FMDCVD
Forbes Marshall Disc Check Valve (Metal-to-Metal / Soft / Viton Seating)

Description
The Forbes Marshall Disc Check Valve, FMDCVD, is of the wafer pattern designed to be sandwiched between flanges. The FMDCV is suitable for use on a wide range of fluids for applications in process lines, Hot water systems, steam and condensate system etc. face-to face dimensions conform to EN558 part 1 series 49

Sizes and Pipe Connections
DN 15, 20, 32, 40, 50, 65, 80, 100 suitable for installation between Din Flanges PN 6, 10, 16, 25,40

Certification
Available with IBR
All certification / inspection requirement must be stated at the time of order placement.

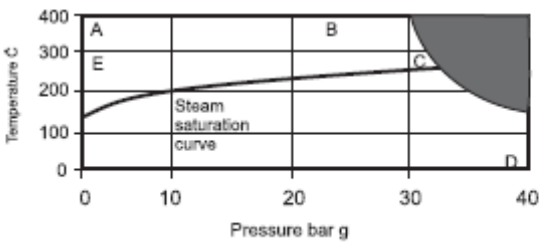
Standard
Designed and manufactured in accordance with BS 7438

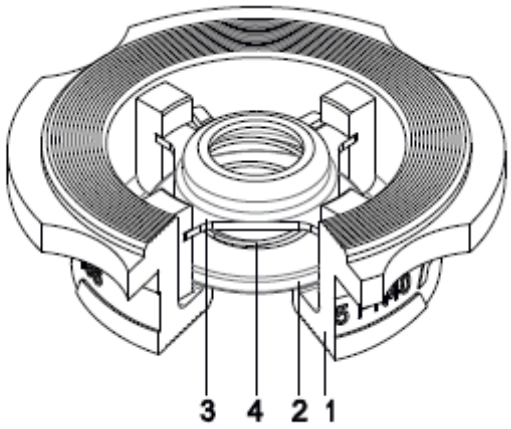
Optional Extras
Viton soft seats for oil, gas and steam applications
EPDM soft seats for water applications

Limiting Conditions

Body design conditions			PN 40
PMO - Maximum operating pressure			40 bar g
TMO-	Maximum Operating Temperature	Standard Spring	300°C
		Without spring	400°C
Minimum operating temperature (standard disc)			-10°C
Temperature Limits	Viton Seat		-10°C to +180°C
	EPDM Seat		-10°C to +150°C
Maximum cold hydraulic test pressure			80 bar g

Operating Range





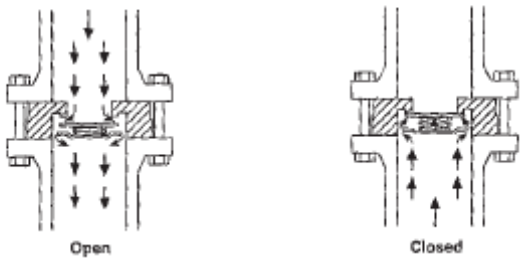
Materials

No	Part	Material	Standard
1	Body	Austentic stainless steel	ASTM A 351 CF8M
2	Disc	Austentic stainless steel	ASTM A 351 CF3M
3	Spring retainer	Austentic stainless steel	ASTM A 240 SS2316L
4	Heavy duty	Austentic stainless steel	IS4454:IV:GR. 3 SS316

Standard Shut-off
Standard valves conform to DIN 3230 part 3, BN2 Valves conforming to DIN 3230 part 3, BO3 available on request.

Soft seated versions meet DIN3230 part 3 BN 1 and BO1 provided a differential pressure exists.

Operation
Forbes Marshall spring-loaded disc check valves are opened by the pressure of the fluid and closed by the spring as soon as flow ceases and before the reverse flow occurs.



