

VDCI mixproof valve technical description

The VDCI mixproof valve performs two primary functions:

- **the orientation of fluids** in the same way as the standard DCX3-DCX4,
- **the bleeding of an air space between the plugs** which is intended to:

- 1• direct the leakage flow out of the system and thereby prevent the mixing of two fluids flowing through the valve.
- 2• warn the user should there be a seal failure on either of the plugs.

This technology creates a **physical barrier between the two fluids** allowing **different type of fluid** to flow through the valve. For example, one of the body compartments can be washed out while the other continues to convey a process fluid.

What's more, by activating the plugs, the valve can be washed completely at the same time as the various pipelines. A single valve can therefore be used on circuits which traditionally required two single-sealing valves.

Mixproof valve technology is constantly changing. The latest versions guarantee **minimal product loss** and risk of circuit contamination by the air space.

These valves have successfully passed the EHEDG tests.



Design

The VDCI mixproof valve consists of six main subassemblies:

- a spherical body with branch outlets providing a variety of configurations,
- a one-piece lower plug equipped with a pressure counterbalance,
- a one-piece concentric upper plug (with floating seal),
- a single-acting main actuator incorporating an auxiliary upper plug break-away actuator,
- a complementary lower plug break-away module and a lower plug counterbalance guard.

These elements are clamped together for good centring and quick removal (from DN 38 to DN 150).

Thanks to the design and quality of manufacture, the components are fully interchangeable.

The body

The VDCI body is made from 316L stainless steel according to a technique that ensures a good level of homogeneity in the material. The spherical form of the bodies ensures optimum fluid flow and a reduction in pressure losses. Its extra-thick walls guarantee excellent mechanical strength as well as a sturdy valve assembly and therefore a firm support for the plugs on their bearing surface. This allows the design of important manifolds, without expansion device.

The polished interior finish ($R_a = 0,8 \mu\text{m}$) contributes to outstanding in-line cleanability. The branch pipes welded to the body provide standard combinations as well as special configurations on request.

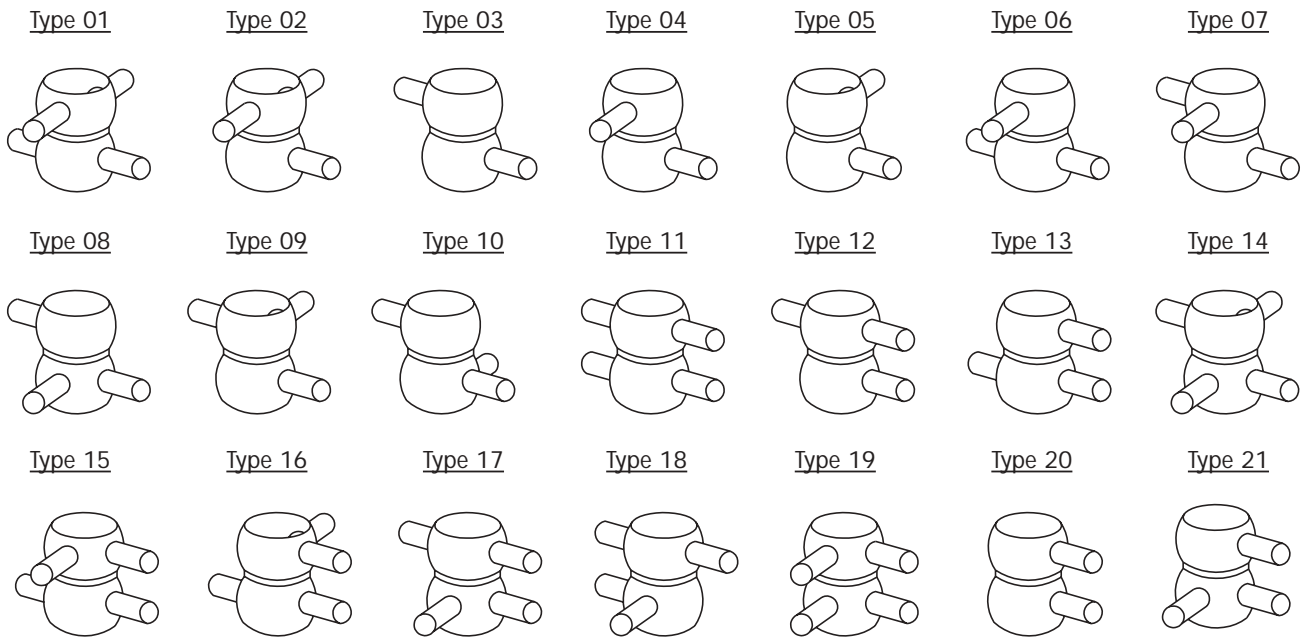
Each nominal diameter corresponds to a particular sphere diameter guaranteeing minimum fluid retention inside the valve. Final hyperquenching regenerates the stainless steel and contributes to the geometric quality of the body.

VDCI mixproof valve technical description

Examples of the most common body configurations

These valves are designed as standard for vertical operation and ensure a natural fluid flow

from the air space. However a slight incline (approx. 10°) is possible.



The plugs

The one-piece lower and upper plugs are made from 316L stainless steel. The design and the quality of surface finish reduce pressure losses. The stem and counterbalance are chromium-plated and guided by rings.

Apart from the PFA plug seals, valve seals are supplied in standard food grade materials.

A leakage indicator in the actuator lantern warns the user of a possible failure of the upper plug seals.

