

DESCRIPTION

BF2SE

Shut-off butterfly valve with body type WAFER for HVAC (heating and cooling), water treatment and water distribution (no drinking water).

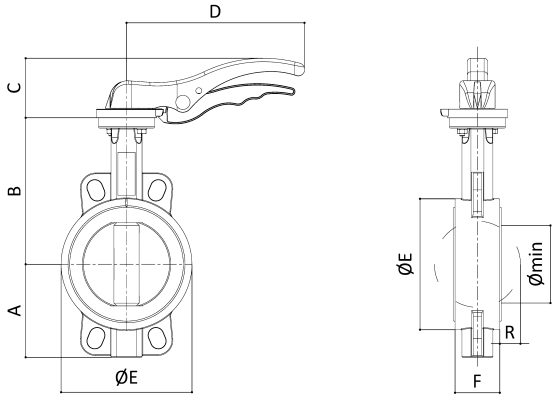
Body made of ductile iron, central disc made of stainless steel and sleeve made of EPDM.

Equipped with alignment holes for mounting between flanges EN 1092-1 (PN6 - PN10 - PN16) and ANSI B16.5 (#150). Tested according to standard EN 12266 category A.

Connection of the operating device (lever included) via integrated ISO 5211 support. Availability of further control devices such as manual handwheel gear boxes (more informations at the "MANUAL GEAR BOX" chapter).

DIMENSIONS

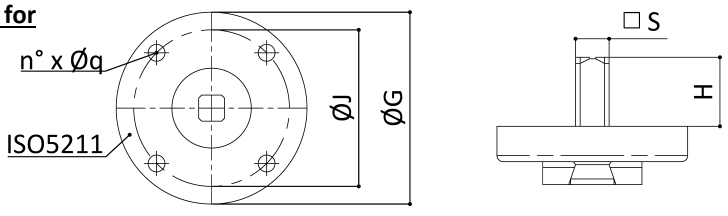
Valve body with operating lever



Dimensions in **mm** – Face to face distance according to EN 558-1 series 20

DN	40	50	65	80	100	125	150	200	250	300
A	63	62	69	90	106	119	131	166	202	235
B	116	126	136	150	170	180	200	230	266	292
C	50	50	50	69	69	90	90	72	**	**
D	170	170	170	206	206	285	285	400	**	**
ØE	82	89	102	118	150	174	205	260	318	376
F	33	43	46	46	52	56	56	60	68	78
R	5	5	9	17	26	34	50	71	91	112
Ømin	27	31	45	65	90	110	146	194	241	291
Weight [kg]*	1.8	2.1	2.4	3.2	4.3	6.3	7.8	15.5	**	**

Connection flange ISO5211 for the operating device



Dimensions in **mm**

DN	40	50	65	80	100	125	150	200	250	300
n° x Øq	4 x 7	4 x 7	4 x 7	4 x 7	4 x 7	4 x 9	4 x 9	4 x 11	4 x13	4 x 13
ISO5211	F05	F05	F05	F05	F05	F07	F07	F10	F12	F12
ØJ	50	50	50	50	50	70	70	102	125	125
ØG	65	65	65	65	65	90	90	125	150	150
S	9	9	9	11	11	14	14	17	27	27
H	21	21	21	21	21	27	27	27	27	27

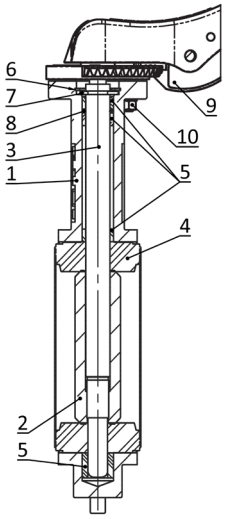
*The indicated weight includes the operating lever. **The DN250 and DN300 models are supplied with a manual handwheel gear box.