Dimensions / Weights (approximate) in mm and kg

SIZE	A	B	C	D	E	F	G	Weight
DN15	60	45	43	38	16	29	15	0.13
DN20	69.5	55	53	45	19	35.7	20	0.19
DN25	80.5	65	63	55	22	44	25	0.32
DN32	84	78	75	68	28	54.5	32	0.53
DN40	101	88	85	79	31.5	65.5	40	0.74
DN50	115	98	95	93	40	77	50	1.25
DN65	129	118	115	113	46	97.5	65	1.84
DN80	154	134	133	128	50	111.5	80	2.42
DN100	184	154	154	148	60	130	100	3.81

Kv Values

DN	15	20	25	32	40	50	65	80	100
Kv	4.4	6.8	10.8	17	26	43	60	80	113

For conversion : Cv (UK)=Kv x 0.963 Cv(US)=kv x 1.158

Opening Pressures in mbar

Differential pressures with zero flow for standard

→ Flow direction

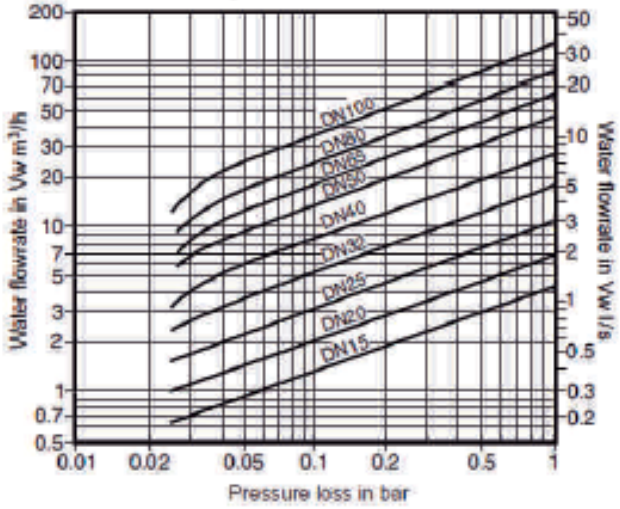
DN	15	20	25	32	40	50	65	80	100
↑	24	24	24	24	27	29	29	30	30
→	22	22	22	22	23	25	25	25	25
↓	19	19	19	19	19	19	19	19	19

Where lowest opening pressures are required, valves without springs can be installed in vertical pipes with bottom-to-top flow

without spring

↑	2.5	2.5	3	3	4.0	4.5	4.5	5	6

Pressure Loss Diagram



Pressure loss diagram with open valve at 20 °C. The values indicated are applicable to spring loaded valves with horizontal flow. With vertical flow, insignificant deviations occur only within the range of partial opening.

The curves given in the chart are valid for water at 20°C to determine the pressure for other fluids the equivalent water volume flowrate must be calculated and used in the graph.

$$Vw = \sqrt{\frac{r}{1000} \times V}$$

Where : Vw = Equivalent water volume flow in l/s or m^3/h

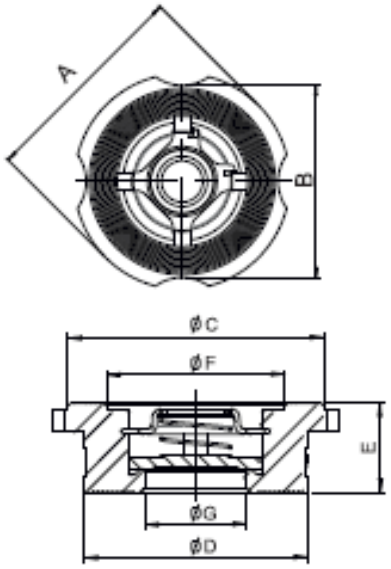
r = Density of fluid kh/cm

V = Volume of fluid l/s or m^3/h

Pressure loss information for steam, compressed air and gases is available from Forbes Marshall.

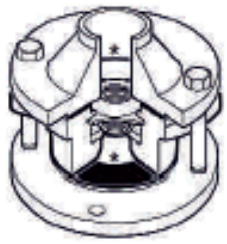
How to Order

Example : 1 No. Forbes Marshall disk check valve DN 50 FMDCV (DIN) austenitic stainless steel for fitting between PN 40 flanges.



