

# Technical catalogue

Manual valves, pipe and fittings in PVDF



Pressure piping fluids conveying





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## **KEY ABBREVIATIONS**

**167**



# General characteristics

## PVDF

**PVDF (polyvinylidene difluoride is a fluorinated and semicrystalline technopolymer containing 59% of its weight in fluorine. This material is obtained through the polymerization of vinylidene fluoride. It boasts exceptional mechanical, physical and chemical resistance, guaranteeing excellent thermal stability up to 140° C.**

The FIP PVDF line uses PVDF resins for the production of pipes, fittings and valves made by extrusion and injection moulding. The entire line is made using resins classified according to ASTM D 3222 and complying with the requirements of ISO 10931.

Thanks to its high purity and exceptional performance, PVDF is the best alternative to metal materials, and is extensively used in industrial applications (chemical, oil, pharmaceutical, pulp and paper, electronic, etc.), whether in process systems or otherwise.

Among the most important properties and advantages of PVDF, the following are particularly worthy of note:

- **Excellent chemical resistance:** the use of resin, a vinylidene fluoride polymer, ensures excellent resistance to corrosion and abrasion when conveying highly aggressive chemicals. PVDF is basically inert to most inorganic acids and bases, organic acids, aromatic and aliphatic hydrocarbons, alcohols and halogenated solvents. However, it is not recommended for use with fluorine, amines, ketones and oleum (sulfuric acid with sulfur trioxide).
- **Excellent thermal stability:** PVDF maintains its characteristics unchanged in a temperature range between -40° C and +140° C. PVDF pipes are particularly suitable in all applications requiring high operating temperatures, very low levels of fluid contamination and high resistance to ageing due to atmospheric agents and UV radiation. The material's excellent mechanical properties are retained even at high temperatures.
- **Fire resistance:** resins guarantee excellent fire resistance without the need for flame retardants (Limit Oxygen Index, LOI = 44%). In case of combustion, smoke emissions are moderated. PVDF resins are classified UL-94, class V-O.
- **Purity:** PVDF resin is an extremely pure polymer that does not contain stabilizers, plasticizers, lubricants or flame retardants. As a result, it is the ideal material for conveying ultra-pure water and chemicals, ensuring the non-contamination of the conveyed fluid. As it is physiologically non-toxic, it is suitable for conveying fluids and food products.
- **High abrasion resistance:** according to the Taber Abrasion Test (in which the weight loss of a material is measured after being exposed to an abrasive wheel for 1000 cycles), PVDF is the most resistant thermoplastic material (CS-10 Load 1kg - Weight Loss / 1000 cycles = 5-10 mg.)



Density		
Test method	ISO 1183	
Unit of measurement	g/cm <sup>3</sup>	
Value	Valves/fittings: 1.78 – Pipes: 1.78	
Fluidity index (MFI 230°C, 5 kg)		
Test method	ISO 1133	ASTM D1238
Unit of measurement	g/(10 min)	g/(10 min)
Value	Valves/fittings: 6 – Pipes: 6	Valves/fittings: 24 – Pipes: 24
Modulus of elasticity		
Test method	ISO 527	ASTM D1238
Unit of measurement	MPa = N/mm <sup>2</sup>	MPa = N/mm <sup>2</sup>
Value	Valves/fittings: 2100 – Pipes: 2100	Valves/fittings: 2200 – Pipes: 2100
IZOD notched impact strength at 23°C		
Test method	ASTM D256	
Unit of measurement	J/m	
Value	Valves/fittings: 55 – Pipes: 110	
Ultimate elongation		
Test method	ISO 527-2	ASTM D1238
Unit of measurement	%	%
Value	Valves/fittings: 80 – Pipes: 80	Valves/fittings: 5-10 – Pipes: 20-50
Rockwell hardness		
Test method	ASTM D 785	
Unit of measurement	R	
Value	Valves/fittings: 110 – Pipes: 110	
Tensile strength		
Test method	ISO 527	ASTM D 638
Unit of measurement	MPa = N/mm <sup>2</sup>	MPa = N/mm <sup>2</sup>
Value	Valves/fittings: 50 – Pipes: 50	Valves/fittings: 53-57 – Pipes: 53-57
Heat distortion temperature HDT (0.46 N/mm <sup>2</sup> )		
Test method	ISO 75	ASTM D 648
Unit of measurement	°C	°C
Value	Valves/fittings: 145 – Pipes: 145	Valves/fittings: 148 – Pipes: 147
Thermal conductivity at 23° C		
Test method	DIN 52612-1	ASTM C 177
Unit of measurement	W/(m °C)	W/(m °C)
Value	Valves/fittings: 0.20 – Pipes: 0.20	Valves/fittings: 0.20 – Pipes: 0.20
Coefficient of linear thermal expansion		
Test method	DIN 53752	ASTM D 696
Unit of measurement	m/(m °C)	m/(m °C)
Value	Valves/fittings: 12x10 <sup>-5</sup> Pipes: 12x10 <sup>-5</sup>	Valves/fittings: 12x10 <sup>-5</sup> Pipes: 12x10 <sup>-5</sup>
Limiting Oxygen Index		
Test method	ISO 4859-1	ASTM D 2863
Unit of measurement	%	%
Value	Valves/fittings: 44 – Pipes: 44	Valves/fittings: 44 – Pipes: 44
Surface electrical resistivity		
Test method	ASTM D257	
Unit of measurement	ohm	
Value	Valves/fittings: >10 <sup>14</sup> – Pipes: >10 <sup>14</sup>	
Flammability		
Test method	UL94	
Value	V-0	

# Reference standards

## PVDF

**Production of the PVDF lines is carried out according to the highest quality standards and in full compliance with the environmental restrictions set by the applicable laws in force and in accordance with [ISO 14001](#).**

**All products are made in accordance with the quality guarantee system in compliance with [ISO 9001](#).**

- **ANSI B16.5**

Pipe flanges, flanged fittings and stubs – NPS 1/2 to NPS 24 mm/inch

- **ASTM D3222**

PVDF materials extrusion moulding and coating

- **DVS 2202-1**

Imperfections of PVDF welded joints, characteristics, descriptions and evaluations

- **DVS 2207-15**

Welding of thermoplastics – Heated tool welding of pipes, pipeline components and sheet made of PVDF

- **DVS 2208-1**

Machinery and equipment for thermocouple welding

- **EN 558-1**

Industrial valves – Overall dimensions of metal valves for use in flanged pipe systems – Part 1: PN designated valves

- **EN 1092-1**

Flanges and their joints – Circular flanges for pipes, valves and accessories – Part 1: Steel flanges, PN designated

- **EN ISO 10931**

Specifications for components (Pipes, Fittings and Valves) in PVDF for industrial applications

- **ISO 5211**








Industrial valves – Part-turn actuator couplings

- **ISO 9624**

Thermoplastic piping systems for fluids under pressure – flange adapters and loose backing flanges – Mating dimensions

# Main properties

## PVDF

Properties of PVDF		Benefits
Thermal resistance		<ul style="list-style-type: none"> <li>Operating range: - 40 + 140° C (see pressure/temperature regression curves)</li> </ul>
Low surface roughness		<ul style="list-style-type: none"> <li>High flow coefficients (extremely smooth internal walls)</li> </ul>
Chemical resistance		<ul style="list-style-type: none"> <li>Exceptional chemical resistance for conveying corrosive fluids (generally inert to inorganic acids and bases, aromatic and aliphatic hydrocarbons, organic acids, alcohols and halogenated solvents)</li> </ul>
Abrasion resistance		<ul style="list-style-type: none"> <li>Extremely low operating costs due to its long service life</li> </ul>
Fully recyclable and nontoxic		<ul style="list-style-type: none"> <li>Physiologically safe</li> </ul>
Easy jointing (hot socket, butt and electrofusion welding, flanging and threading)		<ul style="list-style-type: none"> <li>Low installation costs</li> </ul>
Excellent mechanical properties		<ul style="list-style-type: none"> <li>PVDF responds to the need to provide suitable mechanical resistance meeting the design requirements of industrial plants</li> </ul>

# Socket welding instructions

Hot socket welding involves fusing the pipe in the fitting's socket.

The joint is made by simultaneously fusing the male and female surfaces by means of special manual or automatic heating devices.

These devices, in their simplest form, are composed of a heating plate on which a series of heating bushes are mounted.

The device comes with an appropriate heating system complete with an automatic temperature controller. No additional materials are required for this type of welding.

Socket welding does not affect the chemical resistance of the PVDF, nor does it influence the inner pressure resistance of the assembled pipes and fittings.

The pipe to be welded must be cut, chamfered and peeled if necessary.

The external surface of the pipe and the internal surface of the fitting must be carefully cleaned, and the external surfaces of the pipe and fitting can be marked with a reference notch to eliminate the risk of inadvertent rotation while the joint is setting.

The next step is to insert the pipe in the female bush and the fitting in the male bush and hold them in position for the necessary heating time; when this time has elapsed, the parts must be quickly removed from the bushes and then the pipe inserted into the fitting to the full previously determined insertion length, ensuring the reference notches are correctly aligned.

The two elements must be supported for approximately 15 seconds after initial insertion and then left to cool at ambient temperature without using forced air flows or water immersion.

## Procedure for hot socket welding

The method described below is applicable only when creating thermal socket welds that call for the use of manual type welding equipment (fig. 1).

The use of automatic and semi-automatic appliances, which are particularly suitable for diameters greater than 63 mm, calls for a specific working knowledge of the welding tool. In this case, adhere strictly to the tool manufacturer's instructions

- 1) Select the female bushes and the male bushes of the required diameters, insert them and secure them to the heating plate (fig. 1).
- 2) Carefully clean the contact surfaces (fig. 3). When choosing the type of liquid detergent, use recommended products supplied by specialist producers: trichloroethane, chlorothene, ethyl alcohol and isopropyl alcohol are all suitable.
- 3) Set the temperature of the heating tool. To form the joint correctly, the temperature should be set between 250° C and 270° C.
- 4) When the appliance has reached the preset temperature, check the temperature of the heating plate using a fast acting thermoprobe.
- 5) Cut the pipe at right angles, chamfer it and if necessary peel it out (fig. 4-5). The peeling diameter and length and the chamfer depth must correspond to the values shown in the table named "Pipe peeling and chamfer dimensions". The chamfering process can be performed either after peeling or concurrently with this operation, using special calibrated tools.
- 6) Mark the pipe with the insertion length L1 (fig. 6), referring to the values



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5





Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11

indicated in the table named "Pipe insertion length" and checking that any peeling has been machined to the entire length shown in the table.

**7)** Mark a longitudinal reference line on the outside of the pipe and the fitting to prevent the two parts from rotating while the joint is being made (fig. 7).

**8)** Clean the fitting and pipe from any traces of oil or dust on the weld surfaces (fig. 8).

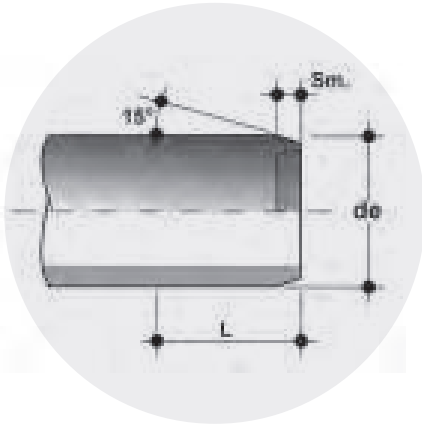
**9)** After having checked that the surface temperature of the heating plate has stabilized at the required value, insert the pipe into the female bush and the fitting in the male bush (fig. 9). Holding the parts inserted in the two bushes (fitting inserted to limit stop, pipe inserted up to the end of the peeling length), wait for the minimum heating time shown in the table named "Heating, welding and cooling times".

**10)** When the minimum heating time has elapsed, quickly remove the elements from the bushes and fit the pipe into the fitting for the entire insertion length L1 marked previously (fig. 10). Do not turn the pipe in the fitting; ensure the longitudinal reference marks are perfectly aligned (fig. 11).

**11)** Hold the jointed elements for the welding time shown in the table named "Heating, welding and cooling times" and then leave them to cool slowly at ambient temperature without using forced air flows or water immersion.

**12)** When the internal and external surfaces have cooled sufficiently, pressurize the plant for the joint hydraulic test.

## Pipe peeling and chamfer dimensions



External diameter de (mm)	Peeling length L (mm)	Chamfer Sm (mm)
16	13	2
20	14	2
25	16	2
32	18	2
40	20	2
50	23	2
63	27	3
75	31	3
90	35	3
110	41	3

## Pipe insertion length

External diameter de (mm)	Length of insertion into the fitting's socket L <sub>i</sub> (mm)
16	12
20	14
25	15
32	17
40	18
50	20
63	26
75	29
90	32
110	35

## Heating, welding and cooling times

de (mm)	PVDF pipes according to: DVS 2207 Part 15			
	Minimum thickness* (mm)	Heating time (sec)	Welding time (s)	Cooling time (min)
16	1.5	4	4	2
20	1.9	6	4	2
25	1.9	8	4	2
32	2.4	10	4	4
40	2.4	12	4	4
50	3	18	4	4
63	3	20	6	6
75	3	22	6	6
90	3	25	6	6
110	3	30	6	8

\* For proper welding, we recommend using pipes with wall thickness exceeding 2 mm, and precisely:

- for d up to 50 mm: pipe series PN 10 and PN 16
- for d from 63 to 110 mm: pipe series PN 16, PN 10 and PN 6.

# Installation instructions for threaded joints

To guarantee the hydraulic seal of the joint on fittings and valves with a threaded female end, we recommend you perform the following operations:

1. Start winding some PTFE sealing tape on the outside of the threaded male end, taking care not to obstruct the through-hole on the pipe, fitting or valve (fig. 1).
2. Complete the first winding layer by winding the tape clockwise until you reach the root of the thread. Remember to keep the tape taut throughout the entire process (fig. 2).
3. Press on the tips of the thread to make sure the tape adheres fully to the support clip.
4. Increase the thickness of the PTFE layer by continuing to apply the taut tape and winding it clockwise until you achieve the optimal level (fig. 3).
5. Connect the previously sealed male end to the female end and proceed manually by screwing the two elements.
6. Make sure the layer of PTFE is not removed during screwing, as this would compromise the hydraulic seal of the joint.
7. Complete screwing the two ends exploiting the entire length of the thread with the aid of a strap wrench or similar tool.
8. Avoid tightening the elements too much, as this could damage the threads or cause stress to the elements themselves.

## Recommendations

For correct installation, we recommend you only use sealing tape in non-sintered PTFE. Under all circumstances avoid using materials such as hemp, lint or paints usually implemented for the hydraulic seal on metal threads.

## Warnings

Avoid using threaded joints in the following cases:

- highly critical applications, such as for conveying chemically aggressive or toxic fluids;
- in the presence of medium or high pressures. In this case, we recommend the use of solvent welding joints, hot welding joints or flanged joints;
- systems subject to mechanical and/or thermal stresses such as water hammers, strong variations in temperature, bends, misalignments and cross tensions which could cause the threaded joint to break prematurely;
- coupling of elements with excessive distance from one another.

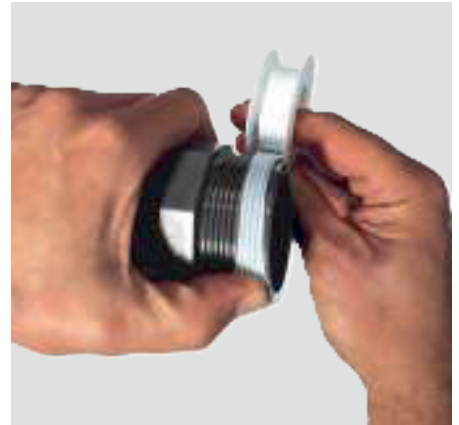


Fig. 1



Fig. 2



Fig. 3

# Installation Instructions for flanged joints

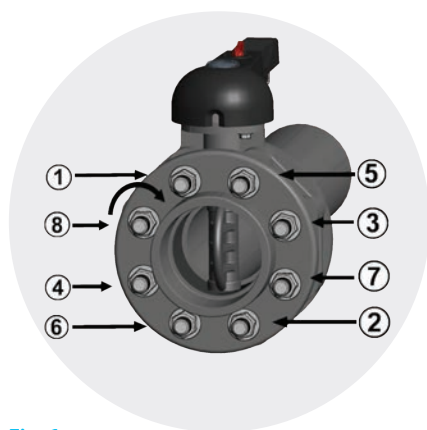


Fig. 1

To guarantee the correct installation of flanged elements, we recommend you perform the following operations:

1. insert the possible backing ring onto the pipe, before proceeding with the installation of the stub;
2. in the event of a fixed flange, check the drilling is correctly aligned with the counter flange;
3. check that the position of the counter flange takes into account the overall dimensions of the face to face distance of the components;
4. insert the flat gasket between the stubs (this step is not necessary for butterfly valves), making sure the sealing surfaces of the flanges to be welded have not been separated by an excessive distance, since this would cause it to compress;
5. proceed with solvent welding or welding of the fixed flanges or stub (in the case of backing rings) following the welding or solvent welding instructions provided by FIP;
6. insert all the bolts, washers and nuts;
7. once the cooling time is up, proceed with tightening the bolts in a "cross-wise" order (fig.1);
8. complete the bolt tightening process using a torque wrench until the tightening torque values shown in the table are reached.

## Tightening torque

Tightening torques for nuts and bolts to achieve the seal with flanges in PP-metal core with gaskets in EPDM/FKM/NBR during the pressure test.

DN	20	25	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400
Nm	10	15	15	20	25	35	35	35	35	35	45	70	70	70	70	70	70	90	120	140

Please note that:

- The use of flanges in coated metal or fibreglass may allow the application of higher tightening torques, provided these do not exceed the elastoplastic limit of the material.
- The use of different elastomeric seal materials from those listed in the previous table may require slightly higher tightening torques.
- FIP always recommends the use of suitably sized washers for any bolt used in the coupling flange.



## Minimum length of bolts

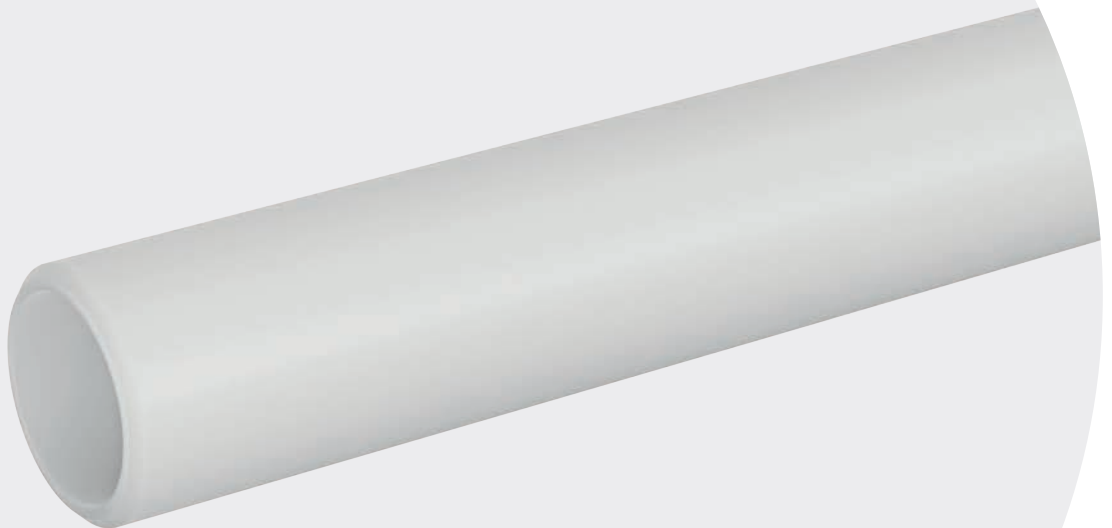
For flanged butterfly valves	
DN	Lmin
40	M 16x150
50	M 16x150
65	M 16x170
80	M 16x180
100	M 16x180
125	M 16x210
150	M 20x240
200	M 20x260
250	M 20x310
300	M 20x340
350	M 20x360
400	M 24x420

For flanged joints on pipes using backing rings				
d	DN	Bolts	Lenght for stub end SDR11	Lenght for stub end SDR 17
20	15	M 12	65	-
25	20	M 12	70	-
32	25	M 12	80	-
40	32	M 16	90	90
50	40	M 16	90	90
63	50	M 16	100	100
75	65	M 16	110	100
90	80	M 16	110	110
110	100	M 16	110	110
125	125	M 16	130	120
140	125	M 16	140	120
160	150	M 20	140	130
180	150	M 20	150	130
200	200	M 20	160	140
225	200	M 20	160	140
250	250	M 20	180	150
280	250	M 20	180	150
315	300	M 20	190	160
355	350	M 20	200	180
400	400	M 24	230	210



# ISO-UNI PIPE

Pressure pipe



# ISO-UNI PIPE

Pressure pipes for connection system  
by butt or socket welding.

## PRESSURE PIPE

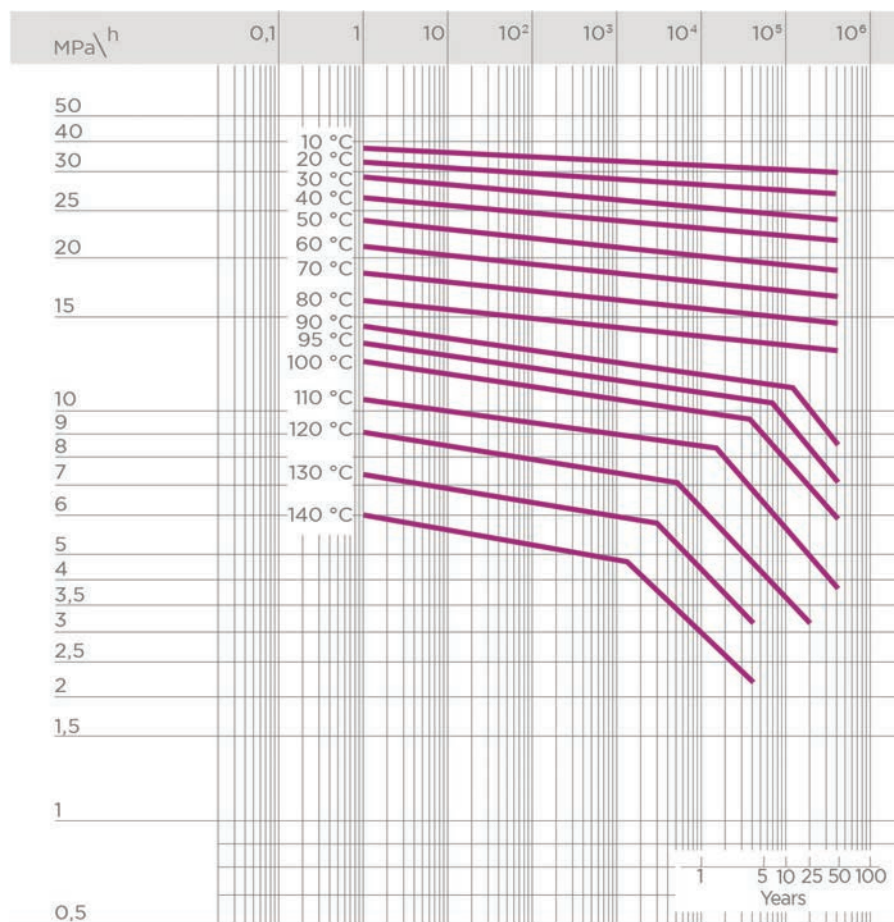
Technical specifications	
Size range	d 16 ÷ d 110 (mm)
Nominal pressure	SDR 21 (PN16) with water at 20° C SDR 33 (PN10) with water at 20° C
Temperature range	-40 °C ÷ 140 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931
Reference standards	<b>Construction criteria:</b> EN ISO 10931
	<b>Test methods and requirements:</b> EN ISO 10931
	<b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1
Material	PVDF



# TECHNICAL DATA

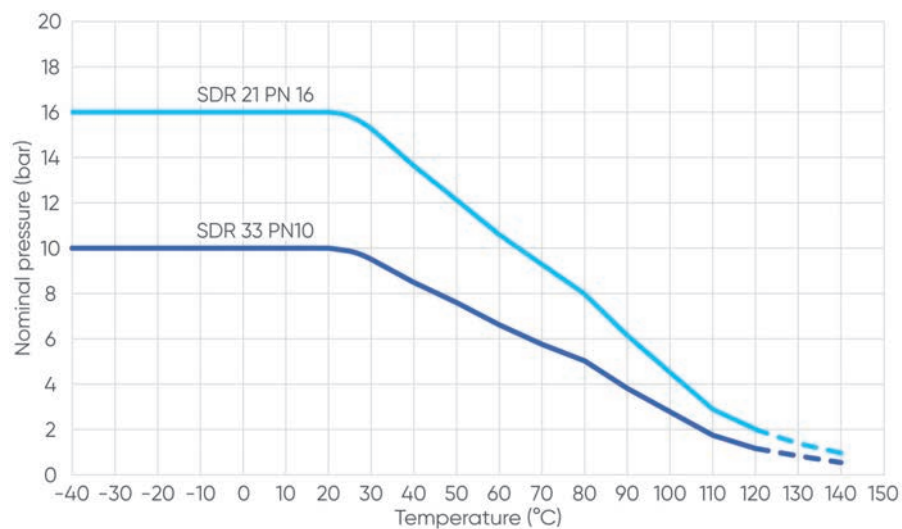
## REGRESSION CURVES FOR PIPES IN PVDF

Regression coefficients according to ISO 10931 for MRS (minimum) = 25 N/mm<sup>2</sup> (MPa)



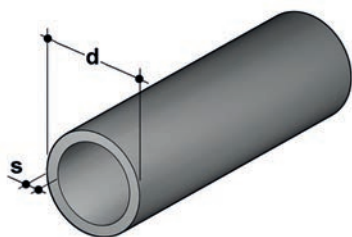
## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids for which the material is classified as CHEMICALLY RESISTANT (life expectancy 25 years). In other cases, a reduction of the nominal pressure PN is required.



The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

# DIMENSIONS



## PRESSURE PIPE

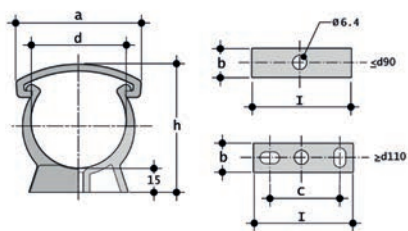
Pressure pipe in PVDF according to ISO 10931, translucent white, standard length 5m

d	DN	S (mm)	kg/m	PN16 code SDR 21 - S10
16	10	1,9	0,137	PIPEF21016
20	15	1,9	0,21	PIPEF21020
25	20	1,9	0,269	PIPEF21025
32	25	2,4	0,435	PIPEF21032
40	32	2,4	0,553	PIPEF21040
50	40	3	0,825	PIPEF21050
63	50	3	1,09	PIPEF21063
75	65	3,6	1,55	PIPEF21075
90	80	4,3	2,22	PIPEF21090
110	100	5,3	3,33	PIPEF21110

all resale products

d	DN	S (mm)	kg/m	PN10 code SDR 33 - S16
63	50	2,5	0,93	PIPEF33063
75	65	2,5	1,11	PIPEF33075
90	80	2,8	1,48	PIPEF33090
110	100	3,4	2,20	PIPEF33110

all resale products

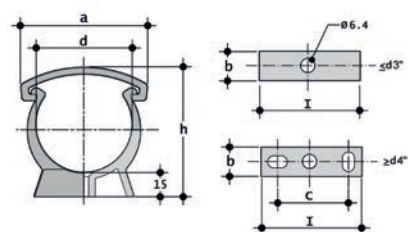


## ZIKM

Pipe clip for ISO-DIN pipes in PP

d	a	b	C	h	l	g	Code
16	26	18	-	33	16	5	ZIKM016
20	33	14	-	38	20	6,4	ZIKM020
25	41	14	-	44	25	7,8	ZIKM025
32	49	15	-	51	32	11,5	ZIKM032
40	58	16	-	60	40	15,7	ZIKM040
50	68	17	-	71	60	23,2	ZIKM050
63	83	18	-	84	63	28,8	ZIKM063
75	96	19	-	97	75	35,5	ZIKM075
90	113	20	-	113	90	52,4	ZIKM090
110	139	23	40	134	125	71	ZIKM110
140	177	27	70	167	155	149,5	ZIKM140
160	210	30	90	190	180	218,4	ZIKM160
180	237	33	100	211	200	293,6	ZIKM180

for pipe support systems, refer to guidelines DVS 2210-1 (Planning and execution - above-ground pipe systems)

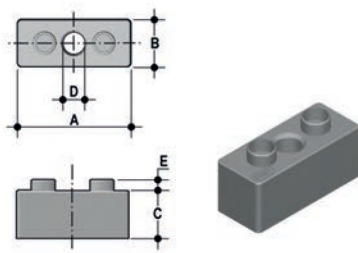


## ZAKM

Pipe clip for ASTM pipes in PP

d	a	b	C	h	l	g	Code
1/2"	33	14	-	39	20	7	ZAKM012
3/4"	41	14	-	45	25	7,8	ZAKM034
1"	49	15	-	52	32	11,7	ZAKM100
1 1/4"	58	16	-	61	40	16	ZAKM114
1 1/2"	68	17	-	67	50	17,9	ZAKM112
2"	83	18	-	80	63	29	ZAKM200
2 1/2"	96	19	-	96	75	36	ZAKM212
3"	118	20	-	110	90	52,3	ZAKM300
4"	140	25	60	135	140	74	ZAKM400
6"	197	30	90	196	180	188	ZAKM600

for pipe support systems, refer to guidelines DVS 2210-1 (Planning and execution - above-ground pipe systems)



## DSM

Distance plates in PP for ZIKM pipe clips

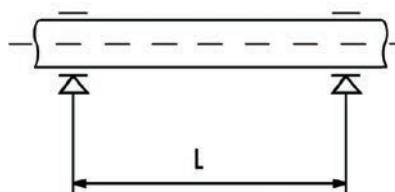
d	A	B	C	D	E	g	Pack	Master	Code
32	33	16	14	8	4	6,4	20	120	DSM032
40	41	17	17	8	4	8,2	10	80	DSM040
50	51	18	17	8	4	9,8	10	50	DSM050
63	64	19	22,5	8	4	13,4	10	40	DSM063
75	76	20	34,5	8	4	20,2	10	40	DSM075

for pipe support systems, refer to guidelines DVS 2210-1 (Planning and execution - above-ground pipe systems)



# INSTALLATION

## POSITIONING OF ZIKM AND ZAKM PIPE CLIPS



The installation of thermoplastic pipe systems requires the use of support clips to prevent flexing and the resulting mechanical stresses. The distance between the clips depends on the pipe material, SDR, surface temperature and the density of the conveyed fluid. Before installing the clips, check the distances reported in the table below, as provided for by guidelines DVS 2210-01 for water pipes.

### Supporting PVDF pipes conveying liquids of density 1 g/cm<sup>3</sup> (water and other fluids of equal intensity).

For pipes of SDR 33 / S 16 / PN 10 and SDR 21 / S 10 / PN 16:

d mm	< 20° C	30° C	40° C	50° C	60° C	70° C	80° C	100° C	120° C	140° C
16	725	700	650	600	575	550	500	450	400	300
20	850	800	750	750	700	650	600	500	450	400
25	950	900	850	800	750	700	675	600	500	450
32	1100	1050	1000	950	900	850	800	700	600	500
40	1200	1150	1100	1050	1000	950	900	750	650	550
50	1400	1350	1300	1200	1150	1100	1000	900	750	600

For pipes of SDR 33 / S 16 / PN 10:

d mm	< 20° C	30° C	40° C	50° C	60° C	70° C	80° C	100° C	120° C	140° C
63	1400	1350	1300	1250	1200	1150	1100	950	800	650
75	1500	1450	1400	1350	1300	1250	1200	1050	850	700
90	1600	1550	1500	1450	1400	1350	1300	1100	950	850
110	1800	1750	1700	1650	1550	1500	1450	1250	1100	950
125	1900	1850	1800	1700	1650	1600	1500	1350	1200	1000
140	2000	1950	1900	1800	1750	1700	1600	1450	1250	1050
160	2150	2100	2050	1950	1850	1800	1700	1550	1350	1150
180	2300	2200	2150	2050	1950	1900	1800	1600	1400	1200
200	2400	2350	2250	2150	2100	2000	1900	1700	1500	1300
225	2550	2500	2400	2300	2200	2100	2000	1800	1600	1400
250	2650	2600	2500	2400	2300	2200	2100	1900	1700	1500
280	2850	2750	2650	2550	2450	2350	2250	2000	1800	1600
315	3000	2950	2850	2750	2600	2500	2400	2150	1900	1650
355	3200	3100	3000	2850	2750	2650	2500	2250	2000	1750
400	3400	3300	3200	3050	2950	2800	2650	2400	2100	1800

For different SDR values, multiply the data in the table by the following factors:

1.08 for SDR21 / S10 / PN16 size range d63 - d400

1.12 for SDR17 / S8 / PN20 entire size range

### Supporting PVDF pipes conveying liquids of density other than 1 g/cm<sup>3</sup>.

If the liquid being conveyed has a density other than 1 g/cm<sup>3</sup>, the distance L must be multiplied by the factors in the table.

Fluid density in g/cm <sup>3</sup>	Support factor
1,25	0,96
1,50	0,92
1,75	0,88
2,00	0,84
< 0,01	1,48 for SDR33 / S16 / PN10 1,36 for SDR21 / S16 / PN16 1,31 for SDR17 / S8 / PN20



# FITTINGS FOR SOCKET WELDING



Fittings, metric series ISO-UNI



# FITTINGS FOR SOCKET WELDING

Series of fittings designed for conveying fluids under pressure with a hot weld connection system (socket welding).

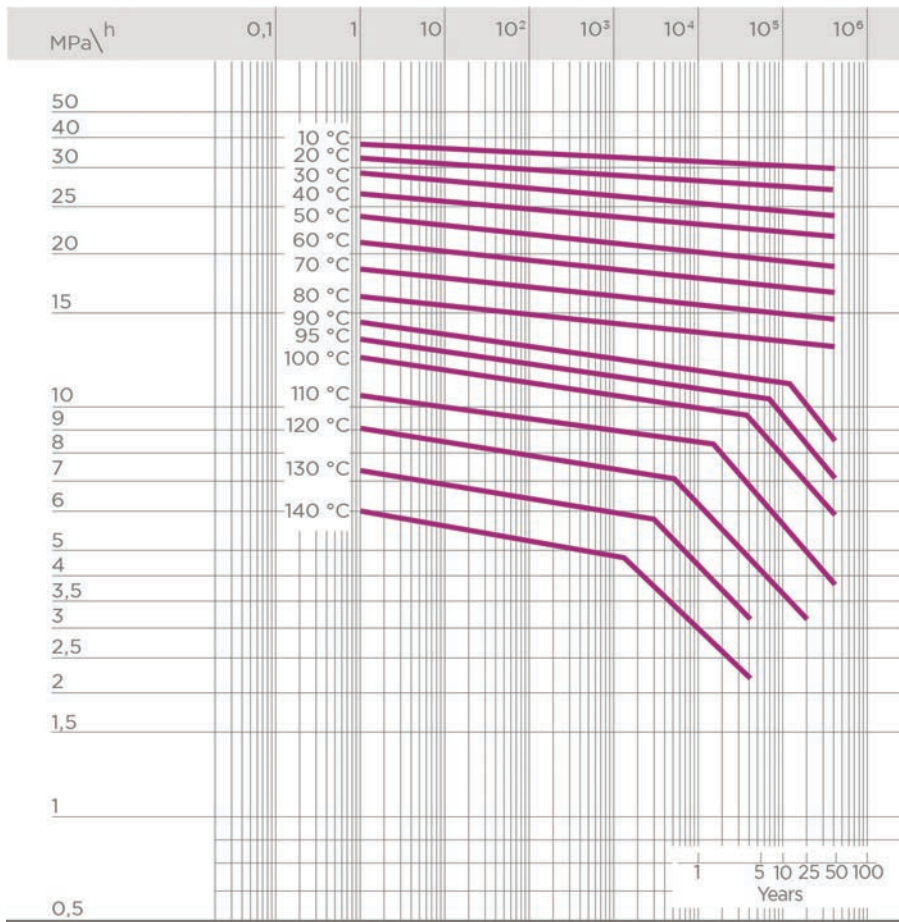
## FITTINGS, METRIC SERIES ISO-UNI

Technical specifications	
Size range	d 16 ÷ 110 (mm)
Nominal pressure	PN 16 with water at 20° C
Temperature range	-40 °C ÷ 140 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931 <b>Flanging system:</b> ISO 9624, EN 10931, EN 558-1, EN1092-1, ANSI B.16.5 cl. 150
Reference standards	<b>Construction criteria:</b> EN ISO 10931 <b>Test methods and requirements:</b> EN ISO 10931 <b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1
Fitting material	PVDF
Seal material	FKM

# TECHNICAL DATA

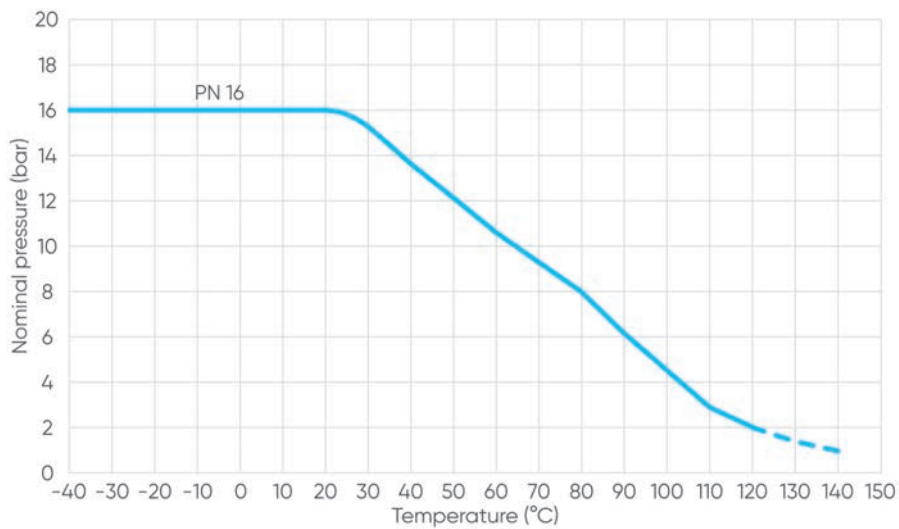
## REGRESSION CURVES FOR FITTINGS IN PVDF

Regression coefficients according to ISO 10931 for MRS (minimum) = 25 N/mm<sup>2</sup> (MPa)



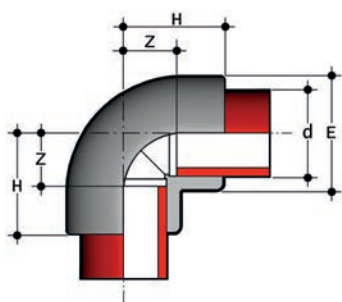
## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids for which the material is classified as CHEMICALLY RESISTANT (life expectancy 25 years). In other cases, a reduction of the nominal pressure PN is required.