The lower plug is equipped with two concentric leakage chambers communicating with the inter-plug air space. The lower end of these chambers is threaded to take a flexible nozzle used for washing or internal sterilisation of the leakage chambers.

VDCI mixproof valve technical description

The floating seals

A PFA (PerFluoroAlcoxy) floating seal is clipped into each plug housing. Its floating arrangement makes for outstanding cleanability. On dilating, it allows circulation of the cleaning fluid around all sides.

Its elastomer structure also guarantees the absence of porosity or cracking, which can be sources of contamination and bacteria development.

The main actuator

The main VDCI actuator is composed of an outer 304L stainless steel cylinder, a lantern and a body mounting plate, pistons using the lower and upper plug stems, springs with an anticorrosion coating and a base held by a stainless steel retaining ring screwed onto the lantern.

It is delivered as standard with adjustable air fittings for 4/6 or 6/8 hoses. The main actuator is

supplied from the side whereas the upper plug break-away actuator is supplied from the underside of the actuator.

Note :

1. Removing the internal break-away piston does not change the outer appearance.

2. An M18 detection lantern can be fitted directly.

The break-away actuator

This complementary module is designed for the lower plug break-away function. It has a 304L stainless steel body and is

positioned above the main actuator. The break-away piston is attached to the lower plug stem.

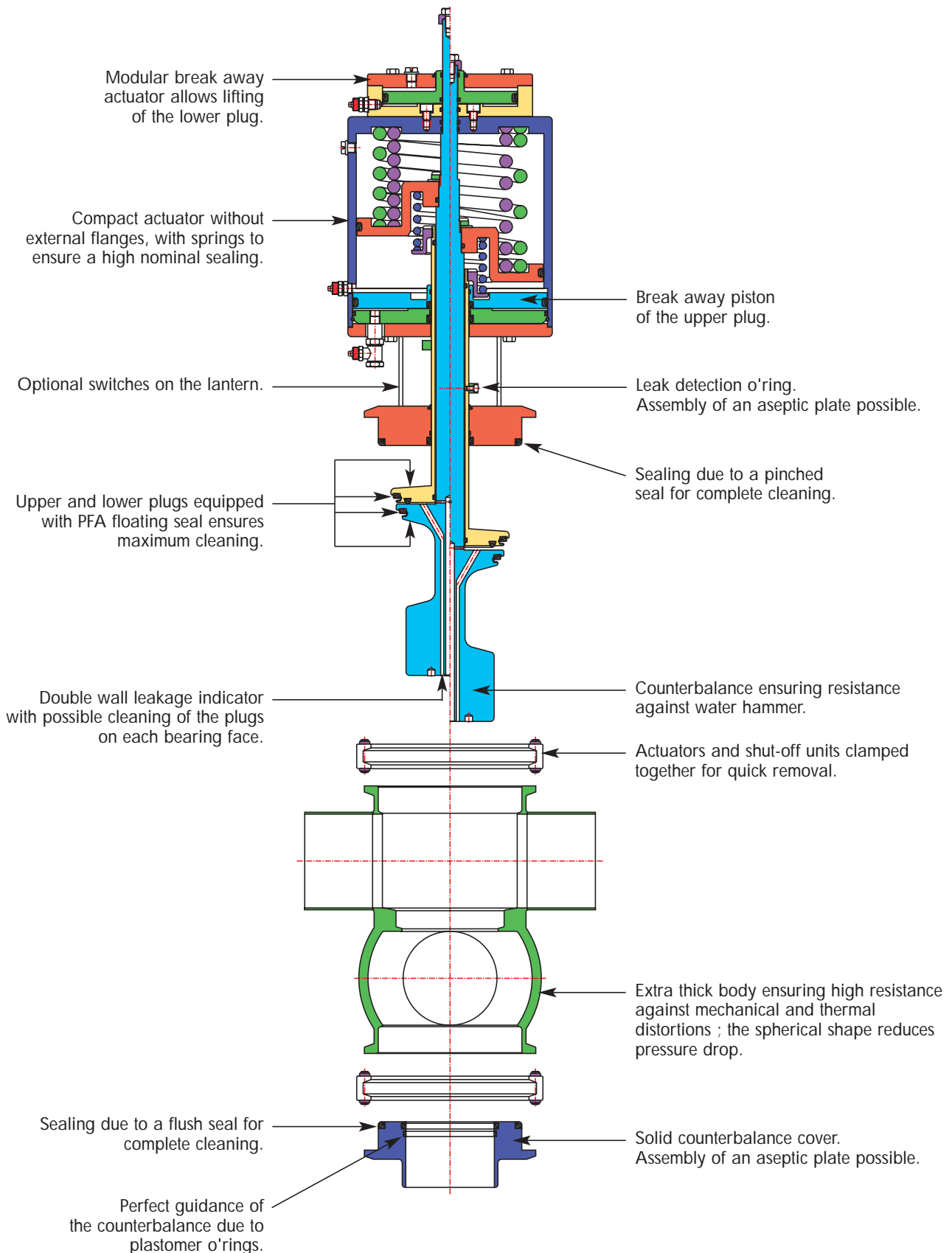
The counterbalance protection unit

The one-piece 316L stainless steel guard fits under the valve body and provides effective protection of the lower plug counterbalance.

A liquid or steam circulation system can be added as an option.

