chemvalve-schmid.com

ChemValve®
Valve Technology



PrimeNozzle | CSL

Nozzle Check Valve

Product Brochure

Company Overview

ChemValve-Schmid AG develops and manufactures high quality valves which are sold and distributed through a carefully developed network of long-standing partners in more than 50 countries all over the world.

We have been developing Check Valves and PTFE Lined Butterfly Valves in close cooperation with the most important European PTFE manufacturers since the 1980s. As a result, we have over 30 years of expertise in valve production. Our private and therefore independent company has shown consistent and healthy growth since then.

„Innovative – proficient – reliable", that's our motto. Thanks to years of investment in state-of-the-art production technologies and highly qualified employees, we offer unprecedented product and service quality in this sector. We creatively develop on-time solutions that are focused on our customers' needs. Thanks to our process reliability, which covers the entire value chain through to warehousing and has evolved over many years, standard products are delivered within only a few days in line with customer-controlled assembly requirements. Existing products are continuously improved and new products are developed based on customer requirements.



Zertifiziertes Managementsystem SQS ISO 9001

CE 1250

Features 4
Components 5
Industry Standards 6
Dimensions & Opening Pressures 7
Flow Rate & Pressure Loss 8
Application Limits 9
Order Code 10
Pressure Loss Comparison | Check Valves 11

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Features



The streamlined **PrimeNozzle | CSL** improves energy efficiency, minimises pressure loss and reduces operating costs.

Optimised Flow

- The streamlined design reduces the pressure drop in the system and the energy usage required for plant operation
- Increased throughput of up to 100% compared to conventional check valves can cut operational costs in half
- The sensitive closing mechanism proactively prevents water hammer

Increased Service Life

- The guided disc increases the operating life of the valve
- Wear is significantly reduced thanks to the predefined movement of the disc
- Jamming or seizing of the valve is prevented, long after installation
- The guided and controlled movement reduces operational noise
- The streamlined form of the disc offers optimised flow behaviour

Versatile Flange Connection

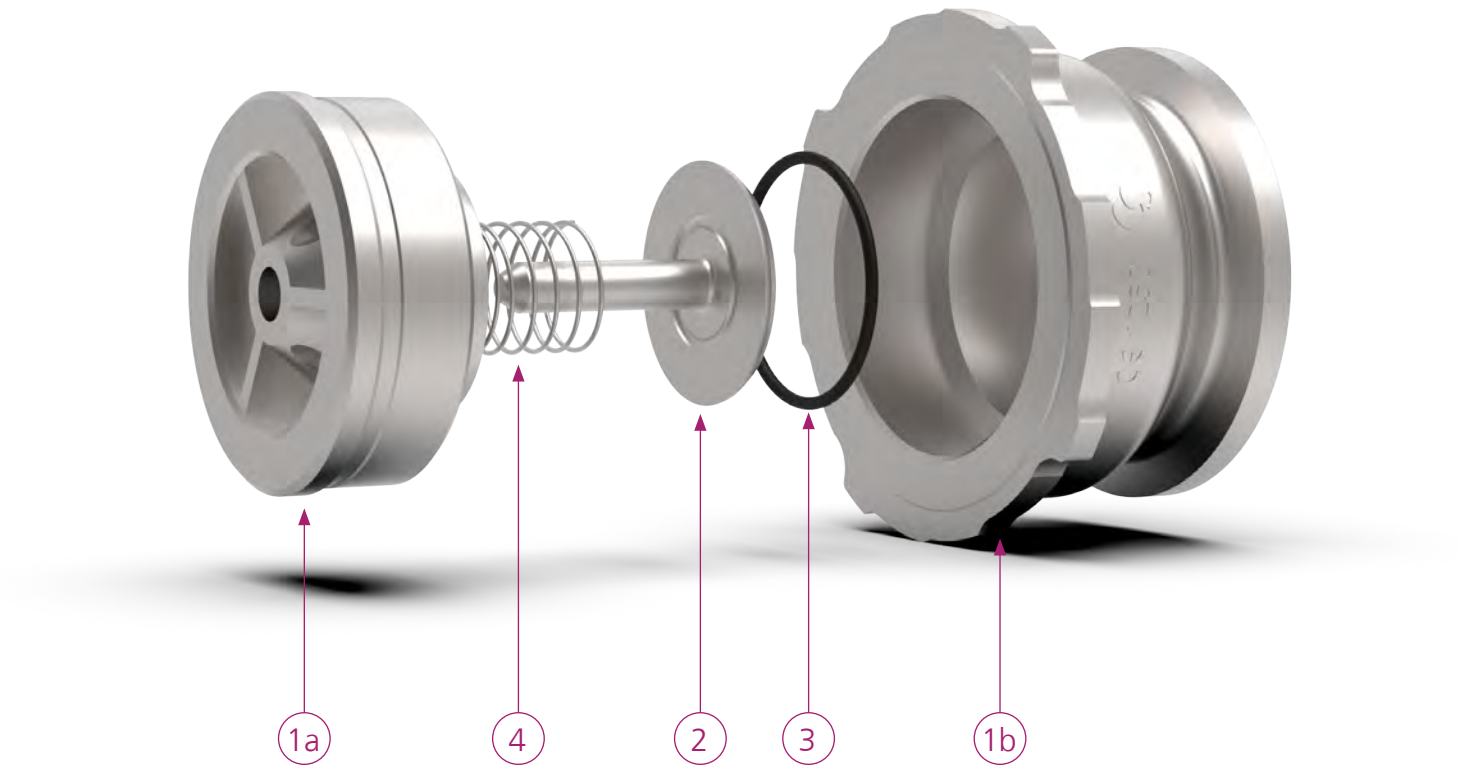
- Easy installation on all common international flange types
- The integrated flange incorporates pressure classes PN 10–40, ANSI Class 150/300 & JIS 10k
- Centering of the valve is simple and intuitive
- Installers are assisted for professional and accurate installation