The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

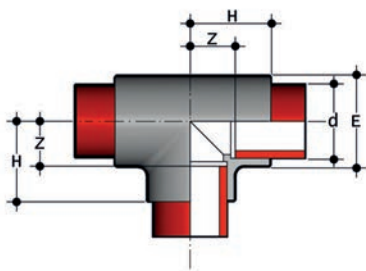
# DIMENSIONS



## GIF

90° elbow for socket welding

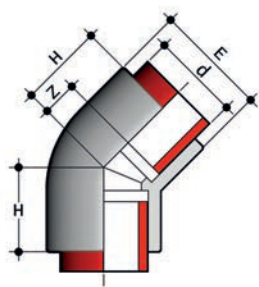
d	PN	E	H	Z	g	Code
16	16	22	23	10	14	GIF016
20	16	28	27	13	28	GIF020
25	16	33	32	16	43	GIF025
32	16	41	37	19	65	GIF032
40	16	52	43	23	125	GIF040
50	16	63	51	27	195	GIF050
63	16	77	61	34	340	GIF063
75	16	92	73	42	575	GIF075
90	16	110	83	47	850	GIF090
110	16	133	99	58	1470	GIF110



## TIF

90° Tee for socket welding

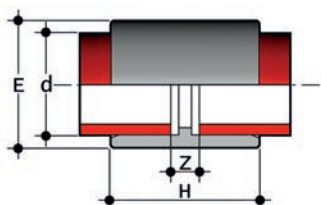
d	PN	E	H	Z	g	Code
16	16	22	23	10	18	TIF016
20	16	28	27	13	35	TIF020
25	16	33	32	16	55	TIF025
32	16	41	37	19	90	TIF032
40	16	51	43	22	150	TIF040
50	16	63	52	29	270	TIF050
63	16	79	63	35	470	TIF063
75	16	93	71	40	665	TIF075
90	16	109	82	46	1025	TIF090
110	16	133	99	58	1800	TIF110



## HIF

45° elbow for socket welding

d	PN	E	H	Z	g	Code
20	16	28	22	7	24	HIF020
25	16	33	25	9	37	HIF025
32	16	42	30	12	63	HIF032
40	16	51	37	16	110	HIF040
50	16	63	43	19	202	HIF050
63	16	79	52	25	337	HIF063
75	16	88	61	30	395	HIF075
90	16	105	73	37	645	HIF090
110	16	127	87	46	1095	HIF110

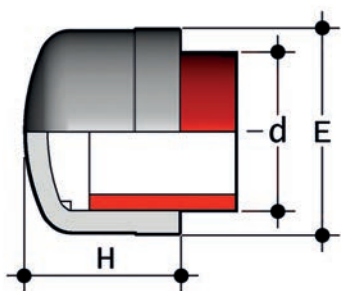


## MIF

Double socket for socket welding

d	PN	E	H	Z	g	Code
20	16	28	36	7	20	MIF020
25	16	33	40	8	28	MIF025
32	16	42	44	8	48	MIF032
40	16	51	49	8	70	MIF040
50	16	63	55	8	120	MIF050
63	16	77	64	9	185	MIF063
75	16	90	72	10	275	MIF075
90	16	108	79	8	415	MIF090
110	16	131	84	11	710	MIF110



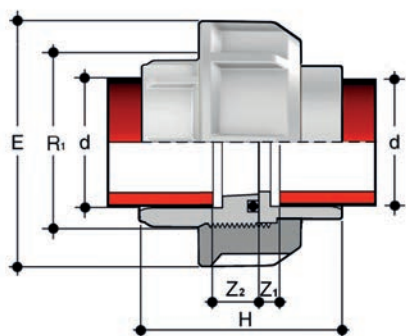


**CIF**

End cap for socket welding

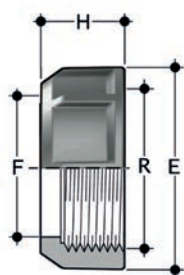
d	PN	H	E	g	Code
20	16	23	28	11	CIF020
25	16	27	33	19	CIF025
32	16	31	41	32	CIF032
40	16	36	50	47	CIF040
50	16	43	61	75	CIF050
63	16	51	76	135	CIF063

\*Resale product



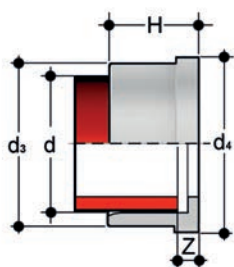
**BIGF**  
Union for socket welding

d	R <sub>1</sub>	PN	E	H	Z1	Z2	g	FKM code
20	1"	16	47	45,5	12	5,5	59	BIGF020F
25	1"1/4	16	58	49,5	12	5,5	99	BIGF025F
32	1"1/2	16	65	53,5	12	5,5	141	BIGF032F
40	2"	16	78	59,5	14	5,5	218	BIGF040F
50	2"1/4	16	85	67,5	16	5,5	290	BIGF050F
63	2"3/4	16	103	79,5	20	5,5	476	BIGF063F



**EFGF**  
Union nut with BSP thread for union types BIGF, BIFXF and BIRXF

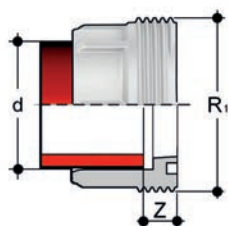
R	d BIGF	E	F	H	g	Code
1"	20	47	28	22	30	EFGF100
1"1/4	25	58	36	25	46	EFGF114
1"1/2	32	65	42	27	63	EFGF112
2"	40	78	53	30	90	EFGF200
2"1/4	50	85	59	33	117	EFGF214
2"3/4	63	103	74	38	188	EFGF234



## Q/BIGF

Union end for socket welding, metric series

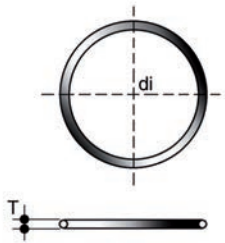
d	PN	d <sub>3</sub>	d <sub>4</sub>	H	Z	g	Code
20	16	27,5	30,1	19,5	5,5	13	QBIGF020
25	16	36	38,8	21,5	5,5	27	QBIGF025
32	16	41,5	44,7	23,5	5,5	32	QBIGF032
40	16	53	56,5	25,5	5,5	57	QBIGF040
50	16	59	62,6	28,5	5,5	57	QBIGF050
63	16	74	78,4	32,5	5,5	97	QBIGF063



## F/BIGF

Union bush for socket welding, metric series

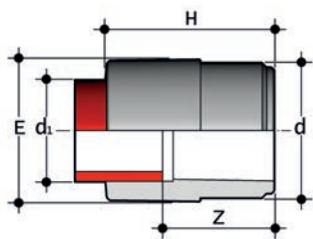
d	R <sub>1</sub>	PN	Z	g	Code
20	1"	16	12	16	FBIGF020
25	1"1/4	16	12	27	FBIGF025
32	1"1/2	16	12	38	FBIGF032
40	2"	16	14	62	FBIGF040
50	2"1/4	16	16	74	FBIGF050
63	2"3/4	16	18	141	FBIGF063



## O-RING

Seals for union types BIGF, BIFXF and BIRXF

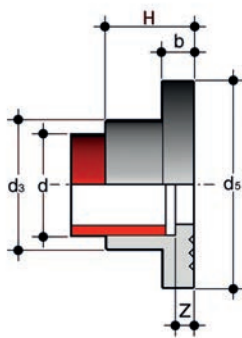
d union	C	di	T	EPDM code	FKM code
16	3062	15,54	2,62	OR3062E	OR3062F
20	4081	20,22	3,53	OR4081E	OR4081F
25	4112	28,17	3,53	OR4112E	OR4112F
32	4131	32,93	3,53	OR4131E	OR4131F
40	6162	40,65	5,34	OR6162E	OR6162F
50	6187	47	5,34	OR6187E	OR6187F
63	6237	59,69	5,34	OR6237E	OR6237F
75	6300	75,57	5,34	OR6300E	OR6300F
90	6362	91,45	5,34	OR6362E	OR6362F
110	6450	113,67	5,34	OR6450E	OR6450F



**RIF**

Reducer: spigot (d), reduced socket for socket welding (d1)

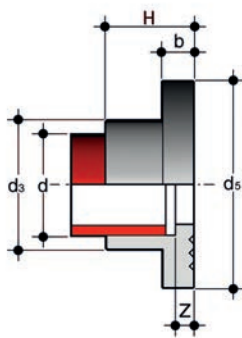
d x d <sub>1</sub>	PN	E	H	Z	g	Code
20 x 16	16	20	35	22	11	RIF020016
25 x 20	16	26	40	26	15	RIF025020
32 x 25	16	32	46	30	28	RIF032025
40 x 25	16	32	51	35	40	RIF040025
40 x 32	16	40	54	36	47	RIF040032
50 x 32	16	39	59	41	55	RIF050032
50 x 40	16	47	63	43	70	RIF050040
63 x 32	16	40	67	49	100	RIF063032
63 x 50	16	60	76	53	130	RIF063050
75 x 63	16	75	89	61	220	RIF075063
90 x 63	16	73	97	70	280	RIF090063
90 x 75	16	87	104	73	335	RIF090075
110 x 90	16	103	121	85	520	RIF110090



## QRNF

Stub with serrated face (according to DIN standards) for socket welding, for use with backing rings ODT

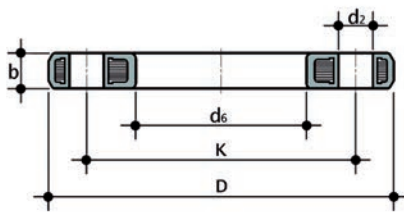
d	DN	PN	b	d <sub>3</sub>	d <sub>5</sub>	H	Z	g	Code
20	15	16	7	27	45	20	6	23	QRNF020
25	20	16	9	34	58	22	6	46	QRNF025
32	25	16	10	41	68	25	6	58	QRNF032
40	32	16	11	50	78	27	6	91	QRNF040
50	40	16	12	61	88	30	6	122	QRNF050
63	50	16	14	76	102	34	6	181	QRNF063
75	65	16	16	90	122	38	7	288	QRNF075
90	80	16	17	108	138	44	8	411	QRNF090
110	100	16	18	131	158	50	8	573	QRNF110



## QRAF

Stub with serrated face for socket welding, for used with backing rings OAB (for other dimensions use QRNF)

d	DN	OAB size	PN	b	d <sub>3</sub>	d <sub>5</sub>	H	Z	g	Code
25	20	3/4"	16	9	34	54	22	6	46	QRAF034
32	25	1"	16	10	41	64	25	6	58	QRAF100
40	32	1 1/4"	16	11	50	72	27	6	91	QRAF114
50	40	1 1/2"	16	12	61	83	30	6	122	QRAF112
90	80	3"	16	17	108	129	44	8	411	QRAF300



## ODT/ODT-SW

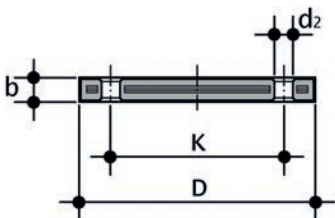
Wedge profile backing ring, with metal core and a PP-GR coating.  
According to EN/ISO/DIN to be used with stub flange QRNF. Drilled: PN 10/16

d	DN	*PMA (bar)	b	d <sub>2</sub>	d <sub>6</sub>	D	K	M	n	**Nm	g	Code
20	15	16	13	14.6	28	100	65	M12	4	10	215	ODT020
25	20	16	15	14.6	34	111	75	M12	4	15	308	ODT025
32	25	16	17	14.6	42	120.2	85	M12	4	15	449	ODT032
40	32	16	18	18.6	51	140	100	M16	4	20	682	ODT040
50	40	16	19	18.6	62	150	110	M16	4	25	808	ODT050
63	50	16	19	18.6	78	164	125	M16	4	35	1100	ODT063
75	65	16	19	18.6	92	186	145	M16	4	35	1200	ODT075
90	80	16	20	18.6	109	200.8	160	M16	8	35	1430	ODT090
110	100	16	20	18.6	135	221	180	M16	8	35	1330	SWODTD110DN100

Maximum pressure values to EN/ISO/DIN. Pay attention to maximum admissible pressure values when selecting gaskets

\*PMA: maximum allowable pressure

\*\*maximum recommended tightening torque  
n = number of bolts



## ODBC

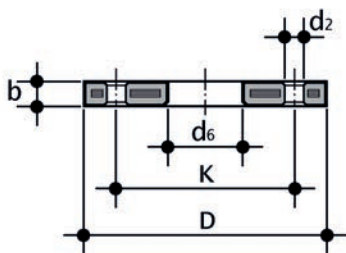
Steel core blind flange, PP/FRP according to EN/ISO/DIN Drilling: PN 10/16

d	DN	*PMA (bar)	b	d <sub>2</sub>	D	k	M	n	**Nm	g	Code
20	15	10	16	14	95	65	M12	4	15	290	ODBC020
25	20	10	12	18	105	75	M12	4	15	380	ODBC025
32	25	10	18	14	115	85	M12	4	15	600	ODBC032
40	32	10	17	18	140	100	M16	4	25	830	ODBC040
50	40	10	18	18	150	110	M16	4	35	1105	ODBC050
63	50	10	18	18	165	125	M16	4	35	1308	ODBC063
75	65	10	18	18	185	145	M16	4	40	1580	ODBC075
90	80	10	20	18	200	160	M16	8	40	2244	ODBC090
110	100	10	20	18	220	180	M16	8	45	2829	ODBC110

\*PMA maximum admissible working pressure

\*\*nominal tightening torque



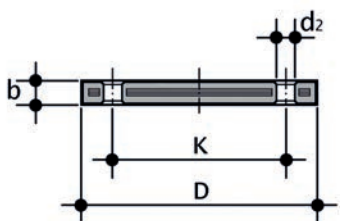


## OAB

Steel core backing ring, PP/FRP coated according to ANSI B16.5 cl.150 for stubs QRNF and QRAF

d (inch)	DN	*PMA (bar)	b	D	d <sub>2</sub> (mm)	d <sub>2</sub> (inch)	d <sub>6</sub>	k(mm)	k(inch)	**Nm	n	g	Code
1/2"	15	16	12	95	16	5/8"	28	60,45	2"3/8	15	4	220	OAB012
3/4"	20	16	12	102	16	5/8"	34	69,85	2"3/4	15	4	240	OAB034
1"	25	16	16	114	16	5/8"	42	79,25	3"1/8	15	4	390	OAB100
1"1/4	32	16	16	130	16	5/8"	51	88,90	3"1/2	25	4	510	OAB114
1"1/2	40	16	18	133	16	5/8"	62	98,55	3"7/8	35	4	580	OAB112
2"	50	16	18	162	20	3/4"	78	120,65	4"3/4	35	4	860	OAB200
2"1/2	65	16	18	184	20	3/4"	92	139,70	5"1/2	40	4	1100	OAB212
3"	80	16	20	194	20	3/4"	111	152,40	6"	40	4	1040	OAB300
4"	100	16	20	229	20	3/4"	133	190,50	7"1/2	40	8	1620	OAB400

\*PMA maximum admissible working pressure  
 \*\*nominal tightening torque

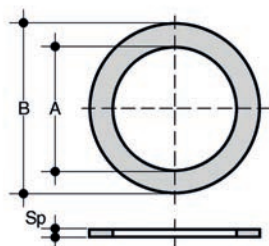


## OABC

Steel core blind flange, PP/FRP coated according to ANSI B16.5 cl.150

d (inch)	DN	*PMA (bar)	b	D	d <sub>2</sub> (mm)	d <sub>2</sub> (inch)	k(mm)	k(inch)	**Nm	n	g	Code
1/2"	15	16	12	95	16	5/8"	60,45	2"3/8	15	4	200	OABC012
3/4"	20	16	12	102	16	5/8"	69,85	2"3/4	15	4	240	OABC034
1"	25	16	16	114	16	5/8"	79,25	3"1/8	15	4	370	OABC100
1"1/4	32	16	16	130	16	5/8"	88,90	3"1/2	25	4	530	OABC114
1"1/2	40	16	18	133	16	5/8"	98,55	3"7/8	35	4	560	OABC112
2"	50	16	18	162	20	3/4"	120,65	4"3/4	35	4	810	OABC200
2"1/2	65	16	18	184	20	3/4"	139,70	5"1/2	40	4	1070	OABC212
3"	80	16	18	194	20	3/4"	152,40	6"	40	4	1030	OABC300
4"	100	16	18	229	20	3/4"	190,50	7"1/2	40	8	1570	OABC400

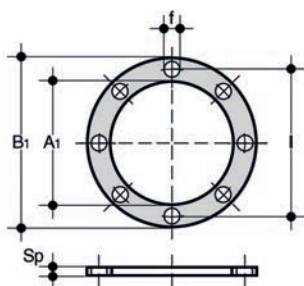
\*PMA maximum admissible working pressure  
 \*\*nominal tightening torque



## QHV/X

Flat gasket in EPDM and FKM for flanges according to EN 1092-1

d	DN	A	B	Sp	EPDM code	FKM code
20 - 1/2"	15	20	32	2	QHVX020E	QHVX020F
25 - 3/4"	20	24	38,5	2	QHVX025E	QHVX025F
32 - 1"	25	32	48	2	QHVX032E	QHVX032F
40 - 1" 1/4	32	40	59	2	QHVX040E	QHVX040F
50 - 1" 1/2	40	50	71	2	QHVX050E	QHVX050F
63 - 2"	50	63	88	2	QHVX063E	QHVX063F
75 - 2" 1/2	65	75	104	2	QHVX075E	QHVX075F
90 - 3"	80	90	123	2	QHVX090E	QHVX090F
110 - 4"	100	110	148	3	QHVX110E	QHVX110F



## QHV/Y

Flat gasket in EPDM for flanges according to EN 1092-1, self-centring for flanges drilled PN 10/16

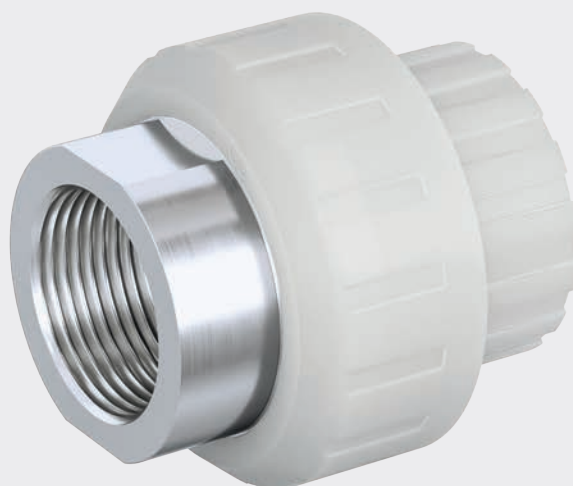
d	DN	A	B <sub>1</sub>	F	I	U	Sp	Code
20 - 1/2"	15	17	95	14	65	4	2	QHVY020E
25 - 3/4"	20	22	107	14	76,3	4	2	QHVY025E
32 - 1"	25	28	117	14	86,5	4	2	QHVY032E
40 - 1" 1/4	32	36	142,5	18	101	4	2	QHVY040E
50 - 1" 1/2	40	45	153,3	18	111	4	2	QHVY050E
63 - 2"	50	57	168	18	125,5	4	2	QHVY063E
75 - 2" 1/2	65	71	187,5	18	145,5	4	3	QHVY075E
90 - 3"	80	84	203	18	160	8	3	QHVY090E
110 - 4"	100	102	223	18	181	8	3	QHVY110E





# FITTINGS FOR SOCKET WELDING

ISO-BSP adaptor fittings



# FITTINGS FOR SOCKET WELDING

Series of fittings designed for conveying fluids under pressure with a hot thread and weld connection system (socket welding).

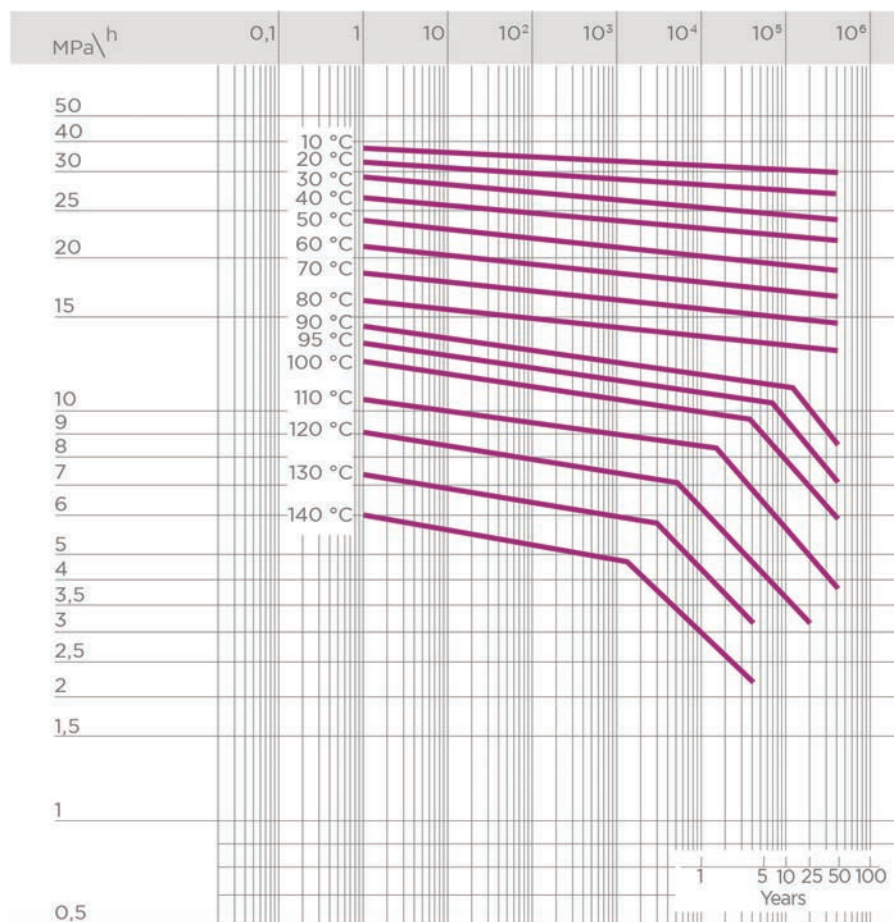
## ISO-BSP ADAPTOR FITTINGS

Technical specifications	
Size range	d 20 ÷ 63 (mm); R 3/8" ÷ 2"
Nominal pressure	PN 16 with water at 20° C
Temperature range	-40 °C ÷ 140 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931 <b>Thread:</b> ISO 228-1, EN 10226-1/2
Reference standards	<b>Construction criteria:</b> EN ISO 10931 <b>Test methods and requirements:</b> EN ISO 10931 <b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1
Fitting material	PVDF
Seal material	FKM

# TECHNICAL DATA

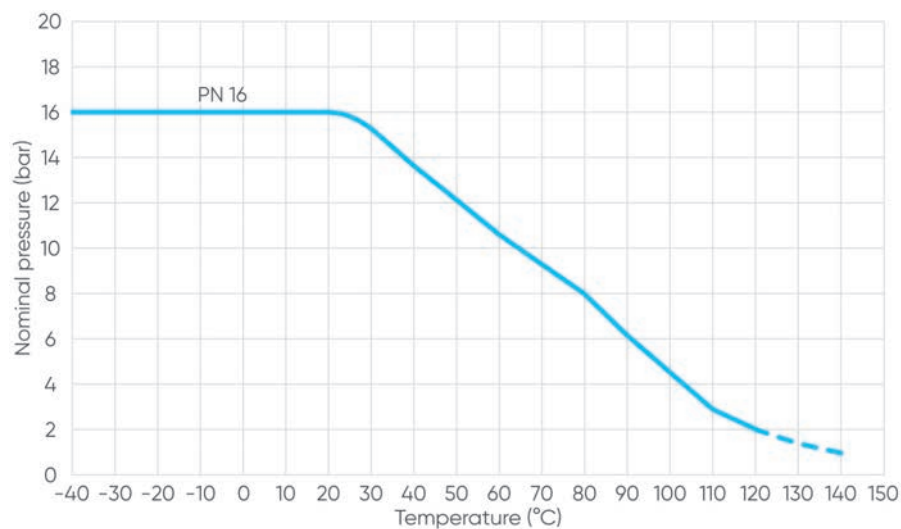
## REGRESSION CURVES FOR FITTINGS IN PVDF

Regression coefficients according to ISO 10931 for MRS (minimum) = 25 N/mm<sup>2</sup> (MPa)



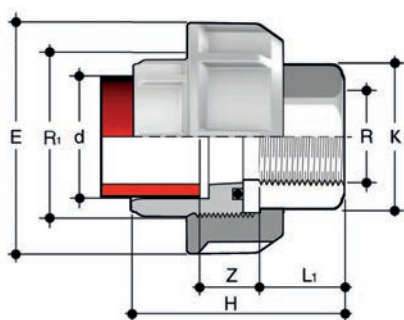
## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids with regard to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required.



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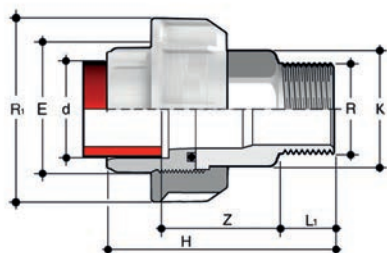




## BIFXF

Adaptor union in PVDF/STAINLESS steel for socket welding (d), BSP (R) threaded A316L STAINLESS steel female end with O-Ring in FKM

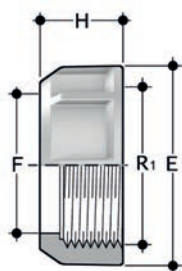
d x R	R <sub>1</sub>	PN	E	H	K	L <sub>1</sub>	Z	g	FKM code
20 x 1/2"	1"	16	47	48,5	25	16,5	18	139	BIFXF020012F
25 x 3/4"	1 1/4"	16	58	53,5	32	18,5	19	242	BIFXF025034F
32 x 1"	1 1/2"	16	65	57,5	38	19,5	20	333	BIFXF032100F
40 x 1 1/4"	2"	16	78	64,5	48	21,5	23	558	BIFXF040114F
50 x 1 1/2"	2 1/4"	16	85	78,5	55	23	32,5	700	BIFXF050112F
63 x 2"	2 3/4"	16	103	85,5	69	27	31,5	1200	BIFXF063200F



## BIRXF

Adaptor union in PVDF/STAINLESS steel for socket welding (d), BSP (R) threaded A316L STAINLESS steel male end with O-Ring in FKM

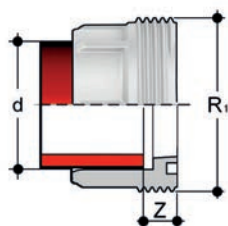
d x R	R <sub>1</sub>	PN	E	H	K	L <sub>1</sub>	Z	g	FKM code
20 x 1/2"	1"	16	47	65	25	13,5	37,5	139	BIRXF020012F
25 x 3/4"	1 1/4"	16	58	71,5	32	15	40,5	242	BIRXF025034F
32 x 1"	1 1/2"	16	65	78	38	17,5	42,5	333	BIRXF032100F
40 x 1 1/4"	2"	16	78	87	48	19,5	47,5	558	BIRXF040114F
50 x 1 1/2"	2 1/4"	16	85	95	55	19,5	52,5	700	BIRXF050112F
63 x 2"	2 3/4"	16	103	113,5	69	24	62,5	1200	BIRXF063200F



## EFGF

Union nut with BSP thread for union types BIGF, BIFXF and BIRXF

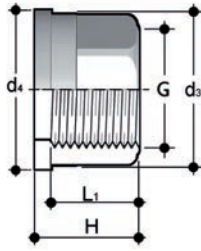
R	d BIGF	E	F	H	g	Code
1"	20	47	28	22	30	EFGF100
1 1/4"	25	58	36	25	46	EFGF114
1 1/2"	32	65	42	27	63	EFGF112
2"	40	78	53	30	90	EFGF200
2 1/4"	50	85	59	33	117	EFGF214
2 3/4"	63	103	74	38	188	EFGF234



## F/BIGF

Union bush for socket welding, metric series

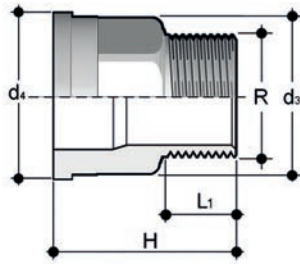
d	R <sub>1</sub>	PN	Z	g	Code
20	1"	16	12	16	FBIGF020
25	1 1/4"	16	12	27	FBIGF025
32	1 1/2"	16	12	38	FBIGF032
40	2"	16	14	62	FBIGF040
50	2 1/4"	16	16	74	FBIGF050
63	2 3/4"	16	18	141	FBIGF063



## Q/BFX

Union end in A316L STAINLESS steel with female BSP thread

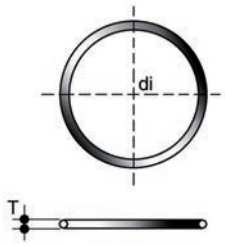
R	d <sub>3</sub>	d <sub>4</sub>	H	L <sub>1</sub>	g	Code
3/8"	22	24	21,5	13,5	34	QBFX038
1/2"	27,5	30,1	22,5	16,5	54	QBFX012
3/4"	36	38,8	25,5	18,5	104	QBFX034
1"	41,5	44,7	27,5	19,5	130	QBFX100
1 1/4"	53	56,5	30,5	21,5	234	QBFX114
1 1/2"	59	62,6	33,5	23	293	QBFX112
2"	74	78,4	38,5	27	520	QBFX200



## Q/BRX

Union end in A316L STAINLESS steel with male BSP thread

R	d <sub>3</sub>	d <sub>4</sub>	H	L <sub>1</sub>	g	Code
3/8"	22	24	34,5	10,5	58	QBRX038
1/2"	27,5	30,1	39	13,5	95	QBRX012
3/4"	36	38,8	43,5	15	166	QBRX034
1"	41,5	44,7	48	17,5	226	QBRX100
1 1/4"	53	56,5	53	19,5	393	QBRX114
1 1/2"	59	62,6	56	19,5	491	QBRX112
2"	74	78,4	65,5	24	843	QBRX200



## O-RING

Seals for union types BIGF, BIFXF and BIRXF

d union	C	d <sub>i</sub>	T	EPDM code	FKM code
16	3062	15,54	2,62	OR3062E	OR3062F
20	4081	20,22	3,53	OR4081E	OR4081F
25	4112	28,17	3,53	OR4112E	OR4112F
32	4131	32,93	3,53	OR4131E	OR4131F
40	6162	40,65	5,34	OR6162E	OR6162F
50	6187	47	5,34	OR6187E	OR6187F
63	6237	59,69	5,34	OR6237E	OR6237F
75	6300	75,57	5,34	OR6300E	OR6300F
90	6362	91,45	5,34	OR6362E	OR6362F
110	6450	113,67	5,34	OR6450E	OR6450F



# VKD DN 10÷50



DUAL BLOCK® 2-way ball valve



# VKD DN 10÷50

FIP has developed a VKD DUAL BLOCK® 2-way ball valve to introduce a high reference standard in thermoplastic valve design. VKD is a True Union ball valve that meets the most stringent needs required by industrial applications.

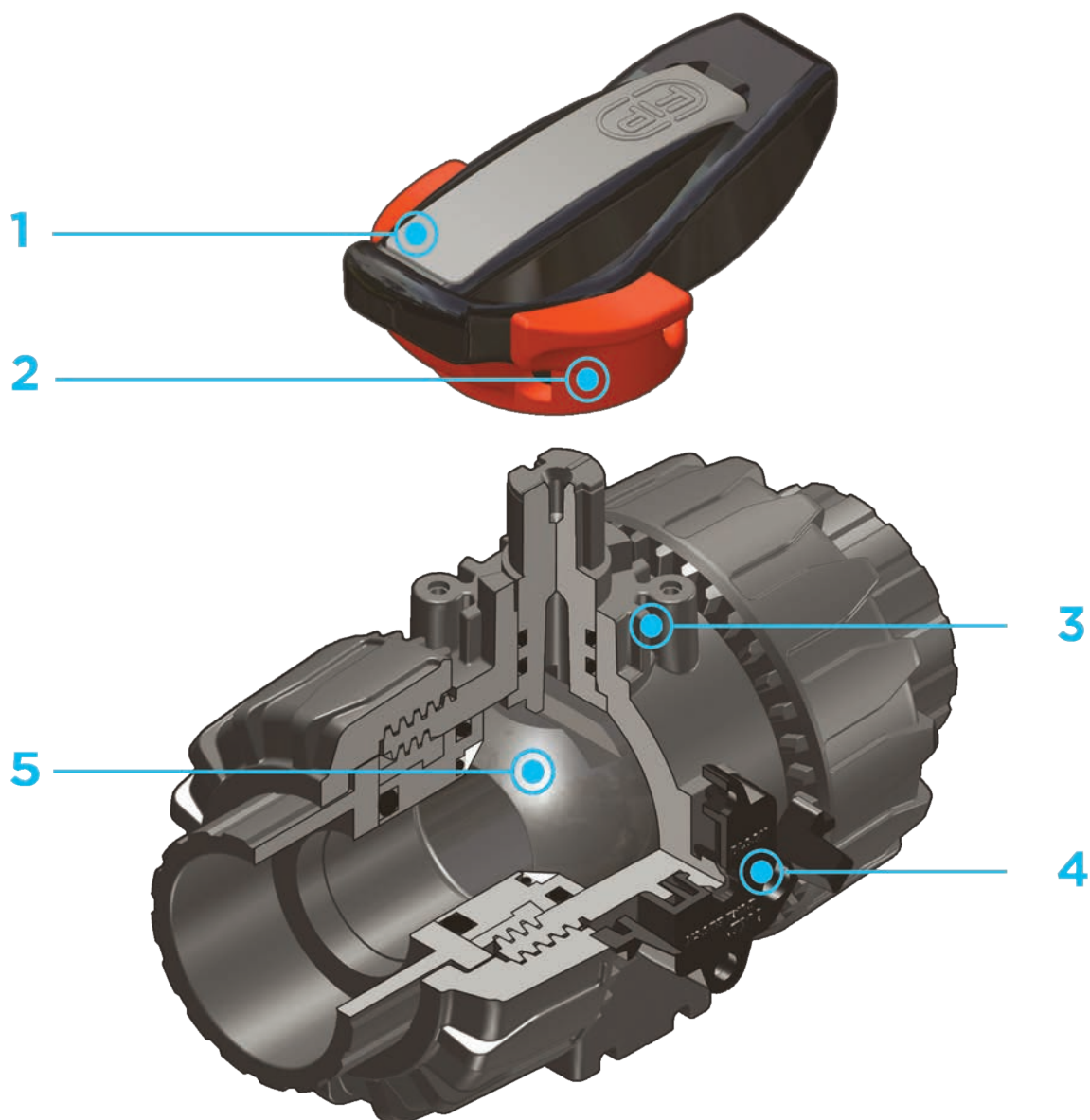


## DUAL BLOCK® 2-WAY BALL VALVE

- Connection system for weld and flanged joints
- Patented **SEAT STOP®** ball carrier system that lets you micro-adjust ball seats and minimise the axial force effect.
- Easy radial disassembly allowing quick replacement of O-rings and ball seats without any need for tools
- **PN16 True Union valve body** made for PVDF injection moulding equipped with built-in bores for actuation. ISO 9393 compliant test requisites
- Option of disassembling downstream pipes with the valve in the closed position
- **Floating full bore ball** with high surface finish
- **Integrated bracket** for valve anchoring
- Ball seat carriers can be adjusted using the **Easylorque adjustment kit**
- Possibility to have handle with integrated LSQT limit micro switch, even as a retrofit in existing installations

Technical specifications	
<b>Construction</b>	2-way True Union ball valve with locked carrier and lockable union nuts.
<b>Size range</b>	DN 10 ÷ 50
<b>Nominal pressure</b>	PN 16 with water at 20° C
<b>Temperature range</b>	-40 °C ÷ 140 °C
<b>Coupling standards</b>	<b>Welding:</b> EN ISO 10931 Can be coupled to pipes according to EN ISO 10931 <b>Flanging system:</b> ISO 9624, EN ISO 10931, EN 558-1, ANSI B.16.5 cl. 150
<b>Reference standards</b>	<b>Construction criteria:</b> EN ISO 16135, EN ISO 10931 <b>Test methods and requirements:</b> ISO 9393 <b>Installation criteria:</b> DVS 2202-1, DVS 2207-15, DVS 2208-1 <b>Actuator couplings:</b> ISO 5211
<b>Valve material</b>	PVDF
<b>Seal material</b>	FKM (standard size O-Ring, EPDM, FEP+FKM, FFKM on request); PTFE (ball seats)
<b>Control options</b>	Manual control; electric actuator; pneumatic actuator





**1** Ergonomic HIPVC handle equipped with **removable tool to adjust the ball seat carrier**.

**2** **Handle lock 0° - 90° SHKD** (available as an accessory) ergonomically operable during service and padlockable

**3** Robust **integrated bracket for valve anchoring**, for easy and quick automation even after valve installation on the system via the Power Quick module (optional)

**4** **DUAL BLOCK®** patented lock system that ensures union nut

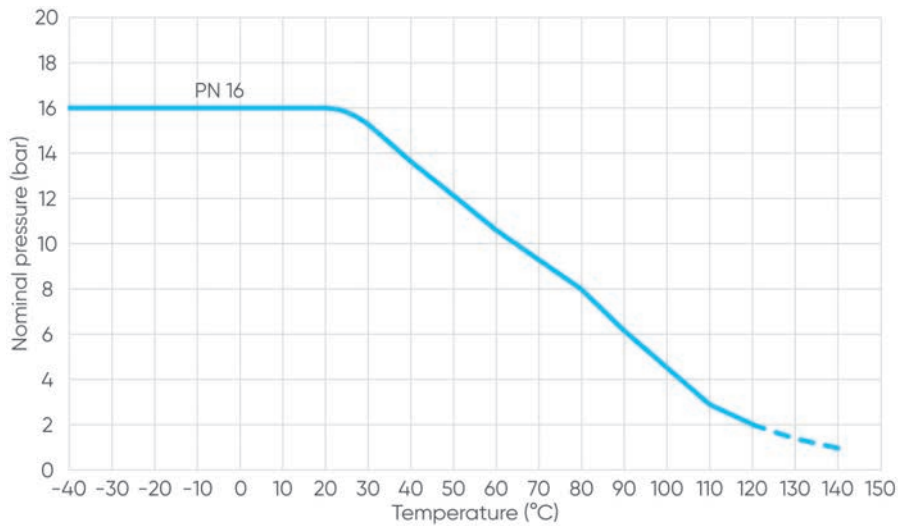
tightening hold even in severe conditions such as vibrations or heat dilation

**5** Machined high surface finish ball that guarantees a smooth operation and increased reliability

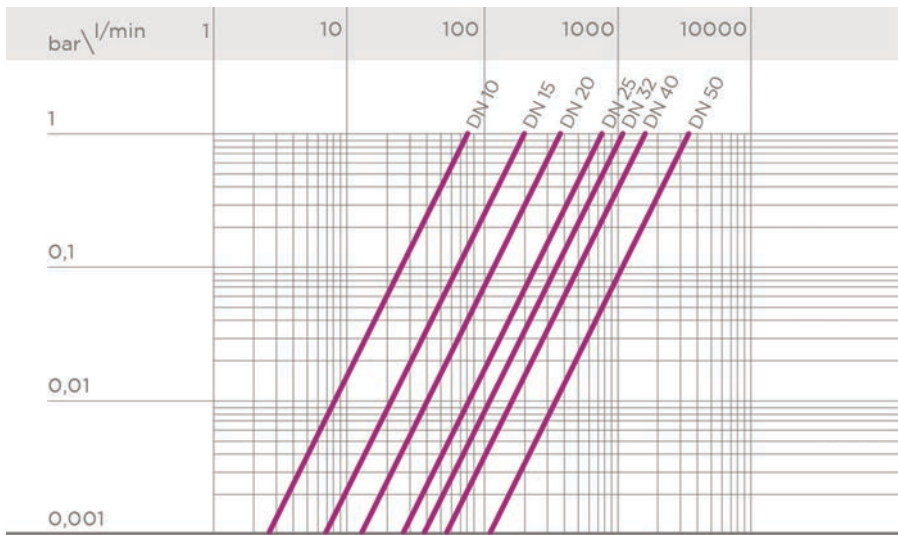
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and harmless fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal PN pressure is required (25 years with safety factor).