Safety Information, Installation and Maintenance

For full details see the user manual(99-001-1178327)supplied with the product. FMDCVD spring loaded disc check valves must be fitted in accordance with the indicating correct fluid flow direction. When fitted with a spring they can be installed in any plane. When supplied without a spring they must be fitted in a vertical flow line with the flow from bottom-to-top.



Note : Flanges, bolts (or studs), nuts and joint gaskets are to be provided by the installer. Forbes Marshall disc check valves are non-maintainable (no spares are available) and are not suitable for use where heavily pulsating flow exists, such as close to a compressor.

The available options are denoted by a marking on the valve body

W	Without spring	Standard metal disc
V	Standard spring	Viton soft faced disc
E	Standard spring	EPDM soft faced disc
WV	Without spring	Viton soft faced disc
WE	Without spring	EPDM soft faced disc

No identification indicates a standard spring with a metal disc

Disposal

If a product containing a viton component has been subjected to a temperature approaching 315 °C or higher, then it may have decomposed and formed hydrofluoric acid. Avoid skin contact and inhalation of any fumes as the acid will cause deep skin burns and damages to the respiratory system.

FMDCVANSI

Forbes Marshall Disc Check Valve
(Metal-to-Metal / Soft / Viton Seating) Compatible to ANSI Flanges

Description

The Forbes Marshall disc check valves compatible to ANSI flanges, FMDCVANSI, are of the wafer pattern designed to be sandwiched between flanges. They are suitable for use on a wide range of fluids for applications in process lines, hot water systems, steam and condensate system etc. face-to face dimensions conform to EN558 part 1 series 52.

Sizes and Pipe Connections

DN 15, 20, 25, 32, 40, 50, 65, 80, 100 suitable for installation between ANSI class 150 and 300

Optional Extras

Viton soft seats for oil, gas and steam application.

EPDM soft seats for water applications.

Certification

Available with IBR with metal seating only.

All certification / inspection requirement must be stated at the time of order placement.

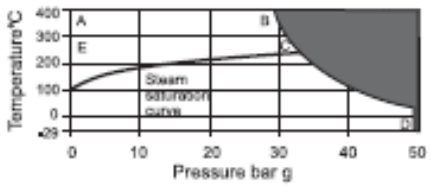
Standard

Designed and manufactured in accordance with BS 7438.

Limiting Conditions

Body design conditions		ANSI 300
PMO - Maximum operating pressure		49 bar g
TMO - Maximum operating temperature	Standard Spring	300°C
	Without spring	400°C
Minimum operating temperature (standard disc)		-10°C
Temperature Limits	Viton Seat	-10°C to +250°C
	EPDM Seat	-10°C to +150°C
Maximum cold hydraulic test pressure		98 bar g

Operating Range



The product must not be used in this region.
A-B-D FMDCV (ANSI)
E-C-D FMDCV (ANSI) Standard Spring.

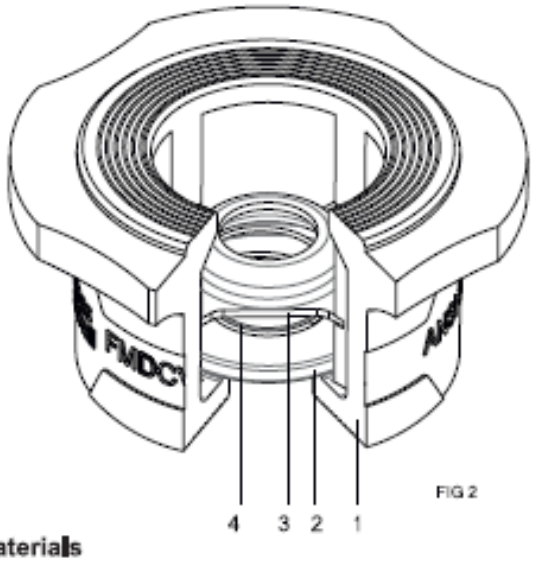


FIG 2

Materials

No	Part	Material	Standard
1	Body	Austentic stainless steel	ASTM A 351 CF8M
2	Disc	Austentic stainless steel	ASTM A 351 CF3M
3	Spring retainer	Austentic stainless steel	ASTM A 240 SS2316L
4	Standard spring	Austentic stainless steel	IS4454:IV:GR. 3 SS316