Additional Features

- The interlocking design protects the pipe system from potential damage, as it removes the need for small parts which may loosen
- The wide flange surface offers optimal sealing performance
- The spring is designed to never fully compress, which increases its operating lifespan
- Optional seals embedded in the body allow leak-free operation

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Components



Item #	Description	DN 15-100
1a	Star	1.4408
1b	Body	1.4408
2	Valve Plate	1.4408
3	Soft Seal	Metallic EPDM NBR FKM PTFE
4	Spring	1.4401

Item #	Description	DN 125-300
1a	Star	1.4404
1b	Body	1.4404
2	Valve Plate	1.4404
3	Seal	Metallic EPDM NBR FKM PTFE
4	Spring	1.4401

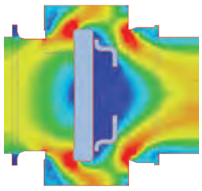
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Industry Standards

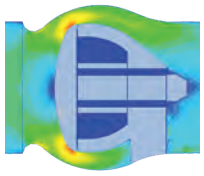
Nominal Diameter	• DN 15-300 / 1/2"-12"
Flange Connection	• EN 1092-1, PN 10-40 • ASME B16.5, Class 150-300 • JIS 10K
Maximum Working Pressure	• 52 bar • Up to 160 bar possible
Operating Temperature	• -200° C to 300° C
Face-to-Face Length	• EN 558-2, Row 52/14
Conformity	• PED 2014/68/EU • ATEX 2014/34/EU • Food (EC) Nr. 1935/2004, FDA
Pressure Test: EN 12266-1	• Leakage Rate A: soft sealings • Leakage Rate C: metal sealings • Leakage Rate D: PTFE

Case Study

DN50 Flowrate Comparison



Common



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1. Flowrate & Pressure Loss

	Common	PrimeNozzle | CSL
Kv [m³/h] / Zeta	41.3 / 5.9	48.3 / 4.3

2. Working Conditions

Medium	Water
Flow Velocity	4 m/s
Energy Costs	0.15 € / kWh
Operating Time	220 Days/Year 16 Hours/Day

