

Dual-plate Check Valve

SERIE 2000 PN 16

PN 16
DN 50-600 (2"-24")
Cast Iron Body

Type Series Booklet



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Type Series Booklet SERIE 2000 PN 16

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Check Valves and Strainers

Dual-plate Check Valve

SERIE 2000 PN 16



Main applications

- Water supply systems
- Hot-water heating systems
- Air-conditioning systems
- General irrigation systems
- Water treatment

Fluids handled

- Hot water
- Hot water
- Service water
- Cooling water
- Drinking water
- Abrasive fluids
- Heat transfer media / oils
- Fluids containing mineral oils
- Explosive fluids
- Combustible fluids
- Toxic fluids
- Volatile fluids
- Gas
- Steam

Operating data

Operating properties

Characteristic	Value
Nominal pressure	PN 16
Nominal size	DN 50-600

Characteristic	Value
Max. permissible pressure	16 bar
Max. permissible temperature	200 °C
Min. permissible temperature	-5 °C

Design details

Design

- Single-piece wafer-type body for long operating reliability and corrosion protection
- Dual-plate design
- Metal/elastomer-seated
- Tight shut-off
Metal/elastomer-seated to EN 12266-1, Leakage rate A, and ISO 5208 Category A
- Face-to-face length to API 594 Class 125, except DN 65 to 300 (2 ½" to 12")
- Installation between flanges to PN 10, 16 and ASME B16.1 Class 125
- Marked in accordance with EN 19
- Exterior coating: polyurethane coating, thickness 80 µm, RAL 5002 blue
- The valves made of lamellar graphite cast iron satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Group 2.
- The valves meet the requirements of the REACH 1907/2006 regulation. None of the substances listed in the candidate list and in Annex XIV of the regulation is present in a concentration above 0.1 % (w/w) (Article 33/REACH).

Body materials

Overview of available materials

Material	Material number	Temperature limit
ASTM A126 Cl. B	JL1040	Up to 200 °C

Product benefits

- Low weight and compact design.
- No additional support of piping required.
- No special tools required for installation.
- Very long service life and excellent corrosion resistance.
- Design prevents friction and resulting damage to seat/disc interface.