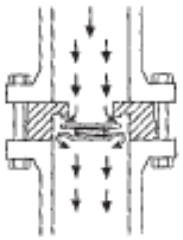
Standard Shut-off

Standard valves conform to DIN 3230 part 3, BN2 Valves conforming to DIN 3230 part 3, BO3 available on request.

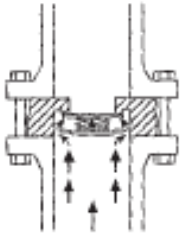
Soft seated versions meet DIN3230 part 3 BN 1 and BO1 provided a differential pressure exists.

Operation

Forbes Marshall disc check valves are opened by the pressure of the fluid and closed by the spring as soon as ceases and before the reverse flow occurs.



Open



Closed

Dimensions / Weights (approximate) in mm and kg

SIZE	A	B	C	D	E	F	G	Weight
DN15	54.5	47	38	38	25	22.3	15	0.19
DN20	67	57	46	47	31	27.3	20	0.31
DN25	73	67	54	55	35	33.1	25	0.54
DN32	82	76	67	68	40	41.2	32	0.53
DN40	95	86	76	80	45	49.1	40	1.0
DN50	111	105	95	97	56	59.1	50	1.85
DN65	130	123	108	113	63	75.2	65	1.84
DN80	149	136	130	132	71	90.2	80	3.6
DN100	181	174	160	161	80	111.1	100	5.9

Kv Values

DN	15	20	25	32	40	50	65	80	100
Kv	4.4	7.4	12	17	26	39	60	84	150

For Conversion : Cv (UK)=Kv x 0.963 Cv(US) =kv x 1.158

Opening Pressures in mbar

Differential Pressures with zero flow for standard springs.

→ Flow direction

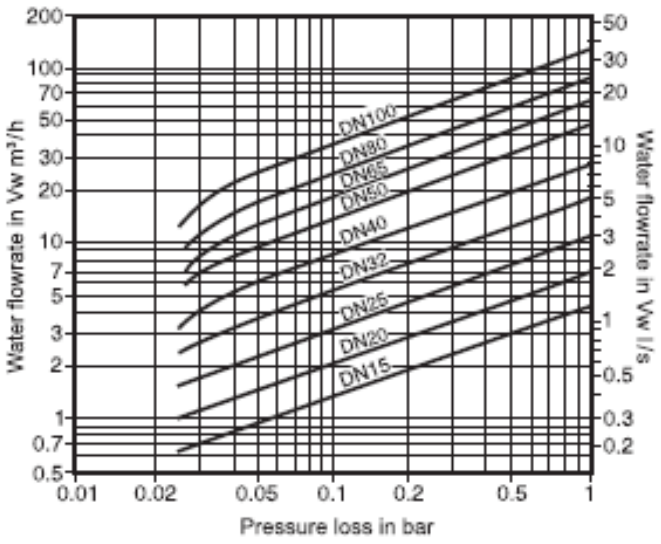
DN	15	20	25	32	40	50	65	80	100
↑	24	24	24	24	27	29	29	30	30
→	22	22	22	22	23	25	25	25	25
↓	19	19	19	19	19	19	19	19	19

Where lowest opening pressures are required, valves without springs can be installed in vertical pipes with bottom-to-top flow.

without spring

↑	2.5	2.5	3	3	4.0	4.5	4.5	5	6

Pressure Loss Diagram



Pressure loss diagram with open valve at 20 °C. The values indicated are applicable to spring loaded valves with horizontal flow. With vertical flow, insignificant deviations occur only within the range of partial opening.