## PRESSURE DROP GRAPH

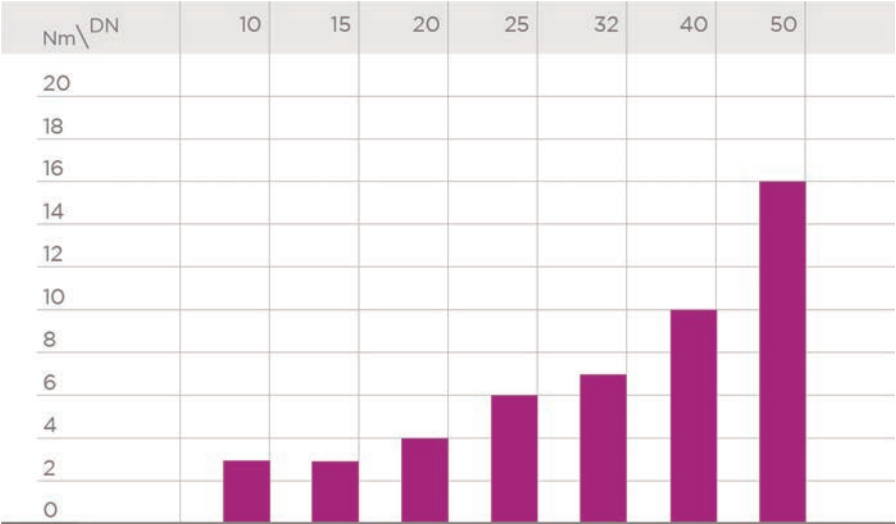


## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate  $\Delta p = 1$  bar pressure drop at a certain valve position. The K<sub>v</sub>100 values shown in the table are calculated with the valve completely open.

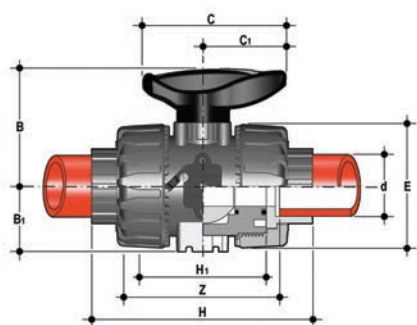
DN	10	15	20	25	32	40	50
Kv100 l/min	80	200	385	770	1100	1750	3400

# OPERATING TORQUE AT MAXIMUM WORKING PRESSURE



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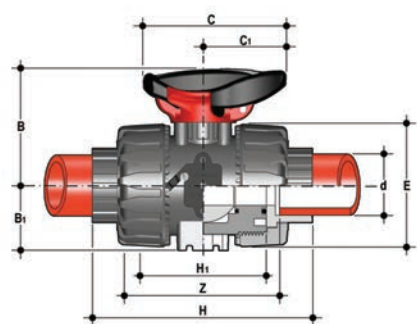
# DIMENSIONS



## VKDIF

DUAL BLOCK® 2-way ball valve with female ends for socket welding, metric series

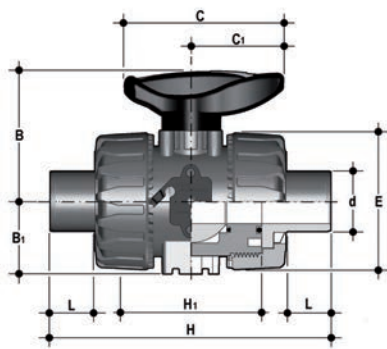
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	Z	g	FKM code
16	10	16	54	29	67	40	54	102	65	74,5	291	VKDIF016F
20	15	16	54	29	67	40	54	102	65	73	272	VKDIF020F
25	20	16	65	34,5	85	49	65	114	70	82	445	VKDIF025F
32	25	16	69,5	39	85	49	73	126	78	90	584	VKDIF032F
40	32	16	82,5	46	108	64	86	141	88	100	938	VKDIF040F
50	40	16	89	52	108	64	98	164	93	117	1242	VKDIF050F
63	50	16	108	62	134	76	122	199	111	144	2187	VKDIF063F



## VKDIF/SHX

DUAL BLOCK® 2-way ball valve with handle lock and STAINLESS steel threaded inserts for fastening, with female ends for butt welding, metric series

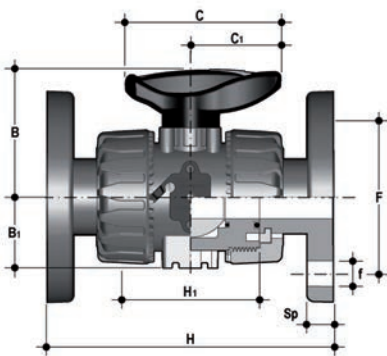
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	Z	g	FKM code
16	10	16	54	29	67	40	54	102	65	74,5	291	VKDIFSHX016F
20	15	16	54	29	67	40	54	102	65	73	272	VKDIFSHX020F
25	20	16	65	34,5	85	49	65	114	70	82	445	VKDIFSHX025F
32	25	16	69,5	39	85	49	73	126	78	90	584	VKDIFSHX032F
40	32	16	82,5	46	108	64	86	141	88	100	938	VKDIFSHX040F
50	40	16	89	52	108	64	98	164	93	117	1242	VKDIFSHX050F
63	50	16	108	62	134	76	122	199	111	144	2187	VKDIFSHX063F



## VKDDF

DUAL BLOCK® 2-way ball valve with male ends for socket welding, metric series

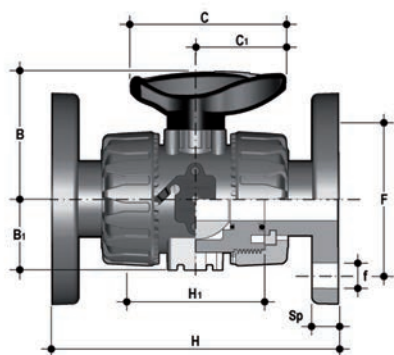
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	g	FKM code
20	15	16	54	29	67	40	54	124	65	16	299	VKDDF020F
25	20	16	65	34,5	85	49	65	144	70	18	466	VKDDF025F
32	25	16	69,5	39	85	49	73	154	78	20	604	VKDDF032F
40	32	16	82,5	46	108	64	86	174	88	22	951	VKDDF040F
50	40	16	89	52	108	64	98	194	93	23	1284	VKDDF050F
63	50	16	108	62	134	76	122	224	111	29	2229	VKDDF063F



## VKDOF

DUAL BLOCK® 2-way ball valve with fixed flanges, drilled EN/ISO/DIN PN10/16. Face to face according to EN 558-1

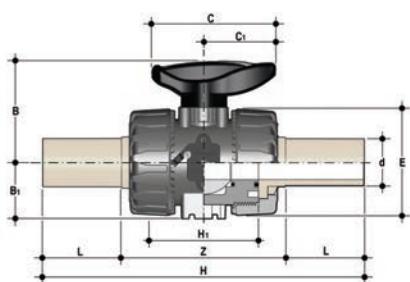
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
20	15	16	54	29	67	40	65	14	130	65	11	4	547	VKDOF020F
25	20	16	65	34,5	85	49	75	14	150	70	14	4	772	VKDOF025F
32	25	16	69,5	39	85	49	85	14	160	78	14	4	1024	VKDOF032F
40	32	16	82,5	46	108	64	100	18	180	88	14	4	1583	VKDOF040F
50	40	16	89	52	108	64	110	18	200	93	16	4	2024	VKDOF050F
63	50	16	108	62	134	76	125	18	230	111	16	4	3219	VKDOF063F



## VKDOAF

DUAL BLOCK® 2-way ball valve with fixed flanges, drilled ANSI B16.5 cl.150 #FF

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
1/2"	15	16	54	29	67	40	60,3	15,9	143	65	11	4	547	VKDOAF012F
3/4"	20	16	65	34,5	85	49	69,9	15,9	172	70	14	4	772	VKDOAF034F
1"	25	16	69,5	39	85	49	79,4	15,9	187	78	14	4	1024	VKDOAF100F
1" 1/4	32	16	82,5	46	108	64	88,9	15,9	190	88	14	4	1583	VKDOAF114F
1" 1/2	40	16	89	52	108	64	98,4	15,9	212	93	16	4	2024	VKDOAF112F
2"	50	16	108	62	134	76	120,7	19,1	234	111	16	4	3219	VKDOAF200F



## VKDBF

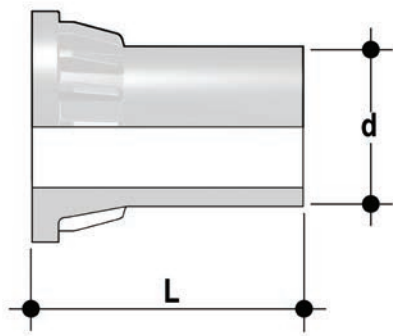
DUAL BLOCK® 2-way ball valve with long spigot male ends in PVDF for butt welding/ IR (CVDF)

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	Z	g	FKM code
20	15	16	54	29	67	40	54	175	65	40,5	94	450	VKDBF020F
25	20	16	65	35	85	49	65	212	70	54	106	516	VKDBF025F
32	25	16	70	39	85	49	73	226	78	56	117	664	VKDBF032F
40	32	16	83	46	108	64	86	246	88	56	131	1020	VKDBF040F
50	40	16	89	52	108	64	98	271	93	60,5	145	1350	VKDBF050F
63	50	16	108	62	134	76	122	300	111	65,5	161	2330	VKDBF063F

# ACCESSORIES

## CVDF

End connector in PVDF SDR 21 PN 16, long spigot, for butt welding



d	DN	PN	L	SDR	Code
20	15	16	55	21	CVDF21020
25	20	16	70	21	CVDF21025
32	25	16	74	21	CVDF21032
40	32	16	78	21	CVDF21040
50	40	16	84	21	CVDF21050
63	50	16	91	21	CVDF21063

## SHKD

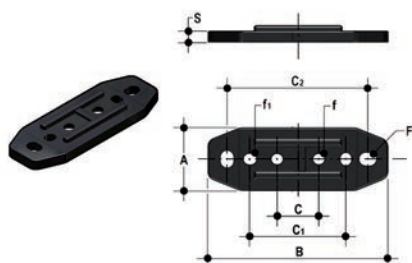
Handle block kit 0° - 90° lockable



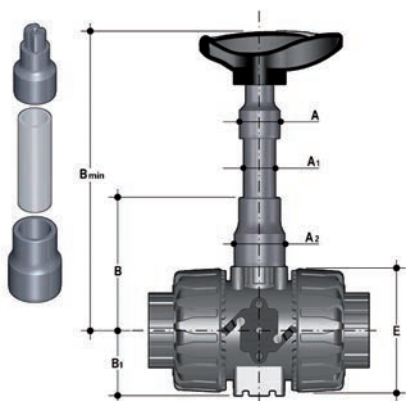
d	DN	Code
16 - 20	10 - 15	SHKD020
25 - 32	20 - 25	SHKD032
40 - 50	32 - 40	SHKD050
63	50	SHKD063

## PMKD

Wall mounting plate



d	DN	A	B	C	C <sub>1</sub>	C <sub>2</sub>	F	f	f <sub>1</sub>	S	Code
16	10	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
20	15	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
25	20	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
32	25	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
40	32	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2
50	40	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2
63	50	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2



## PSKD

Stem extension

d	DN	A	A <sub>1</sub>	A <sub>2</sub>	E	B	B <sub>1</sub>	B <sub>min</sub>	Code
16	10	32	25	32	54	70	29	139,5	PSKD020
20	15	32	25	32	54	70	29	139,5	PSKD020
25	20	32	25	40	65	89	34,5	164,5	PSKD025
32	25	32	25	40	73	93,5	39	169	PSKD032
40	32	40	32	50	86	110	46	200	PSKD040
50	40	40	32	50	98	116	52	175	PSKD050
63	50	40	32	59	122	122	62	225	PSKD063

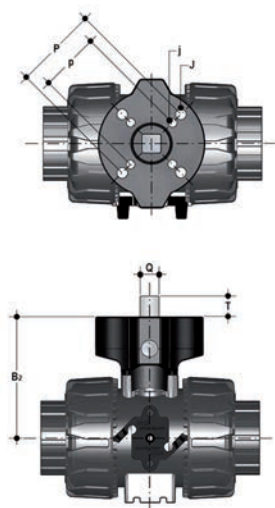


## Easytorque Kit

Kit for ball seat carrier tightening adjustment for DUAL BLOCK® DN 10-50 series valves

d	DN	Tightening torque recommended*	Code
3/8"-1/2"	10-15	3 N m - 2,21 Lbf ft	KET01
3/4"	20	4 N m - 2,95 Lbf ft	KET01
1"	25	5 N m - 3,69 Lbf ft	KET01
1" 1/4	32	5 N m - 3,69 Lbf ft	KET01
1" 1/2	40	7 N m - 5,16 Lbf ft	KET01
2"	50	9 N m - 6,64 Lbf ft	KET01

\*calculated in ideal installation conditions



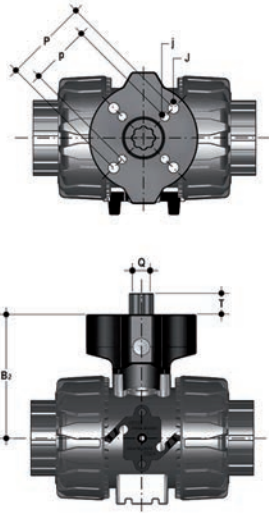
## Power Quick/CP

The valve can be equipped with pneumatic actuators, using the PP-GR module reproducing the drilling pattern foreseen by ISO 5211

d	DN	B <sub>2</sub>	Q	T	p x j	P x J	Code
16	10	58	11	12	F03 x 5,5	F04 x 5,5	PQCP020
20	15	58	11	12	F03 x 5,5	F04 x 5,5	PQCP020
25	20	69	11	12	*F03 x 5,5	F05 x 6,5	PQCP025
32	25	74	11	12	*F03 x 5,5	F05 x 6,5	PQCP032
40	32	91	14	16	F05 x 6,5	F07 x 8,5	PQCP040
50	40	97	14	16	F05 x 6,5	F07 x 8,5	PQCP050
63	50	114	14	16	F05 x 6,5	F07 x 8,5	PQCP063

\*F04 x 5.5 on request



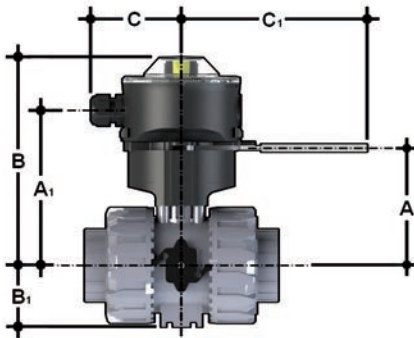


## Power Quick/CE

The valve can be equipped with electric actuators, using the PP-GR module reproducing the drilling pattern foreseen by ISO 5211

d	DN	B <sub>2</sub>	Q	T	p x j	P x J	Code
16	10	58	14	16	F03 x 5,5	F04 x 5,5	PQCE020
20	15	58	14	16	F03 x 5,5	F04 x 5,5	PQCE020
25	20	69	14	16	*F03 x 5,5	F05 x 6,5	PQCE025
32	25	74	14	16	*F03 x 5,5	F05 x 6,5	PQCE032
40	32	91	14	16	F05 x 6,5	F07 x 8,5	PQCE040
50	40	97	14	16	F05 x 6,5	F07 x 8,5	PQCE050
63	50	114	14	16	F05 x 6,5	F07 x 8,5	PQCE063

\*F04 x 5.5 on request



## LS Quick Kit

The Limit Switch Quick Kit allows the fast and secure installation of the FIP LSQT to the VKD valves. The body is in PP-GR and the handle in stainless steel AISI 316. The handle block at 0° and 90° is also available by default (hole diameter 6.5 mm). The kit can be assembled on the valve even if already installed on the system. For technical data of the LSQT box see FIP actuated valves catalogue.

d	DN	A	A <sub>1</sub>	B	B <sub>1</sub>	C	C <sub>1</sub>	Code
16	10	60	91,5	137	29	76,5	157,5	LSQKIT20
20	15	60	91,5	137	29	76,5	157,5	LSQKIT20
25	20	71	102,5	148	34,5	76,5	157,5	LSQKIT25
32	25	76	107,5	153	39	76,5	157,5	LSQKIT32
40	32	93	124,5	170	46	76,5	157,5	LSQKIT40
50	40	99	130,5	176	52	76,5	157,5	LSQKIT50
63	50	116	147,5	193	62	76,5	157,5	LSQKIT63

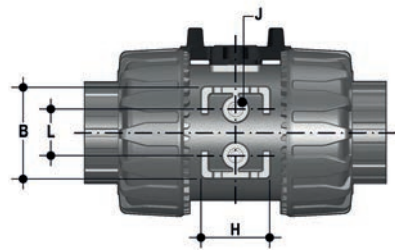
# FASTENING AND SUPPORTING



All valves, whether manual or actuated, must be adequately supported in many applications. The VKD valve series is therefore ready to be equipped with threaded supporting brackets (optional) that permits direct anchoring of the valve body without the need of other components. For wall installation, dedicated PMKD mounting plates which are available as accessories can be used. These plates should be fastened to the valve before wall installation. PMKD plates also allow VKD valve alignment with FIP ZIKM pipe clips as well as allowing different sizes of valves to be aligned.

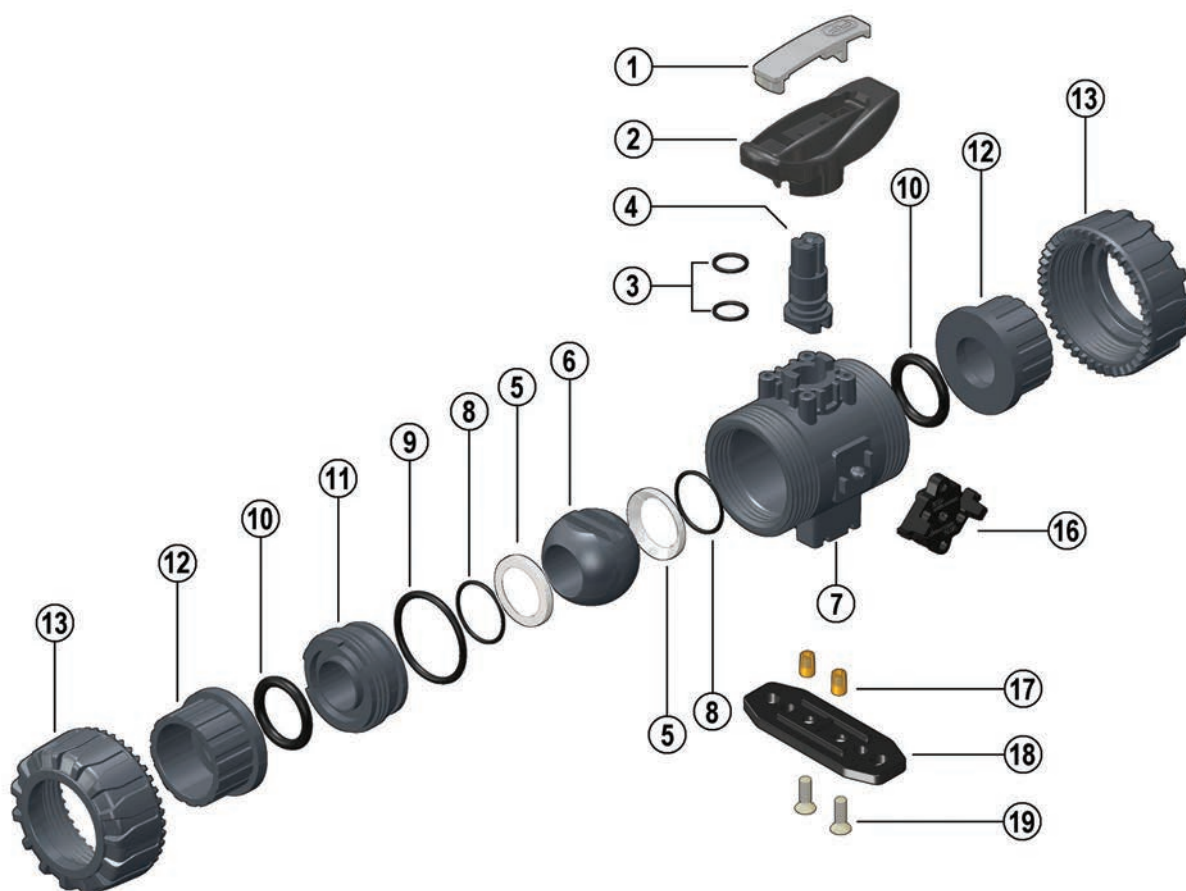
d	DN	g	H	L	J*
16	10	31,5	27	20	M4 x 6
20	15	31,5	27	20	M4 x 6
25	20	40	30	20	M4 x 6
32	25	40	30	20	M4 x 6
40	32	50	35	30	M6 x 10
50	40	50	35	30	M6 x 10
63	50	60	40	30	M6 x 10

\* With threaded inserts



# COMPONENTS

## EXPLODED VIEW



- 1 Handle insert (PVC - 1)
- 2 Handle (HIPVC - 1)
- 3 Stem O-rings (FKM - 2)\*
- 4 Stem (PVDF - 1)
- 5 Ball seat (PTFE - 2)\*
- 6 Ball (PVDF - 1)
- 7 Body (PVDF - 1)

- 8 Ball seat O-Rings (FKM - 2)\*
- 9 Radial seal O-Ring (FKM - 1)\*
- 10 Socket seal O-Ring (FKM - 2)\*
- 11 Ball seat carrier (PVDF - 1)
- 12 End connector (PVDF - 2)\*
- 13 Union nut (PVDF - 2)
- 14 Spring (STAINLESS steel - 1)\*\*

- 15 Handle safety block (PP-GR - 1)\*\*
- 16 DUAL BLOCK® (POM - 1)
- 17 Threaded inserts (STAINLESS steel or Brass - 2)\*\*
- 18 Distance plate (PP-GR - 1)\*\*
- 19 Screw (STAINLESS steel - 2)\*\*

\* Spare parts

\*\* Accessories

The component material and quantity supplied are indicated in the parentheses.

## DISASSEMBLY

- 1) Isolate the valve from the line (release the pressure and empty the pipeline).
- 2) Unlock the union nuts by pressing the lever on the DUAL BLOCK® (16) along the axis and separate it from the union nut (fig. 1-2). It is also possible to completely remove the block device from the body of the valve.
- 3) Fully unscrew the union nuts (13) and extract the body sideways.
- 4) Before dismounting, hold the valve in a vertical position and open it 45° to drain any liquid that might remain.
- 5) After closing the valve, remove the special insert (1) from the handle (2) and push the two projecting ends into the corresponding recesses on the ball seat carrier (11). Rotate the stop ring anti-clockwise to extract it (fig. 3-4).
- 6) Pull the handle (2) upwards to remove it from the valve stem (4).
- 7) Press on the ball from the side opposite the "REGULAR - ADJUST" label, being sure not to scratch it, until the ball seat carrier exits (11), then extract the ball (6).
- 8) Press the stem (4) inwards until it exits the body.
- 9) Remove the O-Ring (3, 8, 9, 10) and PTFE ball seats (5) extracting them from their grooves, as illustrated in the exploded view.

## ASSEMBLY

- 1) All the O-rings (3, 8, 9, 10) must be inserted in their grooves as shown in the exploded view.
- 2) Insert the stem (4) from inside the valve body (7).
- 3) Place the PTFE ball seats (5) in the housings in the body (7) and in the ball seat ball seat carrier (11).
- 4) Insert the ball (6) rotating it to the closed position.
- 5) Screw the carrier (11) into the body and tighten up in the clockwise direction using the handle (2) to limit stop.
- 6) Insert the valve between the end connectors (12) and tighten the union nuts (13) making sure that the socket seal O-rings (10) do not exit their seats.
- 7) The handle (2) should be placed on the valve stem (4).



**Note:** during assembly operations, it is advisable to lubricate the rubber seals. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Fig. 1



Fig. 2



Fig. 3



Fig. 4



# INSTALLATION

Before proceeding with installation, please follow these instructions carefully:

- 1) Check that the pipes to be connected to the valve are aligned in order to avoid mechanical stress on the threaded joints.
- 2) Check that the DUAL BLOCK® union nut locking device (16) is fitted to the valve body.
- 3) To release the union nuts, axially press the release lever to separate the lock and then unscrew it in the counter-clockwise direction.
- 4) Unscrew the union nuts (13) and insert them on the pipe segments.
- 5) Solvent weld or screw the end connectors (12) onto the pipe ends.
- 6) Position the valve body between the end connectors and fully tighten the union nuts (13) manually by rotating clockwise without using wrenches or other tools that could damage the union nut surface.
- 7) Lock the union nuts by returning the DUAL BLOCK® to its housing, pressing on it until the hinges lock on the union nuts.
- 8) If necessary, support the pipework with FIP pipe clips or by means of the carrier built into the valve itself (see paragraph "fastening and carriers").

The VKD valve can be equipped with a handle lock to prevent ball rotation (supplied separately).

When the handle safety block (14, 15) is installed, lift the lever (15) and rotate the handle (fig. 6-7).

A lock can also be installed on the handle to protect the system against tampering (fig. 8).

Seal can be adjusted using the extractable insert on the handle (fig. 3-4).

The seals can be adjusted later with the valve installed on the pipe by simply tightening the union nuts. This "micro adjustment", only possible with FIP valves thanks to the patented "Seat stop system", allows the seal to be recovered where PTFE ball seats are worn due to a high number of operations. The Easytorque kit can also be used for micro adjustments (fig. 5).

## WARNINGS

- If volatile liquid such as Hydrogen Peroxide ( $H_2O_2$ ) or Sodium Hypochlorite ( $NaClO$ ) are used, for safety reasons we recommend you contact the service centre. These liquids, upon vaporising, could create hazardous over pressures in the area between the body and ball.
- Always avoid sudden closing operations and protect the valve from accidental operations.

Fig. 5

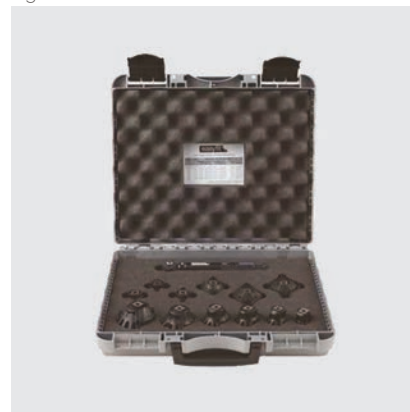


Fig. 6



Fig. 7



Fig. 8





# VKD DN 65÷100



DUAL BLOCK® 2-way ball valve



# VKD DN 65÷100

FIP has developed a VKD DUAL BLOCK® ball valve to introduce a high reference standard in thermoplastic valve design. VKD is a True Union ball valve that meets the most stringent needs required by industrial applications. This valve is also equipped with a customising Labelling System.

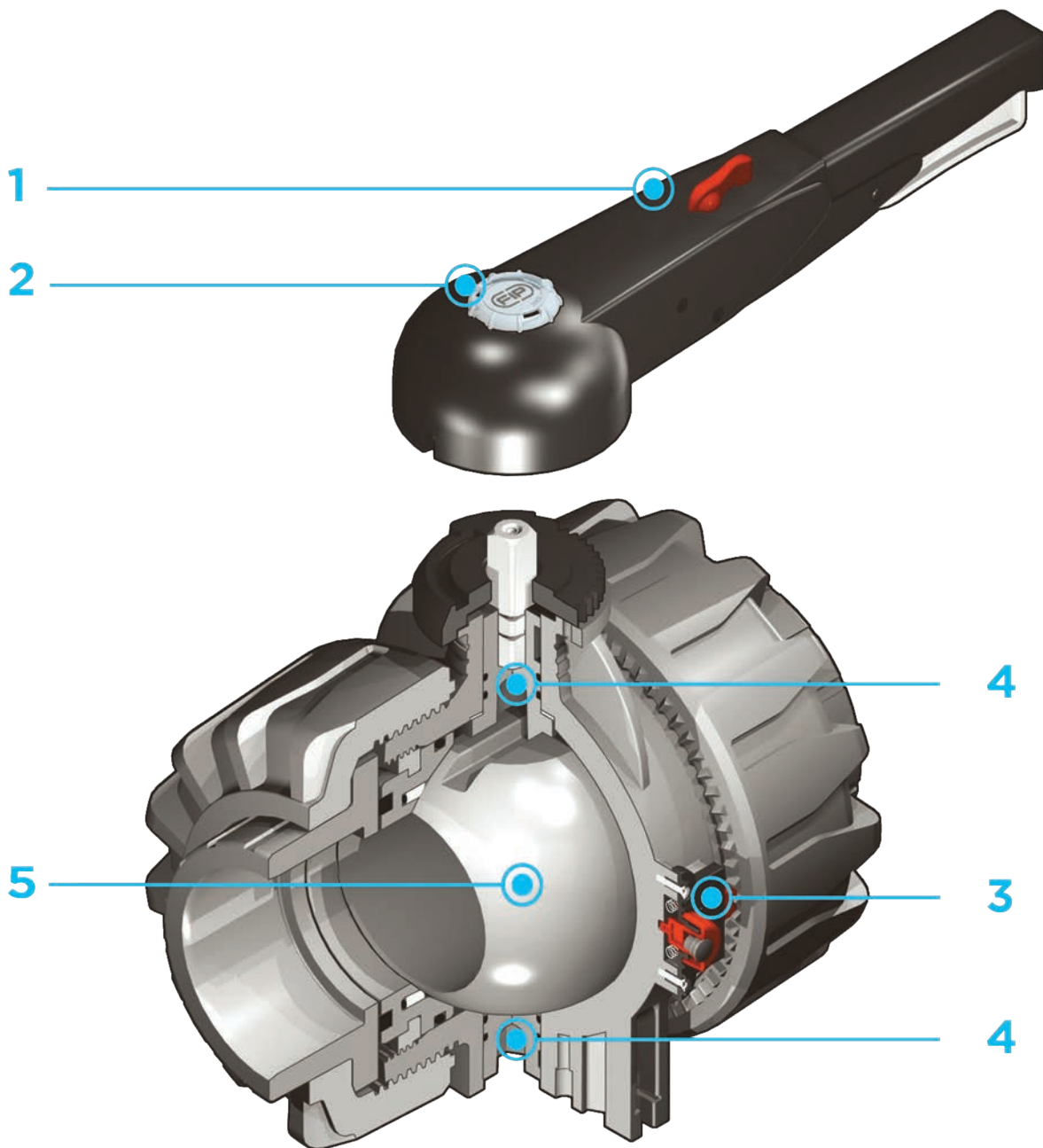


## DUAL BLOCK® 2-WAY BALL VALVE

- Connection system for weld and flanged joints
- Patented **SEAT STOP®** ball seat carrier system that lets you micro-adjust ball seats and minimise axial force effects
- Easy radial disassembly allowing quick replacement of O-rings and ball seats without any need for tools
- PN16 **True Union valve body** made for PVDF injection moulding equipped with built-in bores for actuation. ISO 9393 compliant test requisites
- Option of disassembling downstream pipes with the valve in the closed position
- **Full bore ball** with high surface finish
- **Integrated bracket** for valve anchoring
- Possibility of installing a gear box or pneumatic and/or electric actuators by applying an ISO standard bore PP-GR flange
- **STAINLESS steel co-moulded stem**, with square section as per ISO 5211
- Possibility to have handle with integrated LSQT limit micro switch, even as a retrofit in existing installations

Technical specifications	
<b>Construction</b>	2-way True Union ball valve with locked carrier and union nuts.
<b>Size range</b>	DN 65 ÷ 100
<b>Nominal pressure</b>	PN 16 with water at 20° C
<b>Temperature range</b>	-40 °C ÷ 140 °C
<b>Coupling standards</b>	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931 <b>Flanging system:</b> ISO 9624, EN ISO 10931, EN 558-1, EN 1092-1, ANSI B.16.5 cl.150
<b>Reference standards</b>	<b>Construction criteria:</b> EN ISO 16135, EN ISO 10931 <b>Test methods and requirements:</b> ISO 9393 <b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1 <b>Actuator couplings:</b> ISO 5211
<b>Valve material</b>	PVDF
<b>Seal material</b>	FKM (standard size O-Ring, EPDM on request); PTFE (ball seats)
<b>Control options</b>	Manual control; electric actuator; pneumatic actuator





- 1** HIPVC ergonomic multifunctional handle for quick operation, **lock and graduated adjustment in 10 positions**. Possibility of inhibiting rotation with a lock
- 2** Customisable Labelling System: LCE module made of a transparent protection plug and **customisable tag holder** using the LSE set

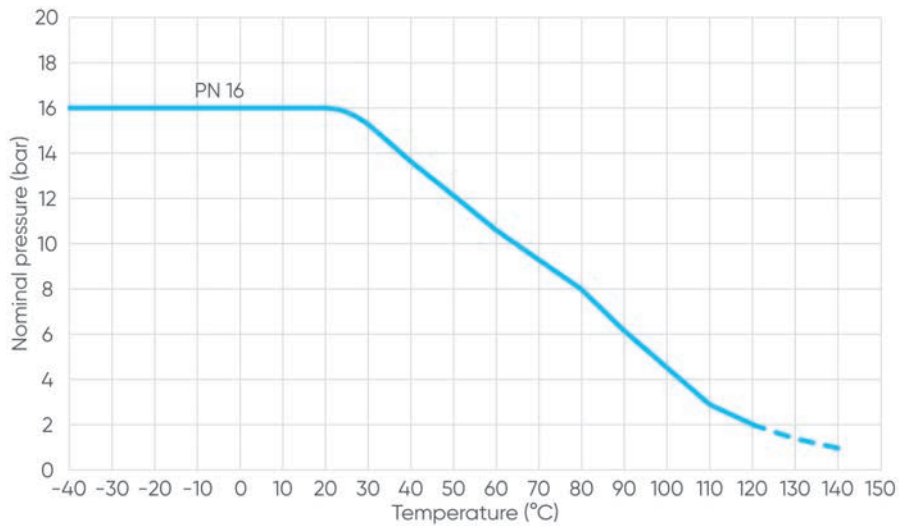
- 3** **DUAL BLOCK®** patented lock system that ensures union nut tightening hold even in severe conditions such as vibrations or heat dilation (available as accessory). The customisation lets you identify the valve on the system according to specific needs

- 4** **Double stem** with double O-Rings for ball centring and operating torque reduction
- 5** Machined high surface finish ball that guarantees a smooth operation and increased reliability

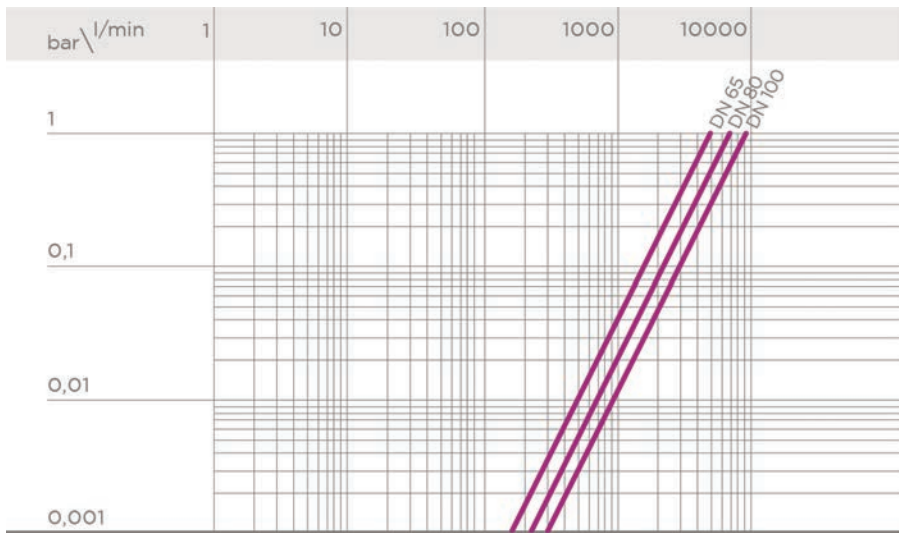
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and harmless fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal PN pressure is required (25 years with safety factor).



## PRESSURE DROP GRAPH

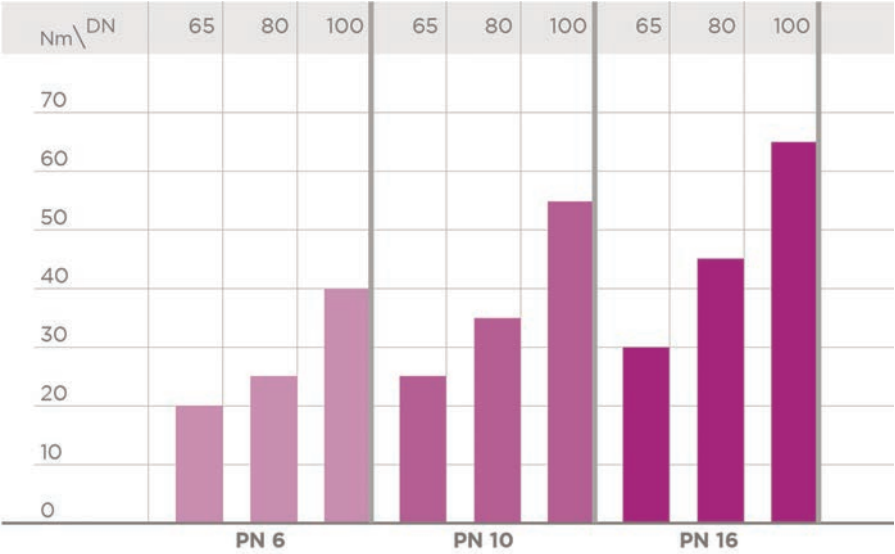


## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate  $\Delta p = 1$  bar pressure drop at a certain valve position. The K<sub>v</sub>100 values shown in the table are calculated with the valve completely open.

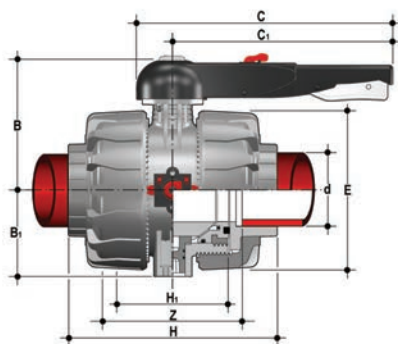
DN	65	80	100
K <sub>v</sub> 100 l/min	5250	7100	9500

# OPERATING TORQUE AT MAXIMUM WORKING PRESSURE



The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

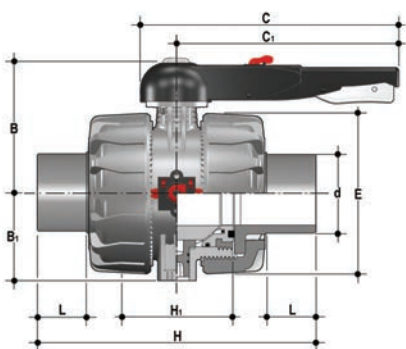
# DIMENSIONS



## VKDIF

DUAL BLOCK® 2-way ball valve with female ends for socket welding, metric series

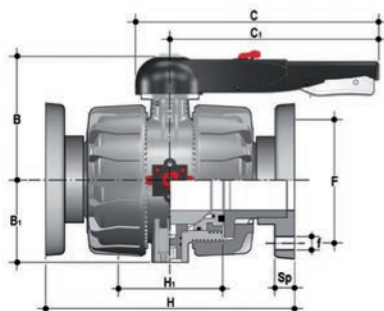
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	Z	g	FKM code
75	65	16	164	87	225	175	162	213	133	153	4380	VKDIF075F
90	80	16	177	105	327	272	202	239	149	173	7200	VKDIF090F
110	100	16	195	129	385	330	236	268	167	199	11141	VKDIF110F



## VKDDF

DUAL BLOCK® 2-way ball valve with male ends for socket welding, metric series

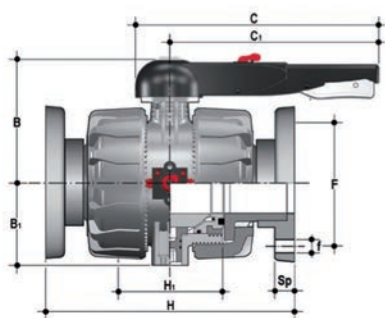
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	g	FKM code
75	65	16	164	87	225	175	162	284	133	44	4420	VKDDF075F
90	80	16	177	105	327	272	202	300	149	51	6930	VKDDF090F
110	100	16	195	129	385	330	236	340	167	61	10950	VKDDF110F



## VKDOF

DUAL BLOCK® 2-way ball valve with fixed flanges, drilled EN/ISO/DIN PN10/16. Face to face according to EN 558-1

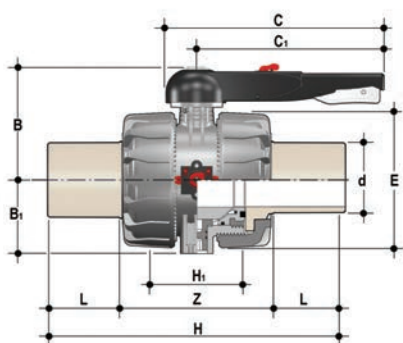
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
75	65	16	164	87	225	175	145	17	290	133	21	4	8588	VKDOF075F
90	80	16	177	105	327	272	160	17	310	149	21,5	8	12122	VKDOF090F
110	100	16	195	129	385	330	180	17	350	167	21,5	8	17949	VKDOF110F



## VKDOAF

DUAL BLOCK® ball valve with ANSI B16.5 cl.150#FF fixed flanges.

