



TKD DN 10÷50
PVC-C

DUAL BLOCK® 3-way ball valve

TKD DN 10÷50

FIP has developed a VKD DUAL BLOCK® ball valve to introduce a high reference standard in thermoplastic valve design. TKD is a True Union diverting and mixing ball valve that meets the most stringent needs required in industrial applications.

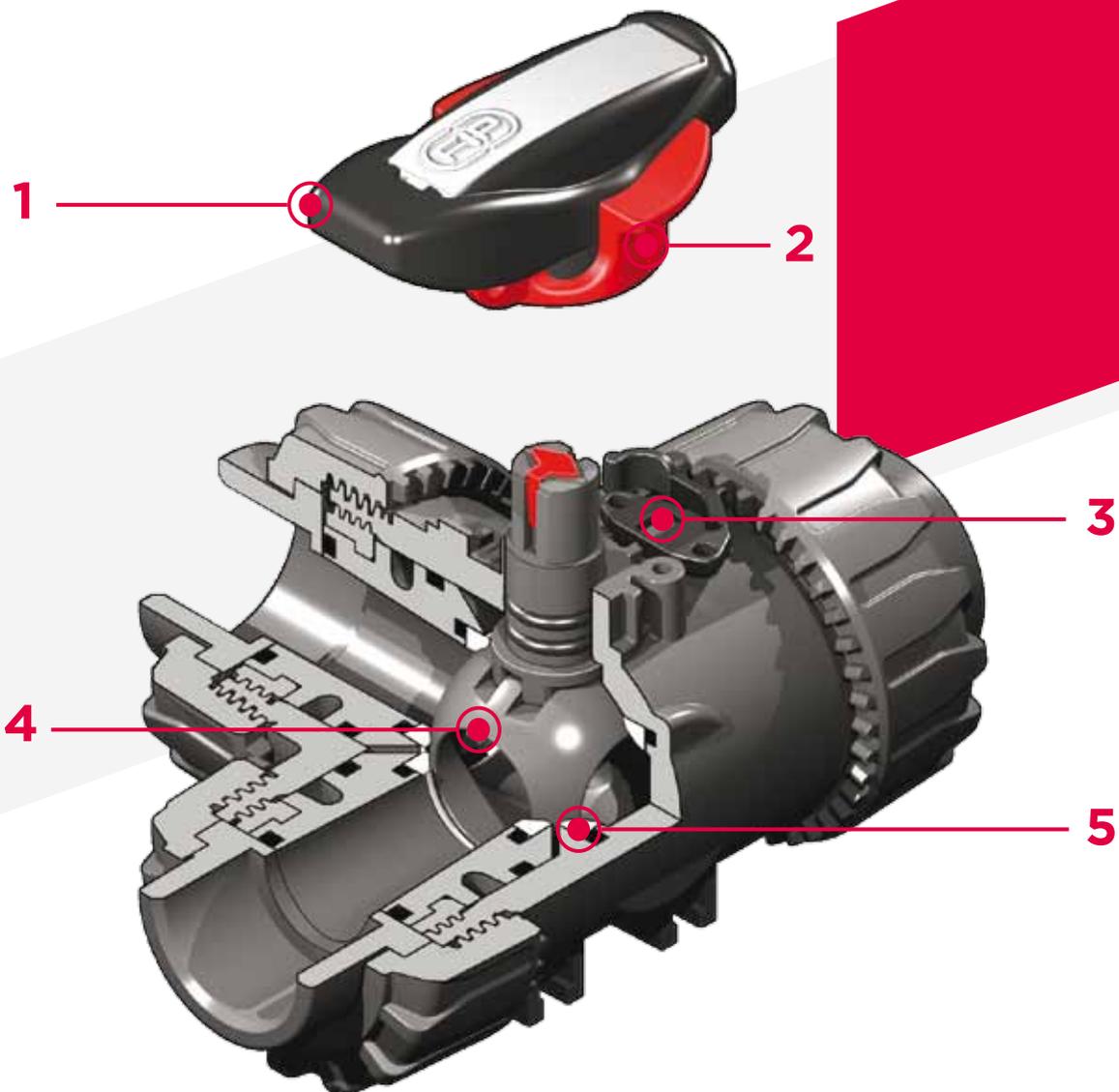


DUAL BLOCK® 3-WAY BALL VALVE

- Connection system for solvent weld and threaded 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 rigid PVC-C 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 connection key to the ball, equipped with **optical position indicator** for correct handle installation
- **Carrier integrated in the body** for valve anchoring
- Possibility of installing pneumatic and/or electric actuators thanks to the robust integrated bracket for valve anchoring for easy and quick automation using the **Power Quick module** (optional)
- **Valve material compatibility** (PVC-C) and elastomer **seal elements** (EPDM or FPM), with water, drinking water and other food substances as per **current regulations**

Technical specifications

Construction	3-way True Union ball valve with locked carrier and union nuts.
Size range	DN 10 ÷ 50
Nominal pressure	PN 16 with water at 20° C
Temperature range	0 °C ÷ 100 °C
Coupling standards	Solvent welding: EN ISO 15493, ASTM F 439. Can be coupled to pipes according to EN ISO 15493, ASTM F 441 Thread: ISO 228-1, DIN 2999, ASTM F437
Reference standards	Construction criteria: EN ISO 16135, EN ISO 15493 Test methods and requirements: ISO 9393 Installation criteria: DVS 2204, DVS 2221, UNI 11242 Actuator couplings: ISO 5211
Valve material	PVC-C
Seal material	EPDM, FPM (standard size O-Ring); PTFE (ball seats)
Control options	Manual control; electric actuator; pneumatic actuator