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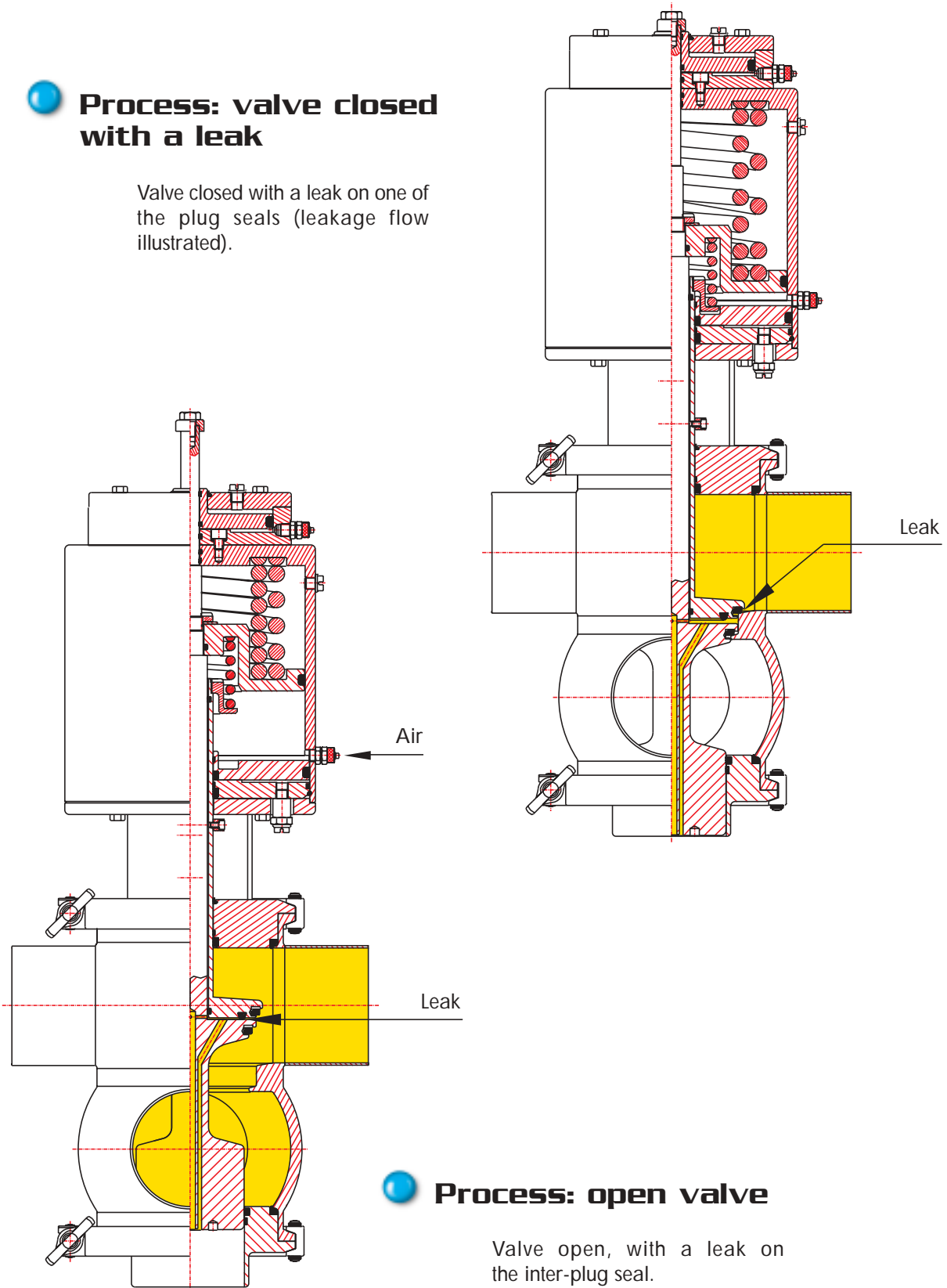
VDCI mixproof valve features



VDCI mixproof valve operation

Process: valve closed with a leak

Valve closed with a leak on one of the plug seals (leakage flow illustrated).