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
2" 1/2	65	16	164	87	225	175	145	17	290	133	21	4	8588	VKDOF075F
3"	80	16	177	105	327	272	160	17	310	149	21,5	8	12122	VKDOF090F
4"	100	16	195	129	385	330	180	17	350	167	21,5	8	17949	VKDOF110F



## VKDBF

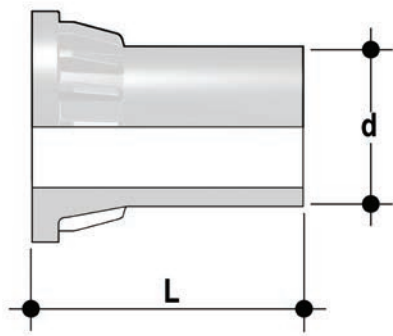
DUAL BLOCK® 2-way ball valve with long spigot male ends in PVDF SDR 21 for butt welding/IR (CVDF)

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	Z	g	FKM code
75	65	16	164	87	225	175	162	284	133	44	196	4700	VKDBF075F
90	80	16	177	105	327	272	202	300	149	51	198	7150	VKDBF090F
110	100	16	195	129	385	330	236	340	167	61	218	11300	VKDBF110F

# ACCESSORIES

## CVDF

End connector in PVDF SDR 21 PN 16, long spigot, for butt welding



d	DN	PN	L	SDR	Code
75	65	16	74	21	CVDF21075
90	80	16	74	21	CVDF21090
110	100	16	87	21	CVDF21110

## LSE

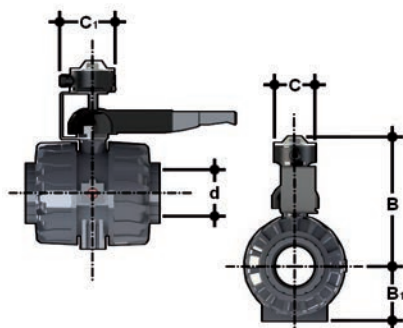
Customisation and label printing set for Easyfit handle made up of precut adhesive sheets and software for guided label creation.



d	DN	VKD* code
75	65	LSE040
90	80	LSE040
110	100	LSE040

## LS Quick Kit

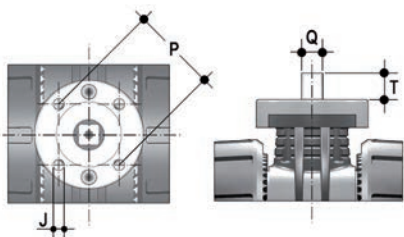
The Limit Switch Quick Kit allows the fast and secure installation of the FIP LSQT to the VKD valves. The body is in PP-GR and the handle in stainless steel AISI 316. The handle block at 0° and 90° is also available by default (hole diameter 6.5 mm). The kit can be assembled on the valve even if already installed on the system. For technical data of the LSQT box see FIP actuated valves catalogue.



d	DN	B	B <sub>1</sub>	C	C <sub>1</sub>	Code
75	65	275	87	103	126,9	LSQKIT75160
90	80	286,7	105	103	126,9	LSQKIT75160
110	100	305,5	129	103	126,9	LSQKIT75160

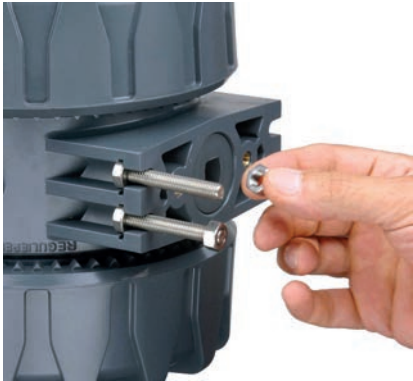
## ACTUATOR MOUNTING FLANGE

The valve can be equipped with standard pneumatic or electric actuators and gearbox for heavy-duty operations, using a flange in PP-GR reproducing the drilling pattern provided for by standard ISO 5211 F07



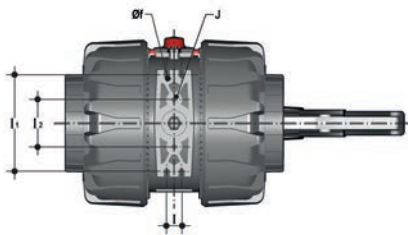
d	DN	P x J	T	Q
75	65	F07 x 9	16	14
90	80	F07 x 9	16	14
110	100	F07 x 9	19	17

# FASTENING AND SUPPORTING

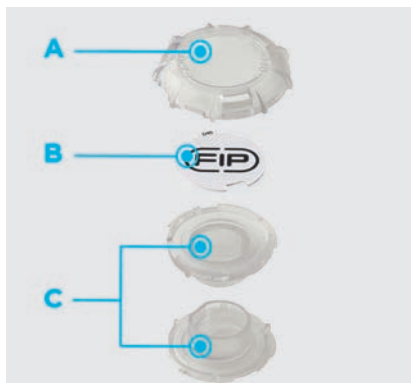


All valves, whether manual or actuated, must be adequately supported in many applications. The VKD DN 65÷100 valve series is therefore ready to be equipped with threaded supporting brackets (optional) that permits direct anchoring on the valve body without the need of other components. Using standard threaded nuts (not included) made of STAINLESS steel, you can anchor the valve on 4 fastening points.

d	DN	J	f	l	l1	l2
75	65	M6	6,3	17,4	90	51,8
90	80	M6	8,4	21,2	112,6	63
110	100	M8	8,4	21,2	137	67



# CUSTOMISATION



The VKD DN 65÷100 valve is equipped with the customisable Labelling System. This system lets you create special labels to insert in the handle. This makes it extremely easy to apply company logos, identification serial numbers or service indications such as, for example, the valve function in the system, the transported fluid, but also specific information for customer service, such as the customer name or installation date or location on the valves.

The specific LCE module is a standard supply and is made up of a rigid transparent water-resistant PVC plug (A-C) and white tag holder (B) made of the same material, one side of which bears the FIP logo.

The holder, inserted in the plug, can be removed and, once overturned, used for customisation by applying labels printed with the software supplied with the LSE set.

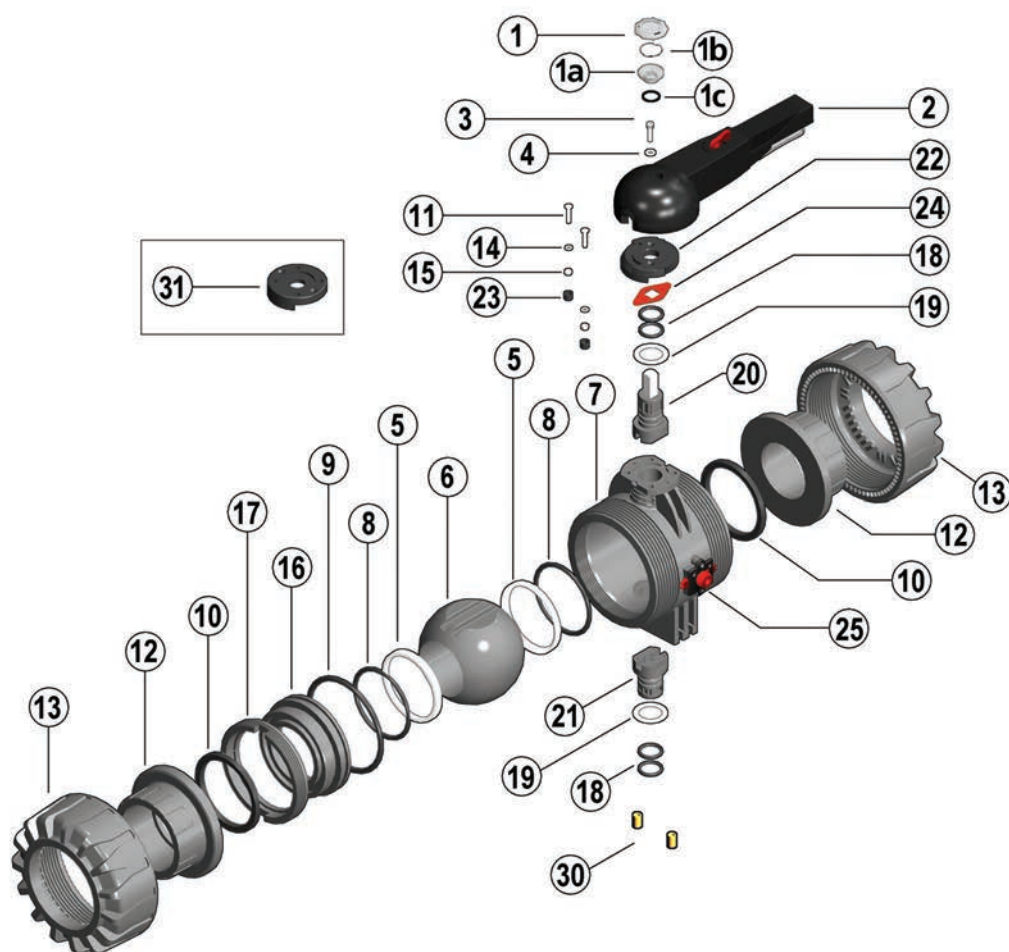
Proceed as follows to apply the label on the valve:

- 1) Remove the upper part of the transparent plug (A) rotating it counter-clockwise as indicated by the "Open" label on the plug and remove it.
- 2) Extract the tag holder from its housing on the lower part of the plug (C)
- 3) Apply the adhesive label on the tag holder (B) to align the profiles matching the tab position.
- 4) Reinsert the tag holder in its housing at the bottom of the plug
- 5) Reposition the top of the plug in the housing rotating it clockwise; this way the label is protected against the elements.



# COMPONENTS

## EXPLODED VIEW



**1-1a** Transparent protection plug (PVC - 1)

**1b** Tag holder (PVC - 1)

**1c** O-Ring (NBR - 1)

**2** Handle (HIPVC - 1)

**3** Screw (STAINLESS steel - 1)

**4** Washer (STAINLESS steel - 1)

**5** Ball seat (PTFE - 2)\*

**6** Ball (PVDF - 1)

**7** Body (PVDF - 1)

**8** Ball seat O-ring (EPDM or FKM - 2)\*

**9** Radial seal O-Ring (EPDM or FKM - 1)\*

**10** Socket seal O-Ring (EPDM or FKM - 2)\*

**11** Screw (STAINLESS steel - 2)

**12** End connector (PVDF - 2)

**13** Union nut (PVDF - 2)

**14** Washer (STAINLESS steel - 2)

**15** Nut (STAINLESS steel - 2)

**16** Ball seat carrier (PVDF - 1)

**17** Threaded ring (PVDF - 1)

**18** Stems O-rings (EPDM-FKM - 4)\*

**19** Anti-friction disk (PTFE - 2)\*

**20** Upper stem (PVDF/INOX - 1)

**21** Lower stem (PVDF - 1)

**22** Plate (PP-GR - 1)

**23** Protection plug (PE - 2)

**24** Position indicator (PA - 1)

**25** DUAL BLOCK® (PP-GR + various - 1)

**30** Threaded inserts (Brass - 2)\*\*

**31** Actuation plate (PP-GR - 1)\*\*

\* Spare parts

\*\* Accessories

The component material and quantity supplied are indicated in the parentheses.

## DISASSEMBLY

- 1) Isolate the valve from the line (release the pressure and empty the pipeline).
- 2) Release the union nuts by rotating the button (25) to the left, pointing the arrow on the open lock (fig. 1).
- 3) Unscrew the union nuts (13) and extract the body (7) (fig. 2).
- 4) Before dismantling, hold the valve in a vertical position and open it 45° to drain any liquid that might remain.
- 5) Open the valve.
- 6) Remove the protection plug on the handle (2) and unscrew the screw (3) with the washer (4).
- 7) Remove the handle (2).
- 8) Remove the screws (11) and plate (22) from the body (7).
- 9) Insert the two supplied wrench protrusions in the corresponding apertures on the threaded ring (17), extracting it by rotating counterclockwise with the ball seat carrier (16) (fig. 3).
- 10) Press on the ball (6), being careful not to scratch it, and remove it from the body.
- 11) Press the upper stem (20) inwards and extract it from the body and remove the lower stem (21). Remove the anti-friction disks (19).
- 12) Remove the O-Ring (8, 9, 10, 18) and PTFE ball seats (5) extracting them from their housings, as illustrated in the exploded view.

## ASSEMBLY

- 1) All the O-rings (8, 9, 10, 18) must be inserted in their grooves as shown in the exploded view.
- 2) Place the anti-friction disks (19) on the stems (20-21) and insert the stems in their housings in the body.
- 3) Place the PTFE ball seats (5) in the housings in the valve body (7) and in the carrier (16).
- 4) Insert the ball (6) rotating it to the closed position.
- 5) Insert the carrier with threaded ring (17) into the body and tighten up in the clockwise direction using the supplied tool, to limit stop.
- 6) Position the plate (22) with rack on the body, and screw in the screws (11) washers (14) and nuts (15).
- 7) The handle (2) with protection plug (1, 1a, 1b, 1c) should be placed on the stem (20) (fig. 4).
- 8) Screw in the screw (3) with the washer (4) and position the protection plug (1, 1a, 1b, 1c).
- 9) Insert the valve between the end connectors (12) and tighten the union nuts (13), making sure that the socket seal O-rings (10) do not exit their seats.
- 10) Release the union nuts by rotating the button (25) to the right, pointing the arrow on the closed lock (fig. 1).



**Note:** during assembly operations, it is advisable to lubricate the rubber seals. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Fig.1



Fig.2



Fig.3



Fig.4



# INSTALLATION

Before proceeding with installation, please follow these instructions carefully:

- 1) Check that the pipes to be connected to the valve are aligned in order to avoid mechanical stress on the threaded joints.
- 2) Make sure the DUAL BLOCK® union nut lock system (25) is in the FREE position.
- 3) Unscrew the union nuts (13) and insert them on the pipe segments.
- 4) Solvent weld or screw the end connectors (12) onto the pipe ends.
- 5) Position the valve body between the end connectors and fully tighten the union nuts (13) clockwise with an appropriate wrench.
- 6) Lock the union nuts rotating the button (25) clockwise (see paragraph "union nut lock").

7) If necessary, support the pipework with FIP pipe clips or by means of the carrier built into the valve itself (see paragraph "fastening and supporting").

Adjust the ball seat carriers using the supplied tool (fig. 3).

The seals can be adjusted later with the valve installed on the pipe by simply tightening the union nuts. This "micro adjustment", only possible with FIP valves thanks to the patented "Seat stop system", allows the seal to be recovered where PTFE ball seats are worn due to a high number of manoeuvres.

## UNION NUT LOCK



Rotate the button to the left, pointing the arrow on the open lock to unlock DUAL BLOCK®: the valve union nuts are free to rotate clockwise and counter-clockwise. Rotate the button to the right, pointing the arrow on the closed lock to lock DUAL BLOCK®: the valve union nuts are blocked in the desired position.

## HANDLE LOCK



Thanks to the multifunctional handle and the red manoeuvre button on the lever, you can perform a 0°-90° operation and a graduated operation by means of the 10 intermediate positions and a stop lock: the handle can be locked in each of the 10 positions by simply pressing the Free-lock button. A lock can also be installed on the handle to protect the system against tampering.

The valve is two-way and can be installed in any position. It can also be installed at end line or tank.



# VKR DN 10÷50



DUAL BLOCK® regulating ball valve



# VKR DN 10÷50

The VKR DUAL BLOCK® valve combines high reliability and safety aspects typical of VKD full bore ball valves with the new flow adjustment function with typical linear curve that meets the most stringent needs typical of industrial applications.

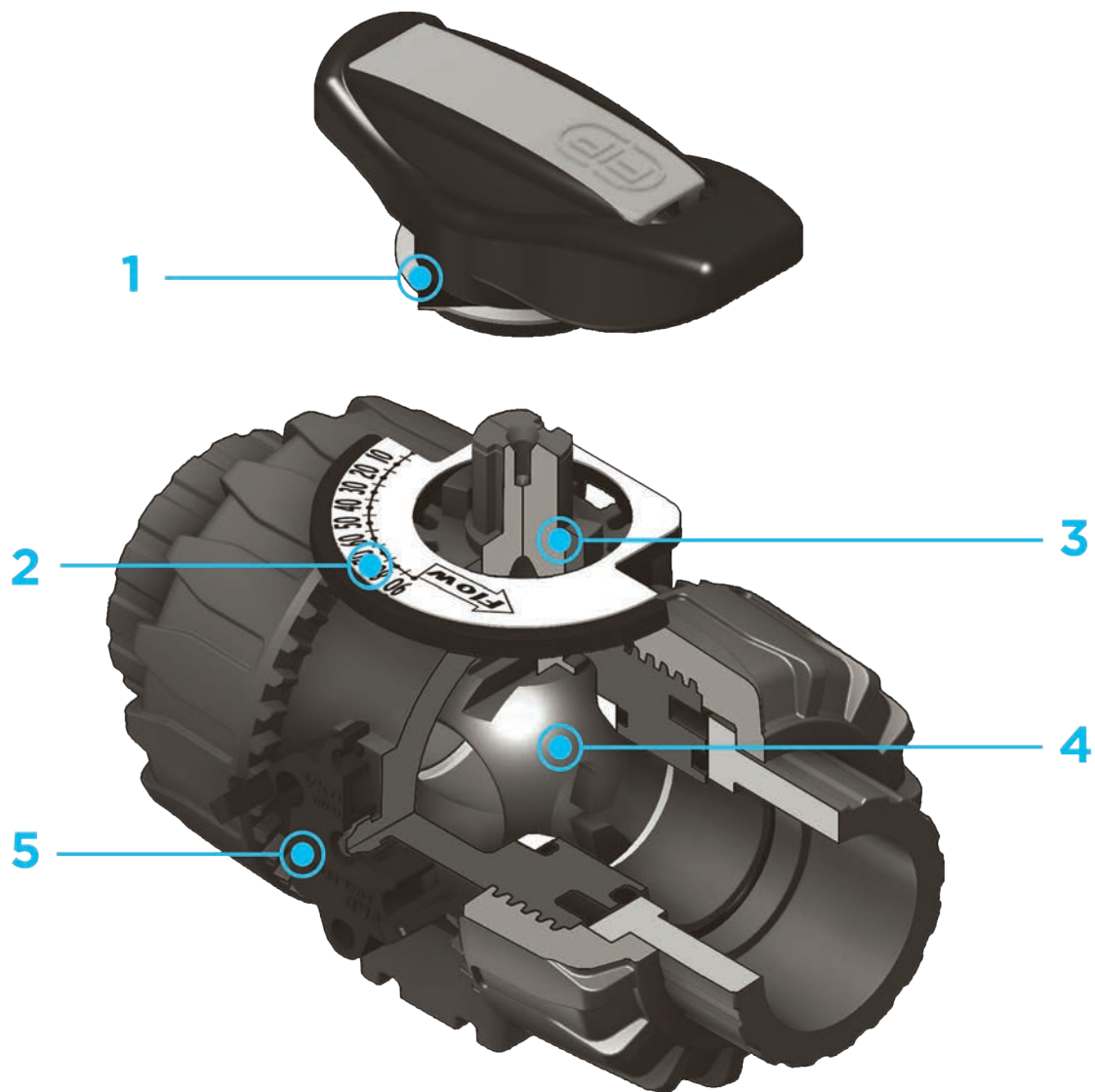


## DUAL BLOCK® REGULATING BALL VALVE

- Connection system for weld and flanged joints
- Patented **SEAT STOP®** ball carrier system that lets you micro-adjust ball seats and minimise axial force effects
- Easy radial disassembly allowing quick replacement of O-rings and ball seats without any need for tools
- **PN16 True Union valve body** made for PVDF injection moulding equipped with built-in bores for actuation. ISO 9393 compliant test requisites
- Option of disassembling downstream pipes with the valve in the closed position
- High surface finish stem with double O-Ring and double groove ball connection
- **Integrated bracket** for valve anchoring
- Ball seat carrier can be adjusted using the **Easytorque adjustment kit**
- Actuation option: version with electric modulating actuator with 4-20 mA / 0-10 V inlet and 4-20 mA / 0-10 V outlet to monitor the position
- Valve suitable for carrying fluids that are clean and free of suspended particles

### Technical specifications

<b>Construction</b>	2-way True Union regulating ball valve with locked carrier and lockable union nuts
<b>Size range</b>	DN 10 ÷ 50
<b>Nominal pressure</b>	PN 16 with water at 20° C
<b>Temperature range</b>	-40 °C ÷ 140 °C
<b>Coupling standards</b>	<b>Welding:</b> EN ISO 10931 Can be coupled to pipes according to EN ISO 10931 <b>Flanging system:</b> ISO 9624, EN ISO 10931, EN 558-1, EN 1092-1, ANSI B.16.5 cl. 150
<b>Reference standards</b>	<b>Construction criteria:</b> EN ISO 16135, EN ISO 10931 <b>Test methods and requirements:</b> ISO 9393 <b>Installation criteria:</b> DVS 2202-1, DVS 2207-15, DVS 2208-1 <b>Actuator couplings:</b> ISO 5211
<b>Valve material</b>	PVDF
<b>Seal material</b>	FKM (standard size O-Ring, EPDM, FEP+FKM, FFKM on request); PTFE (ball seats)
<b>Control options</b>	Manual control; electric actuator



**1** HIPVC ergonomic multifunctional handle with **position indicator** and tool to adjust the ball seat carrier

**2** Flow direction and opening angle indication plate with **graduated scale with 5° detail** for clear and accurate readings

**3** 90° operating angle that permits **the use of standard** quarter turn **actuators**

**4** The patented ball design provides **linear flow adjustment** throughout its range of operation even when the valve is open just a few

degrees.

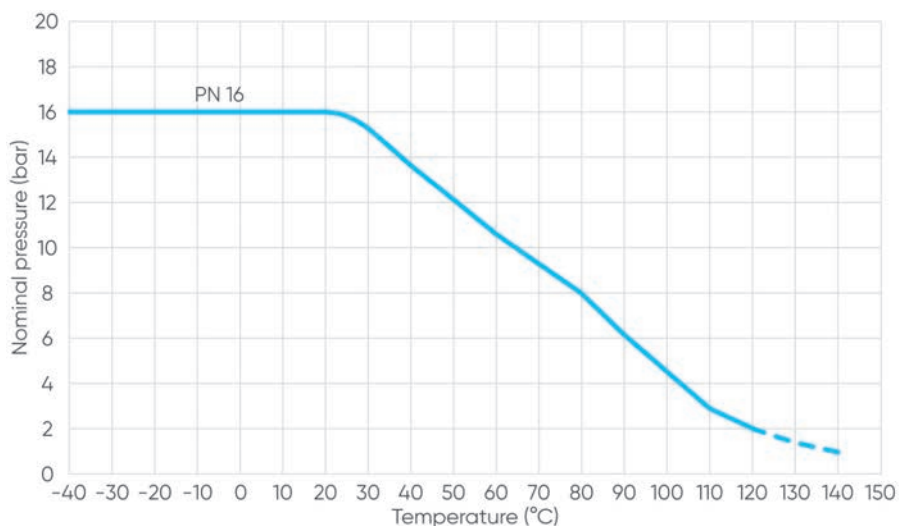
**5** Patented **DUAL BLOCK®** system: prevents union nuts from loosening even under extreme operating conditions: e.g. vibration or thermal expansion



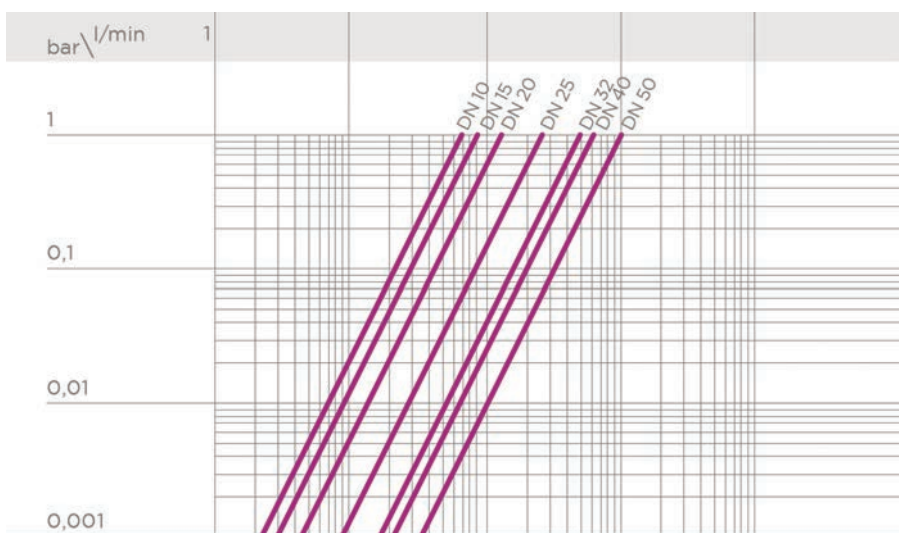
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and harmless fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal PN pressure is required (25 years with safety factor).



## PRESSURE DROP GRAPH



## K<sub>v</sub>100 FLOW COEFFICIENT

Per coefficiente di flusso K<sub>v</sub>100 si intende la portata Q in litri al minuto di acqua a 20°C che genera una perdita di carico  $\Delta p = 1$  bar per una determinata posizione della valvola.

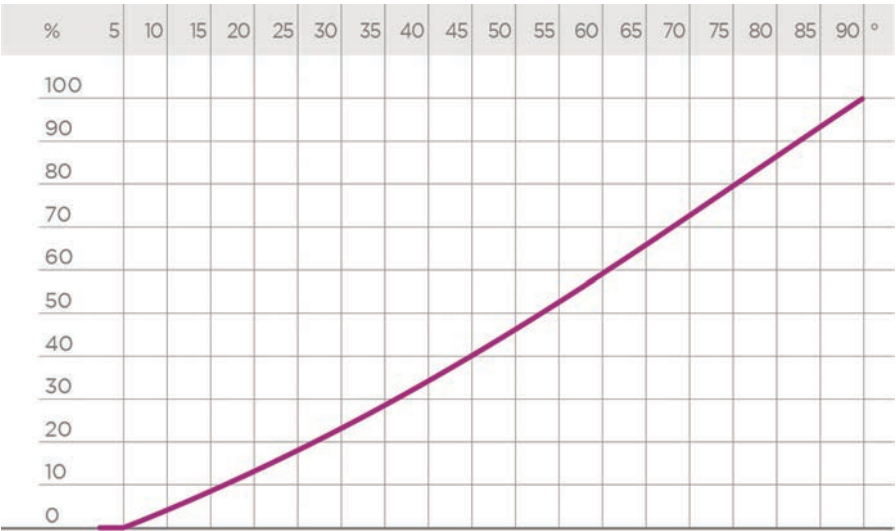
I valori K<sub>v</sub>100 indicati in tabella si intendono per valvola completamente aperta.

DN	10	15	20	25	32	40	50
Kv100 l/min	83	135	256	478	592	1068	

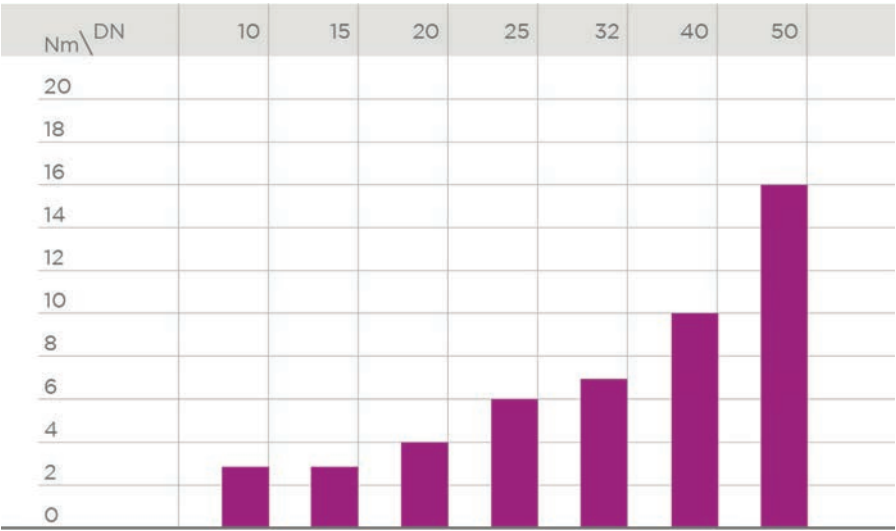


# RELATIVE FLOW COEFFICIENT DIAGRAM

The relative flow coefficient is the flow rate through the valve as a function of the degree of valve aperture.  
Horizontal axis: Ball aperture angle  
Vertical axis: Relative flow coefficient

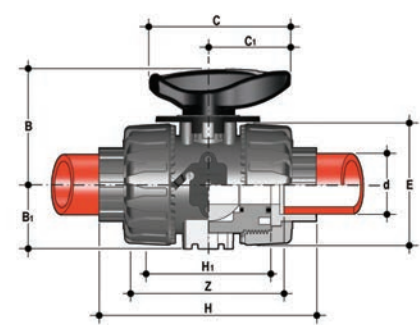


# OPERATING TORQUE AT MAXIMUM WORKING PRESSURE



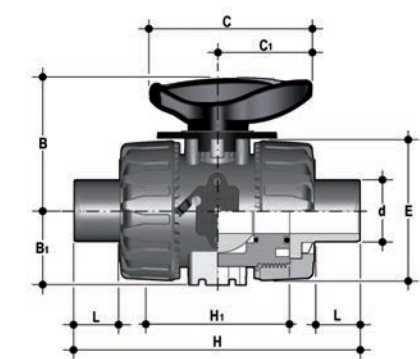
The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

# DIMENSIONS



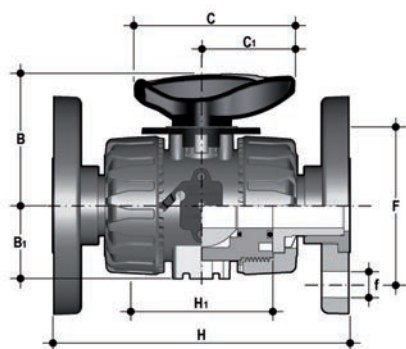
**VKRIF**  
DUAL BLOCK® regulating ball valve with female ends for socket welding, metric series

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	Z	g	FKM code
16	10	16	54	29	67	40	54	102	65	74,5	291	VKRIF016F
20	15	16	54	29	67	40	54	102	65	73	272	VKRIF020F
25	20	16	65	34,5	85	49	65	114	70	82	445	VKRIF025F
32	25	16	69,5	39	85	49	73	126	78	90	584	VKRIF032F
40	32	16	82,5	46	108	64	86	141	88	100	938	VKRIF040F
50	40	16	89	52	108	64	98	164	93	117	1242	VKRIF050F
63	50	16	108	62	134	76	122	199	111	144	2187	VKRIF063F



**VKRDF**  
DUAL BLOCK® regulating ball valve with male ends for socket welding, metric series

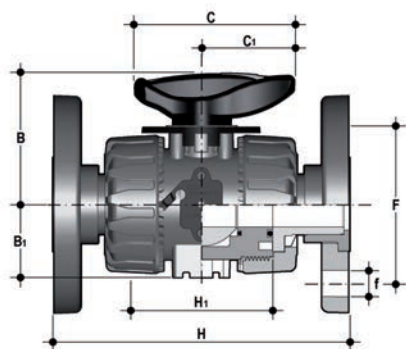
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	g	FKM code
20	15	16	54	29	65	40	54	124	65	16	299	VKRDF020F
25	20	16	65	34,5	70	49	65	144	70	18	466	VKRDF025F
32	25	16	69,5	39	78	49	73	154	78	20	604	VKRDF032F
40	32	16	82,5	46	88	64	86	174	88	22	951	VKRDF040F
50	40	16	89	52	93	64	98	194	93	23	1284	VKRDF050F
63	50	16	108	62	111	76	122	224	111	29	2229	VKRDF063F



## VKROF

DUAL BLOCK® regulating ball valve with EN/ISO/DIN fixed flange, drilled PN10/16. Face to face according to EN 558-1

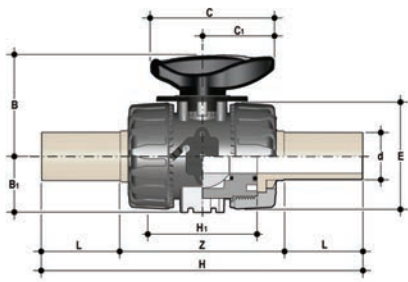
d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
20	15	16	54	29	67	40	65	14	130	65	11	4	547	VKROF020F
25	20	16	65	34,5	85	49	75	14	150	70	14	4	772	VKROF025F
32	25	16	69,5	39	85	49	85	14	160	78	14	4	1024	VKROF032F
40	32	16	82,5	46	108	64	100	18	180	88	14	4	1583	VKROF040F
50	40	16	89	52	108	64	110	18	200	93	16	4	2024	VKROF050F
63	50	16	108	62	134	76	125	18	230	111	16	4	3219	VKROF063F



## VKROAF

DUAL BLOCK® regulating ball valve with ANSI B16.5 cl.150#FF fixed flange bore

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	FKM code
1/2"	15	16	54	29	67	40	60,3	15,9	143	65	11	4	547	VKROAF012F
3/4"	20	16	65	34,5	85	49	69,9	15,9	172	70	14	4	772	VKROAF034F
1"	25	16	69,5	39	85	49	79,4	15,9	187	78	14	4	1024	VKROAF100F
1" 1/4	32	16	82,5	46	108	64	88,9	15,9	190	88	14	4	1583	VKROAF114F
1" 1/2	40	16	89	52	108	64	98,4	15,9	212	93	16	4	2024	VKROAF112F
2"	50	16	108	62	134	76	120,7	19,1	234	111	16	4	3219	VKROAF200F



## VKRBF

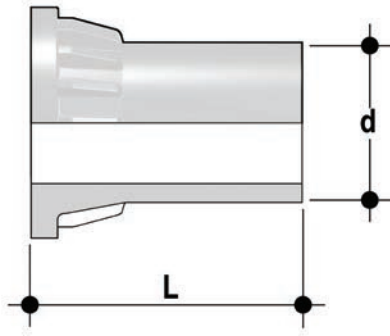
DUAL BLOCK® regulating ball valve with long spigot male ends in PVDF for butt welding/ IR (CVDF)

d	DN	PN	B	B <sub>1</sub>	C	C <sub>1</sub>	E	H	H <sub>1</sub>	L	Z	g	FKM code
20	15	16	54	29	67	40	54	175	65	40,5	94	450	VKRBF020F
25	20	16	65	35	85	49	65	212	70	54	106	516	VKRBF025F
32	25	16	70	39	85	49	73	226	78	56	117	664	VKRBF032F
40	32	16	83	46	108	64	86	246	88	56	131	1020	VKRBF040F
50	40	16	89	52	108	64	98	271	93	60,5	145	1350	VKRBF050F
63	50	16	108	62	134	76	122	300	111	65,5	161	2330	VKRBF063F

# ACCESSORIES

## CVDF

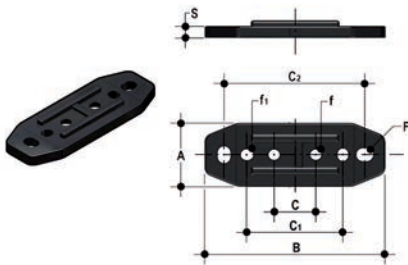
End connector in PVDF SDR 21 PN 16, long spigot, for butt welding



d	DN	PN	L	SDR	Code
20	15	16	55	21	CVDF21020
25	20	16	70	21	CVDF21025
32	25	16	74	21	CVDF21032
40	32	16	78	21	CVDF21040
50	40	16	84	21	CVDF21050
63	50	16	91	21	CVDF21063

## PMKD

Wall mounting plate



d	DN	A	B	C	C <sub>1</sub>	C <sub>2</sub>	F	f	f <sub>i</sub>	S	Code
16	10	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
20	15	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
25	20	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
32	25	30	86	20	46	67,5	6,5	5,3	5,5	5	PMKD1
40	32	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2
50	40	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2
63	50	40	122	30	72	102	6,5	6,3	6,5	6	PMKD2

## Easytorque Kit

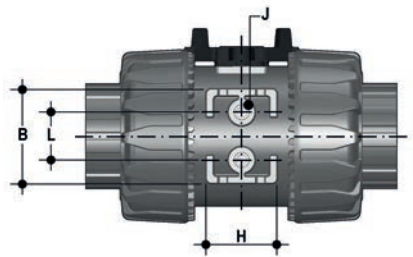
Kit for ball seat carrier tightening adjustment for DUAL BLOCK® DN 10-50 series valves



d	DN	Tightening torque recommended*	Code
3/8"-1/2"	10-15	3 N m - 2,21 Lbf ft	KET01
3/4"	20	4 N m - 2,95 Lbf ft	KET01
1"	25	5 N m - 3,69 Lbf ft	KET01
1" 1/4	32	5 N m - 3,69 Lbf ft	KET01
1" 1/2	40	7 N m - 5,16 Lbf ft	KET01
2"	50	9 N m - 6,64 Lbf ft	KET01

\*calculated in ideal installation conditions

# FASTENING AND SUPPORTING



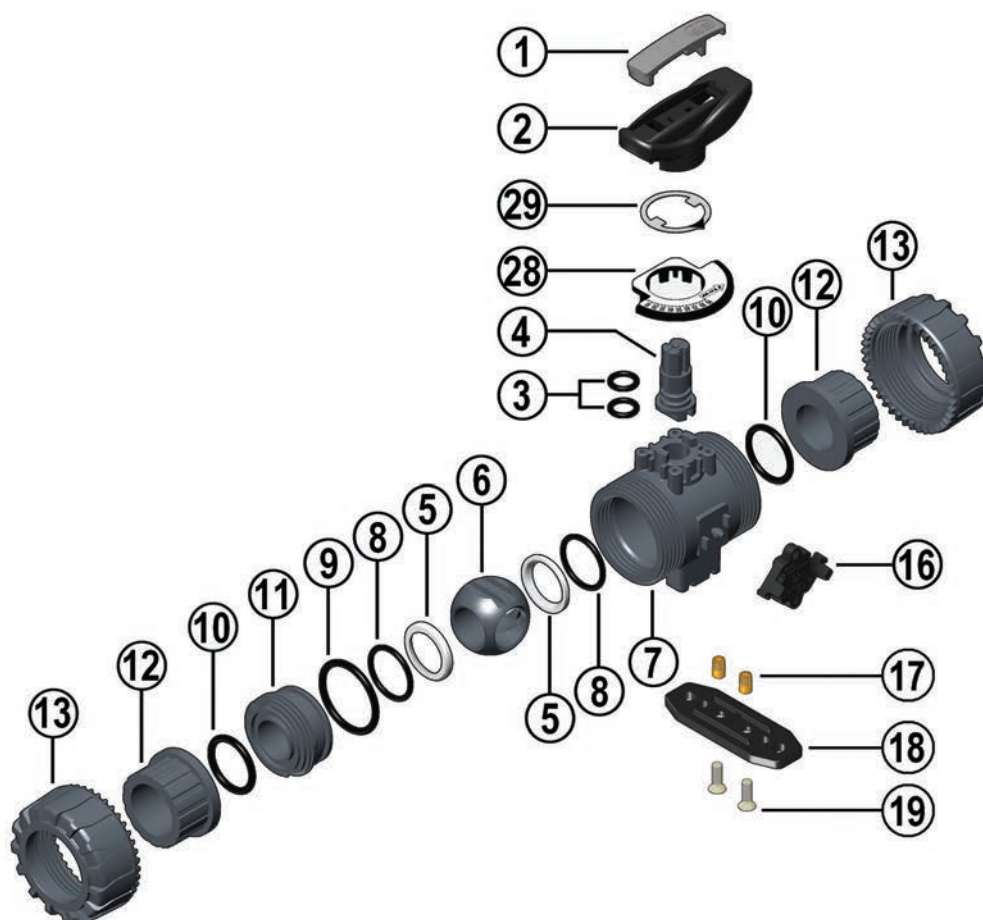
All valves, whether manual or driven, must be adequately supported in many applications. The VKR valve series is therefore ready to be equipped with threaded supporting brackets (optional) that permits direct anchoring of the valve body without the need of other components. For wall installation, dedicated PMKD mounting plates which are available as accessories can be used. These plates should be fastened to the valve before wall installation. PMKD plates also allow VKR valve alignment with FIP ZIKM pipe clips as well as allowing different sizes of valves to be aligned.

d	DN	g	H	L	J*
16	10	31,5	27	20	M4 x 6
20	15	31,5	27	20	M4 x 6
25	20	40	30	20	M4 x 6
32	25	40	30	20	M4 x 6
40	32	50	35	30	M6 x 10
50	40	50	35	30	M6 x 10
63	50	60	40	30	M6 x 10

\* With threaded inserts

# COMPONENTS

## EXPLODED VIEW



**1** Handle insert (PVC - 1)

**2** Handle (HIPVC - 1)

**3** Stem O-ring (FKM - 2)\*

**4** Stem (PVDF - 1)

**5** Ball seat (PTFE - 2)\*

**6** Patented ball design (PVDF - 1)

**7** Body (PVDF - 1)

**8** Ball seat O-Rings (FKM - 2)\*

**9** Radial seal O-Ring (FKM - 1)\*

**10** Socket seal O-Ring (FKM - 2)\*

**11** Ball seat carrier (PVDF - 1)

**12** End connector (PVDF - 2)\*

**13** Union nut (PVDF - 2)

**16** DUAL BLOCK® (POM - 1)

**17** Threaded inserts (STAINLESS steel or Brass - 2)\*\*

**18** Distance plate (PP-GR - 1)\*\*

**19** Screw (STAINLESS steel - 2)\*\*

**28** Graduated plate (POM-PVC - 1)

**29** Indicator (PVC - 1)

\* Spare parts

\*\* Accessories

The component material and quantity supplied are indicated in the parentheses.

