

# BFD\*

## SIX WAYS BANKABLE FLOW DIVERTER SERIES 10

**p** max 320 bar  
**Q** max 90 l/min

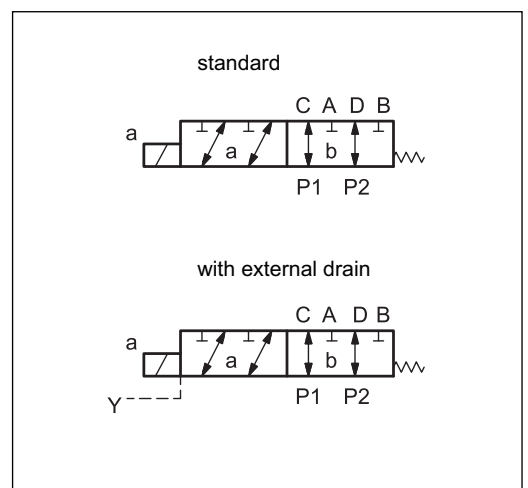
### OPERATING PRINCIPLE

- BFD is a 6 ways bankable flow diverter that allows the simultaneous connection of 2 utilities, alternating the direction of flow through a solenoid operate directional valve.
- It is available in two sizes, depending on the requested flow, and is used mainly for compact applications for the mobile sector.
- Valve BFD is also suitable for series mounting, lining up to max 5 modules.
- The external drain is available as an option on both versions.

### PERFORMANCES (obtained with mineral oil with viscosity of 36 cSt at 50°C)

		BFD06	BFD10
Maximum operating pressure : - with drain Y	bar	250 320	
Maximum flow	l/min	60	90
Pressure drops $\Delta p$ - Q		see paragraph 3	
Electrical features		see paragraph 6	
Operating limits		see paragraph 4	
Electrical connections		see paragraph 10	
Ambient temperature range	°C	-20 / +50	
Fluid temperature range	°C	-20 / +80	
Fluid viscosity range	cSt	10 + 400	
Fluid contamination degree		According to ISO 4406:1999 class 20/18/15	
Recommended viscosity	cSt	25	
Mass:	kg	3	4,2

### HYDRAULIC SYMBOL



### 1 - IDENTIFICATION CODE

<b>BFD</b>	-		-	<b>TA6</b>	/	<b>10</b>	-		/	
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Bankable 6 ways flow diverter

Nominal size  
**06** = 60 l/min  
**10** = 90 l/min

Ports: (see **NOTE 1**)  
**G038** = 3/8" BSP (for BFD06)  
**G012** = 1/2" BSP (for BFD10)

Spool type: \_\_\_\_\_

Series: \_\_\_\_\_  
 (the overall and mounting dimensions remain unchanged from 10 to 19)

Seals: \_\_\_\_\_  
**N** = NBR seals for mineral oil (**standard**)  
**V** = FPM seals for special fluids

**NOTE 1:** On BFD06 are available upon request for the following additional threads: 3/4" 16 UNF (**S08**) e 1/2" BSP (**G012**).

**NOTE 2:** The locking rings of the coils and the relevant O-Rings are supplied together with valves.

Option:  
**Y** = External drain (see par. 12.2)

Manual override: omit for override integrated in the tube (**standard**)  
**CM** = manual override, boot protected

Coil electrical connection (see. par. 9):  
**K1** = plug for connector type DIN 43650 (**standard**)  
**K7** = plug for connector type DEUTSCH DT04-2P male (available only for DN06)