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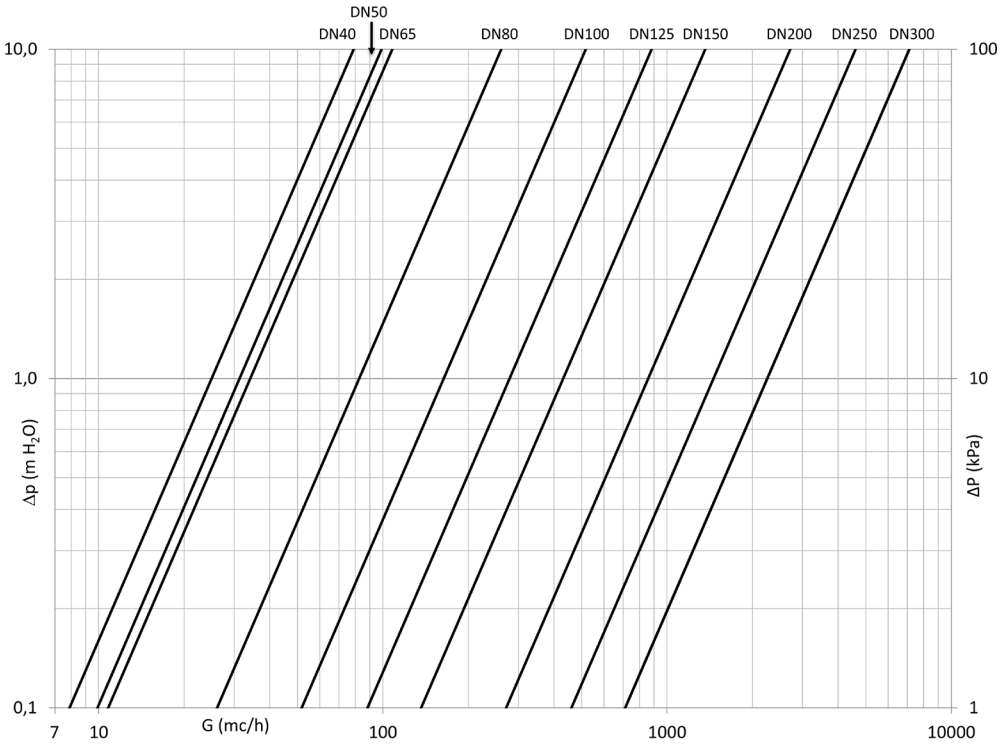
FRATELLI PETTINAROLI S.p.A. CLIMATE SYSTEMS TECHNOLOGY

MATERIALS

1	*Body*	Ductile iron EN GJS 400-15
2	*Disc*	Stainless steel AISI 316
3	*Stem*	Stainless steel AISI 420
4	*Sleeve*	EPDM
5	*Bushing*	PTFE
6	*Washer*	Galvanized carbon steel
7	*Circlip ISO3075*	Spring steel
8	*O-ring*	FKM
9	*Lever*	DN40-DN150 aluminium / DN200 ductile iron EN GJS 400-15
10	*Bolts*	Stainless steel AISI 201
–	*Coating*	Inside and outside water-based epoxy coating high temperature resistant