3. Results

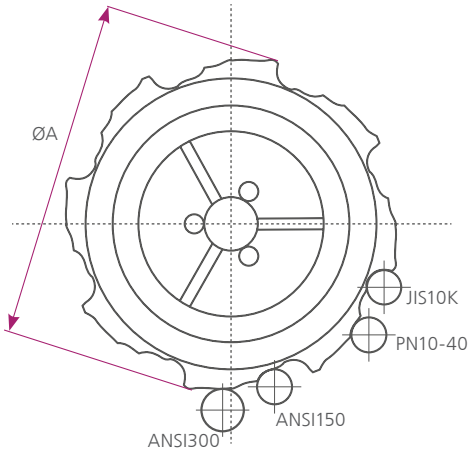
	Common	PrimeNozzle | CSL
Energy Use [kWh / Year]	1313	937
Energy Costs	197 €	141 €
Savings per Year		**56 €**

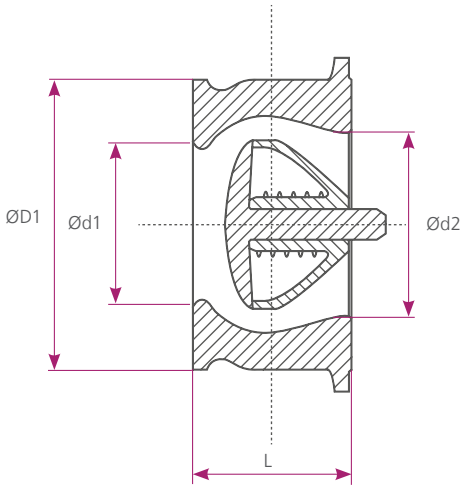
4. Summary

The **PrimeNozzle | CSL** Nozzle Check Valve substantially reduces energy consumption and lowers running costs accordingly.

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Dimensions & Opening Pressures





Dimensions

DN [mm]	15	20	25	32	40	50	65	80	100	125	150	200	250	300
DN [inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
L [mm]	25*	31.5*	35.5*	40*	45*	56*	63*	71*	80*	200**	210**	230**	250**	270**
$ØA_{PN10}$											218	273	328	378
$ØA_{PN16}$														384
$ØA_{PN25}$										192	226	284	336.5	400
$ØA_{PN40}$	61	77	77	93	98.5	116	144	154	185			290	352	417
$ØA_{ANSI150}$											218	273	336.5	406.4
$ØA_{ANSI300}$										212.7	247.7	304.8	358.7	417
$ØA_{JIS10K}$										187	218	267	328	375
ØD1	45	56	65	74	84	96	112	130	154	192	218	273	328	378
$Ød1_{Inlet}$	16.5	22	25.6	33.6	41	52	59.5	75.7	94.1	125	150	200	250	300
$Ød2_{Outlet}$	18.1	23	27.7	35.6	41	52	66	82	105	126	160	208	260	308
$Pressure\ Loss_{Zeta}$	2.7	2.99	3.91	3.71	4.24	4.27	5.85	5.31	5.89	6.14	5.39	6.11	7.95	6.3
$Flow\ Rate_{Kv}$ [m3/h]	5.47	9.24	12.63	21.23	31.04	48.33	69.83	110.95	164.64	252	387.5	646.6	885.6	1432.8
Weight [kg]	0.28	0.44	0.58	0.89	1.33	2.2	3.28	4.78	6.97	-	-	-	-	-

*Face-to-Face length acc. to EN558 Row 52
**Face-to-Face length acc. to EN558 Row 14

Opening Pressure

DN [mm]	15	20	25	32	40	50	65	80	100	125	150	200	250	300
DN [inch]	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"
P_A ↓ [mbar]	15	15	16	15	14	13	12	12	11	7	9	8	3	-4
P_A → [mbar]	20	20	20	20	20	20	20	20	20	20	20	20	20	20
P_A ↑ [mbar]	25	25	25	26	26	26	28	28	29	33	31	32	37	44
P_A ↑ $_{Without\ Spring}$ [mbar]	5	5	5	6	6	6	8	8	9	13	11	12	17	24