Related documents

Document	Number
Operating manual	8000.86

On all enquiries/orders please specify

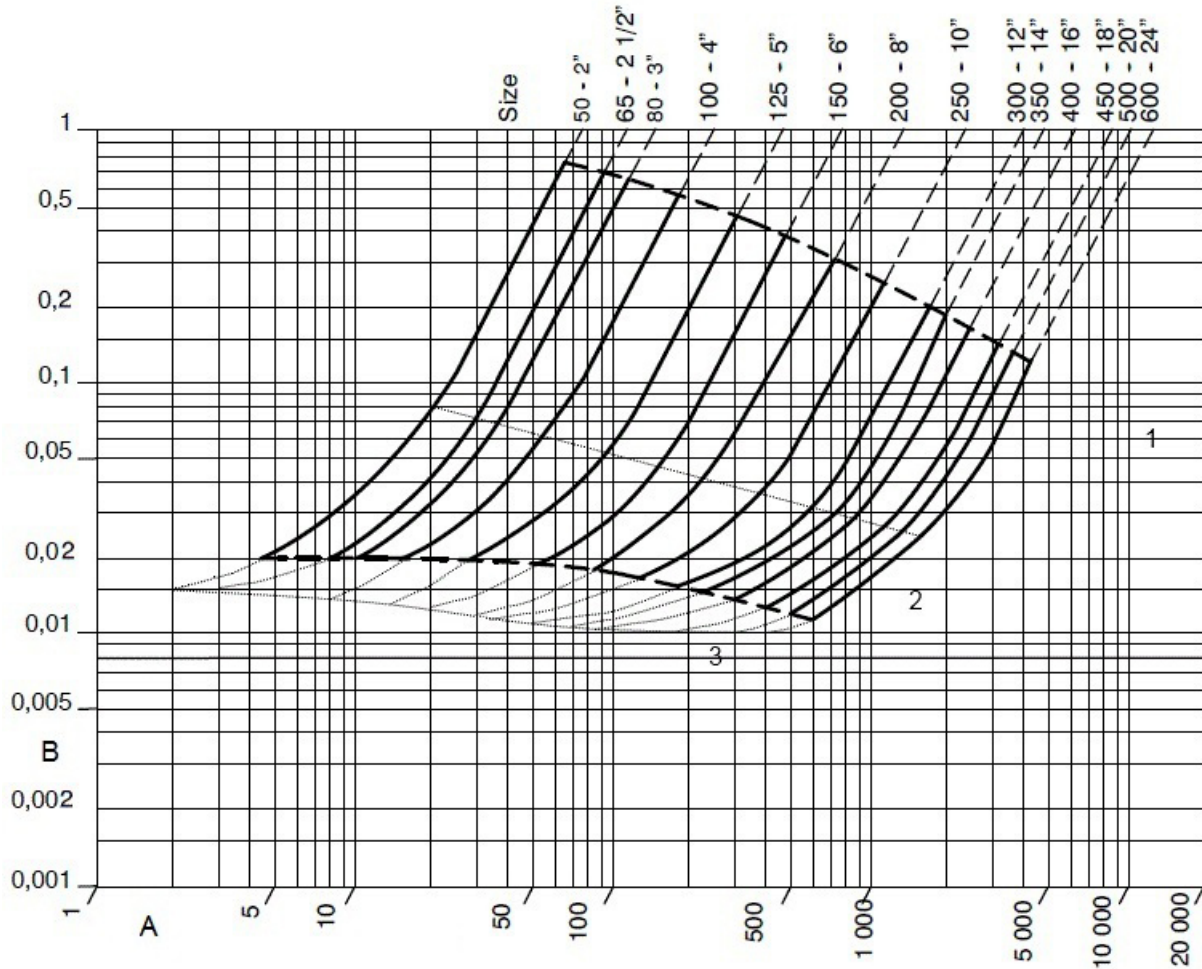
1. Type series
2. Nominal pressure
3. Nominal size
4. Fluid handled
5. Flow rate/velocity
6. Temperature
7. Materials required (body, valve disc, seat)
8. Mating dimensions
9. Reference number of type series booklet

Pressure/temperature ratings

In pressure class PN 16, SERIE 2000 dual-plate check valves meet the requirements of the EN 12516-4 standard.

Material		Operating pressure in bar at a temperature in °C					
Body	Seat	-5	50	100	120	150	200
ASTM A126 Cl. B	Nitrile (K)	16	16	16	Not permitted		
	EPDM (X)	16	16	16	16	Not permitted	
	VITON (V)	16	16	16	16	14,3	12,7

Pressure losses as a function of flow rate



A: Flow rate in m³/h
B: Pressure drop in bar

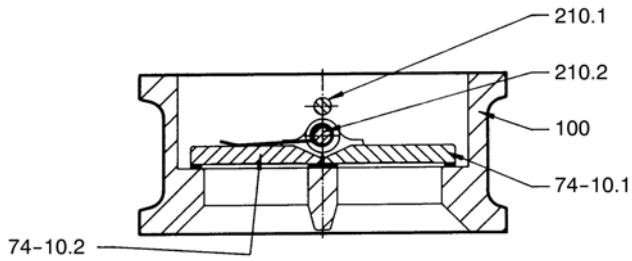
- 1 : Fully open - stable
- 2 : Partially open - stable
- 3 : Partially open (Operation at low velocity is possible, but pressure fluctuations are to be expected).

The continuous curves represent the flow rate range for optimum use of the dual-plate check valve.