## DISASSEMBLY

- 1) Isolate the valve from the line (release the pressure and empty the pipeline).
- 2) Unlock the union nuts by pressing the lever on the DUAL BLOCK® (16) along the axis and separate it from the union nut (fig. 1). It is also possible to completely remove the block device from the body of the valve.
- 3) Fully unscrew the union nuts (13) and extract the body sideways.
- 4) Before dismounting, hold the valve in a vertical position and open it 45° to drain any liquid that might remain.
- 5) After closing the valve, remove the special insert (1) from the handle (2) and push the two projecting ends into the corresponding recesses on the ball seat carrier (11). Rotate the stop ring anti-clockwise to extract it.
- 6) Pull the handle (2) upwards to remove it from the valve stem (4).
- 7) Make sure that the position indicator (29) remains properly fastened to the handle (2).
- 8) Press on the ball from the side opposite the "REGULAR - ADJUST" label, being sure not to scratch it, until the ball seat carrier exits (11), then extract the ball (6).
- 9) Press the stem (4) inwards until it exits the valve body.
- 10) All the O-rings (3, 8, 9, 10) and PTFE ball seats (5) must be removed from their grooves, as shown in the exploded view.

## ASSEMBLY

- 1) All the O-rings (3, 8, 9, 10) must be inserted in their grooves as shown in the exploded view.
- 2) Insert the stem (4) from inside the body (7).
- 3) Place the PTFE ball seats (5) in the housings in the body (7) and in the ball seat carrier (11).
- 4) Insert the ball (6) in the body as shown in Fig. 3
- 5) Screw the carrier (11) into the body and tighten up in the clockwise direction using the special insert (1) to limit stop.
- 6) Position the indicator (29) on the handle with the pointer set to 0 on the graduated scale while making sure that the valve is in the closed position (fig. 2-3).
- 7) Insert the handle (2) with the insert (1) in its housing on the stem (4).
- 8) Insert the valve between the end connectors (12) making sure that they match the direction of flow shown on the plate (fig. 2) then tighten the union nuts (13) making sure that the socket
- 9) seal O-rings (10) do not come out of their grooves.



**Note:** during assembly operations, it is advisable to lubricate the rubber seals. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Fig. 1



Fig. 2



Fig. 3



Fig. 4





# INSTALLATION

Before proceeding with installation, please follow these instructions carefully:

- 1) Check that the pipes to be connected to the valve are aligned in order to avoid mechanical stress on the threaded joints.
  - 2) Check that the DUAL BLOCK® union nut locking device (16) is fitted to the valve body.
  - 3) To release the union nuts (13), axially press the release lever to separate the lock and then unscrew it in the counter-clockwise direction.
  - 4) Unscrew the union nuts (13) and insert them on the pipe segments.
  - 5) Solvent weld or screw the end connectors (12) onto the pipe ends.
  - 6) Position the valve between the pipe end connectors making sure the that direction of flow is the same as shown on the plate (Fig.4). Hand tighten the union nuts in the clockwise direction. Do not use a wrench or other tools which might damage the surface.
  - 7) Lock the union nuts by returning the DUAL BLOCK® to its housing, pressing on it until the hinges lock on the nuts.
  - 8) If necessary, support the pipework with FIP pipe clips or by means of the carrier built into the valve itself (see paragraph "fastening and supporting").
- Seals can be adjusted using the removable insert on the handle.  
The seals can be installed later with the valve installed on the pipe by simply tightening the union nuts. This "micro adjustment", only possible with FIP valves thanks to the patented "Seat stop system", allows the seal to be recovered where PTFE ball seats are worn due to a high number of operations.  
The Easytorque kit can also be used for micro adjustments (fig. 5).

Fig. 5



## WARNINGS

Always avoid sudden closing operations and protect the valve from accidental operations.



# SR DN 15÷50

Ball check valve



# SR DN 15÷50

The SR check valve allows the passage of fluid in a single direction.

## BALL CHECK VALVE

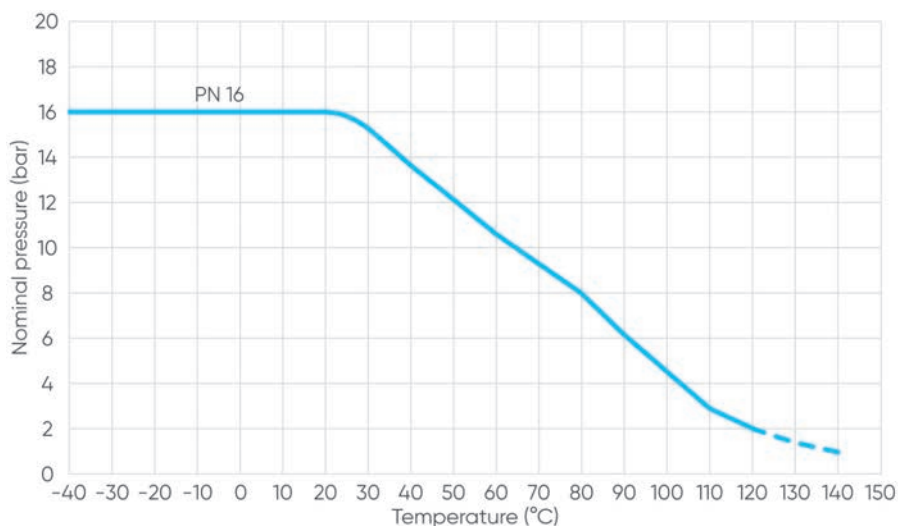
- Connection system for weld joints
- **PN16 valve body made for PVDF injection moulding** and European Directive 2014/68/EU (PED) compliant for pressurised equipment. ISO 9393 compliant test requirements
- The valve can only be used with fluids with specific weight under 1,78 g/cm<sup>3</sup>
- Sealing system **with antiblow out design**
- Ball completely in PVDF
- Can be maintained with the valve body installed
- Can be **installed** in either a **vertical** (preferable) or **horizontal position**

Technical specifications	
Construction	Ball check valve
Size range	DN 15 ÷ 50
Nominal pressure	PN 16 with water at 20° C
Temperature range	-40 °C ÷ 140 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931
Reference standards	<b>Construction criteria:</b> EN ISO 16137, EN ISO 10931
	<b>Test methods and requirements:</b> ISO 9393
	<b>Installation criteria:</b> DVS 2202-1, DVS 2207-15, DVS 2208-1
Valve material	<b>Body:</b> PVDF <b>Ball:</b> PVDF
Seal material	FKM (spare set in EPDM available on request)

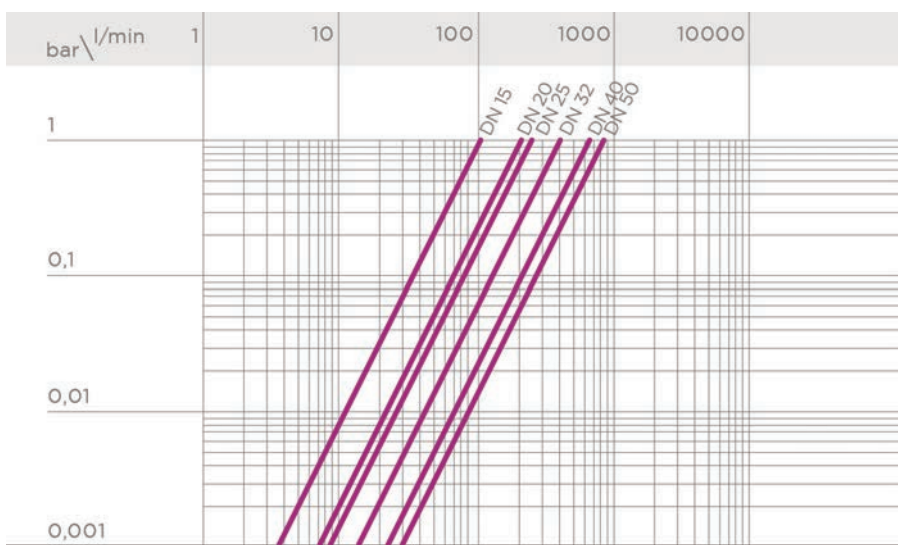
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).



## PRESSURE DROP GRAPH



## MINIMUM PRESSURE

Minimum sealing pressure (valve in horizontal position)

DN	15	20	25	32	40	50
bar	0,2	0,2	0,2	0,2	0,2	0,2

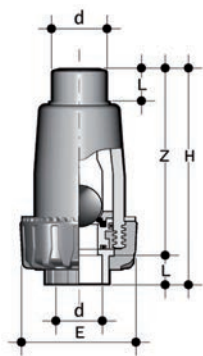
## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate  $\Delta p = 1$  bar pressure drop at a certain valve position. The K<sub>v</sub>100 values shown in the table are calculated with the valve completely open.

DN	15	20	25	32	40	50
Kv100 l/min	110	205	240	410	650	840

The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FiP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

# DIMENSIONS

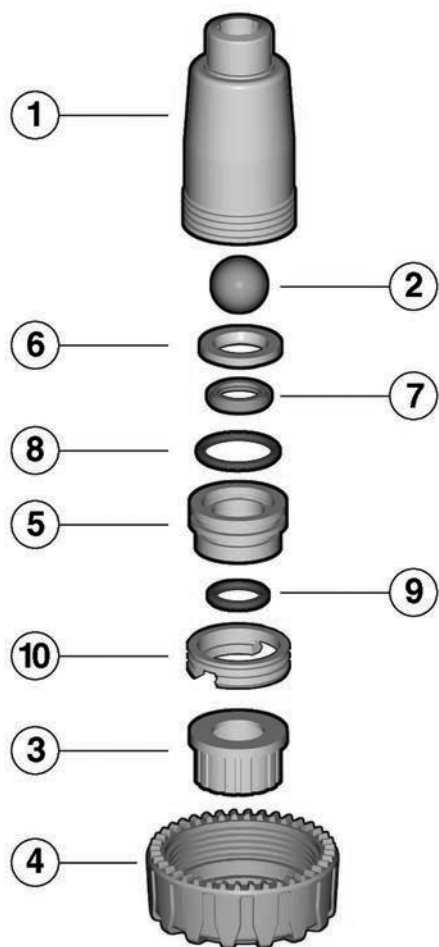


**SRIF**  
 Ball check valve with ends for socket welding, metric series

d	DN	PN	E	H	L	Z	g	Code
20	15	16	54	104	16	88	150	SRIF020F
25	20	16	65	125	19	106	260	SRIF025F
32	25	16	74	148	22	126	390	SRIF032F
40	32	16	86	171	26	145	600	SRIF040F
50	40	16	98	189	31	158	820	SRIF050F
63	50	16	119	222	38	184	1420	SRIF063F

# COMPONENTS

## EXPLODED VIEW



- 1 Body (PVDF - 1)
- 2 Ball (PVDF - 1)\*
- 3 End connector (PVDF - 1)\*

- 4 Union nut (PVDF - 1)\*
- 5 Support clip (PVDF - 1)
- 6 Ball seat (FKM - 1)\*

- 7 Gland packing ring (PVDF - 1)
- 8 Radial seal O-Ring (FKM - 1)\*
- 9 Socket seal O-Ring (FKM - 1)\*

\* Spare parts  
The material of the component and the quantity supplied are indicated between brackets

## DISASSEMBLY

- 1) Isolate the valve from the flow.
- 2) Unscrew the union nut (4).
- 3) Unscrew the carrier (5) using the VKD valve handle insert supplied; remove the gland packing ring (6) to access the ball seat (7).
- 4) Remove the ball (2) from inside the body (1).

## ASSEMBLY

- 1) Insert the ball (2) in the body (1).
- 2) Place the O-rings (9) and (8) in the carrier housings (5).
- 3) Place the seal (7) between the carrier (5) and the gland packing ring (6).
- 4) Screw the carrier (5) into the body (1) to limit stop, using the VKD valve handle insert supplied.
- 5) Insert the stub (3) and screw the union nut (4) making sure that the socket seal O-ring (9) does not exit its seat.



**Note:** maintenance operations can be carried out with the valve body installed. During assembly, it is advisable to lubricate the rubber seals. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

## INSTALLATION

- 1) The SR check valve can be installed on vertical or horizontal axis pipes.
- 2) Install the valve such that the arrow on the body indicates the direction of fluid flow.







# FK DN 40÷400

Butterfly valve



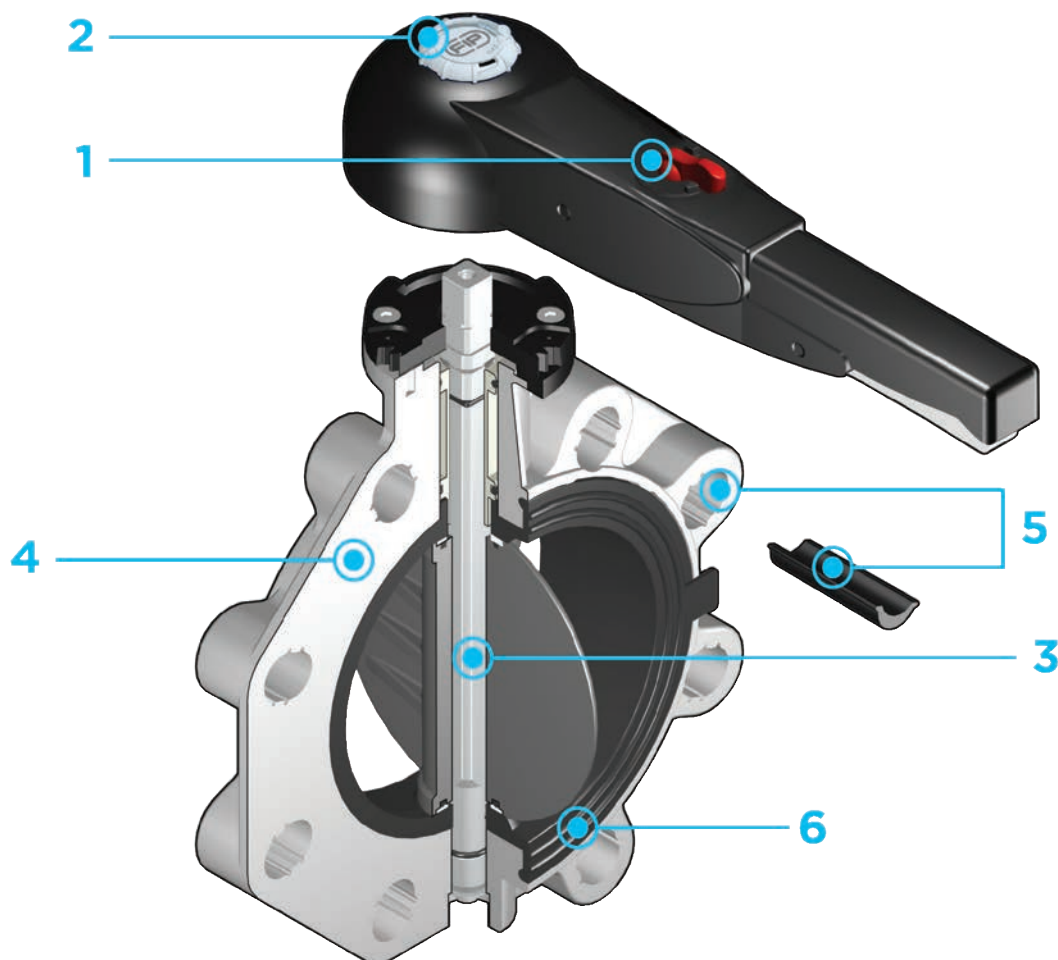
# FK DN 40÷400

The FK is a butterfly valve for shutting off or regulating flow, with structural characteristics that make it ideal for industrial applications requiring high performance and longterm reliability. This valve is also equipped with the customisable Labelling System.

## BUTTERFLY VALVE

- Interchangeable Disk in PVDF with through shaft, available in different thermo-plastic materials: PVC-U, PP-H, PVC-C, ABS
- Overall dimensions of the valve in accordance with standard ISO 5752 and EN 558-1 (DN 40÷65 and DN 250÷350 Long Series 16, DN 80÷200 Medium Series 25, DN 400 according to internal specifications)
- Can also be installed as an end line valve, bottom discharge valve or tank dump valve
- **Special Lug version** PN 10 fully drilled according to EN 1092-1 or ANSI B16.5 cl.150 with molded-in AISI 316 stainless steel threaded inserts
- Possibility of installing a manual reducer or pneumatic and/or electric actuators by applying an ISO standard drilling PP-GR flanges. DN 40 ÷ 200 valve equipped with plate with rack in PP-GR. For actuated versions with flange drilled according to ISO 5211 F05, F07, F10. DN 250÷300 valve, fitted with one-piece top flange in high mechanical strength PP-GR with mounting flange for internal components drilled according to standard ISO 5211 F10 (excluding DN 350÷400), F12, F14.
- Possibility to have handle with integrated LSQT limit micro switch, even as a retrofit in existing installations

Technical specifications	
Construction	Bi-directional centric butterfly valve
Size range	DN 40 ÷ 400
Nominal pressure	<b>Wafer version</b> <b>DN 40 ÷ 50:</b> PN 16 with water at 20° C <b>DN 65÷250:</b> PN 10 with water at 20° C <b>DN 300:</b> PN 8 with water at 20° C <b>DN 350:</b> PN 7 with water at 20° C <b>DN 400:</b> PN 6 with water at 20° C <b>Lug version</b> <b>DN 40÷200:</b> PN 10 with water at 20° C <b>DN 250÷300:</b> PN 6 with water at 20° C
Temperature range	0 °C ÷ 100 °C
Coupling standards	<b>Flanging system:</b> EN ISO 10931, ISO 9624, EN 1092-1, ASTM B16.5 Cl.150, JIS B2220
Reference standards	<b>Construction criteria:</b> EN ISO 16136, EN ISO 10931
	<b>Test methods and requirements:</b> ISO 9393
	<b>Actuator couplings:</b> ISO 5211
Valve material	<b>Body:</b> PP-GR <b>Disk:</b> PVDF <b>Stem:</b> STAINLESS steel AISI 316
Seal material	Liner: FKM. On request EPDM
Control options	Manual control (DN 40÷200); Gearbox, pneumatic actuator, electric actuator



**1 Ergonomic handle** in HIPVC equipped with **locking and unlocking device, release, quick operation and graduated adjustment** in 10 intermediate positions (DN 40÷200). The operating range, starting from the first few degrees of valve opening, also guarantees extremely low pressure drops.

**2 Customisable Labelling System:** integrated module in the handle, made of a transparent protection plug and a customisable tag holder using the LSE set (available as an accessory). The **customisation** lets you **identify the**

**valve on the system** according to specific needs.

**3 STAINLESS steel square section stem** completely isolated from the fluid complying with standard ISO 5211:  
 DN 40÷65: 11 mm  
 DN 80÷100: 14 mm  
 DN 125÷150: 17 mm  
 DN 200: 22 mm  
 DN 250÷400: 27 mm

**4 Body** in polypropylene based **compound reinforced with fibreglass (PP-GR)** **resistant to UV rays** and characterised by **high mechanical strength**.

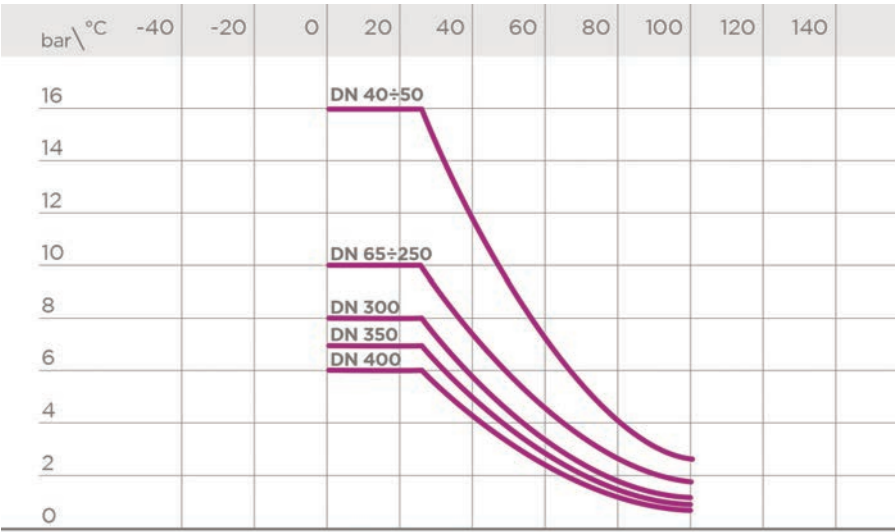
**5 Drilling pattern using oval slots** that allow coupling to flanges according to numerous international standards. The special **self-centring inserts in ABS** supplied for DN 40÷200 guarantee the **correct axial** alignment of the valve during installation. For DN 250÷400 valves, the drilling pattern for the selfcentring system is of the traditional type according to DIN and ANSI standards.

**6 Interchangeable liner** with the dual function of forming a hydraulic seal and isolating the body from the fluid.

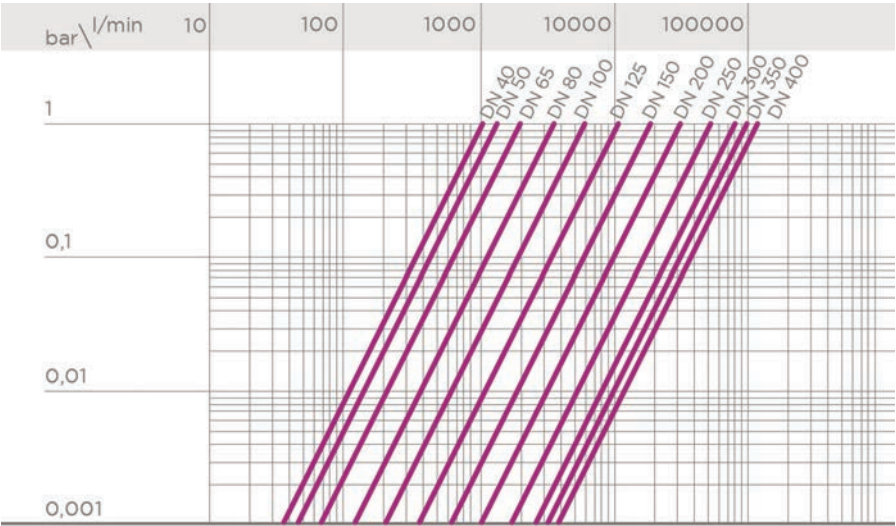
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and harmless fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal PN pressure is required (25 years with safety factor).



## PRESSURE DROP GRAPH



## K<sub>v</sub>100 FLOW COEFFICIENT DN 40÷200

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate Δp= 1 bar pressure drop at a certain valve position. The Kv100 values shown in the table are calculated with the valve completely open.

DN	40	50	65	80	100	125	150	200
Kv100 l/min	1000	1285	1700	3550	5900	9850	18700	30500

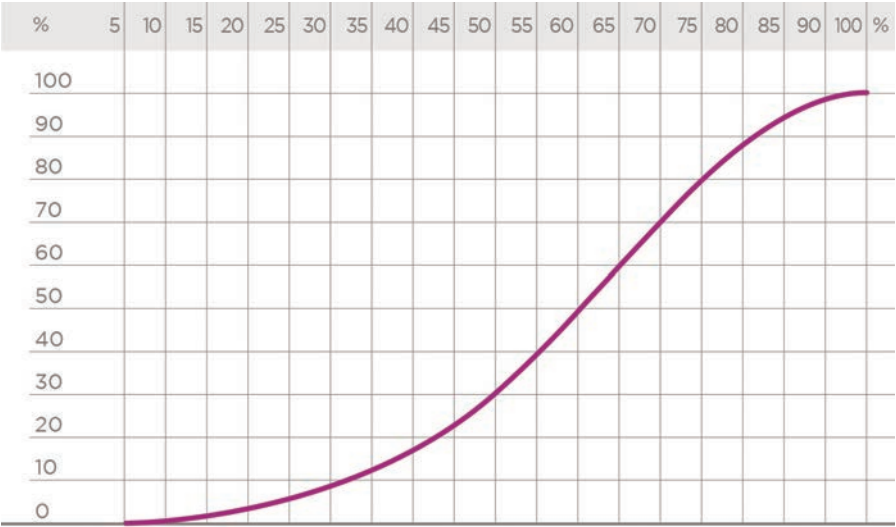
# K<sub>v</sub>100 FLOW COEFFICIENT DN 250÷400

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate Δp= 1 bar pressure drop at a certain valve position. The Kv100 values shown in the table are calculated with the valve completely open.

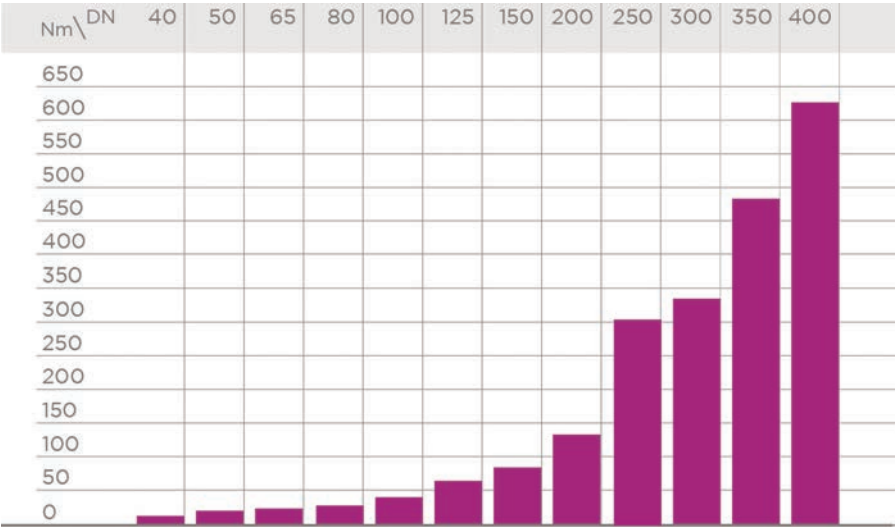
DN	250	300	350	400
Kv100 l/min	53200	81600	94100	124900

# RELATIVE FLOW COEFFICIENT GRAPH

The relative flow coefficient is the flow rate through the valve as a function of the degree of valve opening.  
Horizontal axis: Percentage opening of the disk  
Vertical axis: Relative flow coefficient

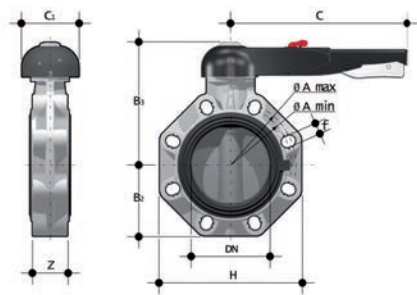


# OPERATING TORQUE AT MAXIMUM WORKING PRESSURE



The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

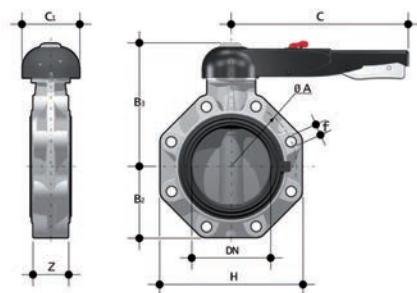
# DIMENSIONS



## FKOF/LM

Hand operated Butterfly valve

d - Size	DN	PN	A min	A max	B <sub>2</sub>	B <sub>3</sub>	C	C <sub>1</sub>	f	H	U	Z	g	FKM code
50 - 1 1/2"	40	16	99	109	60	137	175	100	19	132	4	33	1000	FKOFLM050F
63 - 2"	50	16	115	125,5	70	143	175	100	19	147	4	43	1180	FKOFLM063F
75 - 2 1/2"	65	10	128	144	80	164	175	110	19	165	4	46	1570	FKOFLM075F
90 - 3"	80	10	145	160	93	178	272	100	19	185	12	49	2020	FKOFLM090F
110 - 4"	100	10	165	190	107	192	272	110	19	211	8	56	2370	FKOFLM110F
140 - 5"	125	10	204	215	120	212	330	110	23	240	8	64	3300	FKOFLM140F
160 - 6"	150	10	230	242	134	225	330	110	23	268	8	70	4100	FKOFLM160F
225 - 8"	200	10	280	298	161	272	420	122	23	323	8	71	7050	FKOFLM225F

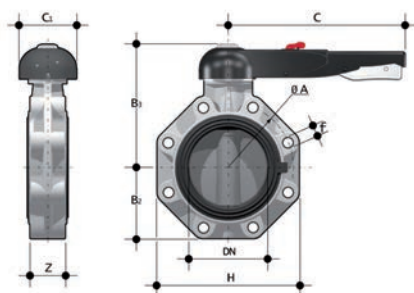


## FKOF/LM LUG ISO-DIN

Hand operated Butterfly valve, version Lug ISO-DIN

d	DN	PN	øA	B <sub>2</sub>	B <sub>3</sub>	C	C <sub>1</sub>	f	H	U	Z	g	FKM code
50	40	10	110	60	137	175	100	M16	132	4	33	1300	FKOLFLM050F
63	50	10	125	70	143	175	100	M16	147	4	43	1580	FKOLFLM063F
75	65	10	145	80	164	175	110	M16	165	4	46	1970	FKOLFLM075F
90	80	10	160	93	178	272	100	M16	185	12	49	2820	FKOLFLM090F
110	100	10	180	107	192	272	110	M16	211	8	56	3170	FKOLFLM110F
140	125	10	210	120	212	330	110	M16	240	8	64	4900	FKOLFLM140F
160	150	10	240	134	225	330	110	M20	268	8	70	5700	FKOLFLM160F
225	200	10	295	161	272	420	122	M20	323	8	71	8650	FKOLFLM225F

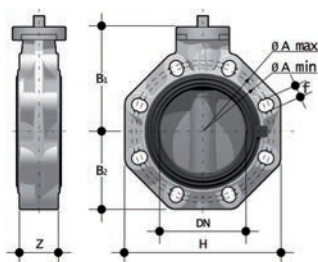




## FKOF/LM LUG ANSI

Hand operated Butterfly valve, version Lug ANSI

d	DN	PN	øA	B <sub>1</sub>	B <sub>2</sub>	C	C <sub>1</sub>	f	H	U	Z	g	FKM code
1" 1/2	40	10	98,4	106	60	175	100	1/2"	132	4	33	1300	FKOALFLM112F
2"	50	10	120,6	112	70	175	100	5/8"	147	4	43	1580	FKOALFLM200F
2" 1/2	65	10	139,7	119	80	175	110	5/8"	165	4	46	1970	FKOALFLM212F
3"	80	10	152,4	133	93	272	100	5/8"	185	12	49	2820	FKOALFLM300F
4"	100	10	190,5	147	107	272	110	5/8"	211	8	56	3170	FKOALFLM400F
5"	125	10	215,9	167	120	330	110	3/4"	240	8	64	4900	FKOALFLM500F
6"	150	10	241,3	180	134	330	110	3/4"	268	8	70	5700	FKOALFLM600F
8"	200	10	298,4	227	161	420	122	3/4"	323	8	71	8650	FKOALFLM800F



## FKOF/FM

Butterfly valve with bare shaft

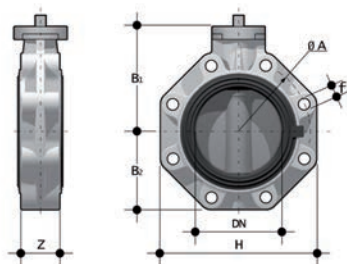
d - Size	DN	PN	A min	A max	øA	B <sub>1</sub>	B <sub>2</sub>	f	H	U	Z	g	FKM code
50 - 1"1/2	40	16	99	109	-	106	60	19	132	4	33	674	FKOFFM050F
63 - 2"	50	16	115	125,5	-	112	70	19	147	4	43	854	FKOFFM063F
75 - 2"1/2	65	10	128	144	-	119	80	19	165	4	46	1100	FKOFFM075F
90 - 3"	80	10	145	160	-	133	93	19	185	12	49	1550	FKOFFM090F
110 - 4"	100	10	165	190	-	147	107	19	211	8	56	1900	FKOFFM110F
140 - 5"	125	10	204	215	-	167	120	23	240	8	64	2750	FKOFFM140F
160 - 6"	150	10	230	242	-	180	134	23	268	8	70	3550	FKOFFM160F
225 - 8"	200	10	280	298	-	227	161	23	323	8	71	6300	FKOFFM225F
250	*250	10	-	-	350	248	210	22	405	12	114	13000	FKOFFM280F
280	*250	10	-	-	350	248	210	22	405	12	114	13000	FKOFFM280F
315	*300	8	-	-	400	305	245	22	475	12	114	21000	FKOFFM315F
10"	**250	10	-	-	362	248	210	25,4	405	12	114	13000	FKOAFM810F
12"	**300	8	-	-	432	305	245	25,4	475	12	114	21000	FKOAFM812F
355	*350	7	-	460	-	330	280	22	530	16	129	28395	FKOFFM355F
400	*400	6	-	515	-	350	306	26	594	16	169	37295	FKOFFM400F
14"	**350	7	-	476	-	330	280	28,5	530	12	129	28395	FKOAFM814F
16"	**400	6	-	540	-	350	306	28,5	594	16	169	37295	FKOAFM816F

FK suitable for flanged JIS K10 wafer installation is also available on request in the size 10" (DN250), 14" (DN350) and 16" (DN400).

\*ISO-DIN

\*\*ANSI B.16.5 150

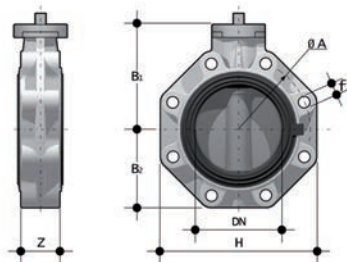
Note: EPDM, (d75-225) primary liner available



## FKOF/FM LUG ISO-DIN

Butterfly valve with bare shaft, version Lug ISO-DIN

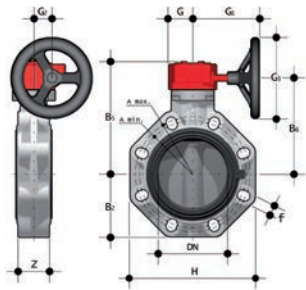
d	DN	PN	øA	B <sub>1</sub>	B <sub>2</sub>	f	H	U	Z	g	FKM code
50	40	10	110	106	60	M16	132	4	33	970	FKOLFFM050F
63	50	10	125	112	70	M16	147	4	43	1250	FKOLFFM063F
75	65	10	145	119	80	M16	165	4	46	1500	FKOLFFM075F
90	80	10	160	133	93	M16	185	12	49	2350	FKOLFFM090F
110	100	10	180	147	107	M16	211	8	56	2700	FKOLFFM110F
140	125	10	210	167	120	M16	240	8	64	4350	FKOLFFM140F
160	150	10	240	180	134	M20	268	8	70	5150	FKOLFFM160F
225	200	10	295	227	161	M20	323	8	71	7900	FKOLFFM225F
315	300	6	400	305	245	M20	475	12	114	25800	FKOLFFM315F



## FKOF/FM LUG ANSI

Butterfly valve with bare shaft, version Lug ANSI

d	DN	PN	øA	B <sub>1</sub>	B <sub>2</sub>	f	H	U	Z	g	FKM code
1" 1/2	40	10	98,4	106	60	1/2"	132	4	33	970	FKOALFFM112F
2"	50	10	125	112	70	5/8"	147	4	43	1250	FKOALFFM200F
2" 1/2	65	10	139,7	119	80	5/8"	165	4	46	1500	FKOALFFM212F
3"	80	10	152,4	133	93	5/8"	185	12	49	2350	FKOALFFM300F
4"	100	10	190,5	147	107	5/8"	211	8	56	2700	FKOALFFM400F
5"	125	10	215,9	167	120	3/4"	240	8	64	4350	FKOALFFM500F
6"	150	10	241,3	180	134	3/4"	268	8	70	5150	FKOALFFM600F
8"	200	10	298,4	227	161	3/4"	323	8	71	7900	FKOALFFM800F
10"	250	6	362	248	210	7/8"	405	12	114	17800	FKOALFFM810F
12"	300	6	431,8	305	245	7/8"	475	12	114	25800	FKOALFFM812F



## FKOF/RM

Gearbox operated Butterfly valve

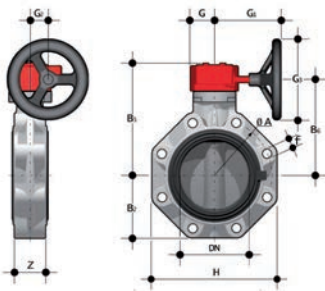
d - Size	DN	PN	A min	A max	øA	B <sub>2</sub>	B <sub>5</sub>	B <sub>6</sub>	G	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	f	U	Z	g	FKM code
75 - 2 1/2"	65	10	128	144	-	80	174	146	48	135	39	125	19	4	46	2500	FKOFRM075F
90 - 3"	80	10	145	160	-	93	188	160	48	135	39	125	19	12	49	3050	FKOFRM090F
110 - 4"	100	10	165	190	-	107	202	174	48	135	39	125	19	8	56	3300	FKOFRM110F
140 - 5"	125	10	204	215	-	120	222	194	48	144	39	200	23	8	64	4650	FKOFRM140F
160 - 6"	150	10	230	242	-	134	235	207	48	144	39	200	23	8	70	5450	FKOFRM160F
225 - 8"	200	10	280	298	-	161	287	256	65	204	60	200	23	8	71	9600	FKOFRM225F
*280	250	10	-	-	350	210	317	281	88	236	76	250	22	12	114	19600	FKOFRM280F
*315	300	8	-	-	400	245	374	338	88	236	76	250	29	12	114	27600	FKOFRM315F
**10"	250	10	-	-	362	210	317	281	88	236	76	250	25,4	12	114	19600	FKOAFRM810F
**12"	300	8	-	-	432	245	374	338	88	236	76	250	25,4	12	114	27600	FKOAFRM812F
*355	350	7	-	-	460	280	438	390	88	361	80	300	22	16	129	36845	FKOFRM355F
*400	400	6	-	-	515	306	438	390	88	361	80	300	26	16	169	45745	FKOFRM400F
**14"	350	7	-	-	460	280	438	390	88	361	80	300	28,5	16	129	36845	FKOAFRM814F
**16"	400	6	-	-	515	306	438	390	88	361	80	300	28,5	16	169	45745	FKOAFRM816F

FK suitable for flanged JIS K10 wafer installation is also available on request in the size 10" (DN250), 14" (DN350) and 16" (DN400).