Step 1 - Formula

To calculate the pressure loss of a given medium, the equivalent water flow rate Q_W must first be calculated using the following formula:

$$Q_W = Q\sqrt{\frac{\rho}{1000}}$$

where

Q_W = Equivalent water flow rate in [m³/h]

Q = Flow rate of the medium in operating conditions in [m³/h]

ρ = Density of the medium in operating conditions in [kg/m³]

Example

Q_{Honey} = 65 m³/h
ρ_{Honey} = 1100 kg/m³

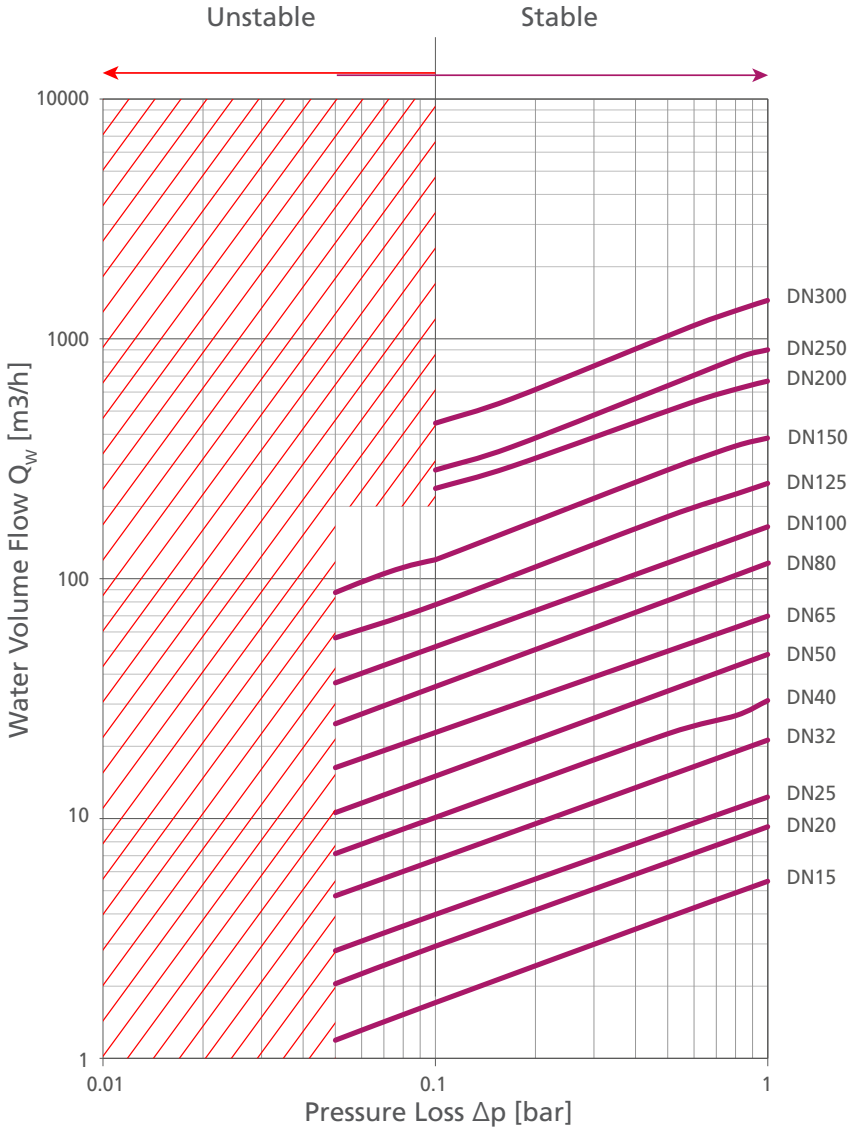
$$Q_W = 65\ m^3/h \cdot \sqrt{\frac{1100\ kg/m^3}{1000}}$$