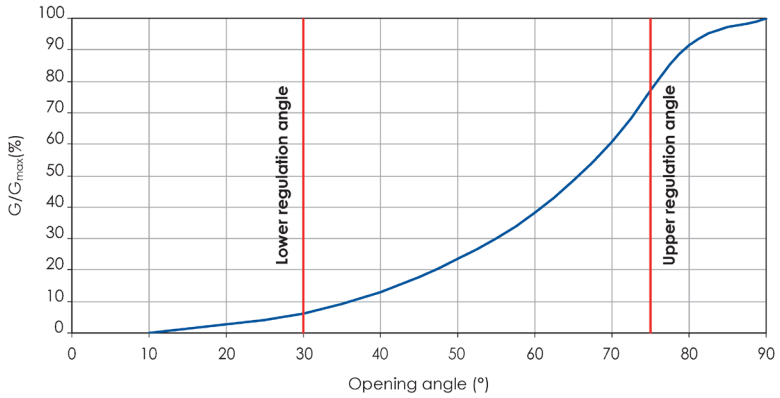
PRESSURE LOSS DIAGRAM



DN		40	50	65	80	100	125	150	220	250	300
Kv		79	99	108	261	518	883	1364	2716	4611	7124
FLOW RATE IN FUNCTION OF THE OPENING ANGLE [m³/h]	**10°**	0.04	0.05	0.09	0.17	0.26	0.43	0.69	2.6	2.6	3.5
	20°	2.1	2.6	3.8	7.8	15	25	39	52	130	202
	30°	4.8	6	14	16	31	53	82	142	276	427
	40°	10	13	33	34	67	115	177	250	599	926
	50°	19	23	53	60	120	205	316	450	1068	1650
	60°	30	38	75	100	199	339	522	713	1768	2730
	70°	48	60	98	158	314	535	827	1122	2798	4322
	80°	73	91	108	237	471	803	1241	1723	4196	6483
	90°	79	99	108	261	518	883	1364	2716	4611	7124

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The following graph shows the trend of flow rate G, expressed as a percentage with respect to the maximum value G_{max}, as the opening angle of the valve varies at the same pressure drop:



RECOMMENDED WORKING PRESSURE / TEMPERATURE LIMITS

Temperature			Nominal pressure	
Minimum [°C]	Maximum continuos [°C]	Maximum peak[°C]	Between flanges [bar]	End line [bar]
-10	120 105 (DN250 – DN300)	130 105 (DN250 – DN300)	16	16
ALLOWED MEDIUM: water / water + glycol (max 30%)				

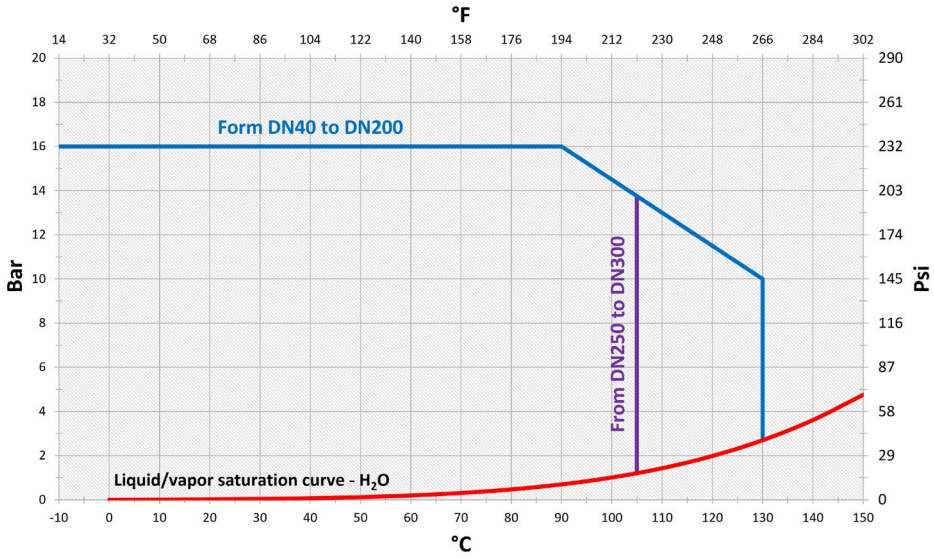
⚠ The maximum pressure decreases as the working temperature increases; refer to the specific diagram to evaluate the limits in conditions different from the nominal ones (next chapter).

⚠ If the valve is installed at the end of the line, a counter flange is always required.

PRESSURE / TEMPERATURE DIAGRAM

Comply with the pressure and temperature limits indicated in the following diagram. Check that the condition of use are:

- Under the maximum value, indicated by the blue curve (purple curve for DN250 and DN300);
- Above the minimum value, indicated by the red curve.



⚠ The valve is not suitable for working with stem or with a mixture of water and stem. The red curve corresponds to the liquid/vapor saturation curve of the water below which it is not possible to work.

APPROVALS

In compliance with european directive PED 2014/68/UE (ex 97/23/CE):

- Models from DN65 to DN200 with **CE** mark (category 1)
- Models DN40 - DN50 - DN250 - DN300 without **CE** mark (article 4, paragraph 3)

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INSTALLATION

The valve can be installed with stem axis in horizontal or vertical position. In case the fluid contains suspended solid particles (e.g. sand, impurities, etc.) or particles that may leave deposits, it is recommend to install the valve with the axis oriented horizontally and in such a way that the bottom end of the disc opens in the direction of the flow F *(Fig.1)*.