1 HIPVC Ergonomic handle equipped with tool to adjust the ball seat carrier. Possibility of installing the **LTKD stroke limiter** (available as an accessory) that permits ball and handle rotation only for set opening and closing angles at 90° or 180°

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

3 **DUAL BLOCK®** patented lock system that ensures union nut tightening hold even in severe conditions such as vibrations or heat dilation

4 **Ball shutter** high surface finish with floating type full passage with **T or L port**

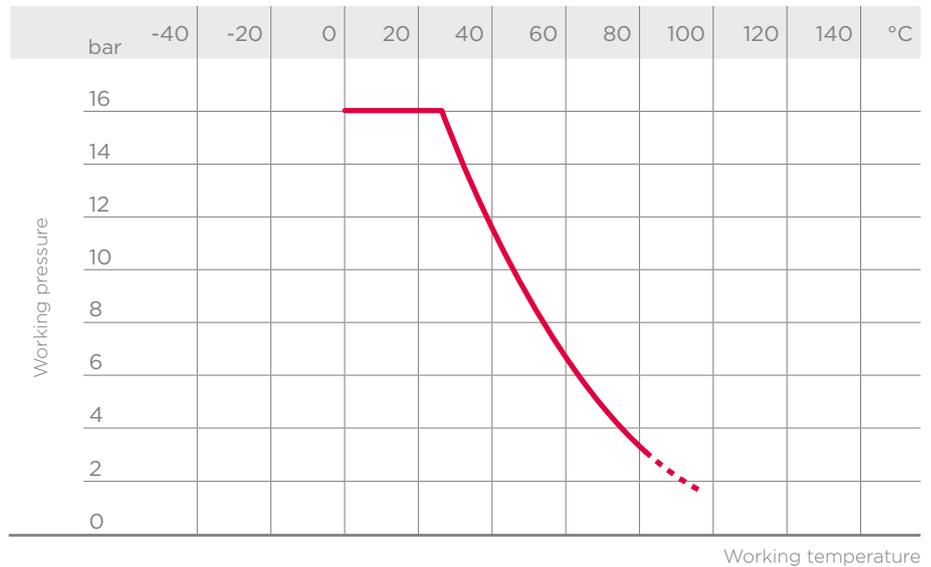
5 **4 PTFE ball seat** system that compensates axial force guaranteeing optimal manageability and long working life

TECHNICAL DATA

PRESSURE VARIATION ACCORDING TO TEMPERATURE

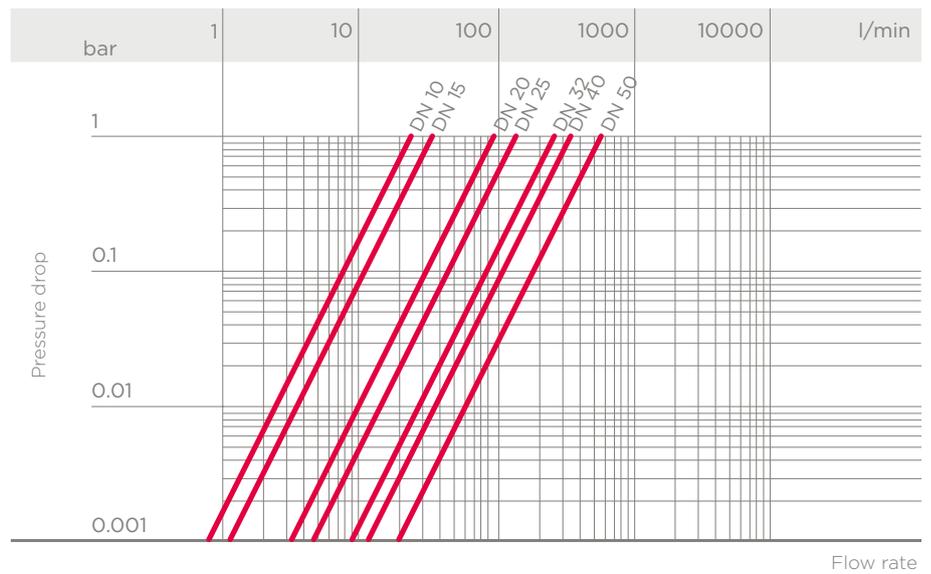
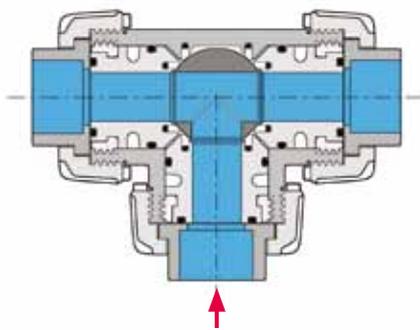
For water and non-hazardous fluids to which the material is classified as CHEMICALLY RESISTANT. In other cases, a reduction of the nominal pressure PN is required (25 years with safety factor).

Note: When using PVC-C at working temperatures higher than 90°, it is advisable to first contact the service centre.

