CONNECTIONS

Connection type	Drawing	Description	Standard	Pipe standard	400	400.5	4000	4020	4040	4060
KLS DIN KLS ISO KLS ASME KLS IX		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	