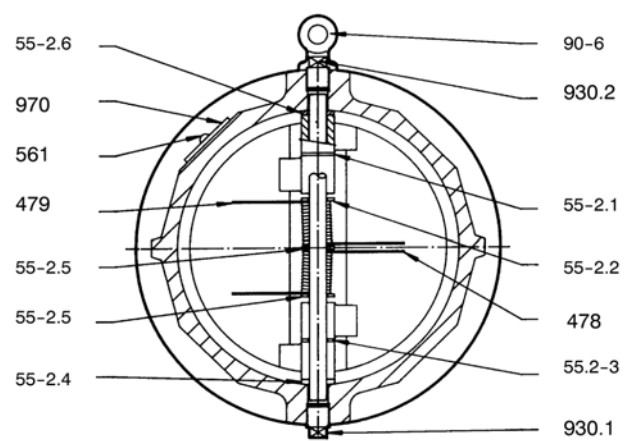
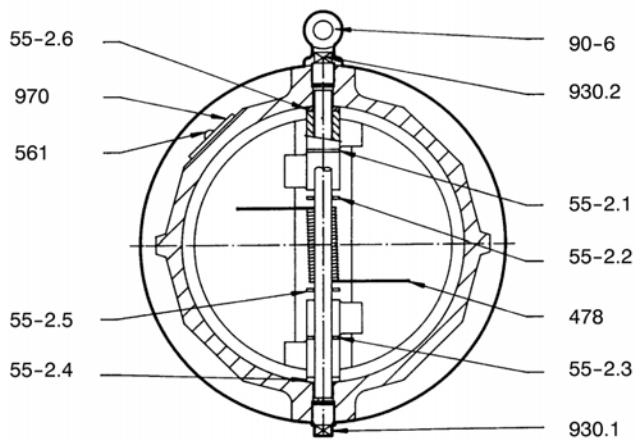
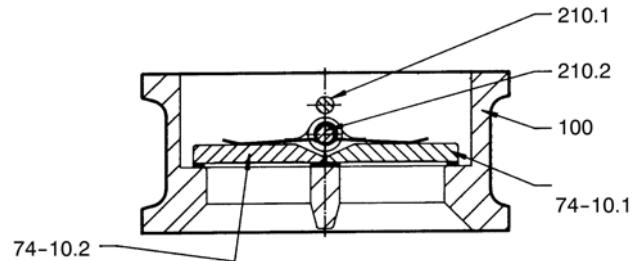
Materials

Sectional drawings

DN 50-350 and 450
(single spring)



DN 400, 500 and 600
(double spring)



List of components

Part No.	Description	DN	Materials	KSB code
100	Body	50-600	Lamellar graphite cast iron ASTM A126 Cl. B	3t
210.1	Stop pin	50-600	Stainless steel 316	
210.2	Hinge pin	50-600	Stainless steel 316	
55-2.1	Anti-friction disc	50-600	Reinforced PTFE	
55-2.2	Anti-friction disc	50-600	Reinforced PTFE	
55-2.3	Anti-friction disc	50-600	Reinforced PTFE	
55-2.4	Anti-friction disc	50-600	Reinforced PTFE	
55-2.5	Anti-friction disc	50-600	Reinforced PTFE	
55-2.6	Anti-friction disc	50-600	Reinforced PTFE	
55-2.7	Anti-friction disc	400, 500 and 600	Reinforced PTFE	
561	Grooved pin	50-600	Stainless steel	
74-10.1	Plate	50-600	Stainless steel ASTM A351 Gr. CF8M	6
			Nodular cast iron ASTM A395 (DN => 250)	3g
			Copper aluminium ASTM B148 C95800 (DN => 300)	2
74-10.2	Plate	50-600	Stainless steel ASTM A351 Gr. CF8M	6
			Nodular cast iron ASTM A395 (DN => 250)	3g
			Copper aluminium ASTM B148 C95800 (DN => 300)	2
90-6	Eyebolt	200-600	Carbon steel	
930.1	Pin retainer (stop pin)	50-450	Carbon steel	
		500 and 600	Stainless steel	
930.2	Pin retainer (hinge pin)	50-450	Carbon steel	
		500 and 600	Stainless steel	
970	Name plate	50-600	Stainless steel	

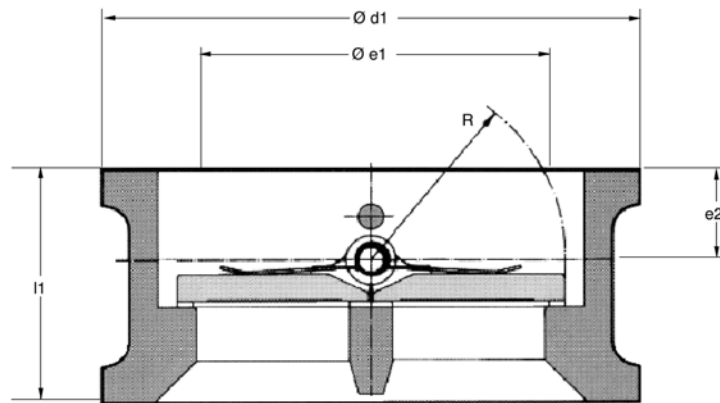
Dual-plate check valve with seat made of Nitrile HT (KSB code K) or EPDM (KSB code X)