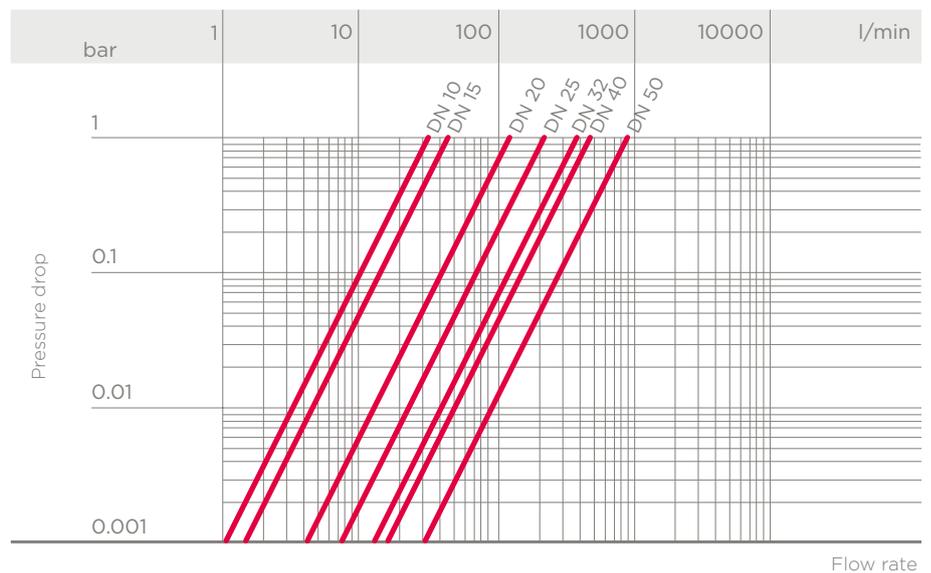
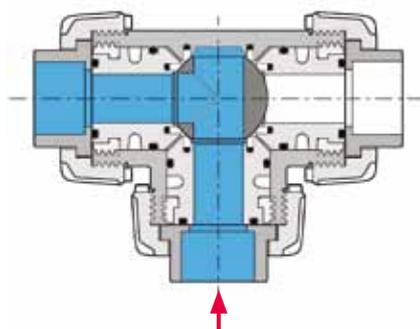


PRESSURE DROP GRAPH AND WORKING POSITIONS

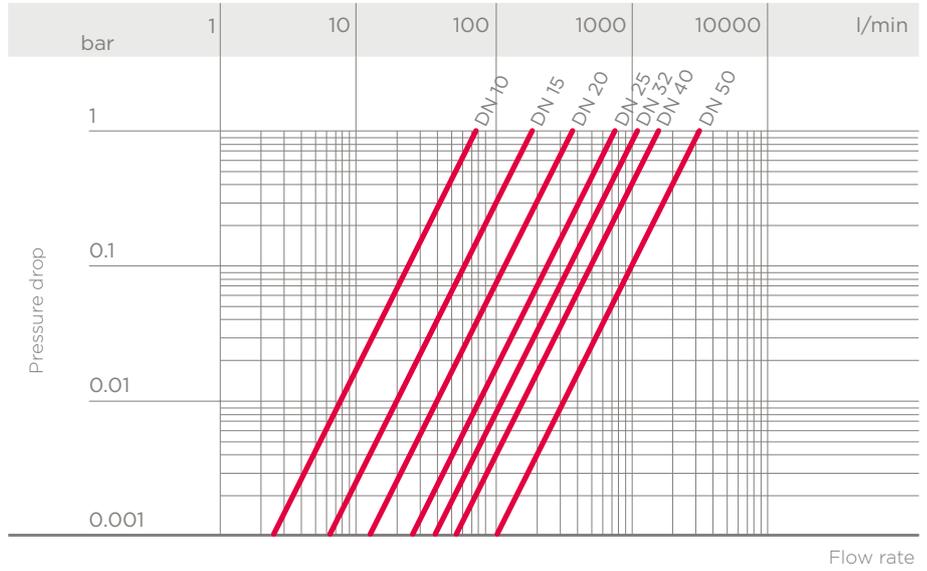
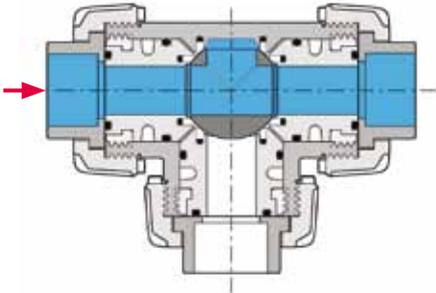
A - T-port ball valve:
0° - Mixing



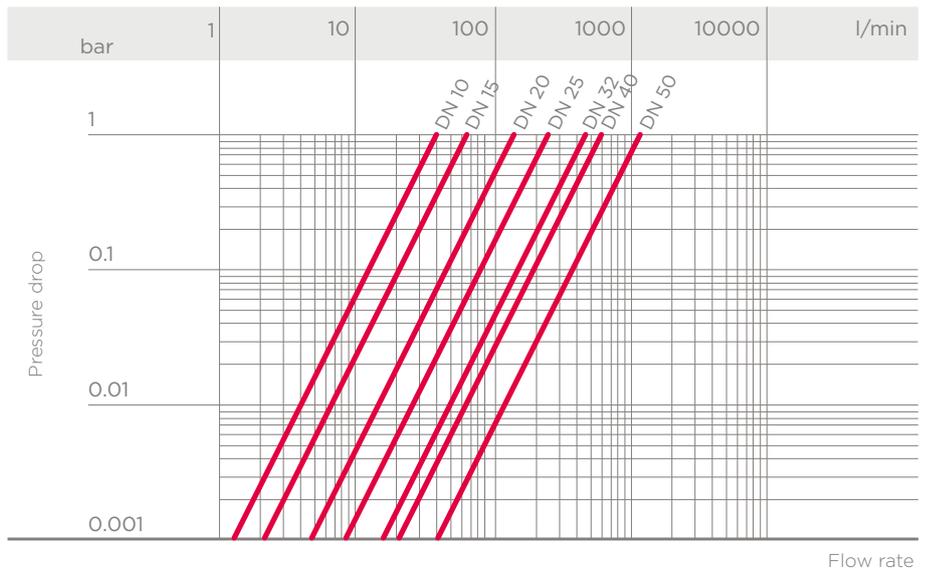
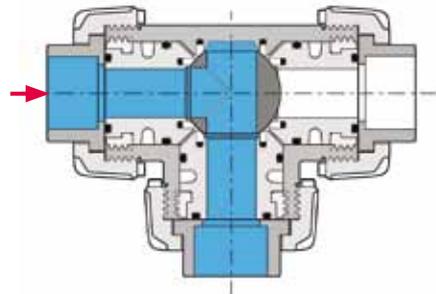
B - T-port ball valve:
90° - Diverting