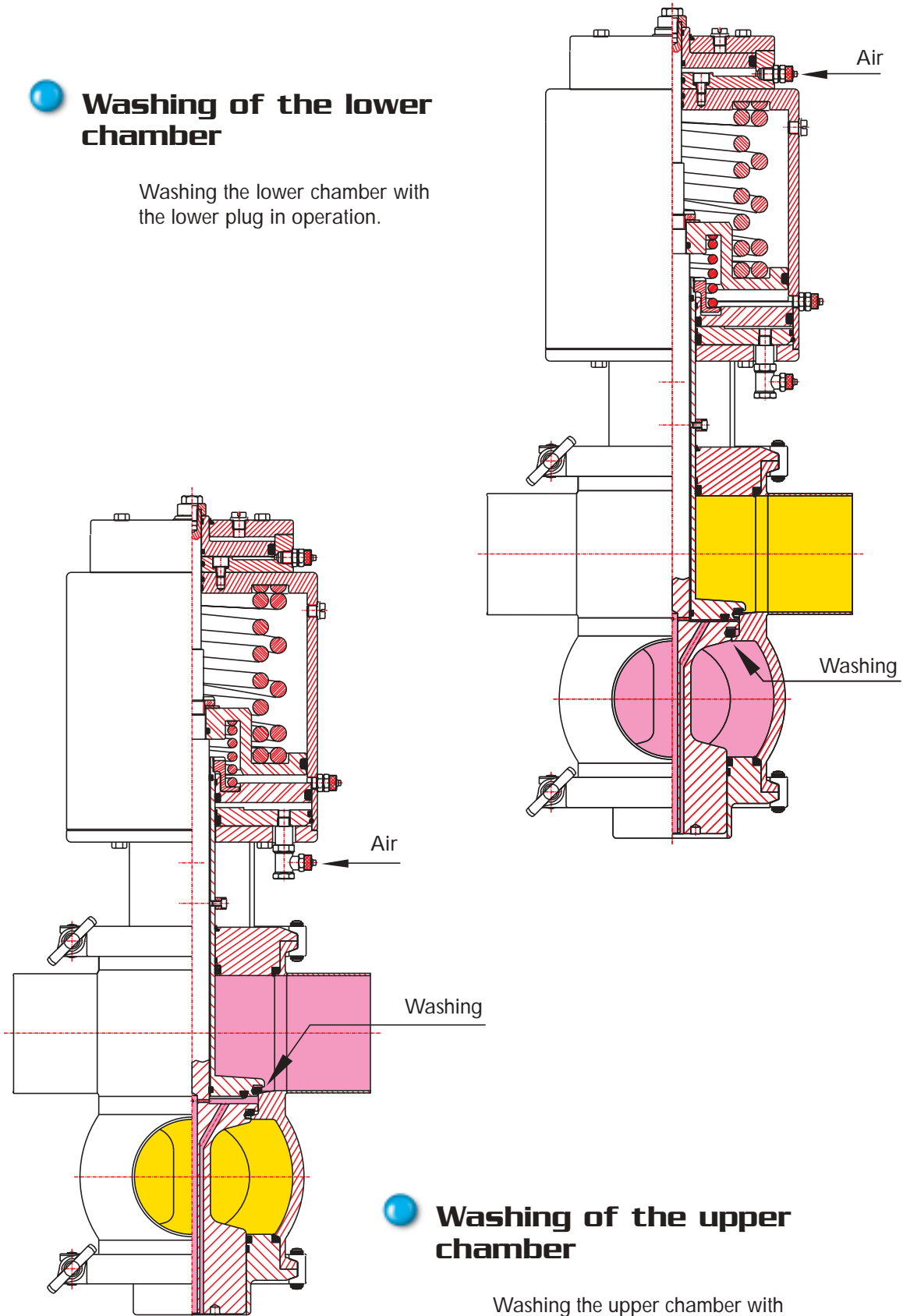
Process: open valve

Valve open, with a leak on the inter-plug seal.

VDCI mixproof valve operation

● Washing of the lower chamber

Washing the lower chamber with the lower plug in operation.