In particular the stem has a machined notch on the head which indicates the position of the disc *(Fig.2)*: refer to it in order to mount levers and actuators correctly, making sure that the valve **is partially open during the installation phase**.

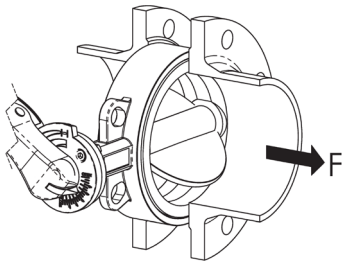


Fig.1

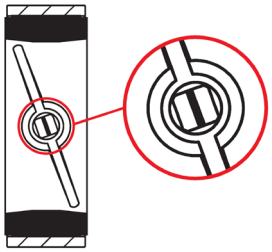


Fig.2

For end line installation a counter flange is always required. Verify maximum working pressure and limits of use at the "RECOMMENDED WORKING PRESSURE / TEMPERATURE LIMITS" chapter.

To proceed with the installation, place the valve between the two flanges making sure that, during this operation, there is sufficient space in order not to damage the rubber; carefully clean the contact surfaces. The valve is already equipped with a suitable sleeve, do not fit gaskets between the valve and the flanges *(Fig.3)*. Do not install the valve in direct contact with a rubber surface (e.g. expansion joints); optimal installation requires a rubber to metal contact *(Fig.4)*.

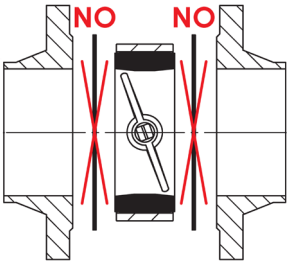


Fig.3

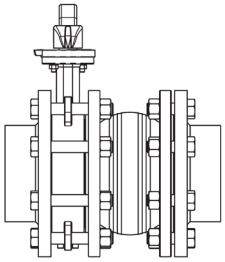


Fig.4

Do not leave sharp edges on the pipe because they may damage the rubber surfaces of the valve *(Fig.5)*. Tighten the bolts crosswise and progressively, in order to distribute the pressure equally before the valve body and the flanges touch each other *(Fig.6)*. Check that the bolts are of the correct lenght in order to ensure the complete compression of the rubber sleeve (more information at the "BOLT LENGTH CALCULATION" chapter).

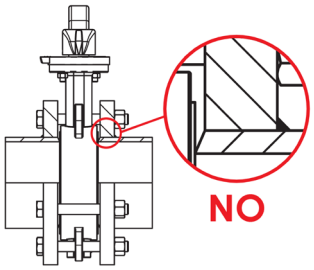


Fig.5

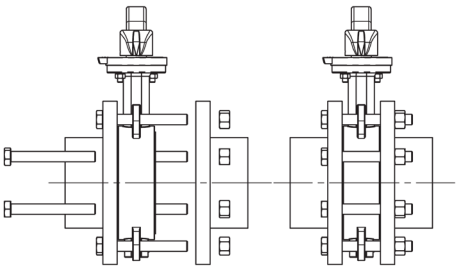


Fig.6

In order to ensure correct operation, the internal diameter of the pipe must be larger than the minimum value indicated as Ømin at the "DIMENSIONS" chapter.

We reccomend the use of flanges according to the table in the "CONNECTION FLANGES" chapter. Avoid as far as possible the use of flat welding flanges (EN 1092-1 type 01); if these flanges are used, do not weld them to the pipe with the valve already installed, ensure perfect centering between the flange and the valve and weld the pipe exactly edgewise to the flange.

Turbolences of the fluid might increase erosion and consequently reduce the useful life of the valve itself. To limit this phenomenon it is recommended to install the valve at a minimum distance of at least 1 times the DN upstream and 2-3 times the DN downstream of fittings and bends *(Fig.7)*.