The curves given in the chart are valid for water at 20°C to determine the pressure for other fluids the equivalent water volume flowrate must be calculated and used in the graph.

$$Vw = \sqrt{\frac{r}{1000}} \times V$$

Where : Vw = Equivalent water volume flow in l/s or m^3/h

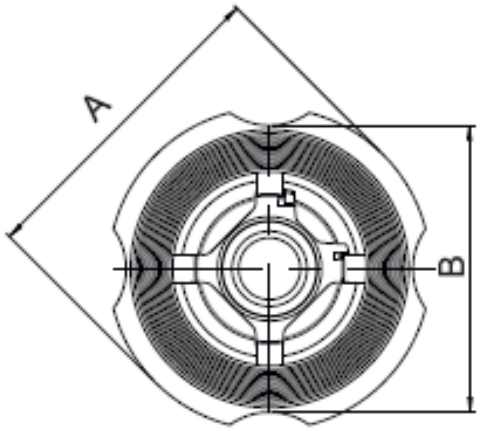
r = Density of fluid kh/cm

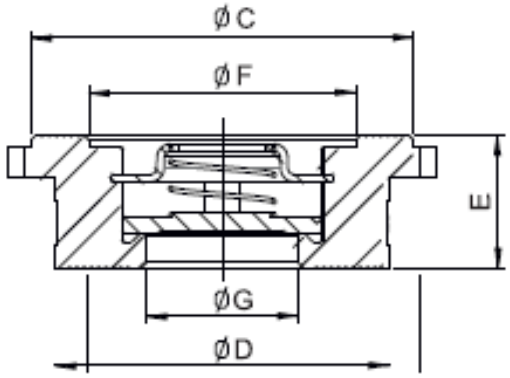
V= Volume of fluid l/s or m^3/h

Pressure loss information for steam, compressed air and gases is available from Forbes Marshall.

How to Order

Example : 1 No. Forbes Marshall spring-loaded disc check valve, DN50 FMDCVANSI austenitic stainless steel for fitting between ANSI 300 flanges.

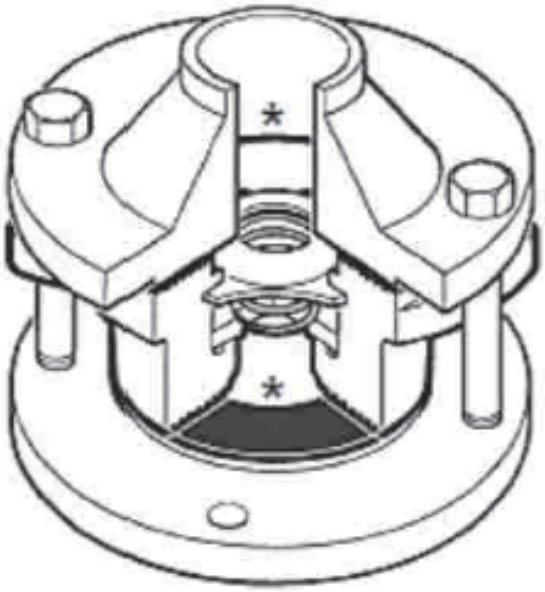




Safety Information, Installation and Maintenance

For full details see the user manual supplied with the product. FMDCVANSI disc check valves must be fitted in accordance with the indicating correct fluid flow direction. When fitted with a spring they can be installed in any plane. When supplied without a spring they must be fitted in a vertical flow line with the flow from bottom-to-top.

Note : Flanges, bolts (or studs), nuts and joint gaskets are to be provided by the installer. Forbes Marshall disc check valves are non-maintainable (no spares are available) and are not suitable for use where heavily pulsating flow exists, such as when close to a compressor.



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'E'	Standard spring	EPDM soft faced disc
'WV'	Without spring	Viton soft faced disc
'WE'	Without spring	EPDM soft faced disc

No identification indicates a standard spring with a metal disc

Disposal

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