Part No.	Description	DN	Materials	KSB code
478	Spring (right-hand)	50-600	Stainless steel 316	
479	Spring (left-hand)	400, 500 and 600	Stainless steel 316	

Dual-plate check valve with seat made of Viton (KSB code V)

Part No.	Description	DN	Materials	KSB code
478	Spring (right-hand)	50-600	Inconel 600	
479	Spring (left-hand)	400, 500 and 600	Inconel 600	

Dimensions



DN	NPS	PN	Dimensions		Plates		
			$\varnothing d1$	$l1$	$e1$	$e2$	R
50	2	10/16	110	54	35	25,8	30
65	2½	10/16	130	54	57	26,0	36
80	3	10/16	145	57	75	25,6	42
100	4	10/16	165	64	99	29,6	54
125	5	10/16	195	70	123	30,8	65
150	6	10/16	221	76	155	28,8	79
200	8	10/16	276	95	198	40,0	103
250	10	10	329	108	248	39,9	127
300	12	10	381	143	291	56,8	153
350	14	10	440	184	302	93,9	175
400	16	10	491	191	366	89,9	200
450	18	10	541	203	422	86,1	224
500	20	10	596	213	471	94,3	250
600	24	10	698	222	577	87,5	298
250	10	16	331	108	248	39,9	127
300	12	16	386	143	291	56,8	153
350	14	16	446	184	302	93,9	175
400	16	16	498	191	366	89,9	200
450	18	16	558	203	422	86,1	224
500	20	16	620	213	471	94,3	250
600	24	16	737	222	577	87,5	298

Installation instructions

Connections and weights

DN	NPS	Connection						Weight ¹⁾ [kg]
		PN 10		PN 16		Class 125		
		Ø d1	l1	Ø d1	l1	Ø d1	l1	
50	2	110	54	110	54	104,9	54	1,5
65	2½	130	54	130	54	123,9	54	2,8
80	3	145	57	145	57	136,6	57	3,6
100	4	165	64	165	64	174,7	64	4,5
125	5	195	70	195	70	196,8	70	6,5
150	6	221	76	221	76	222,2	76	9
200	8	276	95	276	95	279,4	95	16
250	10	329	108	331	108	339,5	108	27
300	12	381	143	386	143	409,4	143	42
350	14	440	184	446	184	450,8	184	77
400	16	491	191	498	191	514,3	191	107
450	18	541	203	558	203	536,7	203	134
500	20	596	213	620	213	606,5	213	170
600	24	698	222	737	222	717,5	222	254

Dead-end service and downstream dismantling

These dual-plate check valves must not be used for dead-end service or downstream dismantling.

Rust protection

- Body
 - External:
Standard: polyurethane coating, thickness 80 µm, colour: RAL 5002 blue.
Other coatings on request: see type series booklet "Valves / Actuators / Automation"
 - Flange faces and internal surfaces:
protected by phosphating or water repellent
- Plates
 - Plates made of nodular cast iron (3g):
protected by phosphating or water repellent
 - Plates made of stainless steel (6) :
protected by pickling and passivation
 - Plates made of copper aluminium (2):
this material does not require any surface protection.

DN 50-600: stainless steel (6), standard protection

DN 300-600: copper aluminium (2), standard protection
- EPDM seat approved for drinking water

Variant recommended for DN 50-150: SERIE 2000 Class 150 with:

- Body and plates made of stainless steel
- EPDM seat approved for drinking water

- S21

Variant recommended for handling brackish water.