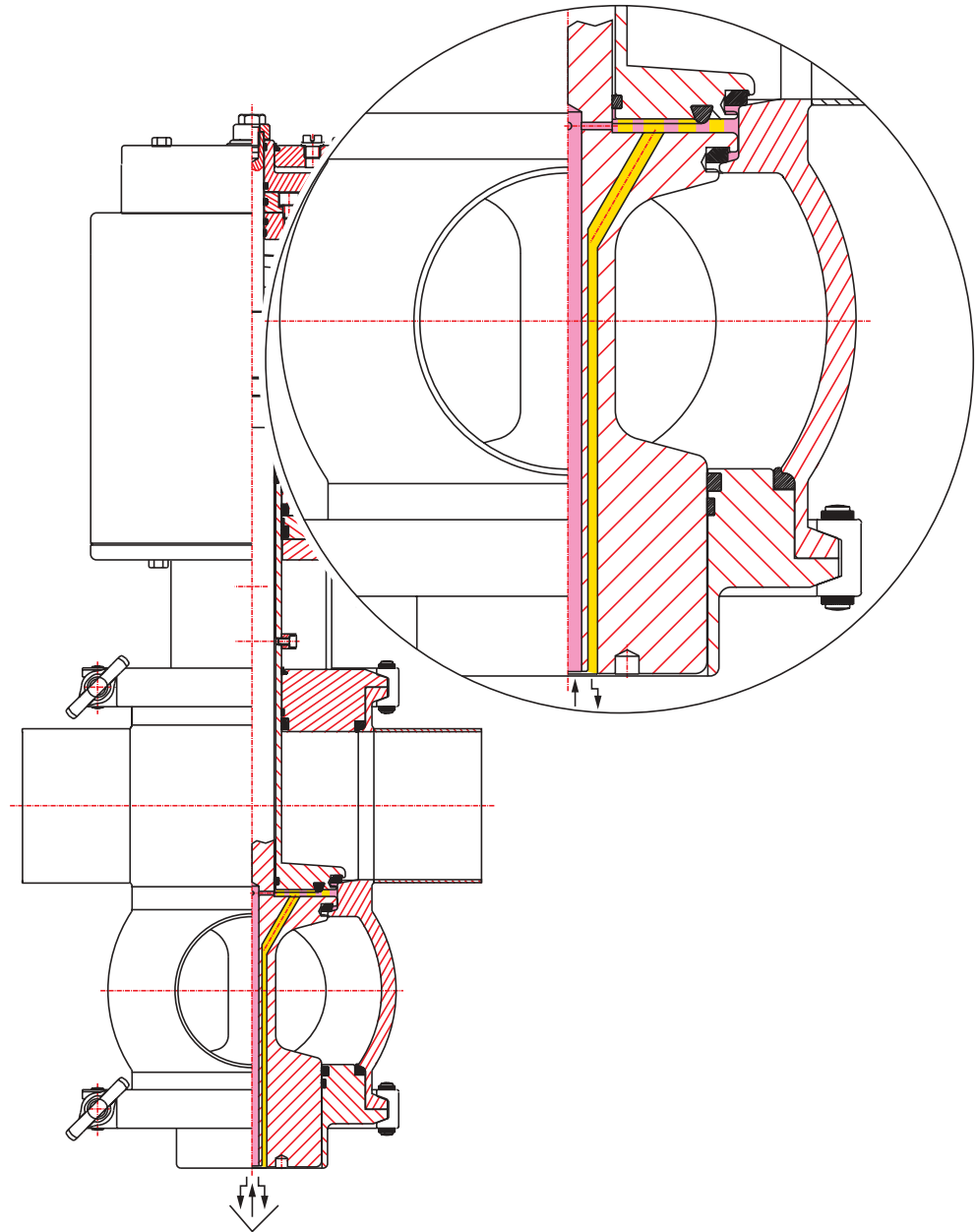
● Washing of the upper chamber

Washing the upper chamber with the upper plug in operation.

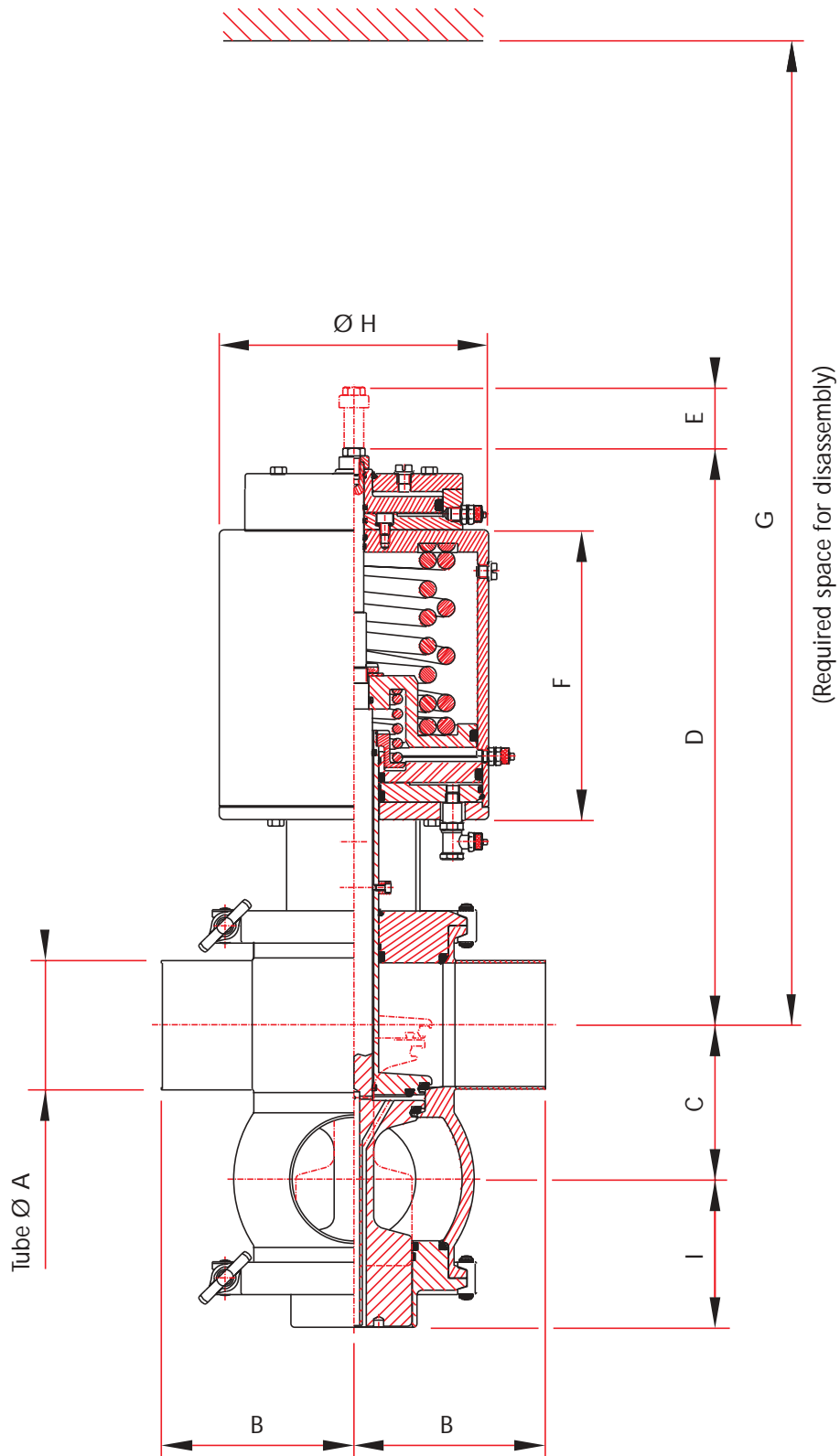
VDCI mixproof valve operation

● Washing of the air space

Washing the air space by forced circulation in the leakage chambers.