\*ISO-DIN

\*\*ANSI B.16.5 150

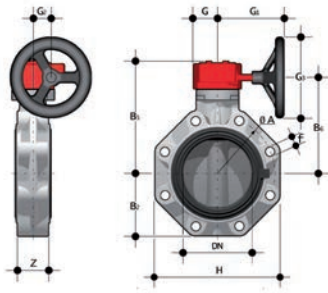
Note: EPDM, (d75-225) primary liner available



## FKOM/RM LUG ISO-DIN

Gearbox operated Butterfly valve, version Lug ISO-DIN

d	DN	PN	øA	B <sub>2</sub>	B <sub>5</sub>	B <sub>6</sub>	f	G	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	H	U	Z	g	FKM code
50	40	10	110	60	161	133	M16	48	135	39	125	132	4	33	2500	FKOLFRM050F
63	50	10	125	70	167	139	M16	48	135	39	125	147	4	43	2780	FKOLFRM063F
75	65	10	145	80	174	146	M16	48	135	39	125	165	4	46	2900	FKOLFRM075F
90	80	10	160	93	188	160	M16	48	135	39	125	185	12	49	3750	FKOLFRM090F
110	100	10	180	107	202	174	M16	48	135	39	125	211	8	56	4100	FKOLFRM110F
140	125	10	210	120	222	194	M16	48	144	39	200	240	8	64	6250	FKOLFRM140F
160	150	10	240	134	235	207	M20	48	144	39	200	268	8	70	7050	FKOLFRM160F
225	200	10	295	161	256	256	M20	65	204	60	200	323	8	71	11200	FKOLFRM225F
315	300	6	400	245	374	338	M20	88	236	76	250	475	12	114	32450	FKOLFRM315F

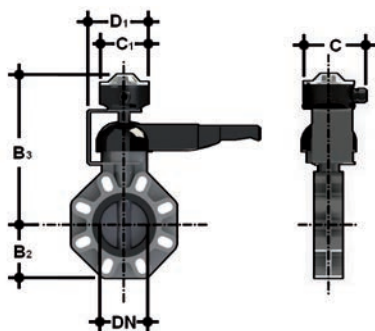


## FKOF/RM LUG ANSI

Gearbox operated Butterfly valve, version Lug ANSI

d	DN	PN	øA	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>	f	G	G <sub>1</sub>	G <sub>2</sub>	G <sub>3</sub>	H	U	Z	g	FKM code
1" 1/2	40	10	98,4	60	161	133	1/2"	48	135	39	125	132	4	33	2500	FKOALFRM112F
2"	50	10	125	70	167	139	5/8"	48	135	39	125	147	4	43	2780	FKOALFRM200F
2" 1/2	65	10	139,7	80	174	146	5/8"	48	135	39	125	165	4	46	2900	FKOALFRM212F
3"	80	10	152,4	93	188	160	5/8"	48	135	39	125	185	12	49	3750	FKOALFRM300F
4"	100	10	190,5	107	202	174	5/8"	48	135	39	125	211	8	56	4100	FKOALFRM400F
5"	125	10	215,9	120	222	194	3/4"	48	144	39	200	240	8	64	6250	FKOALFRM500F
6"	150	10	241,3	134	235	207	3/4"	48	144	39	200	268	8	70	7050	FKOALFRM600F
8"	200	10	298,4	161	287	256	3/4"	65	204	60	200	323	8	71	11200	FKOALFRM800F
10"	250	6	362	210	317	281	7/8"	88	236	76	250	405	12	114	24400	FKOALFRM810F
12"	300	6	431,8	245	374	338	7/8"	88	236	76	250	475	12	114	32450	FKOALFRM812F

# ACCESSORIES



## LS Quick Kit

The Limit Switch Quick Kit allows the fast and secure installation of the FIP LSQT module to the FK/LM valves. The kit can be assembled on the valve even if already installed on the system. For technical data of the LSQT box see FIP actuated valves catalogue.

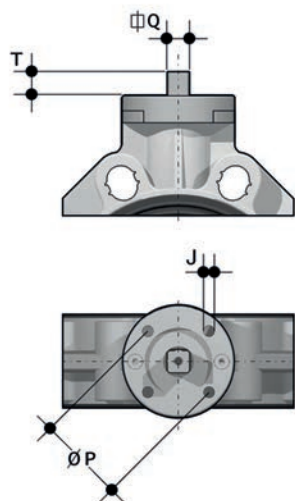
DN	B <sub>2</sub>	B <sub>3</sub>	C	C <sub>1</sub>	D <sub>1</sub>	Code
40	60	260,5	126,9	103	123,5	LSQKITFK5063
50	70	266,5	126,9	103	123,5	LSQKITFK5063
65	80	273,5	126,9	103	123,5	LSQKIT75160
80	93	287,5	126,9	103	123,5	LSQKIT75160
100	107	301,5	126,9	103	123,5	LSQKIT75160
125	120	321,5	126,9	103	123,5	LSQKIT75160
150	134	334,5	126,9	103	123,5	LSQKIT75160
200	161	385	126,9	103	129,8	LSQKIT225



## LSE

Customisation and label printing set for Easyfit handle made up of precut adhesive sheets and software for guided label creation.

DN	FE* - FK* code
40	LSE040
50	LSE040
65	LSE040
80	LSE040
100	LSE040
125	LSE040
150	LSE040
200	LSE040



## Actuator mounting flange

The valve can be equipped with standard pneumatic or electric actuators and gearbox for heavy-duty operations, using a flange in PP-GR reproducing the drilling pattern provided for by standard ISO 5211.

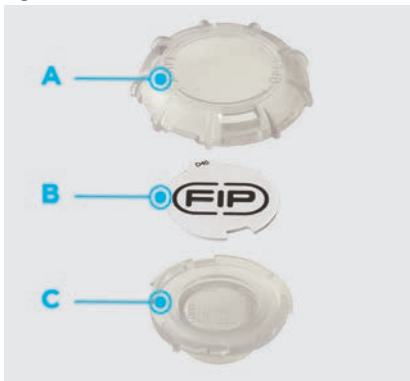
DN	J	P	Ø	T	Q
40	7	50	F 05	12	11
50	7	50	F 05	12	11
65	7/9	50/70	F 05/ F 07	12	11
80	9	70	F 07	16	14
100	9	70	F 07	16	14
125	9	70	F 07	19	17
150	9	70	F 07	19	17
200	11	102	F 10	24	22
200	11	102	F 10	24	22
250	11/13/17	102/125/140	F 10/ F 12/ F 14	29	27
300	11/13/17	102/125/140	F 10/ F 12/ F 14	29	27
350	14/18	125/140	F 12/ F 14	29	27
400	14/18	125/140	F 12/ F 14	29	27

# CUSTOMISATION

Fig. 1



Fig. 2



The FK valve is equipped with the customisable Labelling System.

This system lets you create special labels to insert in the handle. This makes it extremely easy to apply company logos, identification serial numbers or service indications such as, for example, the valve function in the system, the transported fluid, but also specific information for customer service, such as the customer name or installation date or location on the valves.

The specific LCE module is a standard supply and is made up of a rigid transparent water-resistant PVC plug (A-C) and white tag holder (B) made of the same material, one side of which bears the FIP logo (fig. 1).

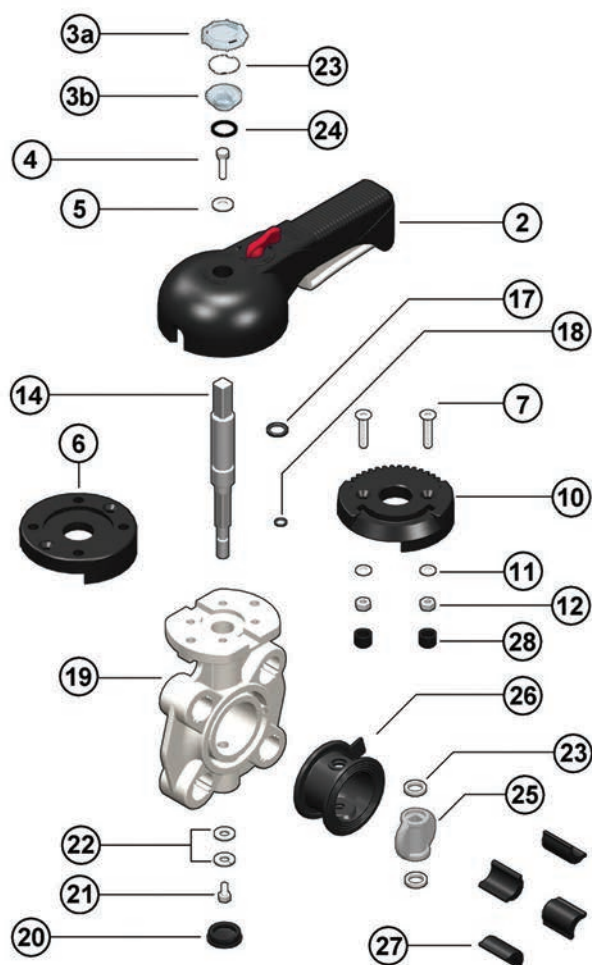
The tag holder, inserted in the plug, can be removed and, once overturned, used for customisation by applying labels printed with the software supplied with the LSE set.

Proceed as follows to apply the label on the valve:

- 1) Remove the upper part of the transparent plug (A) rotating it counter-clockwise as indicated by the word "Open" on the plug and remove it.
- 2) Extract the tag holder from its housing on the lower part of the plug (C).
- 3) Apply the adhesive label on the holder (B) to align the profiles matching the tab position.
- 4) Reinsert the tag holder in its housing at the bottom of the plug.
- 5) Reposition the top of the plug in the housing rotating it clockwise; this way the label is protected against the elements.

# COMPONENTS

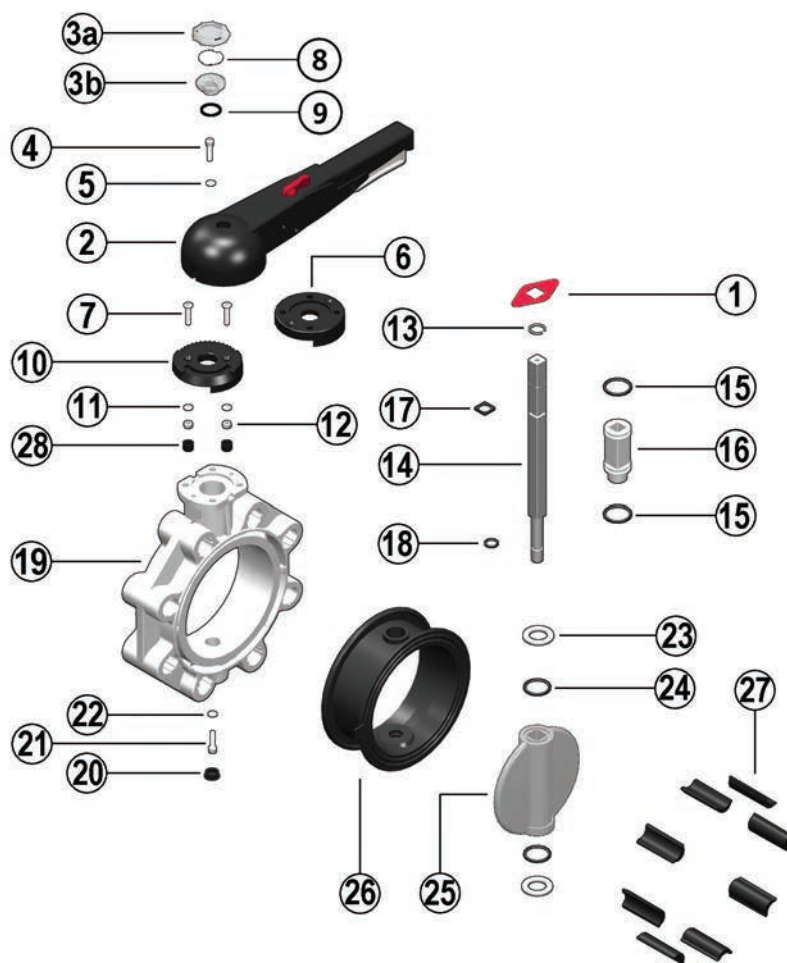
## EXPLODED VIEW DN 40÷65



- |   |  |   |
|---|--|---|
| <b>1</b> Position indicator (PA - 1)              | <b>8</b> Tag holder (PVC-U - 1)          | <b>20</b> Protection plug (PE - 1)      |
| <b>2</b> Handle (HIPVC - 1)                       | <b>9</b> O-Ring (NBR - 1)                | <b>21</b> Screw (STAINLESS steel - 1)   |
| <b>3a/b</b> Transparent protection plug (PVC - 1) | <b>10</b> Plate (PP-GR - 1)              | <b>22</b> Washer (STAINLESS steel - 2)  |
| <b>4</b> Fastening screw (STAINLESS steel - 1)    | <b>11</b> Washer (STAINLESS steel - 2)   | <b>23</b> Anti-friction ring (PTFE - 2) |
| <b>5</b> Washer (STAINLESS steel - 1)             | <b>12</b> Nut (STAINLESS steel - 2)      | <b>25</b> Disk (PVDF - 1)               |
| <b>6</b> Flange (PP-GR - 1)                       | <b>14</b> Stem (STAINLESS steel 316 - 1) | <b>26</b> Liner (FKM - 1)               |
| <b>7</b> Screw (STAINLESS steel - 2)              | <b>17</b> Stem O-Ring (FKM - 1)          | <b>27</b> Inserts (ABS - 4-8)           |
|   | <b>18</b> Stem O-Ring (FKM - 1)          | <b>28</b> Plug (PE - 2)                 |
|   | <b>19</b> Body (PP-GR - 1)               |   |

The component material and quantity supplied are indicated in the parentheses.

## EXPLODED VIEW DN 80÷200

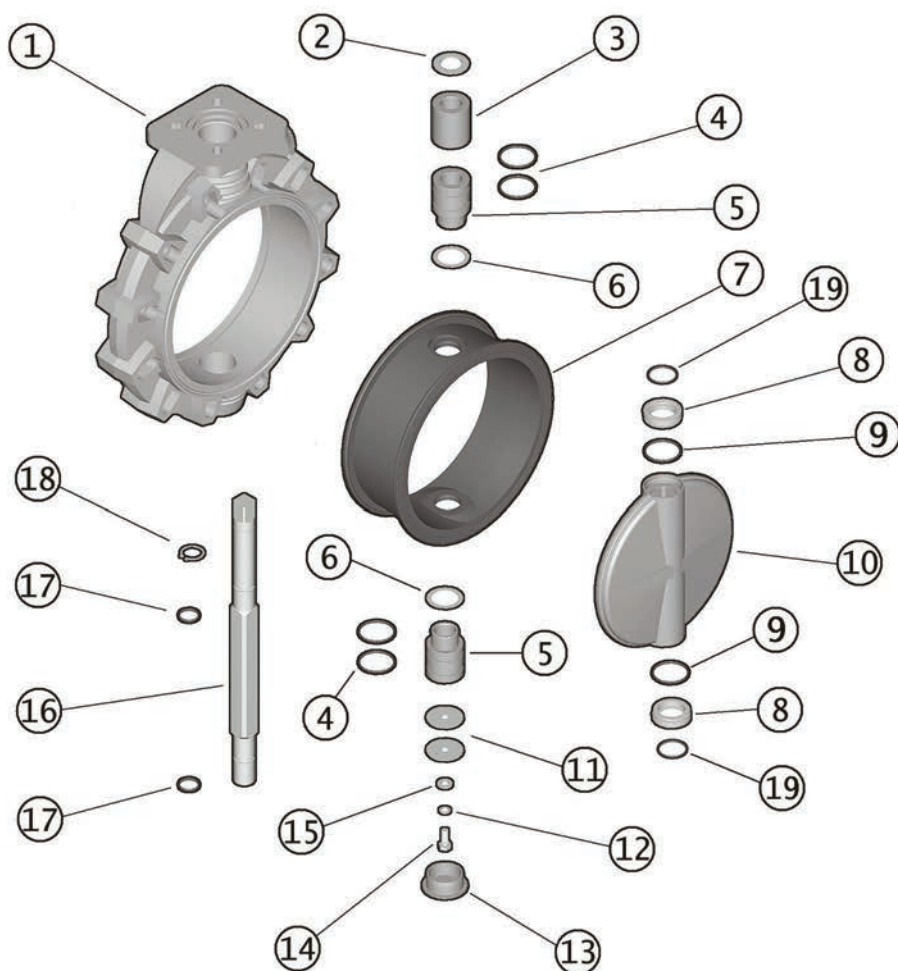


- |   |   |   |
|---|---|---|
| <b>1</b> Position indicator (PA - 1)              | <b>9</b> O-Ring (NBR - 1)                   | <b>19</b> Body (PP-GR - 1)              |
| <b>2</b> Handle (HIPVC - 1)                       | <b>10</b> Plate (PP-GR - 1)                 | <b>20</b> Protection plug (PE - 1)      |
| <b>3a/b</b> Transparent protection plug (PVC - 1) | <b>11</b> Washer (STAINLESS steel - 2)      | <b>21</b> Screw (STAINLESS steel - 1)   |
| <b>4</b> Fastening screw (STAINLESS steel - 1)    | <b>12</b> Nut (STAINLESS steel - 2)         | <b>22</b> Washer (STAINLESS steel - 2)  |
| <b>5</b> Washer (STAINLESS steel - 1)             | <b>13</b> Seeger ring (STAINLESS steel - 1) | <b>23</b> Anti-friction ring (PTFE - 2) |
| <b>6</b> Flange (PP-GR - 1)                       | <b>14</b> Stem (STAINLESS steel 316 - 1)    | <b>24</b> Disk O-Ring (FKM - 2)         |
| <b>7</b> Screw (STAINLESS steel - 2)              | <b>15</b> Bush O-Ring (FKM - 2)             | <b>25</b> Disk (PVDF - 1)               |
| <b>8</b> Tag holder (PVC-U - 1)                   | <b>16</b> Bush (Nylon - 1)                  | <b>26</b> Liner (FKM - 1)               |
|   | <b>17</b> Stem O-Ring (FKM - 1)             | <b>27</b> Inserts (ABS - 4-8)           |
|   | <b>18</b> Stem O-Ring (FKM - 1)             | <b>28</b> Plug (PE - 2)                 |

The component material and quantity supplied are indicated in the parentheses.



## EXPLODED VIEW DN 250÷300



- |                                       |  |   |
|---------------------------------------|--|---|
| <b>1</b> Body (PP-GR - 1)             | <b>8</b> Anti-friction ring (PTFE - 2) | <b>15</b> Washer (STAINLESS steel - 1)      |
| <b>2</b> Washer (STAINLESS steel - 1) | <b>9</b> Disk O-Ring (FKM - 2)         | <b>16</b> Stem (STAINLESS steel 316 - 1)    |
| <b>3</b> Bush (PP - 1)                | <b>10</b> Disk (PVDF - 1)              | <b>17</b> Stem O-Ring (FKM - 2)             |
| <b>4</b> Bush O-Ring (FKM - 4)        | <b>11</b> Washer (STAINLESS steel - 2) | <b>18</b> Seeger ring (STAINLESS steel - 1) |
| <b>5</b> Bush (PVDF - 2)              | <b>12</b> Washer (STAINLESS steel - 1) | <b>19</b> O-Ring (FKM - 2)                  |
| <b>6</b> Washer (PTFE - 2)            | <b>13</b> Protection plug (PE - 1)     |   |
| <b>7</b> Liner (FKM - 1)              | <b>14</b> Screw (STAINLESS steel - 1)  |   |

The component material and quantity supplied are indicated in the parentheses.

## EXPLODED VIEW DN 350÷400



- |  |  |   |
|--|--|---|
| <b>1</b> Body (PP-GR - 1)              | <b>8</b> Anti-friction ring (PTFE - 2) | <b>16</b> Stem (STAINLESS steel 316 - 1)    |
| <b>2</b> Washer (STAINLESS steel - 1)  | <b>9</b> Disk O-Ring (FKM - 2)         | <b>17</b> Stem O-Ring (FKM - 2)             |
| <b>3</b> Bush (PP-H - 1)               | <b>10</b> Disk (PVDF - 1)              | <b>18</b> Seeger ring (STAINLESS steel - 1) |
| <b>4</b> Bush O-Ring (EPDM or FKM - 6) | <b>11</b> Washer (STAINLESS steel - 1) | <b>20</b> Gearbox (Al, Steel - 1)           |
| <b>5</b> Bush (PP-H - 1)               | <b>12</b> Washer (STAINLESS steel - 1) | <b>21</b> Pin (STAINLESS steel - 2)         |
| <b>6</b> Washer (PP-H - 2)             | <b>13</b> Protection plug (PE - 1)     | <b>22</b> Washer (STAINLESS steel - 1)      |
| <b>7</b> Liner (FKM - 1)               | <b>14</b> Screw (STAINLESS steel - 1)  | <b>23</b> Position indicator (PA - 1)       |

The component material and quantity supplied are indicated in the parentheses.

## DISASSEMBLY

### DN 40÷200

- 1) Remove the LCE module consisting of the rigid transparent PVC plug (3a-3b) and white tag holder (8) and remove screw (2) and washer (3) (fig.3).
- 2) Remove the handle (2).
- 3) Remove the screws (7) and plate (10) from the body (19).
- 4) Remove the protection plug (20) and screw (21) with the washer (22).
- 5) Extract the stem (14) and disk (25).
- 6) Remove the anti-friction rings (23) and (DN 65÷200 only) O-Rings (24).
- 7) Remove the liner (26) from the body (19).
- 8) Remove the Seeger ring (13) and (DN 65÷200 only) guide bush (16).
- 9) Remove (DN 65÷200 only) the O-Rings (15) and (17, 18).

### DN 250÷300

- 1) Remove the protection plug (13) and screw (14) with the washers (11-15).
- 2) Extract the stem (16) and disk (10).
- 3) Remove the seal (7) from the body (1).
- 4) Remove the Seeger ring (18) and guide bushes (5-3) with washer (2).
- 5) Extract the lower bush (5).
- 6) Remove O-Rings (4) and (17).

### DN 350÷400

- 1) Remove the position indicator (23) from the stem (16).
- 2) Remove the protection plug (13) from the body (1).
- 3) Remove the screw (14) and the washers (11) and (22).
- 4) Extract the stem unit (16) from the disk.
- 5) Extract the lower bush unit (5) from the lower part of the body (1).
- 6) Remove the disk unit (10) from the body (1).

## ASSEMBLY

### DN 40÷200

- 1) Place the liner (26) on the body (19).
- 2) Insert the O-Rings (17) and (18) on the stem (14).
- 3) Insert the O-Rings (15) on the guide bush (16) and the bush on the stem. Lock the bush using the Seeger ring (13).
- 4) Position the O-Rings (24) and then the anti-friction rings (23) on the disk (25) and the disk inside the body, after having lubricated the liner (26).
- 5) Insert the through stem (14) in the body (19) and disk (25).
- 6) Tighten screw (21) with washer (22) and insert the protection plug (20).
- 7) Position the plate (10) on the body (19) and tighten screws (7).
- 8) Position the handle (2) on the stem (14).
- 9) Tighten screw (4) with washer (5) and replace the LCE module consisting of the rigid transparent PVC plug (3a-3b) and white tag holder (8).

### DN 250÷300

- 1) Place the liner (7) on the body (1).
- 2) Insert the O-Rings (4) and washer (6) on bushes (5).
- 3) Insert the O-Rings (17) on the stem (16); insert the upper bush (5), bush (3), washer (2) on the stem and fix them with Seeger ring (18).
- 4) Insert the seals (19-9) on the antifriction rings (8).
- 5) Position the washers (8) in the housings on the disk (10), and the disk inside the body (1) after having lubricated the liner (7).
- 6) Insert the through stem (16) in the body and disk.
- 7) Position the lower bush (5) from below.
- 8) Tighten screws (14) with washers (11-15) and insert the protection plug (13).

## DN 350÷400

- 1) Insert the lower bush (5) complete with O-rings (4) on the body (1), subsequently inserting the gland packing washer (6) between the bush and the body.
- 2) Insert the second gland packing washer (6) on the liner (7) and fit these inside the body (1).
- 3) Insert the O-rings (9) and anti-friction rings (8) on the disks (10).
- 4) Lubricate the disk (10) and insert it into the liner (7).
- 5) Insert the upper bush complete with O-rings (3 + 4) on the stem (16) joined to the O-rings (17); insert the washer (2) above the upper bush (3) and insert Seeger ring (18) in the appropriate housing on the stem (16). Insert this unit in the body's upper hole (1).
- 6) Overlap washer (22) on washer (11) equipped with pins (21), and insert this unit on the lower part of the stem (16), fastening it with screw (14) and locking washer (12).
- 7) Insert the protection plug (13) on the body (1).
- 8) Insert the position indicator (23) on the upper part of the stem (16).



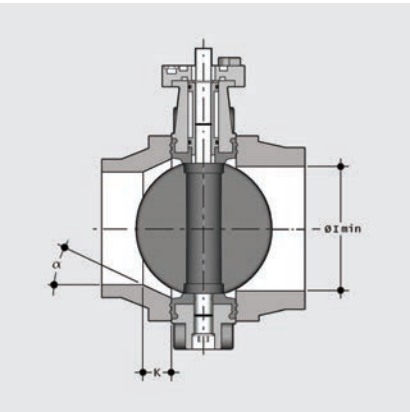
**Note:** during assembly operations, it is advisable to lubricate the rubber seals. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Fig. 3



# INSTALLATION

## JOINTS



Before proceeding with the installation of the stubs, check that the bore of the fittings has sufficient clearance to allow the valve disk to open correctly. Also check the maximum coupling distance for the liner. Before proceeding with the installation of the FK valve, check that the bore of the stub allows the correct opening of the disk.

DN	l min.
40	25
50	28
65	47
80	64
100	84
125	108
150	134
200	187
250	225
300	280
350	324
400	362

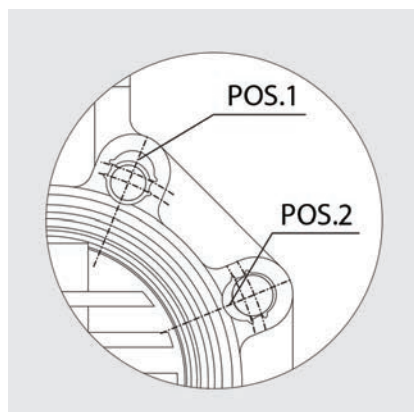
## PP-PE STUBS

For the installation of PP-PE stubs, for butt welding a short spigot or electrofusion/butt welding a long spigot, check the valve-stub-flange couplings and the K – a chamfer dimensions where necessary according to the different SDR's in the following table.

	d	DN	50	63	75	90	110	125	140	160	180	200	225	250	280	315	355	400
			40	50	65	80	100	100	125	150	150	200	200	250	250	300	350	400
FK	50	40																
	63	50																
	75	65																
	90	80																
	110	100																
	140	125																
	160	150																
	225	200																
	280	250																
	315	300																
	355	350																
	400	400																
SDR	17/17,6											k=26,5 a=20°		k=15,7 a=25°		k=13,3 a=25°	k=45 a=25°	k=55 a=25°
	11									k=35 a=20°		k=35 a=25°	k=40 a=15°	k=32,5 a=25°	k=35 a=25°	k=34,5 a=25°	k=55 a=25°	k=80 a=25°
	7,4					k=10 a=35°	k=15 a=35°		k=20 a=30°	k=35 a=20°	k=15 a=35°	k=40 a=20°	k=35 a=30°	k=55 a=30°	k=35 a=30°	k=65 a=30°		
	33																k=17 a=30°	k=25 a=35°

Short/long spigot stubs according to EN ISO 15494

## POSITIONING THE INSERTS



Place the inserts in the holes according to the positions indicated in the table, from the side corresponding to the letters D and DN in order to facilitate the insertion of the stud-bolts and the coupling with the flanges (DN 40 ÷ 200). The self-centring inserts must be inserted in the guides in the slots in the valve body on the side with the writing, with the writing facing upwards, and positioned according to the type of flange drilling, as indicated in the following table:

DN	EN1092-1	EN1092-1 EN ISO15493	BS 10 table A-D-E Spec D-E	ANSI B16.5 cl.150*	JIS B 2220 K5	JIS 2211 K10**
40	Pos.1	Pos. 2	Pos. 1	Pos. 1	Pos. 1	-
50	Pos.1	Pos. 2	Pos. 1	-	N/A	-
65	Pos.1	Pos. 2	Pos. 1	Pos. 2	Pos. 1	Pos. 2
80	Pos.1	Pos. 2	Pos. 1	Pos. 2	Pos. 1	Pos. 1
100	Pos.1	Pos. 2	Pos. 1	Pos. 2	Pos. 1	Pos. 1
125	Pos.1	Pos. 2	Pos. 1	Pos. 2	Pos. 1	-
150	Pos.1	Pos. 2	Pos. 1	Pos. 2	Pos. 1	Pos. 2
200	Pos.1	PN 10 Pos. 2	Pos. 2	Pos. 2	Pos. 1	N/A

\* DN 50 without inserts

\*\* DN 40, 50, 125 without inserts

## POSITIONING THE VALVE

Position the valve between two flanged stubs, taking care to respect the installation tolerances Z. It is advisable to always install the valve with the disk partially closed (it must not exit the body) and avoid any misalignment of the flanges, as this would cause

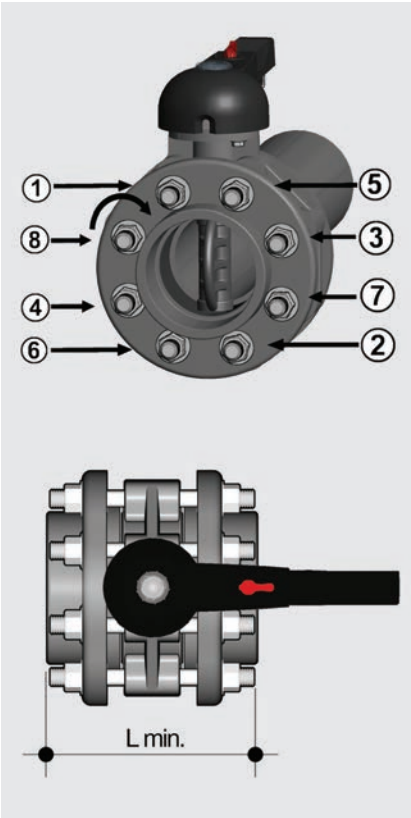
leaks. Where possible comply with the following requirements:

- Conveying dirty fluids: position the valve with the stem inclined at an angle of 45° to the pipe support plane.
- Conveying fluids with sediment: position the valve with the stem parallel to the pipe support plane.
- Conveying clean fluids: position the valve with the stem perpendicular to the pipe support plane.

## JIS FLANGED OPTIONS

FK suitable for flanged JIS K10 wafer installation is also available on request in the size 10" (DN250), 14" (DN350) and 16" (DN400) and in JIS K5 in the size of 10" (DN250) and 12" (DN300)

## TIGHTENING THE STUD-BOLTS



Before tightening the stud-bolts, it is advisable to open the disk in order to prevent damage to the seal. Tighten the stud-bolts in a uniform manner, in the order indicated in the figure, to the nominal operating torque value indicated in the table. The stud-bolts do not need to be excessively tightened in order to produce a perfect hydraulic seal. Overtightening could adversely affect the operating torque of the valve.

DN	L min.	*Nm
40	M16 x 150	9
50	M16 x 150	12
65	M16 x 170	15
80	M16 x 180	18
100	M16 x 180	20
125	M16 x 210	35
150	M20 x 240	40
200	M20 x 260	55
250	M20 x 310	70
300	M20 x 340	70
350	M20 x 360	75
400	M24 x 420	75

\* Tightening torques for nuts and bolts on couplings with backing rings.

Values required to obtain the hydraulic test seal (1.5xPN at 20°C) (new or lubricated nuts and bolts)

## HANDLE LOCK



Thanks to the multifunctional handle and the red manoeuvre button on the lever, you can perform a 0°-90° operation and a graduated operation by means of the 10 intermediate positions and a stop lock: the handle can be locked in each of the 10 positions by simply pressing the Free-lock button. A lock can also be installed on the handle to protect the system against tampering. The valve is two-way and can be installed in any position. It can also be installed at end line or tank.







# DK DN 15÷65



DIALOCK® 2-way diaphragm valve



# DK DN 15÷65

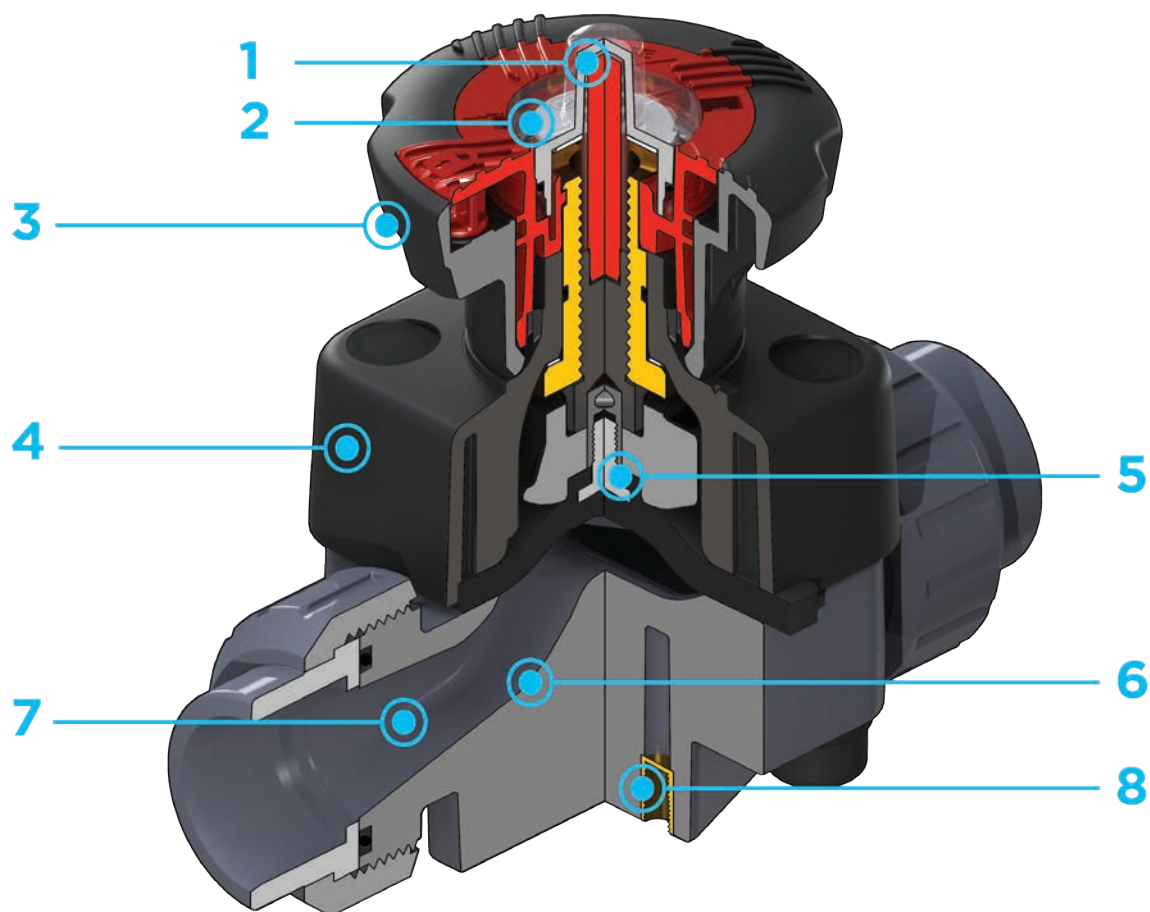
The DK DIALOCK® diaphragm valve is particularly suitable for shutting off and regulating abrasive or dirty fluids. The new internal geometry of the body increases flow coefficient, reduce pressure drop and allows a sensitive and precise adjustment along the entire stroke of the shutter. The DK is extremely compact and very light. The innovative handwheel is equipped with a patented immediate and ergonomic operating locking device that allows it to be adjusted and locked in any position.