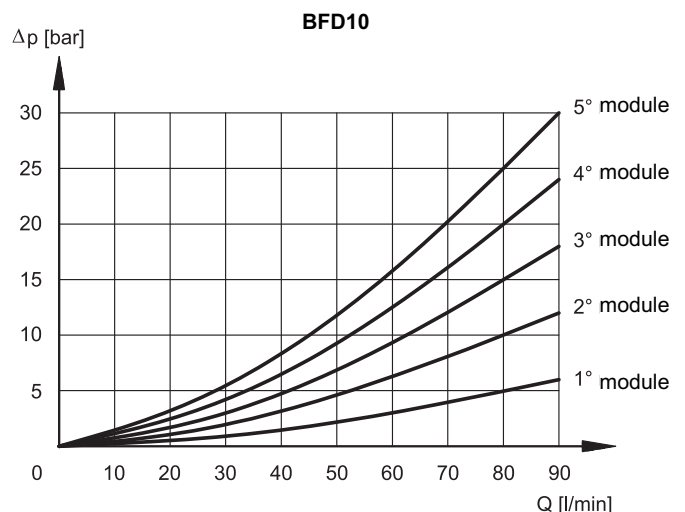
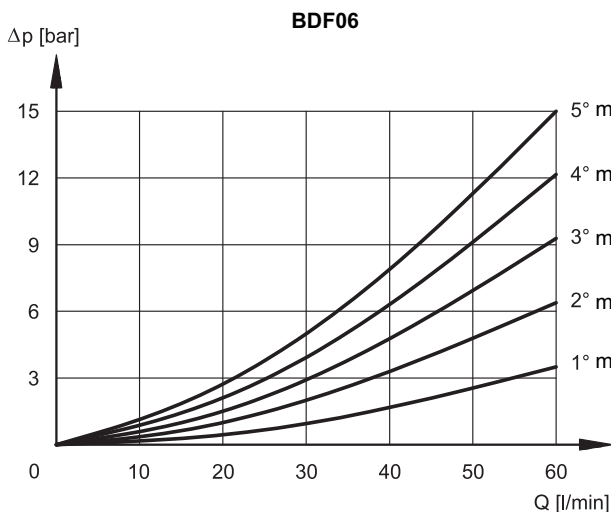
Coil type  
**D12** = 12 V  
**D24** = 24 V  
**D28** = 28 V (BFD06 only)  
**D00** = valve without coils (see **NOTE 2**)

### 2 - HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals (code N). For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department. Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics. The fluid must be preserved in its physical and chemical characteristics.

### 3 - CHARACTERISTIC CURVES (obtained with viscosity 36 cSt at 50 °C)

#### 3.1 - Pressure Drops $\Delta p$ -Q at rest

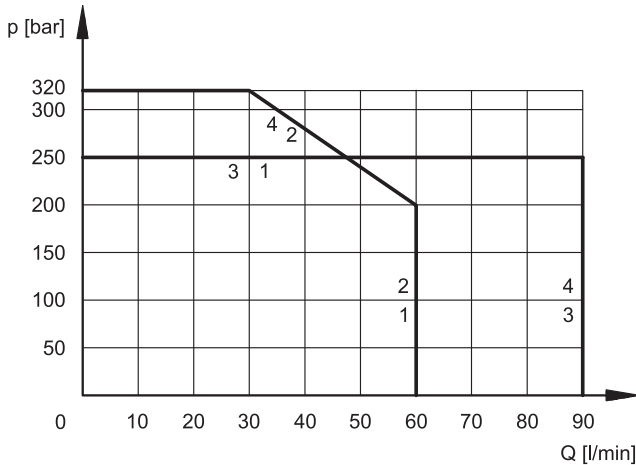


#### 4 - OPERATING LIMITS

The curves define the flow rate operating fields according to the valve pressure of the different versions.

The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage.

The value have been obtained with mineral oil, viscosity 36 cSt, temperature 50 °C and filtration according to ISO 4406:1999 class 18/16/13.



VALVE	CURVE
BFD06*	1
BFD06*/Y	2
BFD10*	3
BFD10*/Y	4

#### 5 - SWITCHING TIMES

The values indicated are obtained according to ISO 6403 standard, with mineral oil viscosity 36 cSt at 50°C.

TIMES ms (±10%)	ENERGIZING	DE-ENERGIZING
<b>BFD06</b>	25 ÷ 75	20 ÷ 50
<b>BFD10</b>	50 ÷ 100	20 ÷ 40

#### 6 - ELECTRICAL CHARACTERISTICS

##### 6.1 Solenoids

These are essentially made up of two parts: tube and coil. The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation.

##### Protection from atmospheric agents CEI EN 60529

Plug-in type	IP
K1 DIN 43650	IP 65
K7 DEUTSCH DT04 male	IP 69 K

**NOTE:** The protection degree is guaranteed only with the connector correctly connected and installed.

**NOTE 2:** In order to further reduce the emissions, use of type H connectors is recommended. These prevent voltage peaks on opening of the coil supply electrical circuit (see cat. 49 000).

<b>SUPPLY VOLTAGE FLUCTUATION</b>	± 10% Vnom
<b>MAX SWITCH ON FREQUENCY</b>	10.000 ins/hr
<b>DUTY CYCLE</b>	100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE 2)</b>	In compliance with 2004/108/ CE
<b>LOW VOLTAGE</b>	In compliance with 2006/95 CE
<b>CLASS OF PROTECTION :</b> Coil insulation (VDE 0580) Impregnation:	class H class F (BFD06) class H (BFD10)