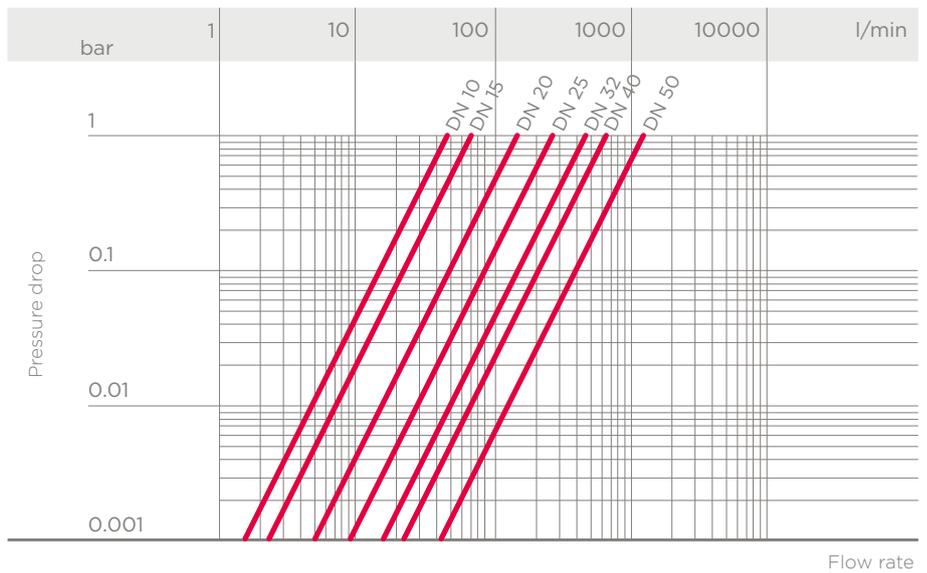
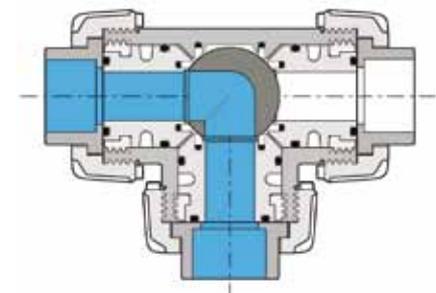
C - T-port ball valve:
180° - Branch closed/direct
flow



D - T-port ball valve:
270° - Diverting



E - L-port ball valve:
0°/270° - Diverting



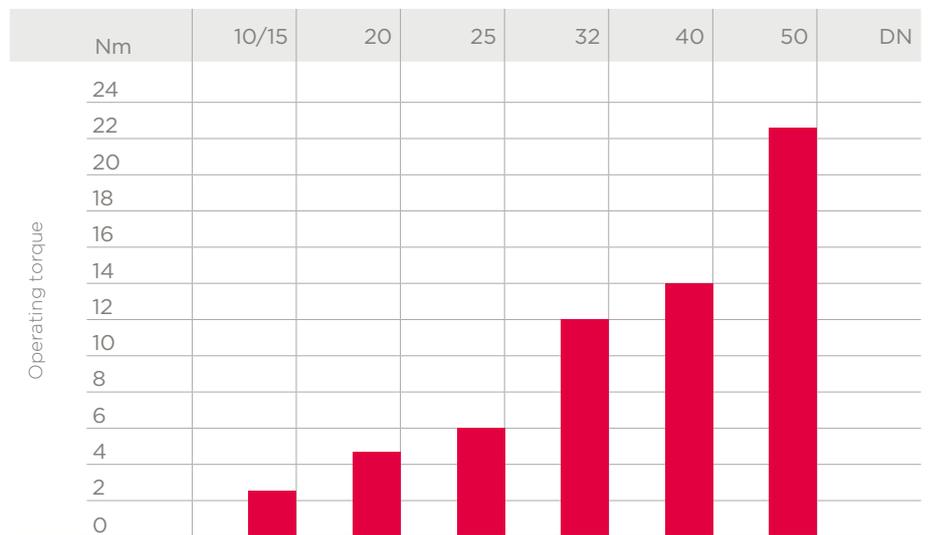
K_v100 FLOW COEFFICIENT

The K_v100 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 K_v100 values shown in the table are calculated with the valve completely open.

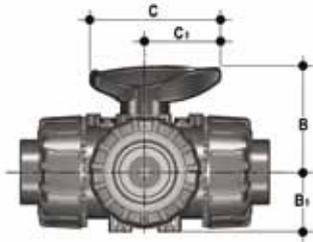
	DN	10	15	20	25	32	40	50
K _v 100 l/min	A	25	35	95	140	270	330	620
	B	37	55	135	205	390	475	900
	C	78	195	380	760	1050	1700	3200
	D	40	65	145	245	460	600	1200
	E	48	73	150	265	475	620	1220

OPERATING TORQUE AT MAXIMUM WORKING PRESSURE



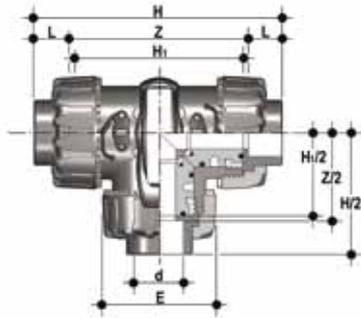
The information in this leaflet is provided in good faith. No liability will be accepted concerning technical data that is not directly covered by recognised international standards. FIP reserves the right to carry out any modification. Products must be installed and maintained by qualified personnel.