Q_W = 70 m³/h

Step 2 - Pressure Loss Diagram

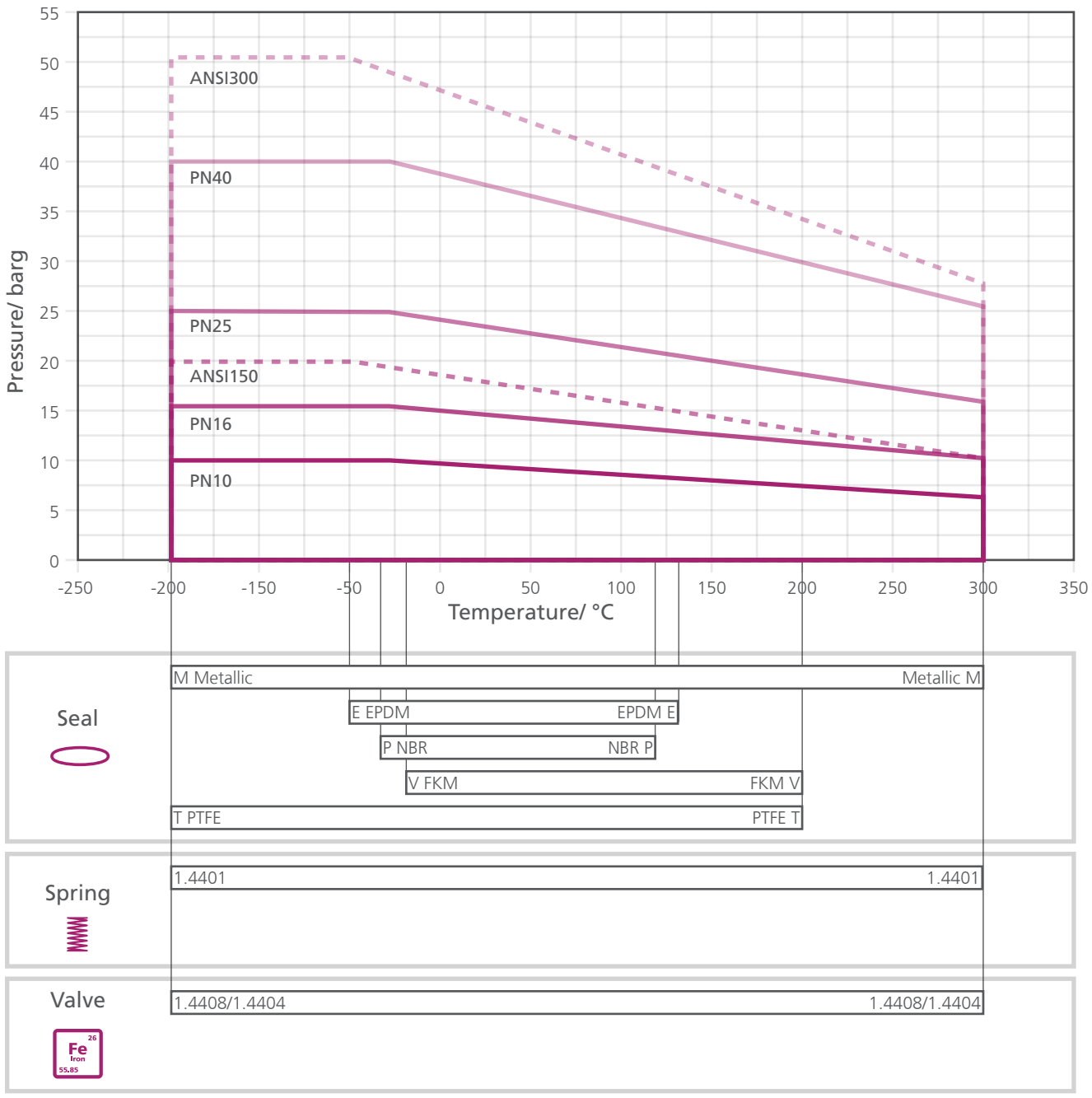
Cross-reference the equivalent water flow rate with the relevant valve diameter in the pressure loss diagram to find the pressure loss for the given medium.