VDCI mixproof valve dimensions



VDCl mixproof valve dimensions

ITDFX102 GB - REV 1 - MAY 2002

SMS	DN		Tube Ø A	B	C	D	Stroke E	F	G	Ø H	I	Weight in kg*
	DIN	US										
38			38 x 1,2	105	55	353	25	179	530	128	72	22
			38,1 x 1,65	105	55	353	25	179	530	128	72	22
		1" 1/2	40 x 1	105	55	353	25	179	530	128	72	22
51			51 x 1,25	105	70	358	35	179	565	128	80	22
		2"	50,8 x 1,65	105	70	358	35	179	565	128	80	22
			53 x 1,5	105	70	358	35	179	565	128	80	22
63			63,5 x 1,6	130	85	400	35	204	640	167	95	43
			63,5 x 1,65	130	85	400	35	204	640	167	95	43
		2" 1/2	70 x 2	130	90	402	43	204	650	167	97	43
76			76 x 2	130	95	407	41	204	665	167	100	43
			76 x 1,65	130	95	407	41	204	665	167	100	43
		3"	85 x 2	155	110	455	50	234	750	218	110	78
			85 x 2	155	110	455	50	234	750	218	110	78
		4"	101,6 x 2,1	155	125	465	50	234	795	218	120	87
104			104 x 2	155	125	465	50	234	795	218	120	87
			129 x 2	200	155	556	60	310	950	270	129	135
			152,4 x 2,75	200	180	576	60	310	1020	270	139	145
		6"	154 x 2	200	180	576	60	310	1020	270	139	145

* Without
control unit

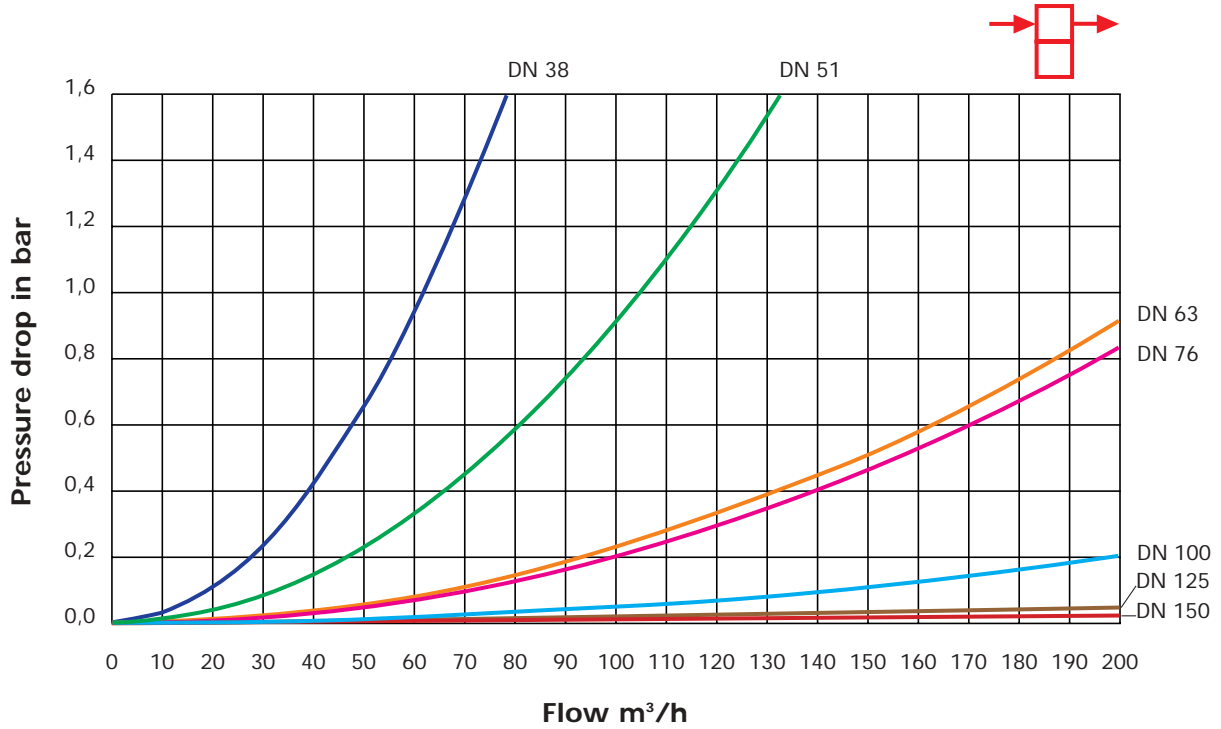
VDCI mixproof valve working conditions

DN			Pressure drop (Kv)	Pressure drop (Cv)	Opening time (s)	Air consumption (NI)
SMS	DIN	US				
38		1"1/2	44	51,04	4,2	2
51	50	2"	48	55,68	4,2	2
63		2"1/2	95	110,2	9	5
	65		97	112,52	9	6
76		3"	100	116	9	6
	80		170	197,2	10,8	11
104	100	4"	215	249,4	10,8	11
	125		400	464	17	21
	150	6"	465	539,4	17	21