DIMENSIONS



Dimensions shared by all versions

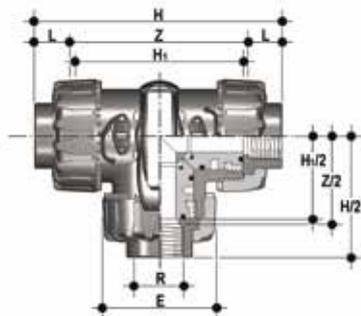
d	DN	B	B ₁	C	C ₁
16	10	54	29	67	40
20	15	54	29	67	40
25	20	65	34.5	85	49
32	25	69.5	39	85	49
40	32	82.5	46	108	64
50	40	89	52	108	64
63	50	108	62	134	76



TKDIC - LKDIC

DUAL BLOCK® 3-way ball valve with female ends for solvent welding, metric series.
TKDIC - T-port ball/ LKDIC - L-port ball

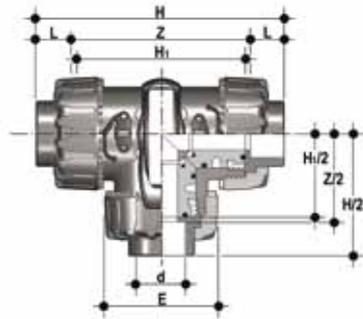
d	DN	PN	E	H	H ₁	L	Z	g	TKDIC EPDM Code	TKDIC FPM Code	LKDIC EPDM Code	LKDIC FPM Code
16	10	16	54	118	80	14	90	310	TKDIC016E	TKDIC016F	LKDIC016E	LKDIC016F
20	15	16	54	118	80	16	86	310	TKDIC020E	TKDIC020F	LKDIC020E	LKDIC020F
25	20	16	65	145	100	19	107	550	TKDIC025E	TKDIC025F	LKDIC025E	LKDIC025F
32	25	16	73	160	110	22	116	790	TKDIC032E	TKDIC032F	LKDIC032E	LKDIC032F
40	32	16	86	188.5	131	26	136.5	1275	TKDIC040E	TKDIC040F	LKDIC040E	LKDIC040F
50	40	16	98	219	148	31	157	1660	TKDIC050E	TKDIC050F	LKDIC050E	LKDIC050F
63	50	16	122	266.5	179	38	190.5	2800	TKDIC063E	TKDIC063F	LKDIC063E	LKDIC063F



TKDFC - LKDFC

Dual Block® 3-way ball valve with BSP threaded female ends.
TKDFC - T-port ball/ LKDFC - L-port ball

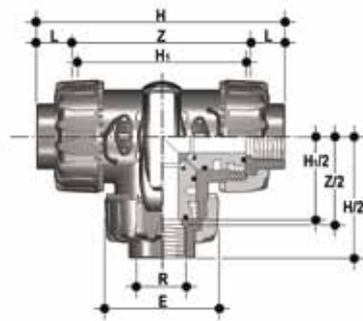
R	DN	PN	E	H	H ₁	L	Z	g	TKDFC EPDM Code	TKDFC FPM Code	LKDFC EPDM Code	LKDFC FPM Code
1/2"	15	16	54	126	80	18	90.4	310	TKDFC012E	TKDFC012F	LKDFC012E	LKDFC012F
3/4"	20	16	65	146.4	100	18	110.4	550	TKDFC034E	TKDFC034F	LKDFC034E	LKDFC034F
1"	25	16	73	166.6	110	22.6	121.4	790	TKDFC100E	TKDFC100F	LKDFC100E	LKDFC100F
1 1/4"	32	16	86	195.8	131	25.1	145.6	1275	TKDFC114E	TKDFC114F	LKDFC114E	LKDFC114F
1 1/2"	40	16	98	211.4	148	24.7	162	1660	TKDFC112E	TKDFC112F	LKDFC112E	LKDFC112F
2"	50	16	122	253.8	179	29.6	194.6	2800	TKDFC200E	TKDFC200F	LKDFC200E	LKDFC200F



TKDAC - LKDAC

DUAL BLOCK® 3-way ball valve with female ends for solvent welding, ASTM series.
TKDAC - T-port ball/ LKDAC - L-port ball

d	DN	PN	E	H	H ₁	L	Z	g	TKDAC EPDM Code	TKDAC FPM Code	LKDAC EPDM Code	LKDAC FPM Code
1/2"	15	16	54	132.2	80	23	87.2	310	TKDAC012E	TKDAC012F	LKDAC012E	LKDAC012F
3/4"	20	16	65	159.2	100	25.5	108.2	550	TKDAC034E	TKDAC034F	LKDAC034E	LKDAC034F
1"	25	16	73	174	110	28.7	116.6	790	TKDAC100E	TKDAC100F	LKDAC100E	LKDAC100F
1 1/4"	32	16	86	205	131	32	141	1275	TKDAC114E	TKDAC114F	LKDAC114E	LKDAC114F
1 1/2"	40	16	98	227.6	148	35	157.6	1660	TKDAC112E	TKDAC112F	LKDAC112E	LKDAC112F
2"	50	16	122	267	179	38.2	190.6	2800	TKDAC200E	TKDAC200F	LKDAC200E	LKDAC200F