The graph shows pressure loss values for water at 20°C, measured across valves installed in horizontal pipelines. When installed in vertical pipelines, there are insignificant deviations in the partial opening range.



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Application Limits



DN	Flange Combinations
15-100	PN10-40, ANSI150-300 & JIS10k
125	PN10-40 & ANSI150; ANSI300; JIS10k
150	PN10-16, ANSI150 & JIS10k; PN25-40; ANSI300
200	PN10-16 & ANSI150; PN25; PN40; ANSI300; JIS10k
250	PN10-16 & JIS10k; PN25 & ANSI150; PN40; ANSI300
300	PN10; PN16; PN25; PN40 & ANSI300; ANSI150; JIS10k

Other flanges and pressure ratings are available on request.

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Order Code



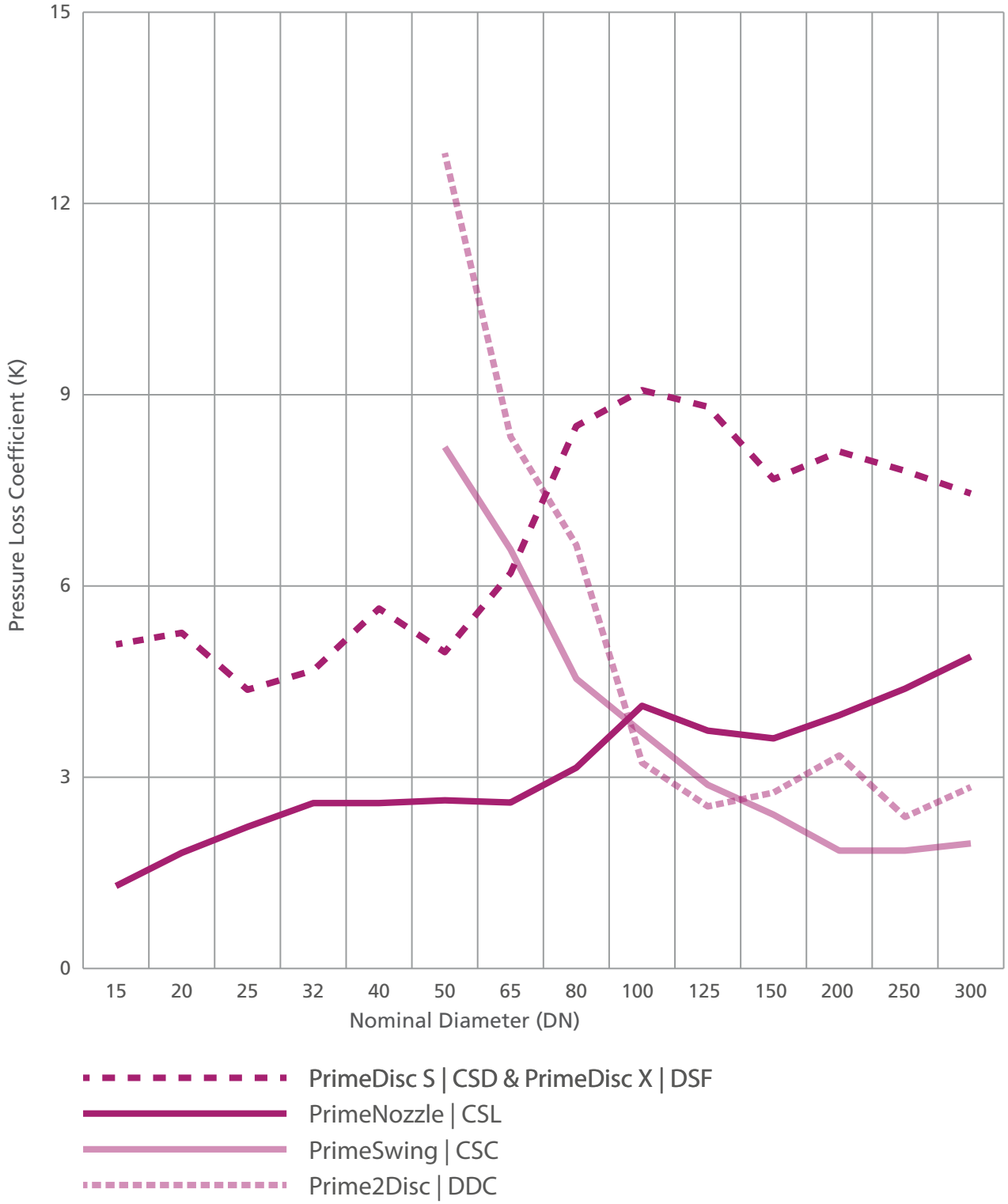
Order Code

Code example: CSL6464MS025PN10-40ANSI150-300

Type	Body		Disc		Seal		Spring		DN	Flange
	Code	Material	Code	Material	Code	Material	Code	Material	[mm]	
CSL	64	1.4408 / 1.4404	64	1.4408 / 1.4404	M	Metallic/None	S	1.4401	015-300	PN 10-40
					E	EPDM				ANSI Class 150-300
					P	NBR				
					V	FKM				
					T	PTFE				

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Pressure Loss Comparison | Check Valves



								
		PrimeDisc S | CSD	**PrimeDisc S | CVD**	**PrimeDisc X | DSF**	**ChemDisc | DTEF**	**PrimeNozzle | CSL**	**PrimeSwing | CSC**	**Prime2Disc | DDC**
	Nominal Diameter	DN15-200 | 1/2"-8"	DN15-350 | 1/2"-14"	DN15-100 | 1/2"-4"	DN15-150 | 1/2"-6"	DN15-300 | 1/2"-12"	DN50-1000 | 2"-40"	DN50-1000 | 2"-40"