**Dialock®**

## DIALOCK® 2-WAY DIAPHRAGM VALVE

- Connection system for solvent weld, threaded and flanged joints
- **Optimised fluid dynamic design:** maximum output flow rate thanks to the optimised efficiency of the fluid dynamics that characterise the new internal geometry of the body
- **Internal components in metal, totally isolated from the fluid** and external environment
- **Modularity of the range:** only 2 handwheel and 4 diaphragm and bonnet sizes for 7 different valve sizes
- Non-rising handwheel that stays at the same height during rotation, equipped with a graduated optical indicator protected by a transparent PVC cap with seal O-Ring
- Bonnet fastening screws in stainless steel protected against the external environment by PE plugs. Absence of metal parts exposed to the external environment to prevent any risk of corrosion
- **New flanged bodies:** the new bodies, characterised by a monolithic flanged structure, are available in PVC-U, PVC-C, PP-H and PVDF. This design, free from body and flange joints, greatly reduces mechanical stress and increases system performance.
- **CDSA** (Circular Diaphragm Sealing Angle) system that, thanks to the uniform distribution of shutter pressure on the diaphragm seal, offers the following advantages:
  - reduction in the tightening torque of the screws fixing the actuator to the valve body
  - reduced mechanical stress on all valve components (actuator, body and diaphragm)
  - easy to clean valve interior
  - low risk of the accumulation of deposits, contamination or damage to the diaphragm due to crystallisation
  - operating torque reduction

Technical specifications	
Construction	Diaphragm valve with maximized flow rate and DIALOCK® lockable handwheel
Size range	DN 15 ÷ 65
Nominal pressure	PN 10 with water at 20° C
Temperature range	-20 °C ÷ 120 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931. <b>Flanging system:</b> ISO 9624, EN 10931, EN 558-1, EN 1092-1, ANSI B.16.5 cl.150
Reference standards	<b>Construction criteria:</b> EN ISO 16138, EN ISO 10931 <b>Test methods and requirements:</b> ISO 9393 <b>Installation criteria:</b> DVS 2202-1, DVS 2207-15, DVS 2208-1
Valve material	<b>Body:</b> PVDF <b>Bonnet and handwheel:</b> PP-GR <b>Position indicator cap:</b> PVC
Seal material	EPDM, FKM, PTFE
Control options	Manual control; pneumatic actuator



**1 High visibility graduated optical position indicator** protected by a transparent cap with seal O-Ring

**2 Customisation plate:** the customisation lets you identify the valve on the system according to specific needs

**3 DIALOCK® SYSTEM:** innovative handwheel with a patented immediate and ergonomic operating locking device that allows it **to be adjusted and locked in over 300 positions**

**4 Handwheel and bonnet in** high mechanical strength and chemically resistant **PP-GR**, providing full protection **by isolating** all internal metal parts from contact with external agents

**5 Floating pin connection** between the control screw and diaphragm to prevent concentrated loads, improve the seal and extend its lifetime

**6 New design of valve body interior:** **substantially increased flow coefficient** and reduced pressure drop. The degree of efficiency

reached has also enabled **the size and weight** of the valve to be **reduced**

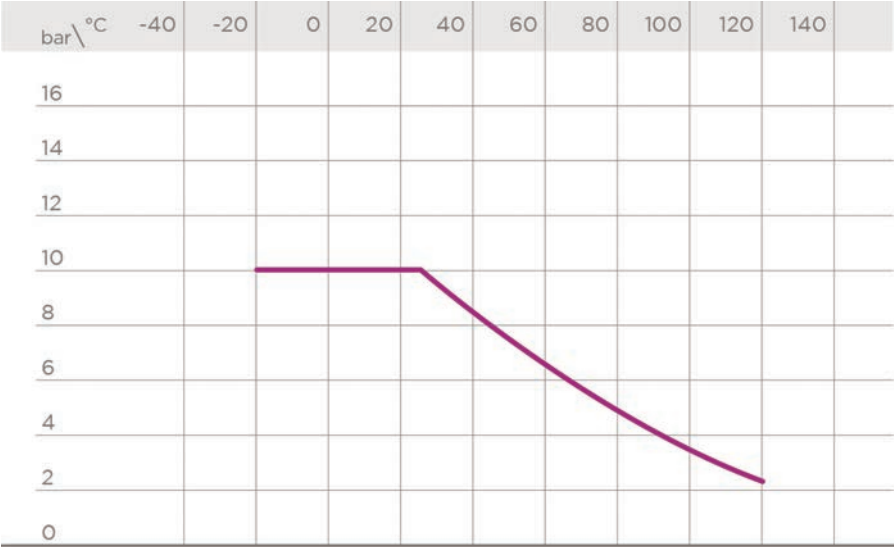
**7 Adjustment linearity:** the internal profiles of the valve also greatly improve its characteristic curve, resulting in **extremely sensitive and precise adjustment** along the entire stroke of the shutter

**8 Valve anchoring bracket integrated in the body**, with threaded metal inserts allowing **simple panel or wall mounting** using the PMDK mounting plate (supplied as an accessory)

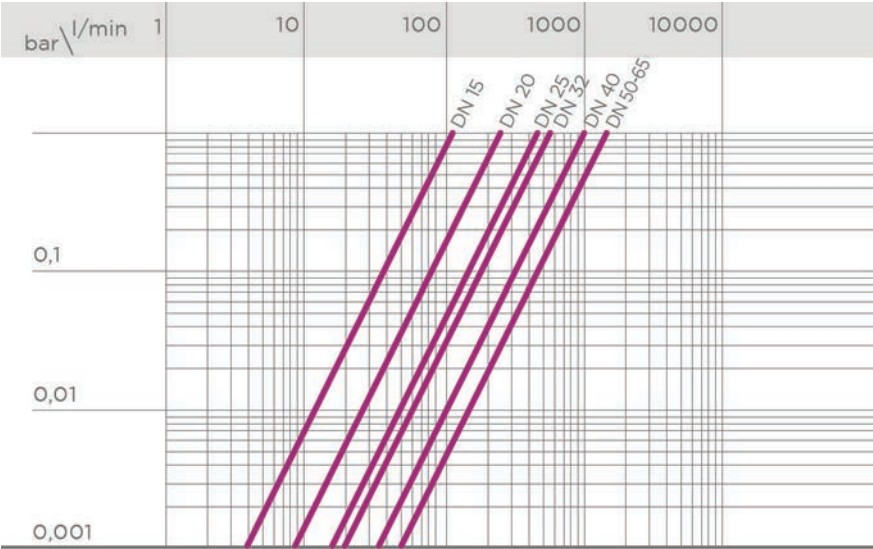
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids with regard to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).



## PRESSURE DROP GRAPH



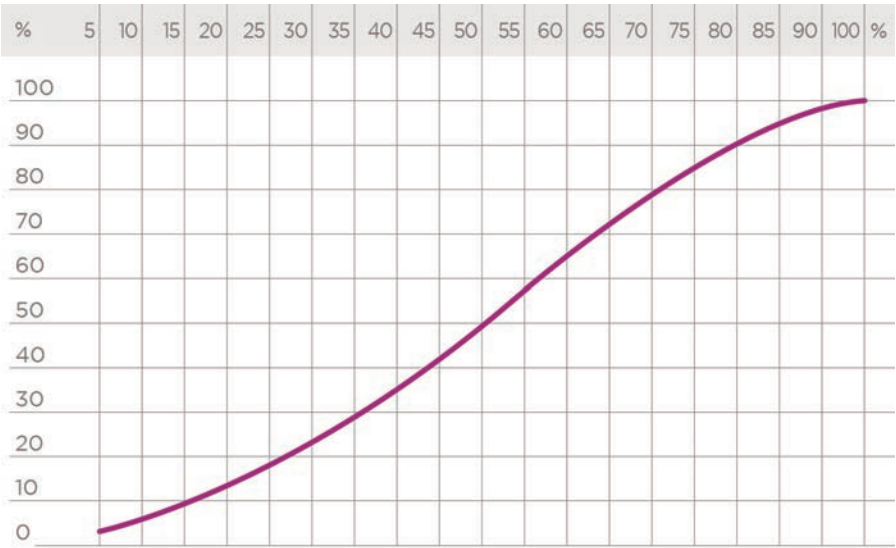
## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate Δp= 1 bar pressure drop at a certain valve position. The Kv100 values shown in the table are calculated with the valve completely open.

DN	15	20	25	32	40	50	65
Kv100 l/min	112	261	445	550	1087	1648	1600

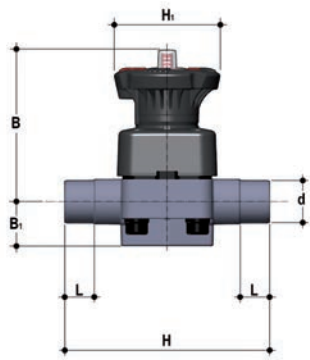
# RELATIVE FLOW COEFFICIENT GRAPH

The relative flow coefficient is the flow rate through the valve as a function of the degree of valve opening.  
Horizontal axis: Opening percentage of the valve  
Vertical axis: Relative flow coefficient



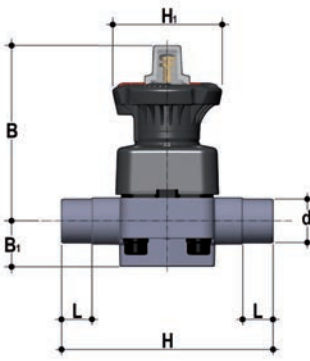
The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

# DIMENSIONS



**DKDF**  
DIALOCK® diaphragm valve with male ends for socket welding, metric series

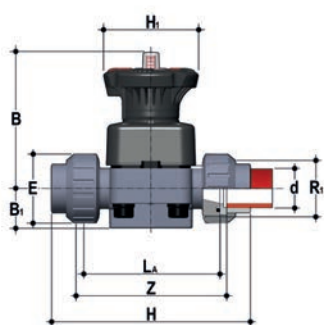
d	DN	PN	B	B <sub>1</sub>	H	H <sub>1</sub>	L	g	EPDM code	FKM code	PTFE code
20	15	10	102	25	124	80	16	497	DKDF020E	DKDF020F	DKDF020P
25	20	10	105	30	144	80	19	527	DKDF025E	DKDF025F	DKDF025P
32	25	10	114	33	154	80	22	756	DKDF032E	DKDF032F	DKDF032P
40	32	10	119	30	174	80	26	817	DKDF040E	DKDF040F	DKDF040P
50	40	10	149	35	194	120	31	1700	DKDF050E	DKDF050F	DKDF050P
63	50	10	172	46	224	120	38	2693	DKDF063E	DKDF063F	DKDF063P
75	65	10	172	46	284	120	44	2871	DKDF075E	DKDF075F	DKDF075P



**DKLDF**  
DIALOCK® diaphragm valve with stroke limiter and male ends for socket welding, metric series

d	DN	PN	B	B <sub>1</sub>	H	H <sub>1</sub>	L	g	EPDM code	FKM code	PTFE code
20	15	10	115	25	124	80	16	527	DKLDF020E	DKLDF020F	DKLDF020P
25	20	10	118	30	144	80	19	557	DKLDF025E	DKLDF025F	DKLDF025P
32	25	10	127	33	154	80	22	786	DKLDF032E	DKLDF032F	DKLDF032P
40	32	10	132	30	174	80	26	847	DKLDF040E	DKLDF040F	DKLDF040P
50	40	10	175	35	194	120	31	1760	DKLDF050E	DKLDF050F	DKLDF050P
63	50	10	200	46	224	120	38	2753	DKLDF063E	DKLDF063F	DKLDF063P
75	65	10	200	46	284	120	44	2931	DKLDF075E	DKLDF075F	DKLDF075P

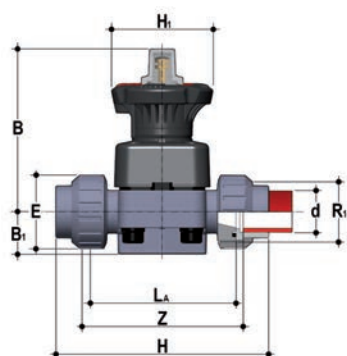




## DKUIF

DIALOCK® diaphragm valve with female union ends for socket welding, metric series

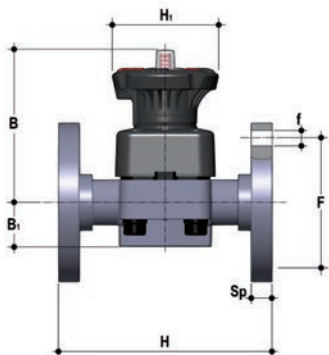
d	DN	PN	B	B <sub>1</sub>	E	H	H <sub>t</sub>	La	R <sub>1</sub>	Z	g	EPDM code	FKM code	PTFE code
20	15	10	102	25	41	129	80	90	1"	100	551	DKUIF020E	DKUIF020F	DKUIF020P
25	20	10	105	30	50	154	80	108	1 1/4"	116	636	DKUIF025E	DKUIF025F	DKUIF025P
32	25	10	114	33	58	168	80	116	1 1/2"	124	905	DKUIF032E	DKUIF032F	DKUIF032P
40	32	10	119	30	72	192	80	134	2"	140	1077	DKUIF040E	DKUIF040F	DKUIF040P
50	40	10	149	35	79	222	120	154	2 1/4"	160	1989	DKUIF050E	DKUIF050F	DKUIF050P
63	50	10	172	46	98	266	120	184	2 3/4"	190	3235	DKUIF063E	DKUIF063F	DKUIF063P



## DKLUIF

DIALOCK® diaphragm valve with stroke limiter and female union ends for socket welding, metric series

d	DN	PN	B	B <sub>1</sub>	E	H	H <sub>t</sub>	La	R <sub>1</sub>	Z	g	EPDM code	FKM code	PTFE code
20	15	10	115	25	41	129	80	90	1"	100	581	DKLUIF020E	DKLUIF020F	DKLUIF020P
25	20	10	118	30	50	154	80	108	1 1/4"	116	666	DKLUIF025E	DKLUIF025F	DKLUIF025P
32	25	10	127	33	58	168	80	116	1 1/2"	124	935	DKLUIF032E	DKLUIF032F	DKLUIF032P
40	32	10	132	30	72	192	80	134	2"	140	1107	DKLUIF040E	DKLUIF040F	DKLUIF040P
50	40	10	175	35	79	222	120	154	2 1/4"	160	2049	DKLUIF050E	DKLUIF050F	DKLUIF050P
63	50	10	200	46	98	266	120	184	2 3/4"	190	3295	DKLUIF063E	DKLUIF063F	DKLUIF063P

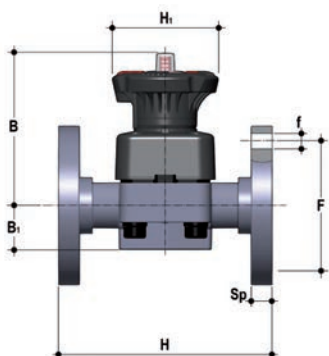


## DKOF

DIALOCK® diaphragm valve with flanged monolithic body, drilled PN10/16. Face to face according to EN 558-1

d	DN	PN	B	B <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	EPDM code	FKM code	PTFE code
20	15	10	102	25	65	14	130	80	4	13.5	1011	DKOF020E	DKOF020F	DKOF020P
25	20	10	105	30	75	14	150	80	4	13.5	1102	DKOF025E	DKOF025F	DKOF025P
32	25	10	114	33	85	14	160	80	4	13.5	1212	DKOF032E	DKOF032F	DKOF032P
40	32	10	119	30	100	18	180	80	4	14	1486	DKOF040E	DKOF040F	DKOF040P
50	40	10	149	35	110	18	200	120	4	16	2479	DKOF050E	DKOF050F	DKOF050P
63	50	10	172	46	125	18	230	120	4	16	3454	DKOF063E	DKOF063F	DKOF063P
75	65	10	172	46	145	18	290	120	4	21	4223	DKOF075E	DKOF075F	DKOF075P

DKLOF version available on request



## DKOAF

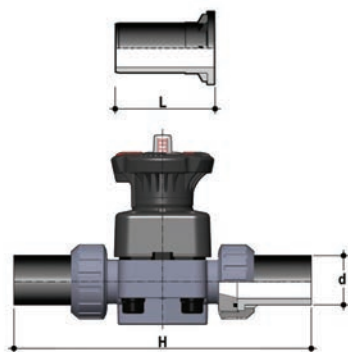
DIALOCK® diaphragm valve with flanged monolithic body, drilled ANSI B16.5 cl. 150 #FF

d	DN	PN	B	B <sub>1</sub>	F	f	H	H <sub>1</sub>	Sp	U	g	EPDM code	FKM code	PTFE code
1/2"	15	10	102	25	60.3	14	108	80	13,5	4	1011	DKOAF012E	DKOAF012F	DKOAF012P
3/4"	20	10	105	30	70	15.7	120	80	13,5	4	1102	DKOAF034E	DKOAF034F	DKOAF034P
1"	25	10	114	33	80	15.7	131	80	13,5	4	1212	DKOAF100E	DKOAF100F	DKOAF100P
1" 1/4	32	10	119	30	89	15.7	162	80	14	4	1486	DKOAF114E	DKOAF114F	DKOAF114P
1" 1/2	40	10	149	35	99	15.7	180	120	16	4	2479	DKOAF112E	DKOAF112F	DKOAF112P
2"	50	10	172	46	121	19	210	120	16	4	3454	DKOAF200E	DKOAF200F	DKOAF200P
2" 1/2	65	10	172	46	140	19	250	120	21	4	4223	DKOAF212E	DKOAF212F	DKOAF212P

DKLOAF version available on request

For installation prior to october 2017 please contact Fip Technical Support

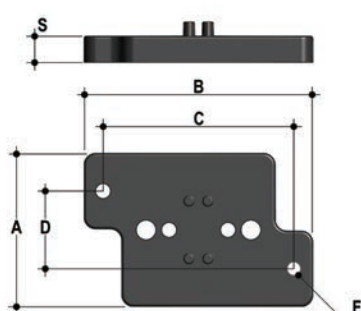
# ACCESSORIES



## Q/BBF-L

Long spigot PVDF end connectors for butt welding

d	DN	L	H	SDR	Code
20	15	52	194	21	QBBFL21020
25	20	68	244	21	QBBFL21025
32	25	70	258	21	QBBFL21032
40	32	76	286	21	QBBFL21040
50	40	85	324	21	QBBFL21050
63	50	92	368	21	QBBFL21063

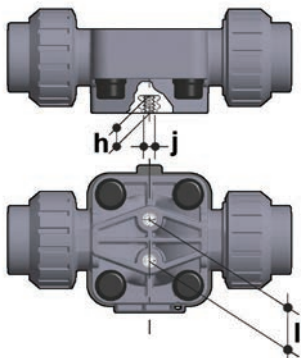


## PMDK

Wall mounting plate

d	DN	A	B	C	D	F	S	Code
20	15	65	97	81	33	5,5	11	PMDK1
25	20	65	97	81	33	5,5	11	PMDK1
32	25	65	97	81	33	5,5	11	PMDK1
40	32	65	97	81	33	5,5	11	PMDK2
50	40	65	144	130	33	6,5	11	PMDK2
63	50	65	144	130	33	6,5	11	PMDK2
75	65	65	144	130	33	6,5	11	PMDK2

# FASTENING AND SUPPORTING



All valves, whether manual or actuated, must be adequately supported in many applications. The DK valve series is therefore provided with an integrated bracket that permits direct anchoring of the valve body without the need of other components. For wall or panel installation, dedicated PMDK mounting plates which are available as accessories can be used. These plates should be fastened to the valve before wall installation. PMDK plates also allow DK valve alignment with FIP ZIKM pipe clips.

d	DN	h	l	j
20	15	10	25	M6
25	20	10	25	M6
32	25	10	25	M6
40	32	10	25	M6
50	40	13	44,5	M8
63	50	13	44,5	M8
75	65	13	44,5	M8

# CUSTOMISATION

Fig. 1



Fig. 2



Fig. 3



The DIALOCK® DK DN 15÷65 valve can be customised using a customisation plate in white PVC.

The customisation plate (B), housed in the transparent protection cap (A), can be removed and, once overturned, used for indicating identification serial numbers or service indications on the valves such as, for example, the valve function in the system, the conveyed fluid, but also specific information for customer service, such as the customer name or installation date or location on the valves. The waterproof transparent protection cap with seal O-Ring protects the customisation plate against deterioration.

To access the customisation plate, make sure the handwheel is in the unlock position and proceed as follows:

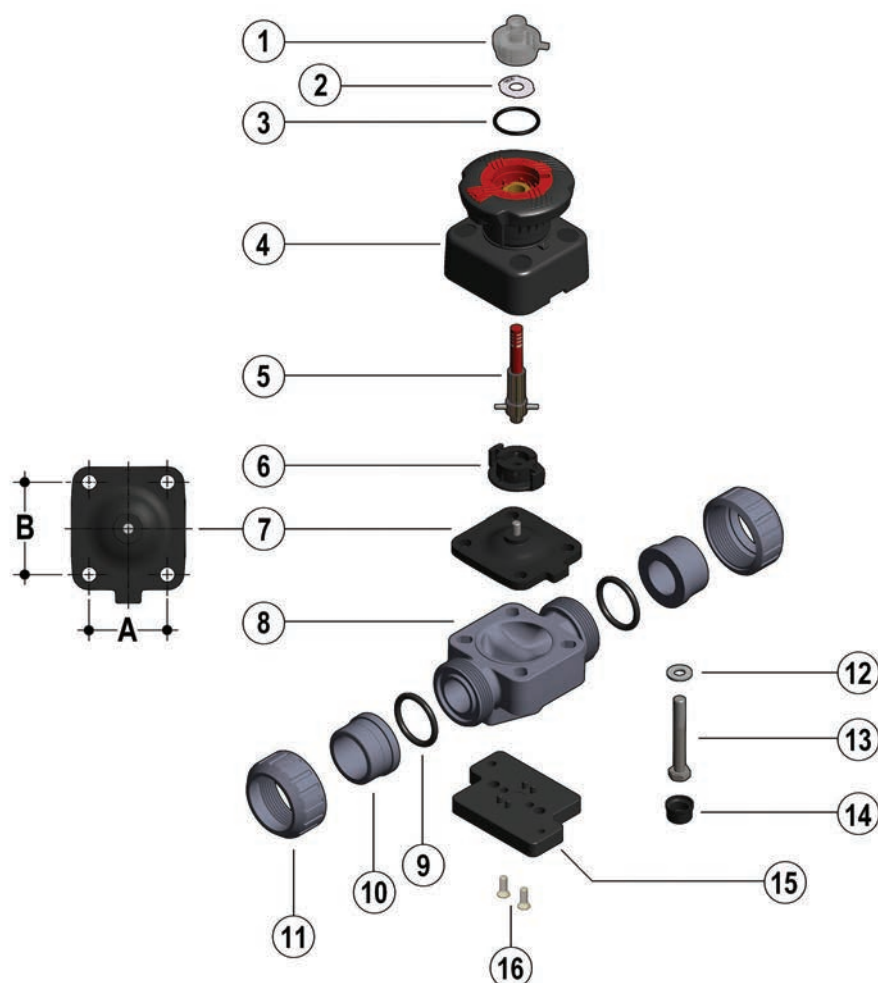
- 1) Turn the transparent protection cap anti-clockwise to limit stop (fig. 1) and remove it by pulling it upwards and, if necessary, by inserting a screwdriver into the slot (C) to facilitate operation (fig. 2 ).
- 2) Remove the plate inside the transparent protection cap and customise it as required (fig. 3).
- 3) Re-assemble, making sure that the seal O-Ring of the transparent protection cap remains in its seating (fig. 4).

Fig. 4



# COMPONENTS

## EXPLODED VIEW



DN	15	20	25	32	40	50	65
A	40	40	46	46	65	78	78
B	44	44	54	54	70	82	82

- 1** Transparent protection cap (PVC - 1)\*
- 2** Customisation plate (PVC-U - 1)
- 3** O-Ring (EPDM - 1)
- 4** Operating mechanism (PP-GR / PVDF - 1)
- 5** Threaded stem – Indicator (STAINLESS steel - 1)

- 6** Compressor (PA-GR IXEF® - 1)
- 7** Diaphragm seal (EPDM, FKM, PTFE - 1)\*
- 8** Valve body (PVDF - 1)\*
- 9** Socket seal O-Ring (EPDM-FKM - 2)\*
- 10** End connector (PVDF - 2)\*

- 11** Union nut (PVDF - 2)\*
- 12** Washer (STAINLESS steel - 4)
- 13** Bolt (STAINLESS steel - 4)
- 14** Protection plug (PE - 4)
- 15** Distance plate (PP-GR - 1)\*\*
- 16** Screw (STAINLESS steel - 2)\*\*

\* Spare parts

\*\* Accessories

The material of the component and the quantity supplied are indicated in brackets

## DISASSEMBLY

- 1) Isolate the valve from the line (release the pressure and empty the pipeline).
- 2) Unlock the handwheel if necessary by pushing it downwards (fig.5), and open the valve completely by turning it counter-clockwise.
- 3) Unscrew the union nuts (11) and extract the valve.
- 4) Remove the protection plugs (14) and remove the bolts (13) with the relative washers (12).
- 5) Separate the valve body (8) from the operating mechanism (4).
- 6) Rotate the handwheel clockwise until the threaded stem (5), the compressor (6) and the diaphragm (7) are released.
- 7) Unscrew the diaphragm (7) and remove the shutter (6).

## ASSEMBLY

- 1) Insert the compressor (6) onto the threaded stem (5), aligning it correctly with the stem pin.
- 2) Screw the diaphragm (7) onto the threaded stem (5).
- 3) Lubricate the threaded stem (5) and insert it into the operating mechanism (4), then turn the handwheel counter-clockwise until the stem is fully screwed in (5). Make sure that the compressor (6) and the diaphragm are properly aligned with the respective slots in the operating mechanism (4) (fig. 7).
- 4) Assemble the operating mechanism (4) on the body of the valve (8) and tighten the bolts (13) with the relative washers (12).
- 5) Tighten the bolts (13) evenly (diagonally) to the tightening torque suggested on the relative instruction sheet.
- 6) Replace the protection plugs (14).
- 7) Position the valve body between the end connectors (10) and tighten the union nuts (11), making sure that the socket seal O-rings (9) do not exit their seats.
- 8) If necessary, lock the handwheel by gripping it and pulling it upwards (fig.6).



**Note:** during assembly operations, it is advisable to lubricate the threaded stem Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Fig. 5



Fig. 6



Fig. 7





# INSTALLATION

Before proceeding with installation, please follow these instructions carefully: (instructions refer to versions with union ends). The valve can be installed in any position and in any direction.

- 1) Check that the pipes to be connected to the valve are aligned in order to avoid mechanical stress on the threaded joints.
- 2) Unscrew the union nuts (11) and insert them on the pipe segments.
- 3) Solvent weld or screw the end connectors (10) onto the pipe ends.
- 4) Position the valve body between the end connectors making sure the socket seal O-Rings (9) do not exit the seats.
- 5) Fully tighten the union nuts (11).
- 6) If necessary, support the pipework with FIP pipe clips or by means of the carrier built into the valve itself (see paragraph "Fastening and supporting").

**Note:** Before putting the valve into service, check that the bolts on the valve body (13) are tightened correctly at the suggested torque.



## LOCKING DEVICE

The DK valve is equipped with a DIALOCK® handwheel locking system that prevents the valve from being operated.

The system can be used simply by lifting the handwheel once it reaches the desired position (fig. 8).

To unlock, simply move the handwheel back to the previous position by pressing downwards (fig. 6).

When the system is in a locked position, it is also possible to install a lock to protect the system against tampering (fig. 9).

The diameter of the hole to put the padlock in is 4,5 mm for the dimensions between DN 15 and DN 32 and 6,5 mm for the dimensions between DN 40 and DN 65.



## STROKE LIMITER

The DKL version of the diaphragm valve is equipped with a handwheel stroke control system which allows the minimum and maximum flows to be preset and preserves the diaphragm from excessive compression during closing operations. The system allows the valve stroke to be modified using the two independent adjusting screws, which determine the mechanical limits of the valve during opening and closing. The valve is sold with the stroke limiters positioned so as not to limit the stroke both during closing and opening.

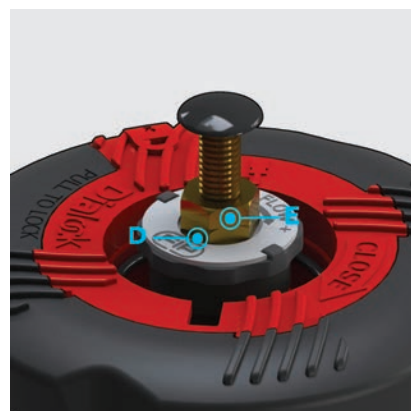
To access and set the adjusting screws, remove the transparent protection cap (A) as previously described (see chapter "Customisation").

### Travel stop adjustment. Minimum flow rate or valve closed.

- 1) Turn the handwheel clockwise until the desired minimum flow rate or the closed position is reached.
- 2) Fully screw the nut (D) to limit stop, and lock it in this position by tightening the locknut (E). If you want to exclude the stroke limiting function during closing, unscrew the nuts (D and E) completely. In this way, the valve will close completely.
- 3) Re-assemble the transparent protection cap making sure that the seal O-Ring remains in its seating.

### Stroke limiter adjustment. Maximum flow rate

- 1) Turn the handwheel counter-clockwise until the desired maximum flow rate is reached.
- 2) Turn the knob (F) counter-clockwise to limit stop. The plate shows the direction of rotation of the wheel to obtain a smaller or greater maximum flow rate. If it is not necessary to limit the opening stroke, turn the knob (F) clockwise several times. In this way, the valve will open completely.
- 3) Re-assemble the transparent protection cap making sure that the seal O-Ring remains in its seating.









# VM DN 80÷100

Diaphragm valve



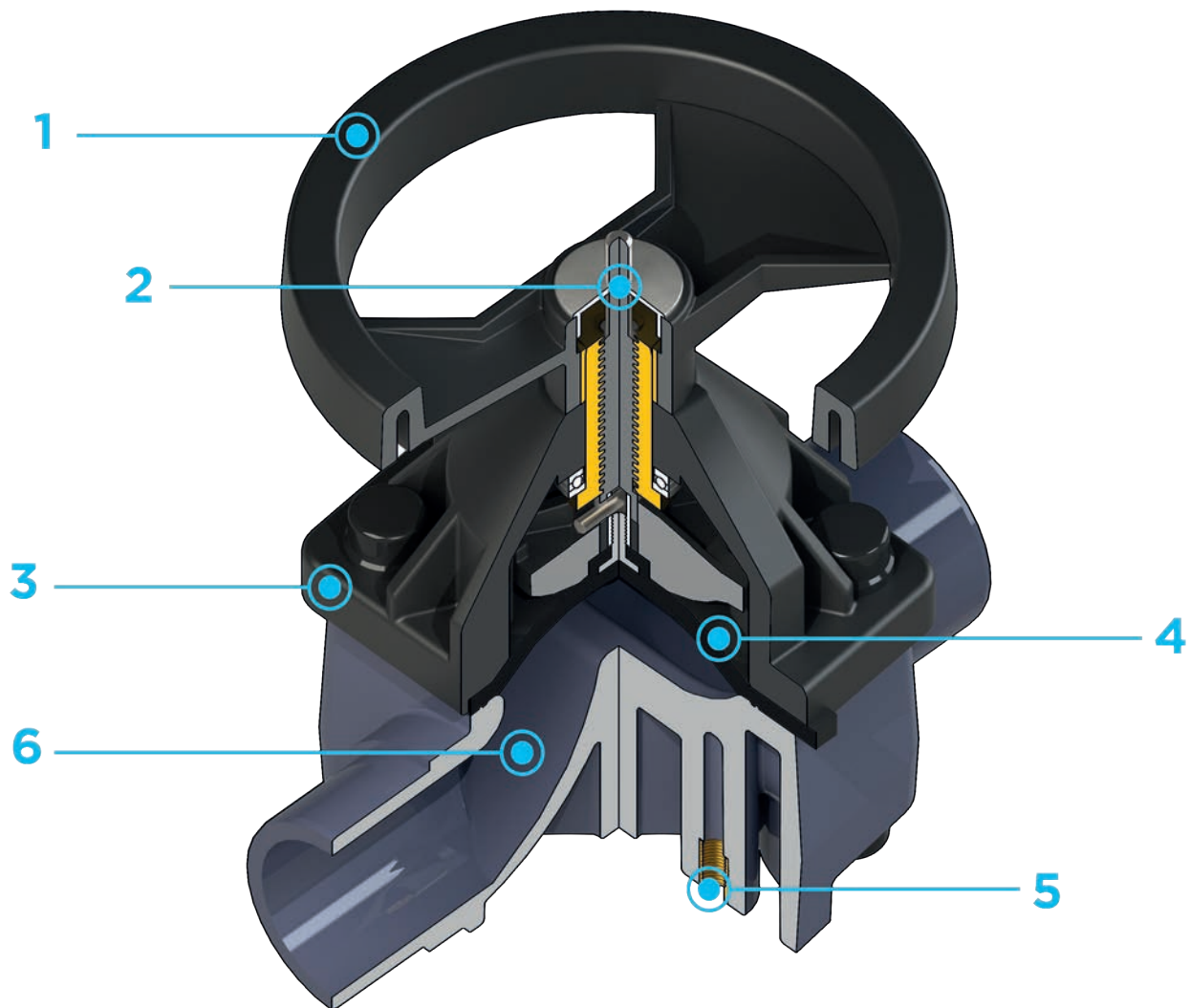
# VM DN 80÷100

The VM is particularly suitable for isolating and regulating abrasive or dirty fluids. The handwheel control and diaphragm seal provide precise and effective control, while reducing the risk of water hammer to a minimum.

## DIAPHRAGM VALVE

- Connection system for solvent welding and for flanged joints
- **Optimised fluid dynamic design:** maximum output flow rate thanks to the optimised efficiency of the fluid dynamics that characterise the new internal geometry of the body.
- Handwheel that stays at the same height during rotation, with internal bearing to minimise friction and operating torque
- Standard optical indicator
- **Internal operating components in metal** totally isolated from the conveyed fluid
- Bonnet fastening screws in STAINLESS steel protected against the external environment by PE plugs
- **New flanged bodies:** the new bodies, characterised by a monolithic flanged structure, are available in PVC-U, PVC-C, PP-H and PVDF. This design, free from body and flange joints, greatly reduces mechanical stress and increases system performance.

Technical specifications	
Construction	Single wear diaphragm valve
Size range	DN 80 ÷ 100
Nominal pressure	PN 10 with water at 20° C PN 6 with water at 20° C (PTFE version)
Temperature range	-20 °C ÷ 120 °C
Coupling standards	<b>Welding:</b> EN ISO 10931. Can be coupled to pipes according to EN ISO 10931. <b>Flanging system:</b> ISO 9624, EN 10931, EN 558-1, EN 1092-1, ANSI B.16.5 cl. 150.
Reference standards	<b>Construction criteria:</b> EN ISO 16138, EN ISO 10931 <b>Test methods and requirements:</b> ISO 9393 <b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1.
Valve material	<b>Body:</b> PVDF <b>Bonnet:</b> PP-GR <b>Handwheel:</b> PA-GR
Seal material	EPDM, FKM, PTFE (on request NBR)
Control options	Manual control; pneumatic actuator

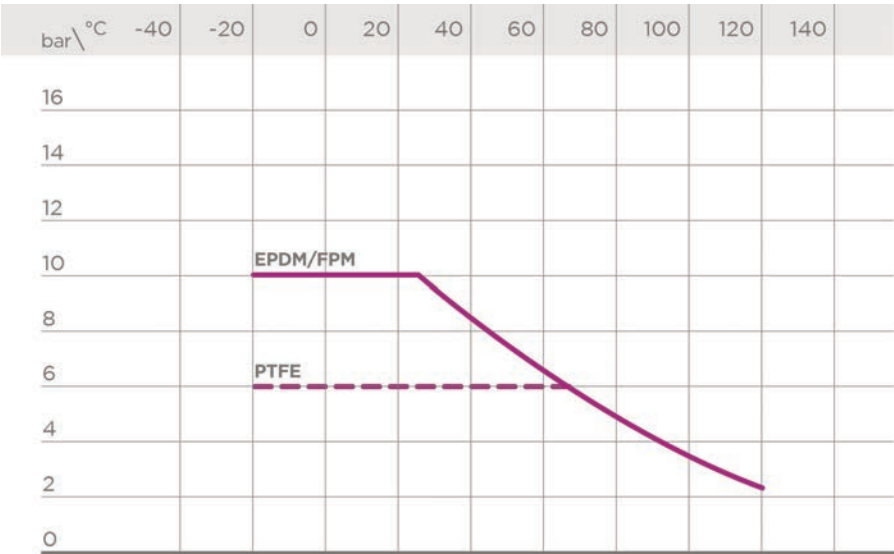


- 1 Handwheel** in (PA-GR) with high mechanical strength and ergonomic **grip for optimum manageability**
- 2 Metal optical position indicator** supplied as standard
- 3 Full protection bonnet in PP-GR**  
Internal circular and symmetrical diaphragm sealing area
- 4** Diaphragm available in EPDM, FKM, PTFE (NBR on request) and easy to replace
- 5 Threaded metal inserts** for anchoring the valve
- 6 New valve body internal design:** substantially higher flow coefficient resulting in lower pressure drops. Optimised adjustment curve for effective and precise flow rate regulation

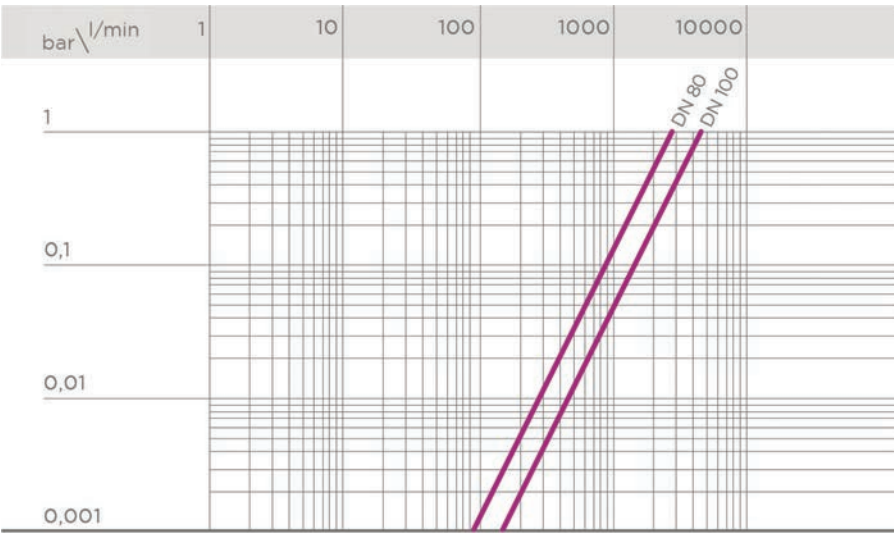
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids with regard to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).



## PRESSURE DROP GRAPH



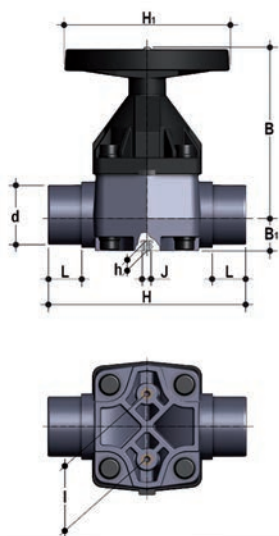
## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate Δp= 1 bar pressure drop at a certain valve position. The Kv100 values shown in the table are calculated with the valve completely open.