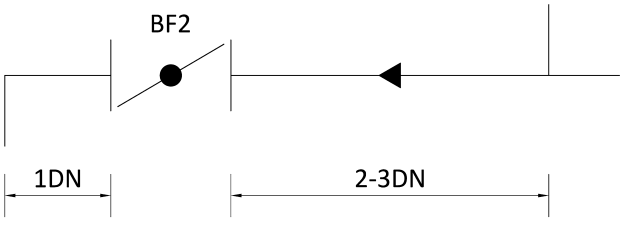


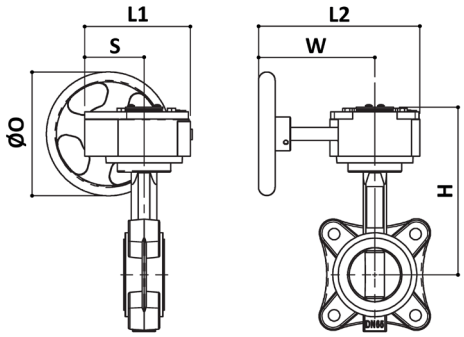
Fig.7

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MANUAL GEAR BOX

With the exception of the DN250 and DN300 models, the BF2SE valve is supplied by default with an operating lever suitable for intermediate regulation, thanks to its graduated scale, and lockable. According to the requirements, it is then possible to pair the valve with a manual handwheel gear box (already included with the DN250 and DN300 models). The relative dimensions are shown below:





Dimensions in **mm**

DN	40	50	65	80	100	125	150	200	250	300
L1	130	130	130	130	130	130	130	180	205	205
L2	225	225	225	225	225	225	225	338	345	345
S	77	77	77	77	77	77	77	104	124	124
W	170	170	170	170	170	170	170	260	260	260
H	178	188	198	212	232	242	262	308	346	372
ØO	150	150	150	150	150	150	150	300	300	300
Weight [kg]*	5.8	6.1	6.4	7.0	8.1	9.6	11.1	22.3	32.8	42

*The indicated weight is of the assembly valve plus gear box.

OPERATING TORQUE

The following table collects the torque values, expressed in **Nm**, required to operate each valve model for different values of the differential pressure across it:

DN	40	50	65	80	100	125	150	200	250	300
ΔP 3 bar	7.8	11.3	17	23	33	48	68	120	189	290
ΔP 6 bar	8.4	12	18	25	36	54	78	134	212	316
ΔP 10 bar	8.8	13	20	26	40	61	88	148	234	342
ΔP 16 bar	9.2	13	21	28	44	68	99	162	257	367

CONNECTION FLANGES

The BF2SE valve is equipped with suitable alingment holes which allow assembly between EN 1092-1 (PN6 - PN10 - PN16) flanges and ANSI B16.5 (#150) flanges. The following table collects the recommended flange models based on the reference standard:

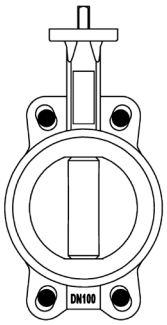
Standard	Type	Description
EN 1092-1 PN6 - PN10 - PN16	Type 11	Weld neck
	Type 21	Integral
	Type 02+35	Loose plate with weld ring neck
	Type 02+36	Loose plate with pressed collar
	Type 04+34	Loose plate with weld rinng neck collar
ANSI B16.5	#150	Flat face
	#150	Raised face
	#150	Lap joint

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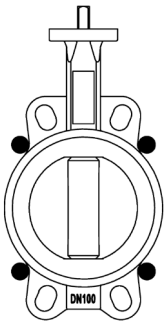
The assembly of the valve can then vary according to the DN selected as the realization of the alingment holes varies: refer to the following table to determine the arrangement of the connecting elements (bolts or tie rods) according to the valve model selected and the type of flanges used:

	DN	40	50	65	80	100	125	150	200	250	300
FLANGES	EN 1092-1 PN6	A	A	A	D	B	A	A	A	A	A
	EN 1092-1 PN10	A	A	A	C*	A	A	A	A	A	A
	EN 1092-1 PN16	A	A	A	C*	A	A	A	A	A	A
	ANSI B16.5 #150	A	A	A	D	A	A	A	A	A	A

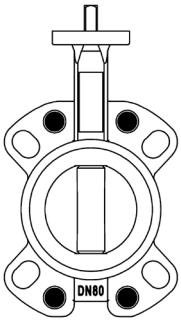
*In case of the DN80 model with EN 1092-1 PN10 or PN16 flanges with only 4 alingment holes, use the D arrangement.