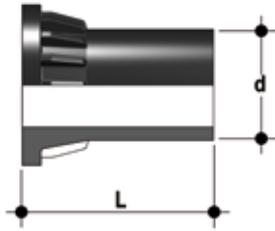


TKDNC - LKDNC

DUAL BLOCK® 3-way ball valve with female ends, NPT thread.
TKDNC - T-port ball/ LKDNC - L-port ball

d	DN	PN	E	H	H ₁	L	Z	g	TKDNC EPDM Code	TKDNC FPM Code	LKDNC EPDM Code	LKDNC FPM Code
1/2"	15	16	54	126	80	18	90.4	310	TKDNC012E	TKDNC012F	LKDNC012E	LKDNC012F
3/4"	20	16	65	146.4	100	18	110.4	550	TKDNC034E	TKDNC034F	LKDNC034E	LKDNC034F
1"	25	16	73	166.6	110	22.6	121.4	790	TKDNC100E	TKDNC100F	LKDNC100E	LKDNC100F
1 1/4"	32	16	86	195.8	131	25.1	145.6	1275	TKDNC114E	TKDNC114F	LKDNC114E	LKDNC114F
1 1/2"	40	16	98	211.4	148	24.7	162	1660	TKDNC112E	TKDNC112F	LKDNC112E	LKDNC112F
2"	50	16	122	253.8	179	29.6	194.6	2800	TKDNC200E	TKDNC200F	LKDNC200E	LKDNC200F

ACCESSORIES



CVDE

Long spigot PE100 end connectors for joints with electrofusion fittings or for butt welding

d	DN	PN	L	SDR	Code
20	15	16	55	11	CVDE11020
25	20	16	70	11	CVDE11025
32	25	16	74	11	CVDE11032
40	32	16	78	11	CVDE11040
52	40	16	84	11	CVDE11050
63	50	16	91	11	CVDE11063



SHKD

Handle block kit 0° - 90° lockable

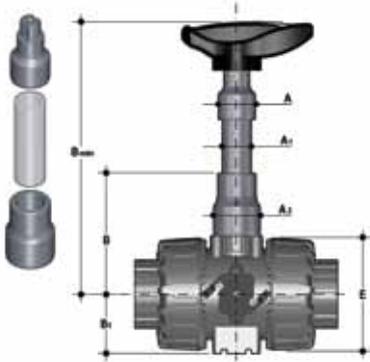
d	DN	Code
16 - 20	10 - 15	SHKD020
25 - 32	20 - 25	SHKD032
40 - 50	32 - 40	SHKD050
63	50	SHKD063



LTKD

The LTKD stroke limiter specifically permits handle and ball rotation only at set opening and closing angles. The LTKD090 version permits operations for 90° angles while the LTKD180 version for 180° angles. The LTKD stroke limiter is made up of a single removable plate made of technopolymer. Designed for ISO 5211 bore and specifically designed to be directly housed on the valve body mounting flange. It is secured to the valve body by self-tapping screws or plastic rivets.

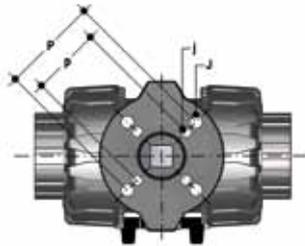
d	DN	Code 90°	Code 180°
16 - 20	10 - 15	LTKD090020	LTKD180020
25 - 32	20 - 25	LTKD090032	LTKD180032
40 - 50	32 - 40	LTKD090050	LTKD180050
63	50	LTKD090063	LTKD180063



PSKD

Stem extension

d	DN	A	A ₁	A ₂	E	B	B ₁	B min	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	206	PSKD050
63	50	40	32	59	122	122	62	225	PSKD063

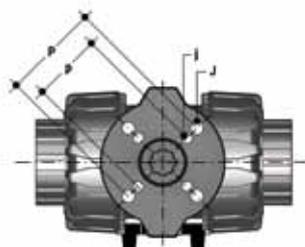


POWER QUICK CP

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

d	DN	B ₂	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 upon request

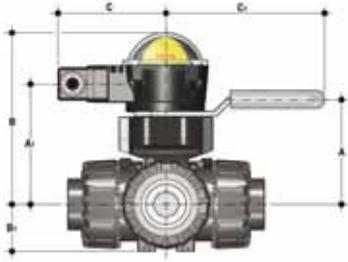


POWER QUICK CE

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

d	DN	B ₂	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

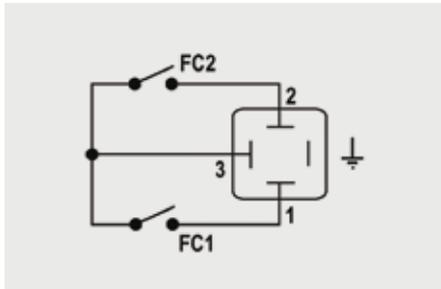
*F04 x 5.5 upon request



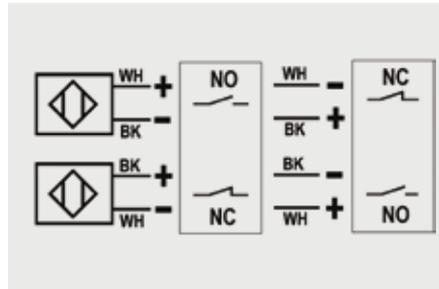
MSKD

MSKD is a limit switch box with electromechanical or inductive micro switches to remotely signal the valve position (maximum 90° rotation). Manual valve installation is possible using the Power Quick actuation module. The box can be assembled on the TKD valve even if already installed on the system.