DN	80	100
Kv100 l/min	2910	4620

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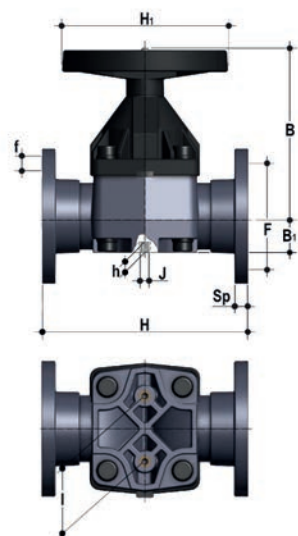
# DIMENSIONS



**VMDF**  
Diaphragm valve with male ends for socket welding, metric series

d	DN	PN	B	B <sub>1</sub>	H	H <sub>1</sub>	h	I	J	L	g	EPDM code	FKM code	PTFE code
90	80	*10	225	55	300	200	23	100	M12	51	7840	VMDF090E	VMDF090F	VMDF090P
110	100	*10	295	69	340	250	23	120	M12	61	11670	VMDF110E	VMDF110F	VMDF110P

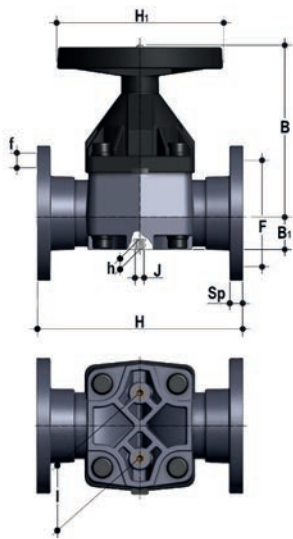
\*PTFE PN6



**VMOF**  
Diaphragm valve with flanged monolithic body, drilled EN/ISO/DIN PN10/16. Face to face according to EN 558-1

d	DN	PN	B	B <sub>1</sub>	F	f	H	H <sub>1</sub>	I	J	Sp	U	g	EPDM code	FKM code	PTFE code
90	80	*10	225	64	160	18	310	200	100	M12	22	8	10020	VMOF090E	VMOF090F	VMOF090P
110	100	*10	295	72	180	18	350	250	120	M12	23	8	14290	VMOF110E	VMOF110F	VMOF110P

\*PTFE PN6



## VMOAF

Diaphragm valve with flanged monolithic body, drilled ANSI B16.5 cl.150 #FF

d	DN	B	B <sub>1</sub>	F	f	H	H <sub>1</sub>	I	J	Sp	U	g	EPDM code	FKM code	PTFE code
3"	80	225	64	152,4	19,1	263	200	100	M12	22	4	10020	VMOAF300E	VMOAF300F	VMOAF300P
4"	100	295	72	190,5	19,1	328	250	120	M12	23	8	14290	VMOAF400E	VMOAF400F	VMOAF400P

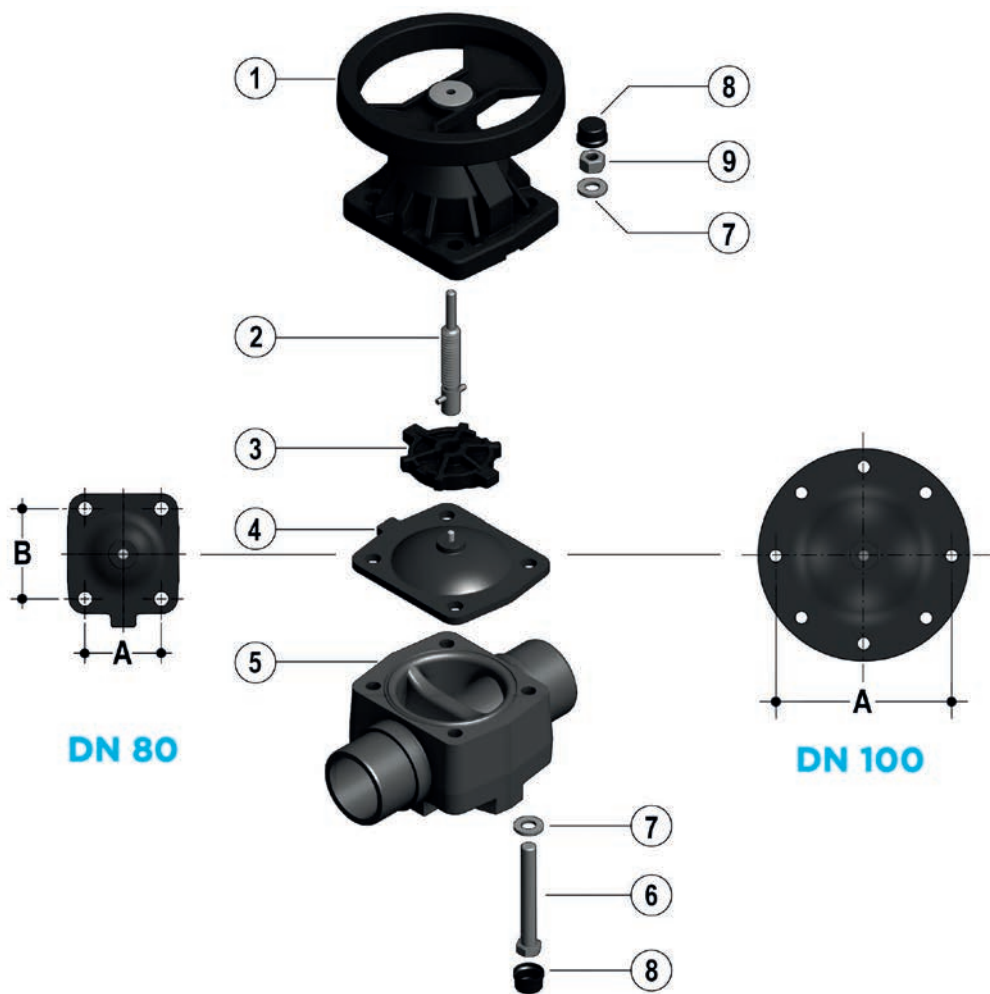
\*PTFE: PN 6

For installation prior to october 2017 please contact Fip Technical Support



# COMPONENTS

## EXPLODED VIEW



DN	80	100
A	114	193
B	127	-

- 1 Bonnet (PP-GR - 1); Handwheel (PA-GR - 1)
2 Indicator - stem (STAINLESS steel - 1)
3 Shutter (PBT - 1)

4 Diaphragm seal (EPDM, FKM, PTFE - 1)
5 Body (PVDF - 1)
6 Hexagonal screw (Zinc plated steel - 4)

7 Washer (Zinc plated steel - 4)
8 Protection plug (PE - 4)
9 Nut (Zinc plated steel - 4)

The material of the component and the quantity supplied are indicated in brackets

## DISASSEMBLY

The diaphragm constitutes the part of the valve more subject to mechanical and chemical stress from the fluid. Consequently, the condition of the diaphragm must be checked at regular intervals in accordance with the service conditions. To do this, it must be disconnected from the handwheel and from the valve body.

- 1) Cut-off fluid upstream from the valve and make sure it is de-pressurised (downstream drain if necessary).
- 2) Unscrew the four screws (6) and separate the body (5) from the internal components.
- 3) Unscrew the diaphragm (4) from the shutter (3). Rotate the handwheel clockwise to free the stem-shutter unit. Clean or replace the diaphragm, if necessary (4). If necessary, lubricate the stem (2).

## ASSEMBLY

- 1) Apply the shutter (3) to the stem (2), ensuring the stem pin is positioned correctly.
- 2) Screw the diaphragm (4) onto the stem (2), taking care not to stretch it.
- 3) Open the valve.
- 4) Place the bonnet-handwheel unit (1) on the body (5) and join the two components with bolts.
- 5) Press the protection plugs into place (8).

## INSTALLATION

The valve can be installed in any position and in any direction.

When starting up the plant, make sure that there are no leaks from between the diaphragm and the valve body. If necessary, tighten the fastening screws (6).

## WARNINGS

**Note:** during assembly operations, it is advisable to lubricate the threaded stem. Mineral oils are not recommended for this task as they react aggressively with EPDM rubber.

Moreover, as the diaphragm seal is compressed between the body and the actuator, the valve body stud-bolts and nuts must be checked and tightened, if necessary, prior to installation.





# CM DN 12÷15

Compact diaphragm valve



# CM DN 12÷15

The CM is a manually operated diaphragm valve of reduced dimensions and particularly compact structure, ideal for use in confined spaces.

## COMPACT DIAPHRAGM VALVE

- Connection system for solvent weld joints
- Extremely compact construction
- **Internal components in metal totally isolated from the conveyed fluid**
- Valve stem in STAINLESS steel
- **Compressor with floating diaphragm carrier**
- Easy to replace diaphragm seal
- Corrosion-proof internal components
- **Innovative CDSA** (Circular Diaphragm Sealing Angle) system offering the following advantages:
  - uniform distribution of shutter pressure on the diaphragm seal
  - reduction in the tightening torque of the screws fixing the actuator to the valve body
  - reduced mechanical stress on all valve components (actuator, body and diaphragm)
  - easy to clean valve interior
  - low risk of the accumulation of deposits, contamination or damage to the diaphragm due to crystallisation
  - operating torque reduction

Technical specifications	
Construction	Compact single wear diaphragm valve
Size range	DN 12 ÷ 15
Nominal pressure	PN 6 with water at 20° C
Temperature range	-20 °C ÷ 140 °C
Coupling standards	<b>Welding:</b> EN ISO 10931 Can be coupled to pipes according to EN ISO 10931
	<b>Thread:</b> ISO 228-1, EN 10226-1/2
Reference standards	<b>Construction criteria:</b> EN ISO 16138, EN ISO 10931
	<b>Test methods and requirements:</b> ISO 9393
	<b>Installation criteria:</b> DVS 2201-1, DVS 2207-15, DVS 2208-1
Valve material	<b>Body:</b> PVDF <b>Bonnet and handwheel:</b> PA - GR
Seal material	EPDM, FKM, PTFE
Control options	Manual control; pneumatic actuator



- Internal circular and symmetrical diaphragm sealing area
- 5 STAINLESS steel bolts**, can also be inserted from above
- 6 Threaded metal inserts** for anchoring the valve

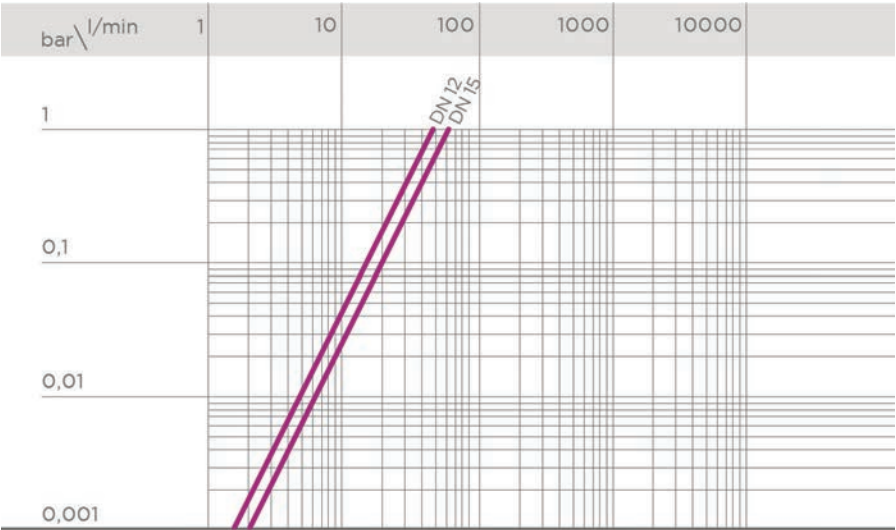
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water and non-hazardous fluids with regard to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).



## PRESSURE DROP GRAPH



## K<sub>v</sub>100 FLOW COEFFICIENT

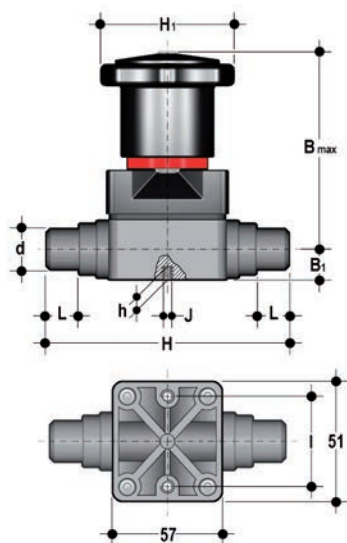
The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate  $\Delta p = 1$  bar pressure drop at a certain valve position. The K<sub>v</sub>100 values shown in the table are calculated with the valve completely open.

DN	12	15
Kv100 l/min	47	60

The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

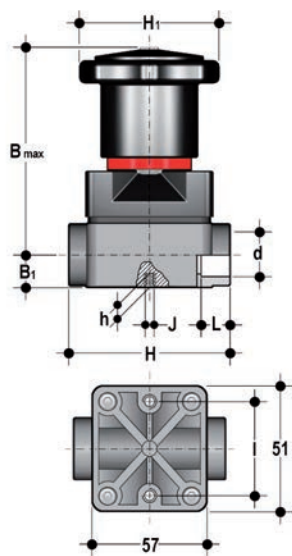


# DIMENSIONS



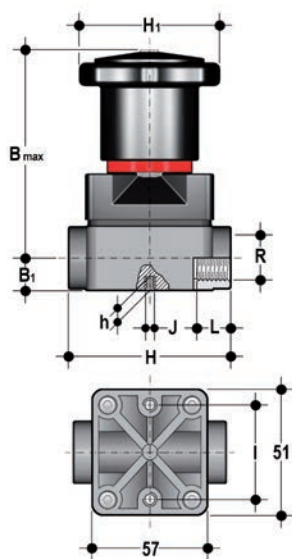
**CMDF**  
Compact diaphragm valve with male ends for socket welding, metric series

d	DN	PN	B <sub>max</sub>	B <sub>1</sub>	H	H <sub>1</sub>	h	I	J	L	g	EPDM code	FKM code	PTFE code
20	15	6	86	15	124	58,5	8	35	M <sub>5</sub>	17	330	CMDF020E	CMDF020F	CMDF020P



**CMIF**  
Compact diaphragm valve with female ends for socket welding, metric series

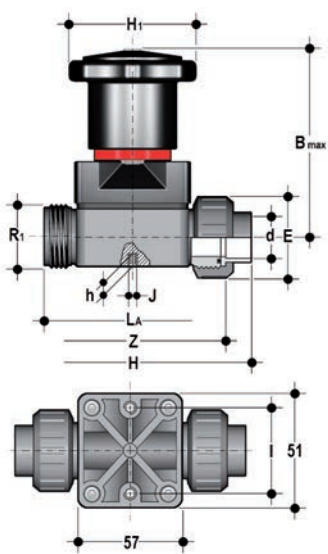
d	DN	PN	B <sub>max</sub>	B <sub>1</sub>	H	H <sub>1</sub>	h	I	J	L	g	EPDM code	FKM code	PTFE code
16	12	6	86	15	75	58,5	8	35	M <sub>5</sub>	14	290	CMIF016E	CMIF016F	CMIF016P
20	15	6	86	15	75	58,5	8	35	M <sub>5</sub>	16	290	CMIF020E	CMIF020F	CMIF020P



## CMFF

Compact diaphragm valve with BSP threaded female ends

R	DN	PN	B <sub>max</sub>	B <sub>1</sub>	H	H <sub>1</sub>	h	I	J	L	g	EPDM code	FKM code	PTFE code
3/8"	12	6	86	15	75	58,5	8	35	M <sub>s</sub>	11,5	290	CMFF038E	CMFF038F	CMFF038P
1/2"	15	6	86	15	75	58,5	8	35	M <sub>s</sub>	15	290	CMFF012E	CMFF012F	CMFF012P



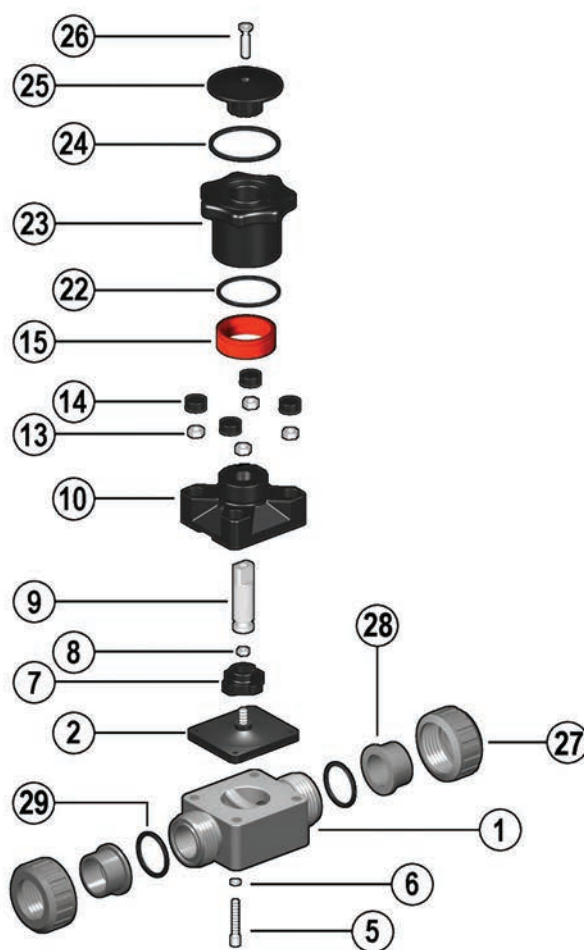
## CMUIF

Compact diaphragm valve with female union ends for socket welding, metric series

d	DN	PN	B <sub>max</sub>	E	H	H <sub>1</sub>	h	I	J	LA	R <sub>1</sub>	Z	g	EPDM code	FKM code	PTFE code
20	15	6	86	41	129,5	58,5	8	35	M <sub>s</sub>	90	1"	97,5	285	CMUIF020E	CMUIF020F	CMUIF020P

# COMPONENTS

## EXPLODED VIEW



- |  |   |   |
|--|---|---|
| <b>1</b> Body (PVDF - 1)                       | <b>8</b> Nut (STAINLESS steel - 1)              | <b>22</b> O-Ring (NBR - 1)                      |
| <b>2</b> Diaphragm seal (EPDM, FKM, PTFE - 1)  | <b>9</b> Stem (STAINLESS steel - 1)             | <b>23</b> Handwheel (PA-GR - 1)                 |
| <b>5</b> Fastening screw (STAINLESS steel - 4) | <b>10</b> Bonnet (PA-GR - 1)                    | <b>24</b> O-Ring (NBR - 1)                      |
| <b>6</b> Washer (STAINLESS steel - 4)          | <b>13</b> Nut (STAINLESS steel - 4)             | <b>25</b> Bonnet (PA-GR - 1)                    |
| <b>7</b> Shutter (PA-GR - 1)                   | <b>14</b> Protection plug (POM - 4)             | <b>26</b> Fastening screw (STAINLESS steel - 1) |
|  | <b>15</b> Optical position indicator (PVDF - 1) |   |

The material of the component and the quantity supplied are indicated between brackets

## DISASSEMBLY

If the valve is already installed on the line, shut-off the fluid flow upstream and make sure that there is no pressure. If necessary, fully drain the system downstream. If there are hazardous fluids present, drain and ventilate the valve.

The diaphragm constitutes the part of the valve more subject to mechanical and chemical stress from the fluid. Consequently, the condition of the diaphragm must be checked at regular intervals in accordance with the service conditions. To do this, it must be

disconnected from the handwheel and from the valve body.

- 1) Unscrew the four screws (5) and separate the body (1) from the internal components.
- 2) Unscrew the diaphragm seal (2) from the shutter (7).
- 3) If necessary, clean or replace the diaphragm seal (2).
- 4) If necessary, lubricate the stem (9).

## ASSEMBLY

- 1) The diaphragm seal (2) must be screwed fully into the compressor (7) in a clockwise direction. If necessary, unscrew slightly in an anticlockwise direction to line up the screw holes.
- 2) Fix the bonnet (10) to the body (1) using screws (5). Tighten the screws, making sure not to over-compress the diaphragm.

# INSTALLATION

The valve can be installed in any position and in any direction. When starting up the plant, make sure that there are no leaks from between the diaphragm and the valve body. If necessary, tighten the fastening screws (5).

### SETTING

The valve is factory set to guarantee a permanent seal without requiring any further intervention. To adjust the setting, rotate the handwheel to the required minimum opening position, remove screw (26) using a hex key.

Remove the bonnet (25) and rotate the handwheel (23) clockwise until a resistance to the rotation is felt.

If necessary, replace the O-Ring (24) in its seating and re-insert the bonnet (25) in the handwheel: the double D connection must fit over the stem (9) and, with a slight twisting action, align the ribs in the bonnet with those in the handwheel.

Tighten screw (26) to a sufficiently high torque value.

Each turn of the handwheel corresponds to 1.75mm travel.





# FR DN 32÷400

Wafer check valve



# FR DN 32÷400

The FR wafer check valve is designed to be installed directly between stubs and flanges in accordance with ISO/DIN, ANSI standards.

Available also with springs for low backpressure applications.

## WAFER CHECK VALVE

- **Metal support for easy and precise centring of the valve** during installation
- Can be installed in either a vertical or horizontal position
- **Models with springs in INOX 316 stainless steel or Hastelloy for the conveyance of aggressive fluids.**
- **Sealing system with O-ring** for optimum sealing and installation without flat gaskets

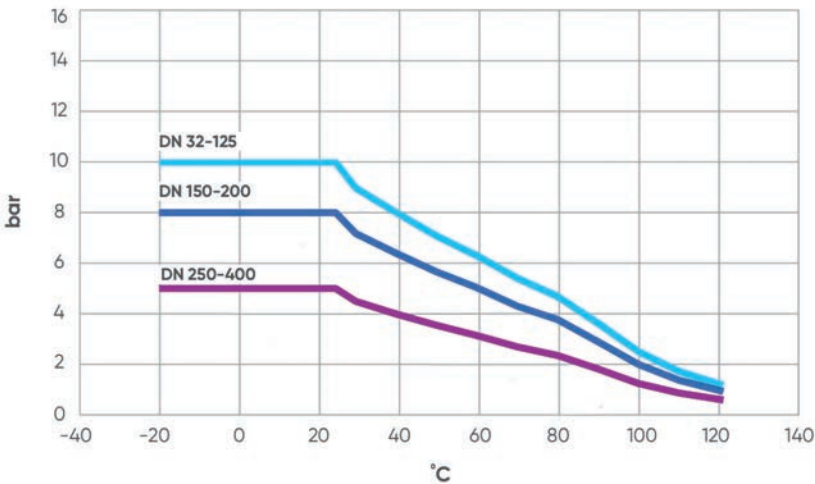
Technical specifications	
Construction	Wafer check valve
Size range	DN 32 ÷ 400
Nominal pressure	PN 10 (DN32-125), PN 8 (DN150-200), PN 5 (DN250-400) in water at 20°C
Temperature range	-20 °C ÷ 120 °C
Coupling standards	<b>Flanging system:</b> EN 1092-1, EN ISO 1452, EN ISO 15493, ANSI B16.5 cl.150, JIS B2220
Reference standards	<b>Construction criteria:</b> EN ISO 16137 EN ISO 1452, EN ISO 15493
	<b>Test methods and requirements:</b> ISO 9393
	<b>Installation criteria:</b> DVS 2204, DVS 2221, UNI 11242
Valve material	PVDF
Seal material	EPDM, FKM, PTFE
Spring material	SS 316, Hastelloy C4



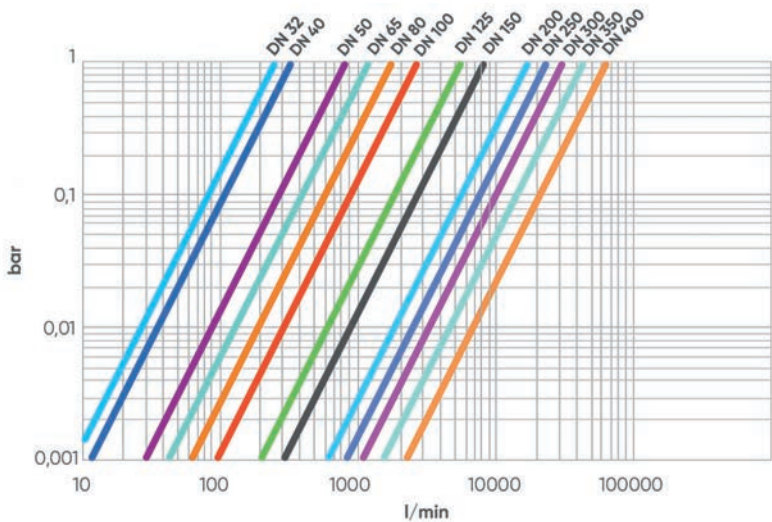
# TECHNICAL DATA

## PRESSURE VARIATION ACCORDING TO TEMPERATURE

For water e non-hazardous fluids with regard to which the material is clas- sified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).



## PRESSURE DROP GRAPH



## K<sub>v</sub>100 FLOW COEFFICIENT

The K<sub>v</sub>100 flow coefficient is the Q flow rate of litres per minute of water at a temperature of 20°C that will generate Δp= 1 bar pressure drop at a certain valve position. The Kv100 values shown in the table are calculated with the valve completely open.

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
Kv100 l/min	270	370	900	1250	1867	2867	5700	8167	18800	25000	31900	46700	61700

## MINIMUM PRESSURE REQUIRED TO OPEN THE VALVE IN A VERTICAL FLOW

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
mbar	2	2	3	3	3	3	3	3	4	4	4	5	7

WITHOUT SPRING

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
mbar	4	4	5	5	5	5	5	5	6	6	6	7	9

WITH SPRING

## MINIMUM PRESSURE REQUIRED TO OPEN THE VALVE IN A HORIZONTAL FLOW

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
mbar	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3

WITHOUT SPRING

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
mbar	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,2	2,3

WITH SPRING

## MINIMUM VALVE SEALING PRESSURES

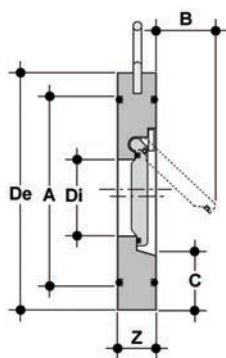
DN	32	40	50	65	80	100	125	150	200	250	300	350	400
bar	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3

## TIGHTENING TORQUE

\*Tightening torques for nuts and bolts on couplings with backing rings. Values required to obtain the hydraulic test seal (1.5 x PN at 20°C) (new or lubricated nuts and bolts)

DN	32	40	50	65	80	100	125	150	200	250	300	350	400
Nm*	15	15	20	20	20	20	25	30	35	40	45	50	60

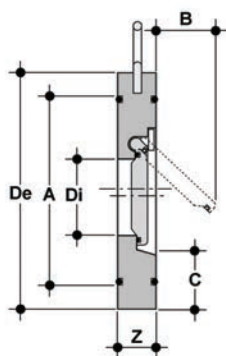
# DIMENSIONS



## FROF

Wafer check valve PVDF without spring, version ISO-DIN

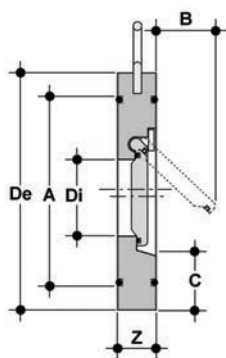
d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
40	32	10	59	22	25	85	18	15	160	FROF040E	FROF040F	FROF040P
50	40	10	72	25	28	95	22	16	210	FROF050E	FROF050F	FROF050P
63	50	10	86	37	29	109	32	18	340	FROF063E	FROF063F	FROF063P
75	65	10	105	50	31	129	40	20	430	FROF075E	FROF075F	FROF075P
90	80	10	119	61	32	144	54	20	520	FROF090E	FROF090F	FROF090P
110	100	10	146	77	31	164	70	23	720	FROF110E	FROF110F	FROF110P
140	125	10	173	94	35	195	92	23	980	FROF140E	FROF140F	FROF140P
160	150	8	197	100	40	220	105	26	1440	FROF160E	FROF160F	FROF160P
225	200	8	255	152	38	275	154	34	2730	FROF225E	FROF225F	FROF225P
280	250	5	312	180	41	330	192	40	4560	FROF280E	FROF280F	FROF280P
315	300	5	363	215	41	380	227	45	6950	FROF315E	FROF315F	FROF315P
350	350	5	416	245	44	440	266	49	10131	FROF355E	FROF355F	FROF355P
400	400	5	467	285	50	491	310	65	16736	FROF400E	FROF400F	FROF400P



## FROF - Spring in A316

Wafer check valve PVDF with spring, version ISO-DIN

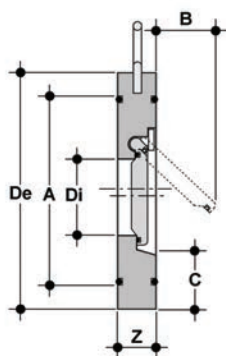
d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
40	32	10	59	22	25	85	18	15	160	FROF040EMLX	FROF040FMLX	FROF040PMLX
50	40	10	72	25	28	95	22	16	210	FROF050EMLX	FROF050FMLX	FROF050PMLX
63	50	10	86	37	29	109	32	18	340	FROF063EMLX	FROF063FMLX	FROF063PMLX
75	65	10	105	50	31	129	40	20	430	FROF075EMLX	FROF075FMLX	FROF075PMLX
90	80	10	119	61	32	144	54	20	520	FROF090EMLX	FROF090FMLX	FROF090PMLX
110	100	10	146	77	31	164	70	23	720	FROF110EMLX	FROF110FMLX	FROF110PMLX
140	125	10	173	94	35	195	92	23	980	FROF140EMLX	FROF140FMLX	FROF140PMLX
160	150	8	197	100	40	220	105	26	1440	FROF160EMLX	FROF160FMLX	FROF160PMLX
225	200	8	255	152	38	275	154	34	2730	FROF225EMLX	FROF225FMLX	FROF225PMLX
280	250	5	312	180	41	330	192	40	4560	FROF280EMLX	FROF280FMLX	FROF280PMLX
315	300	5	363	215	41	380	227	45	6950	FROF315EMLX	FROF315FMLX	FROF315PMLX
350	350	5	416	245	44	440	266	49	10131	FROF355EMLX	FROF355FMLX	FROF355PMLX
400	400	5	467	285	50	491	310	65	16736	FROF400EMLX	FROF400FMLX	FROF400PMLX



## FROF - Spring in Hastelloy

Wafer check valve PVDF with spring, version ISO-DIN

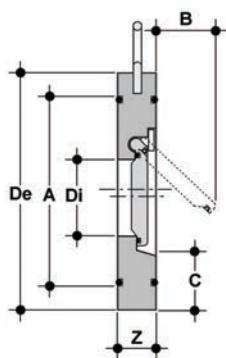
d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
40	32	10	59	22	25	85	18	15	160	FROF040EMLH	FROF040FMLH	FROF040PMLH
50	40	10	72	25	28	95	22	16	210	FROF050EMLH	FROF050FMLH	FROF050PMLH
63	50	10	86	37	29	109	32	18	340	FROF063EMLH	FROF063FMLH	FROF063PMLH
75	65	10	105	50	31	129	40	20	430	FROF075EMLH	FROF075FMLH	FROF075PMLH
90	80	10	119	61	32	144	54	20	520	FROF090EMLH	FROF090FMLH	FROF090PMLH
110	100	10	146	77	31	164	70	23	720	FROF110EMLH	FROF110FMLH	FROF110PMLH
140	125	10	173	94	35	195	92	23	980	FROF140EMLH	FROF140FMLH	FROF140PMLH
160	150	8	197	100	40	220	105	26	1440	FROF160EMLH	FROF160FMLH	FROF160PMLH
225	200	8	255	152	38	275	154	34	2730	FROF225EMLH	FROF225FMLH	FROF225PMLH
280	250	5	312	180	41	330	192	40	4560	FROF280EMLH	FROF280FMLH	FROF280PMLH
315	300	5	363	215	41	380	227	45	6950	FROF315EMLH	FROF315FMLH	FROF315PMLH
350	350	5	416	245	44	440	266	49	10131	FROF355EMLH	FROF355FMLH	FROF355PMLH
400	400	5	467	285	50	491	310	65	16736	FROF400EMLH	FROF400FMLH	FROF400PMLH



## FROAF

Wafer check valve PVDF without spring, version ANSI

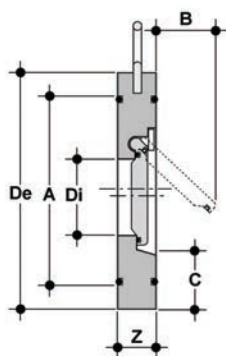
d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
1 1/4"	32	10	59	22	25	74	18	15	120	FROAF114E	FROAF114F	FROAF114P
1 1/2"	40	10	72	25	28	83	22	16	210	FROAF112E	FROAF112F	FROAF112P
2"	50	10	86	37	29	105	32	18	340	FROAF200E	FROAF200F	FROAF200P
2 1/2"	65	10	105	50	31	124	40	20	430	FROAF212E	FROAF212F	FROAF212P
3"	80	10	119	61	32	137	54	20	520	FROAF300E	FROAF300F	FROAF300P
4"	100	10	146	77	31	175	70	23	720	FROAF400E	FROAF400F	FROAF400P
5"	125	10	173	94	35	197	92	23	980	FROAF500E	FROAF500F	FROAF500P
6"	150	8	197	100	40	222	105	26	1440	FROAF600E	FROAF600F	FROAF600P
8"	200	8	255	152	38	279	154	34	2730	FROAF800E	FROAF800F	FROAF800P
10"	250	5	312	180	41	340	192	40	4560	FROAF810E	FROAF810F	FROAF810P
12"	300	5	363	215	41	410	227	45	6950	FROAF812E	FROAF812F	FROAF812P
14"	350	5	416	245	44	451	266	49	10131	FROAF814E	FROAF814F	FROAF814P
16"	400	5	467	285	50	514	310	65	16736	FROAF816E	FROAF816F	FROAF816P



## FROAF - Spring in A316

Wafer check valve PVDF with spring, version ANSI

d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
1"1/4	32	10	59	22	25	74	18	15	120	FROAF114EMLX	FROAF114FMLX	FROAF114PMLX
1"1/2	40	10	72	25	28	83	22	16	210	FROAF112EMLX	FROAF112FMLX	FROAF112PMLX
2"	50	10	86	37	29	105	32	18	340	FROAF200EMLX	FROAF200FMLX	FROAF200PMLX
2"1/2	65	10	105	50	31	124	40	20	430	FROAF212EMLX	FROAF212FMLX	FROAF212PMLX
3"	80	10	119	61	32	137	54	20	520	FROAF300EMLX	FROAF300FMLX	FROAF300PMLX
4"	100	10	146	77	31	175	70	23	720	FROAF400EMLX	FROAF400FMLX	FROAF400PMLX
5"	125	10	173	94	35	197	92	23	980	FROAF500EMLX	FROAF500FMLX	FROAF500PMLX
6"	150	8	197	100	40	222	105	26	1440	FROAF600EMLX	FROAF600FMLX	FROAF600PMLX
8"	200	8	255	152	38	279	154	34	2730	FROAF800EMLX	FROAF800FMLX	FROAF800PMLX
10"	250	5	312	180	41	340	192	40	4560	FROAF810EMLX	FROAF810FMLX	FROAF810PMLX
12"	300	5	363	215	41	410	227	45	6950	FROAF812EMLX	FROAF812FMLX	FROAF812PMLX
14"	350	5	416	245	44	451	266	49	10131	FROAF814EMLX	FROAF814FMLX	FROAF814PMLX
16"	400	5	467	285	50	514	310	65	16736	FROAF816EMLX	FROAF816FMLX	FROAF816PMLX



## FROAF - Spring in Hastelloy

Wafer check valve PVDF with spring, version ANSI

d	DN	PN	A	B	C	De	Di	Z	g	EPDM Code	FKM Code	PTFE Code
1"1/4	32	10	59	22	25	74	18	15	120	FROAF114EMLH	FROAF114FMLH	FROAF114PMLH
1"1/2	40	10	72	25	28	83	22	16	210	FROAF112EMLH	FROAF112FMLH	FROAF112PMLH
2"	50	10	86	37	29	105	32	18	340	FROAF200EMLH	FROAF200FMLH	FROAF200PMLH
2"1/2	65	10	105	50	31	124	40	20	430	FROAF212EMLH	FROAF212FMLH	FROAF212PMLH
3"	80	10	119	61	32	137	54	20	520	FROAF300EMLH	FROAF300FMLH	FROAF300PMLH
4"	100	10	146	77	31	175	70	23	720	FROAF400EMLH	FROAF400FMLH	FROAF400PMLH
5"	125	10	173	94	35	197	92	23	980	FROAF500EMLH	FROAF500FMLH	FROAF500PMLH
6"	150	8	197	100	40	222	105	26	1440	FROAF600EMLH	FROAF600FMLH	FROAF600PMLH
8"	200	8	255	152	38	279	154	34	2730	FROAF800EMLH	FROAF800FMLH	FROAF800PMLH
10"	250	5	312	180	41	340	192	40	4560	FROAF810EMLH	FROAF810FMLH	FROAF810PMLH
12"	300	5	363	215	41	410	227	45	6950	FROAF812EMLH	FROAF812FMLH	FROAF812PMLH
14"	350	5	416	245	44	451	266	49	10131	FROAF814EMLH	FROAF814FMLH	FROAF814PMLH
16"	400	5	467	285	50	514	310	65	16736	FROAF816EMLH	FROAF816FMLH	FROAF816PMLH

# INSTALLATION

During installation, make sure that the following requirements are complied with:

- 1) Check that the operating temperature and pressure are below those allowed by the PN of the specific model.
- 2) Leave a straight section of pipe of length equal to 5 times the nominal diameter before and after the valve.
- 3) Do not install the valve directly on the pump flange. The use of flat gaskets is recommended in order to guarantee a perfect seal between the valve and stubs with serrated face.
- 4) The spring loaded versions are advised in case of pulsating flow in order to avoid noises.
- 5) The FR valve can be used on vertical pipes only if the fluid flow is upwards.
- 6) After having aligned the valve with the stub, tighten the flange bolts in a diagonal sequence to the required torque. Run a test before starting the full operation.
- 7) For installation on PP-H or PE piping with butt welding fusion: The use of special stubs QBXM or QBXE on the outlet side of the valve is advised in order to allow a complete valve opening.
- 8) For the installation of FR valves on PP-H or PVDF piping with socket welding fusion: the use of QRX spacers of the designed material on the outlet side of the valve is advised to allow full opening of the FR. Please ask your commercial contact or FIP technical support for further information.
- 9) The spacer needs to be installed between the valve and the QRNM or QRNF stub; the flat side of the spacer needs to be installed on the side of the valve and a flat gasket needs to be installed between the spacer and the stub. It is recommended to remove the welded material after the fusion from the stub to be installed on the outlet side of the valve.

**The use on piping with an SDR lower than 17 for dimensions above d63 is not advised (SDR11, d75-110).**

# Key

## Abbreviations

<b>ABS</b>	Acrylonitrile butadiene styrene
<b>b</b>	Bolts
<b>c</b>	O-ring code
<b>d</b>	Nominal external diameter of the pipe in mm
<b>DA</b>	Double acting
<b>DN</b>	Nominal internal diameter of the pipe in mm
<b>EPDM</b>	Ethylene-Propylene-Diene-Monomer
<b>FKM (FPM)</b>	Fluoroelastomer
<b>g</b>	Weight in grams
<b>HIPVC</b>	PVC high impact
<b>K</b>	Lid key
<b>Kg</b>	Weight in kilograms
<b>L</b>	Length in meters
<b>MRS</b>	minimum guaranteed breaking strength of the material at 20°C - water - for 50 years of service
<b>n</b>	Number of flange holes
<b>NBR</b>	Nitrile butadiene rubber
<b>OP</b>	Working pressure
<b>P</b>	Hose adaptor
<b>PA</b>	Polyamide
<b>PA-GR</b>	Fibreglass reinforced polyamide
<b>PBT</b>	Polybutylene terephthalate
<b>PE</b>	Polyethylene
<b>PN</b>	Nominal pressure in bar (max.operating pressure at 20°C water)
<b>POM</b>	Polyoxymethylene
<b>PP-GR</b>	Fibreglass reinforced polypropylene
<b>PP-H</b>	Polypropylene homopolymer

<b>PPS</b>	Polifenilensulfide
<b>PPSU</b>	Polifenilsulfone
<b>PTFE</b>	Politetrafluoroetilene
<b>PVC-C</b>	Chlorinated polyvinyl chloride
<b>PVC-U</b>	Unplasticized polyvinylchloride
<b>PVDF</b>	Polyvinylidene difluoride
<b>R</b>	Nominal thread size in inches
<b>s</b>	Pipe thickness in mm
<b>S</b>	Thickness series = $(SDR - 1)/2$
<b>SA</b>	Single acting
<b>SDR</b>	Standard dimension ratio = $d/s$
<b>Sp</b>	Flange thickness on flanged valves
<b>U</b>	Number of holes for flanged version







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