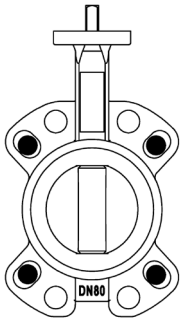
Arrangement A



Arrangement B



Arrangement C



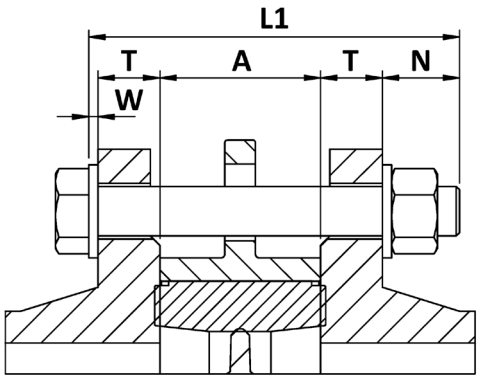
Arrangement D

BOLTS LENGHT CALCULATION

It is possible to secure the BF2SE valve by using bolts or tie rods. The minimum length of the fixing element varies according to the valve model selected and can be determined as follows:

Mounting with bolts

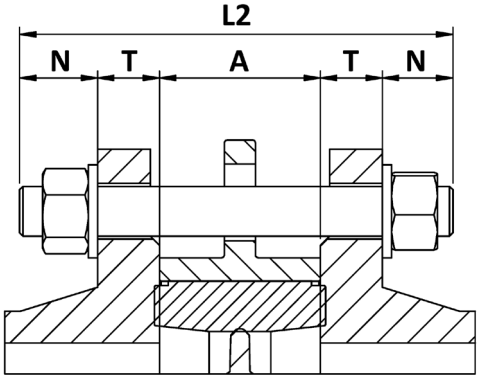
L1 ≥ A+2T+W+N



L1 = minimum lenght of the bolt
T = thickness of the flange (flange supplied by the end user)
A = thickness of the valve (see table below)
N = minimum lenght of nut+fixing washer (see table below)
W = thickness of the washer under bolt's head

Mounting with tie rods

L2 ≥ A+2T+2N



L2 = minimum lenght of the tie rod
T = thickness of the flange (flange supplied by the end user)
A = thickness of the valve (see table below)
N = minimum lenght of nut+fixing washer (see table below)

DN	40	50	65	80	100	125	150	200	250	300
A	33	43	46	46	52	56	56	60	68	78
N*	24	24	24	24	24	26	26	26	32	32

*Maximum between EN 1092-1 (PN6 - PN10 - PN16) and ANSI B16.5 (#150).

⚠ Fixing elements are not supplied.

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WARNING

Inclination, twisting and misalignment of the piping can cause improper stresses on the valve once installed. Pay attention to water hammers as they might cause damage and breakage. We recommend to avoid them as much as posssible or adopting elastic joints in order to reduce these effects.

In the opening position the valve is larger than the nominal face to face value. Check that there is no interference with other components of the piping which could cause damage and malfunctions *(Fig.8)*. If necessary, install a spacer to allow the correct opening of the valve *(Fig.9)*.

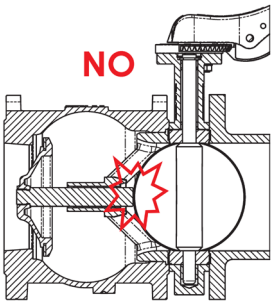


Fig.8

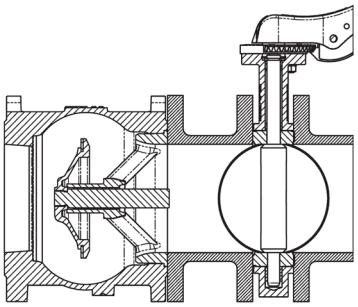


Fig.9

Before maintenance operations or disassembly:

- Wait for the cooling of the piping, the valve and the fluid
- Let the pressure escape

Assembly, disassembly, commissioning and maintenance operations must be carried out by **trained personnel** and in compliance with the instructions and local safety regulations. **Temperature over 50°C and under 0°C can cause damage to people.**

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