Springs and internals (stop pin, hinge pin, anti-friction discs and pin retainers) made of MONEL 400

Variants

- S14 / S17 – approved for drinking water to ACS

Version approved for drinking water and food applications in accordance with applicable regulations:

- ACS - France

DN 50-600:

- Body DN 50-600

Lamellar graphite cast iron (3t)

Internal surfaces with acrylic coating, blue colour, thickness 250 µm, approved for drinking water

- Plates

DN 250-600: nodular cast iron (3g), protected by acrylic coating, blue colour, thickness 250 µm, approved for drinking water

¹⁾ Mean weight of dual-plate check valve with mating dimensions in compliance with pressure class

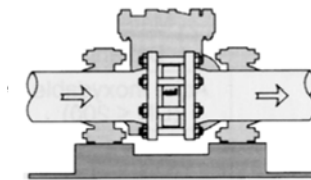
Installation

SERIE 2000 dual-plate check valves are designed for quick and straightforward installation between standard flanges:

- Low weight and compact design
- Installation without additional piping support
- Can be installed in horizontal or vertical pipes
- Easy to install without special tools
- No maintenance required

SERIE 2000 PN 16 dual-plate check valves with:

- Standard: flat-face flanges (FF), flange faces machined to "smooth finish" Ra 3.2 to 6.3 (KSB code 1A)
- Optional: flat-face flanges (FF), flange faces machined to "stock finish" Ra 6.3 to 12.5 (KSB code 1B)
- On request: raised-face flanges (RF)

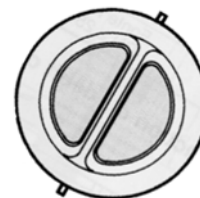


Optimum installation (horizontal pipe)

In a horizontal pipe, the dual-plate check valve must be installed with the hinge pin in a vertical position.



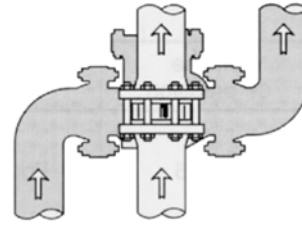
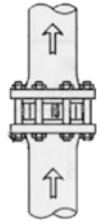
CORRECT



INCORRECT

Installation in vertical pipe

When installed in a vertical pipe, the dual-plate check valve will only function reliably if fluid flow is upwards. (Please contact us if flow direction is reversed, i.e. downwards).



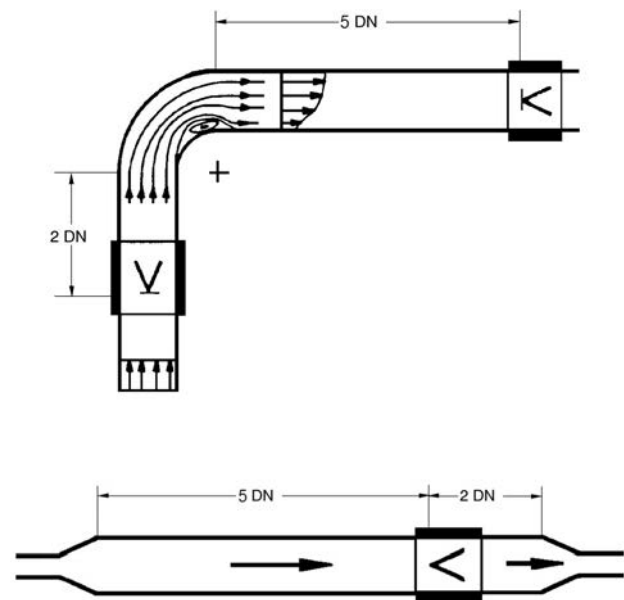
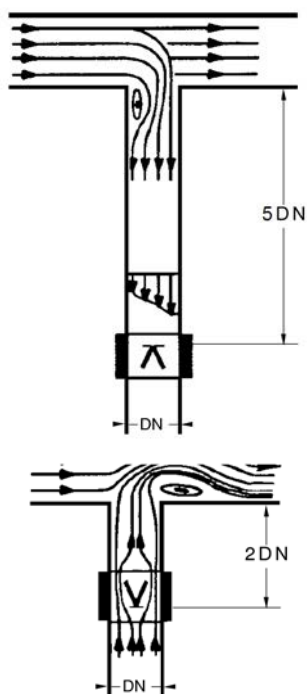
System configuration

Depending on the system configuration, minimum distances must be observed between the dual-plate check valve and elbows or piping tees.

The drawings below show a horizontal pipe (viewed from above) in which the dual-plate check valve is installed with the hinge pin in a vertical position.

The minimum distance for a dual-plate check valve installed downstream of a turbulence-causing element (elbow, pump, valve, etc.) is 5 DN.

If a turbulence-causing element is installed downstream of the dual-plate check valve, any special instructions regarding the respective element or a minimum distance of 2 DN must be observed.





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