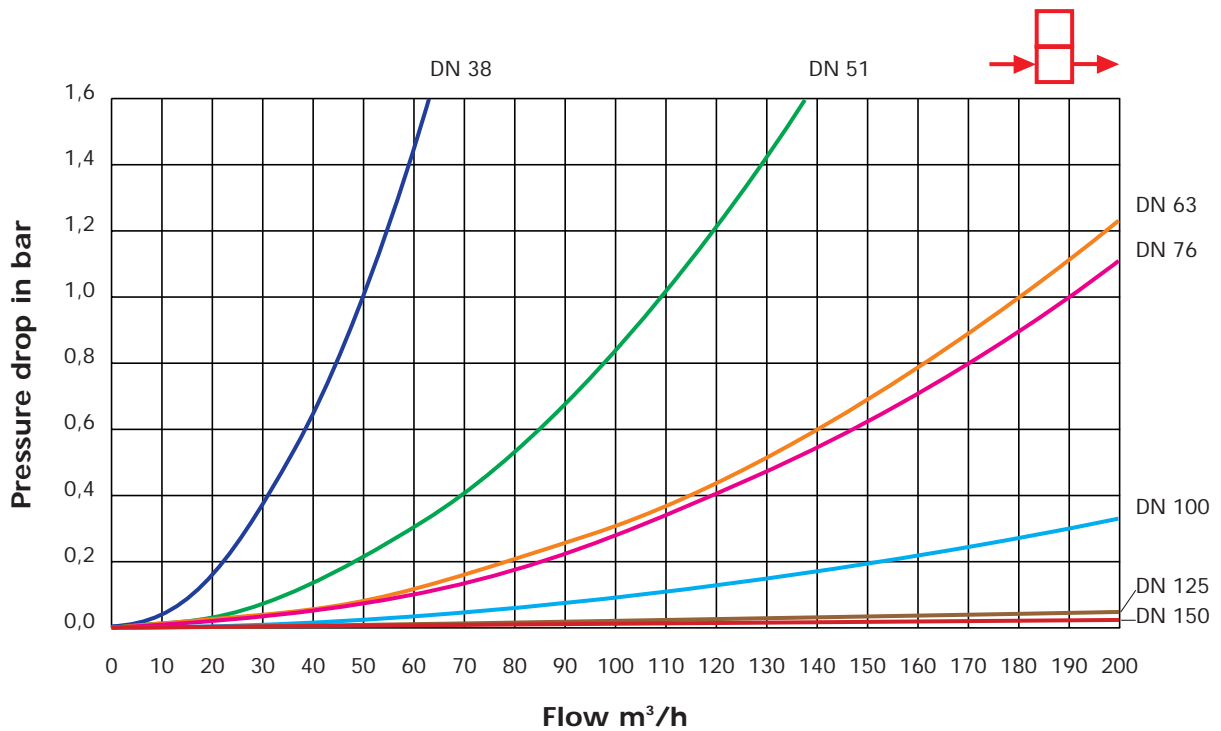
FOR ALL DIAMETERS OF MIXPROOF VALVE		
Maximum temperature: +140 °C	Minimum temperature: -5 °C	Temperature difference: 120 °C
Maximum working pressure: 10 Bar	Vacuum resistance: 0,4 cm ³ /s	Maximum sealing pressure: 12 Bar
Maximum supply pressure: 8 Bar	Minimum supply pressure: 5 Bar	