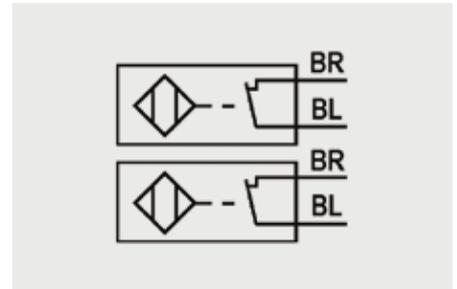
d	DN	A	A ₁	B	B ₁	C	C ₁	Code electromechanical	Code inductive	Code Namur
16	10	58	85	132.5	29	88.5	134	MSKD1M	MSKD1I	MSKD1N
20	15	58	85	132.5	29	88.5	134	MSKD1M	MSKD1I	MSKD1N
25	20	70.5	96	143.5	34.5	88.5	134	MSKD1M	MSKD1I	MSKD1N
32	25	74	101	148.5	39	88.5	134	MSKD1M	MSKD1I	MSKD1N
40	32	116	118	165.5	46	88.5	167	MSKD2M	MSKD2I	MSKD2N
50	40	122	124	171.5	52	88.5	167	MSKD2M	MSKD2I	MSKD2N
63	50	139	141	188.5	62	88.5	167	MSKD2M	MSKD2I	MSKD2N



Electromechanical



Inductive



Namur

WH = white; BK = black; BL = blue; BR = brown

Type switches	Flow rate	Lifetime [drives]	Rated operating	Rated voltage	Operating current	Voltage drop	Empty current	Protection rate
Electromechanical	250 V - 5 A	3 x 10 ⁷	-	-	-	-	-	IP65
Inductive	-	-	5 ÷ 36 V	-	4 ÷ 200 mA	< 4,6 V	< 0,8 mA	IP65
Namur*	-	-	7,5 ÷ 30 V DC**	8,2 V DC	< 30 mA**	-	-	IP65

* To be used with an amplifier

** Outside areas with explosion risks

FASTENING AND SUPPORTING



All valves, whether manual or driven, must be adequately supported in many applications.

The TKD valve series is therefore provided with an integrated bracket that permits direct anchoring of 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.

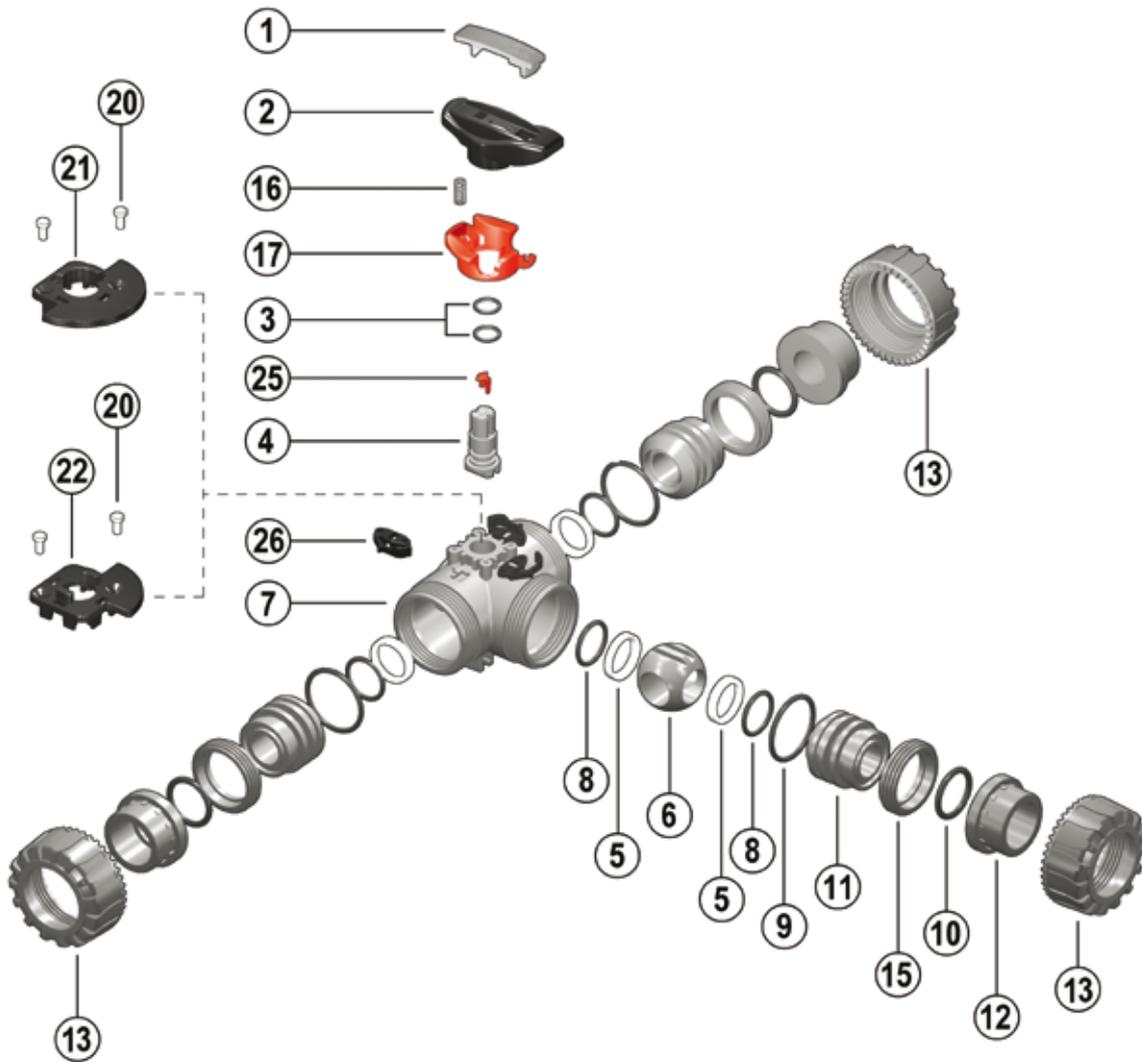


d	DN	B	H	L	J*
16	10	31.5	27	20	M4 x 6
20	15	31.5	27	20	M4 x 6
25	20	40	30	20	M4 x 6
32	25	40	30	20	M4 x 6
40	32	50	35	20	M6 x 10
50	40	50	35	20	M6 x 10
63	50	60	40	20	M6 x 10