	Flange	PN10-16, ANSI 150	Customisable	PN10-16 | ASME 150 | JIS 10K	PN10-16 | ASME 150 | JIS 10K	PN10-40 | ASME 150-300 | JIS 10K	PN10-40 | ASME 150-300	PN10-40 | ASME 150-300 | JIS 10K
	Max. Pressure	40 bar	40 bar	40 bar	10 bar	52 bar | up to 160 bar possible	40 bar	40 bar
p-T	**Temperature**	-200°C to 300°C	-200°C to 677°C	-200°C to 500°C	-200°C to 160°C	-200°C to 300°C	-200°C to 500°C	-200°C to 500°C
L	**F2F Length**	EN 558, Series 49	EN 558, Series 49/52	EN 558-2, Row 52	EN 558-1, Series 52	EN 558-2, Row 52/14	EN 558, Row 97	EN 558-1, Row 16
26 Fe Iron 55.85	**Materials**	C-Steel | Stainless Steel	Special Materials	C-Steel | Stainless Steel | Duplex | Uranus | Titan	Stainless Steel | mPTFE | mPTFE Conductive	Stainless Steel	Stainless Steel | C-Steel | Polypropylene | mPTFE	C-Steel | Stainless Steel | Bronze
	Seal	Metallic | EPDM | NBR | FKM | PTFE	Metallic | EPDM | NBR | FKM | PTFE	Metallic | EPDM | NBR | FKM | PTFE	PTFE | EPDM | NBR | FKM	Metallic | EPDM | NBR | FKM | PTFE	Metallic | EPDM | NBR | FKM | PTFE	Metallic | EPDM | NBR | FKM | PTFE
	Flow Direction	← → ↑ ↓	← → ↑ ↓	← → ↑ ↓	← → ↑ ↓	← → ↑ ↓	← → ↑	← → ↑
CE 1250	**Conformity**	PED | ATEX | Food | FDA	PED | ATEX | Food | FDA	PED | ATEX | Food | FDA	PED | ATEX | Food | FDA	PED | ATEX | Food | FDA	PED | ATEX | Food | FDA	PED
	Pressure Test	A | D	A | D	A | D	A | D	A | C | D	A | D	A | G

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