VDCI mixproof valve working conditions

Pressure drop VDCI valve upper line



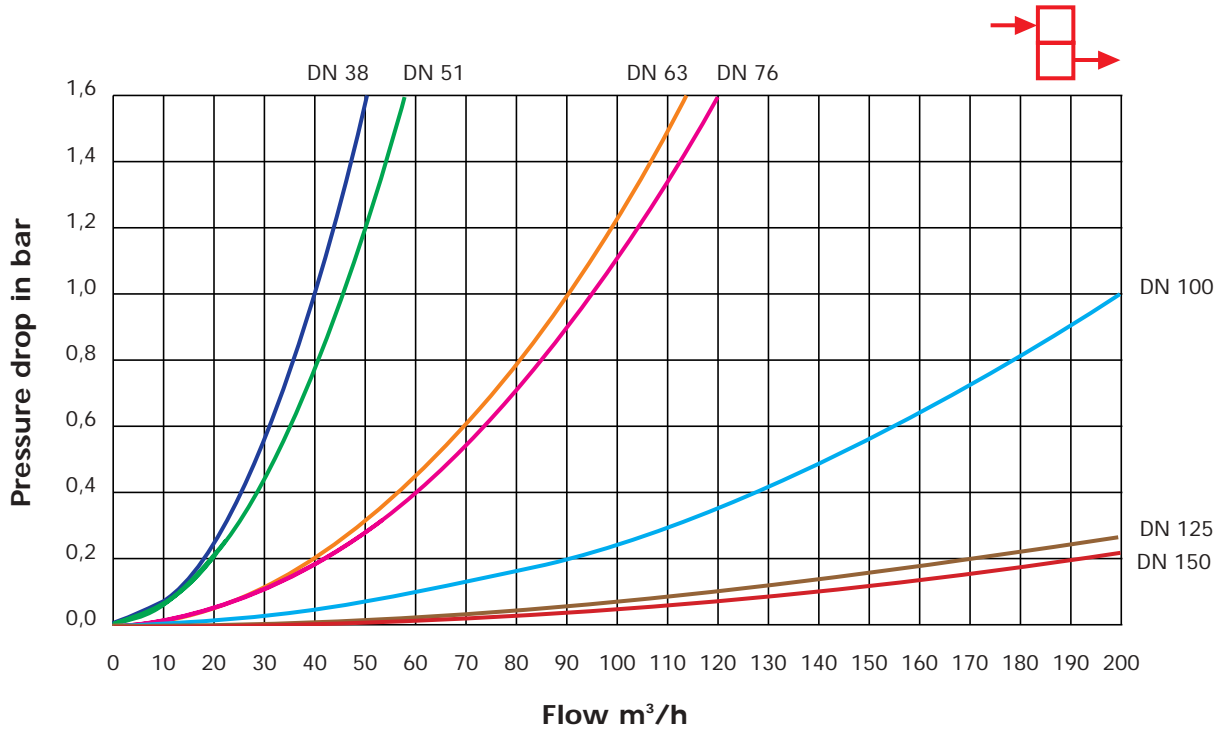
Pressure drop VDCI valve lower line



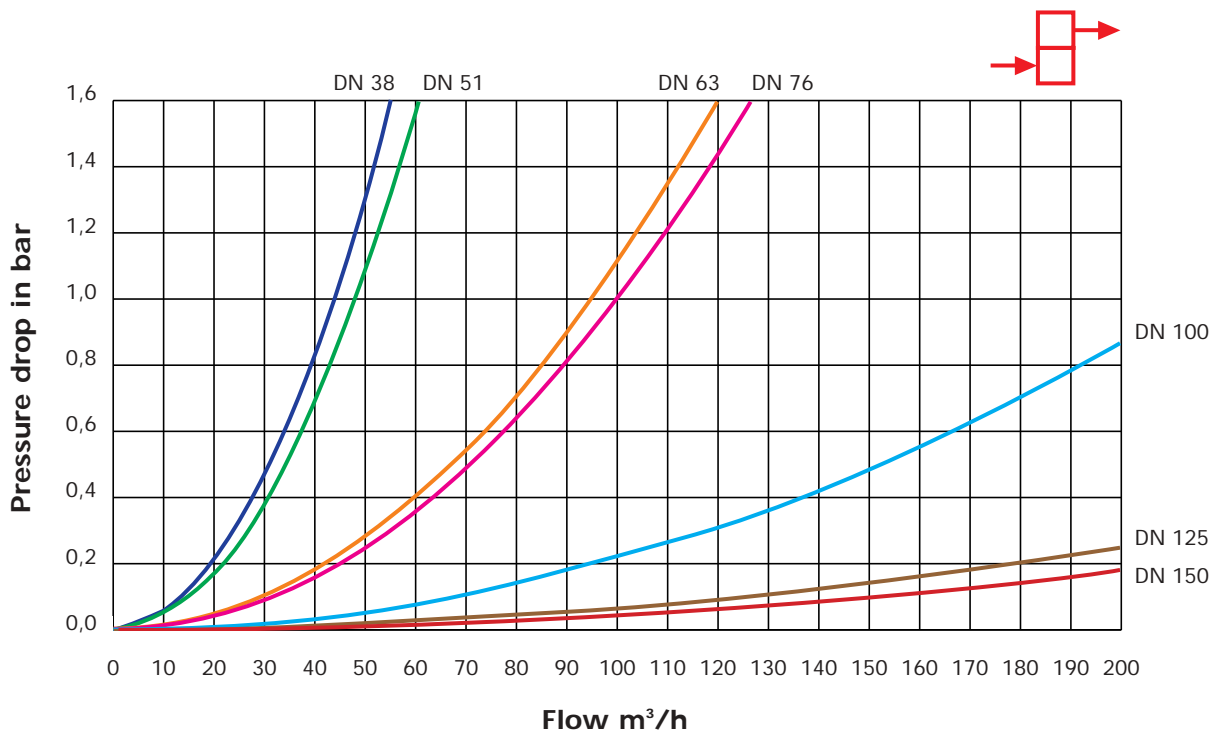
VDCI mixproof valve working conditions



Pressure drop VDCI valve upper → lower line



Pressure drop VDCI valve lower → upper line



VDCI mixproof valve options

VDCI mixproof valve with steam bearing

SMS	DN		Tube Ø A	B	C	D	E	F	G	Ø H	I	Weight* in kg*
	DIN	US										
38			38 x 1,2	105	55	368	25	179	585	128	112	23
			38,1 x 1,65	105	55	368	25	179	585	128	112	23
		1"1/2	40 x 1	105	55	368	25	179	585	128	112	23
51			51 x 1,25	105	70	373	35	179	620	128	120	23
			50,8 x 1,65	105	70	373	35	179	620	128	120	23
		2"	53 x 1,5	105	70	373	35	179	620	128	120	23
			63,5 x 1,6	130	85	434	35	204	720	167	140	46
63			63,5 x 1,65	130	85	434	35	204	720	167	140	46
		2"1/2	70 x 2	130	90	436	43	204	730	167	142	46
			76 x 2	130	95	441	41	204	745	167	145	46
76			76 x 1,65	130	95	441	41	204	745	167	145	46
		3"	85 x 2	155	110	491	50	234	845	218	166	83
			101,6 x 2,1	155	125	501	50	234	890	218	176	92
104			104 x 2	155	125	501	50	234	890	218	176	92
			129 x 2	200	155	595	60	310	1065	270	204	142
		125	152,4 x 2,75	200	180	615	60	310	1135	270	214	152
		6"	154 x 2	200	180	615	60	310	1135	270	214	152

* Without control unit

Design

The VDCI can be equipped with a steam or fluid circulation bearing. In this case, the actuator lantern and counterbalance cover are fitted with a circulating ring and are

connected externally by an aseptic product feed pipe.

Technical specifications of this valve are the same as the base model specifications.