* With threaded inserts

COMPONENTS

EXPLODED VIEW



1 · Handle insert (PVC-U - 1)

2 · Handle (HIPVC - 1)

3 · Stem O-ring
(EPDM or FPM - 2)*

4 · Stem (PVC-C - 1)

5 · Ball seat (PTFE - 4)*

6 · Ball (PVC-C - 1)

7 · Body (PVC-C - 1)

8 · Ball seat O-Ring
(EPDM or FPM - 4)*

9 · Radial seal O-Ring
(EPDM or FPM - 3)

10 · Socket seal O-Ring
(EPDM or FPM - 3)*

11 · Ball seat carrier (PVC-C - 3)

12 · End connector (PVC-C - 3)*

13 · Union nut(PVC-C - 3)

15 · Threaded ring (PVC-C - 3)

16 · Spring - SHKD accessory

(STAINLESS steel - 1)**

17 · Handle safety block - SHKD
accessory (PP-GR - 1)**

20 · Rivet for LTKD (POM - 2)**

21 · LTKD 180° (POM - 1)**

22 · LTKD 90° (POM - 1)**

25 · Position indicator
(POM - 1)

26 · DUAL BLOCK® (POM - 3)

* Spare parts

** Accessories

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

DISASSEMBLY

- 1) Isolate the valve from the line (release the pressure and empty the pipeline).
- 2) Release the union nuts by pressing the lever on the DUAL BLOCK® (26) along the axis and separate it from the union nut (fig. 1). It is also possible to completely remove the locking device from the valve body.
- 3) Unscrew the union nuts (13) and extract the body (7).
- 4) After turning the handle (2) to the position with the three arrows pointing at the three ports (for L-port ball with two arrows facing the ports a and b), extract the insert (1) from the handle (2) and insert the two protrusions in the corresponding apertures in the threaded rings (15), extracting the carriers (11) by turning counter-clockwise.
- 5) Extract the ball (6) from the central port being careful not to damage the seat surface.
- 6) Remove the PTFE ball seats (5) and O-Rings (8, 9, 10) from the carriers (11).
- 7) Pull the handle (2) upwards to remove it from the stem (4).
- 8) Press the stem (4) into the body and extract it.
- 9) Remove the PTFE ball seat (5) with relevant O-ring (8) from inside the valve body.
- 10) Remove the stem (4) O-rings (3) from their seats.

ASSEMBLY

- 1) Insert the O-rings (3) on the stem (4).
- 2) Insert the O-ring (8) in the seat in the valve body and, next, the PTFE ball seat (5).
- 3) Insert the stem (4), from the interior, in the body, being sure the three bores match the three outlets.
- 4) Insert the ball (6) from the central port b, being careful that the three bores match the three outlets (for L-port ball, the two bores must match the a and b outlets).
- 5) Insert the O-rings (8), PTFE ball seats (5), socket seal O-rings (10) and radial seal O-rings (9) in their seats on the carriers (11).
- 6) Insert the three carriers (11) with the relevant threaded rings (15), screwing in clockwise with the handle insert (1) and starting from the one on the central outlet b.
- 7) Press the handle (2) on the stem (4), being careful to match the printed arrows with the lines on the stem (fig. 2-3).
- 8) Return the insert (1) in the handle (2)
- 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.



Note: 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

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 (26) 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 three 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 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”).

Fig. 1



Fig. 2



Fig. 3



Fig. 4



The TKD valve can be equipped with a handle block to prevent ball rotation (available as an accessory). When the block (16, 17) is installed, lift the lever (17) and rotate the handle.

A lock can also be installed on the handle to protect the system against tampering (fig. 4).

Seals can be adjusted using the extractable insert on the handle (fig. 5-6). After positioning the ball as in figure 7-8, using this insert as a tool you can adjust the seals by screwing in the carriers following the indicated sequence (fig. 7-8).

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 high number of manoeuvres.

Fig. 5



Fig. 6



Fig. 7

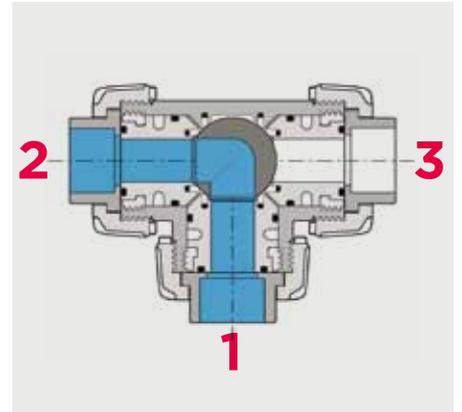
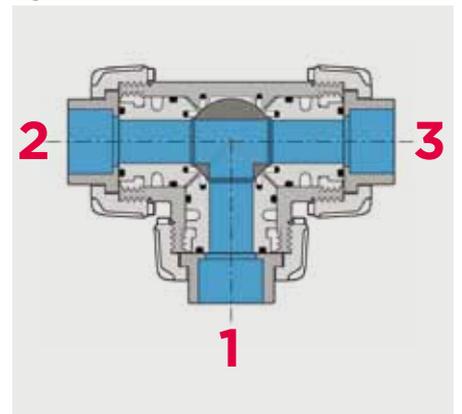


Fig. 8



WARNINGS

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