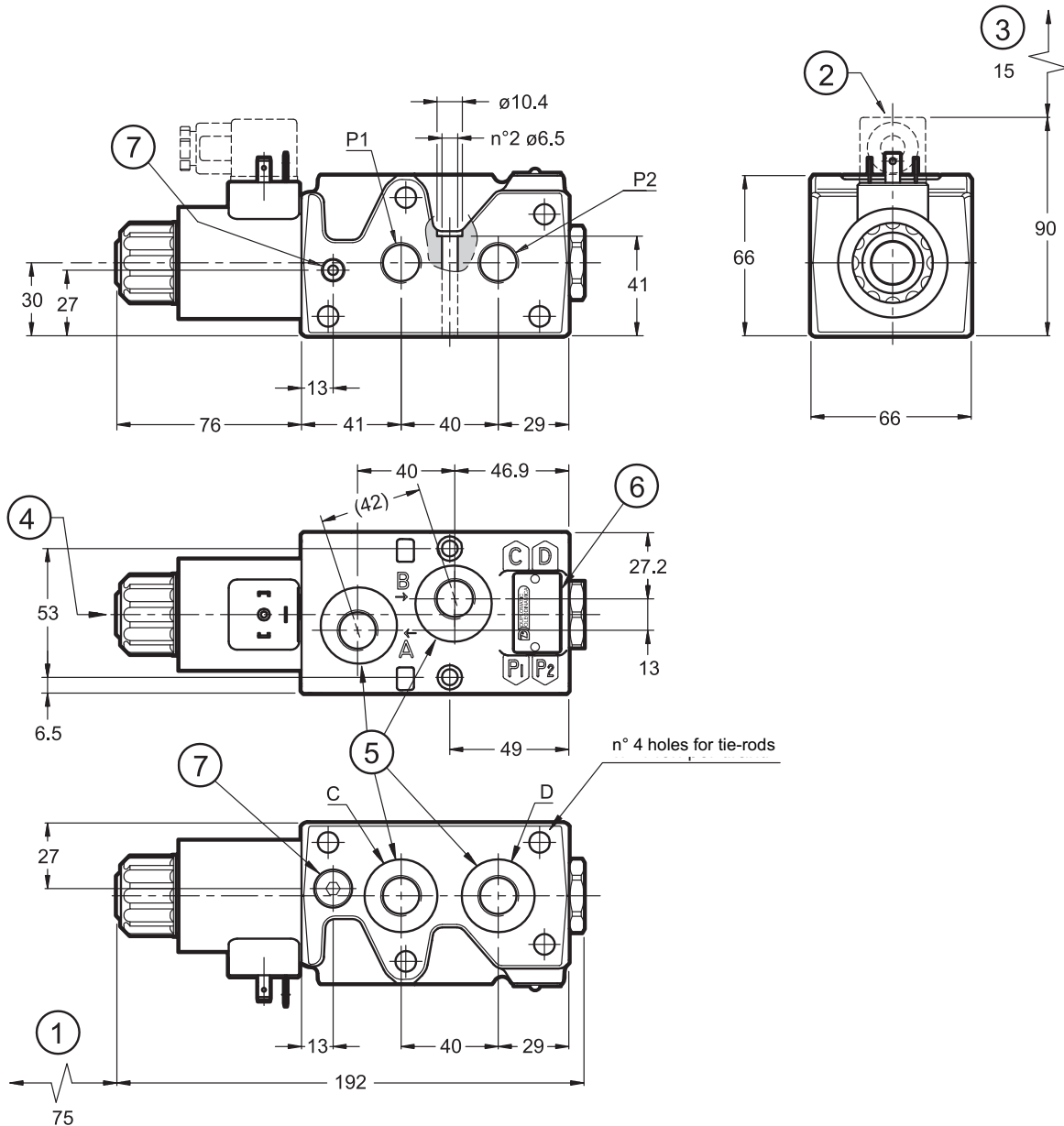
##### 6.2 Current and absorbed power

The table shows current and power consumption values relevant to the different coil types.

Valve	Coil	Resistance at 20°C [Ω] (±1%)	Current consumpt. [A] (±5%)	Absorbed power [W] (±5%)	Coil code	
					K1	K7
<b>BFD06*</b>	<b>C22S3-D12</b>	4 ÷ 5	2,72	32,7	1903080	1902940
	<b>C22S3-D24</b>	18 ÷ 19,5	1,29	31	1903081	1902941
	<b>C22S3-D28</b>	24,5 ÷ 27	1,11	31	1903082	-
<b>BFD10*</b>	<b>C22L5-D12*</b>	2,9	4,14	50	1903150	-
	<b>C22L5-D24*</b>	12,3	1,95	47	1903151	-

**7 - BFD06 OVERALL AND MOUNTING DIMENSIONS**

dimensions in mm

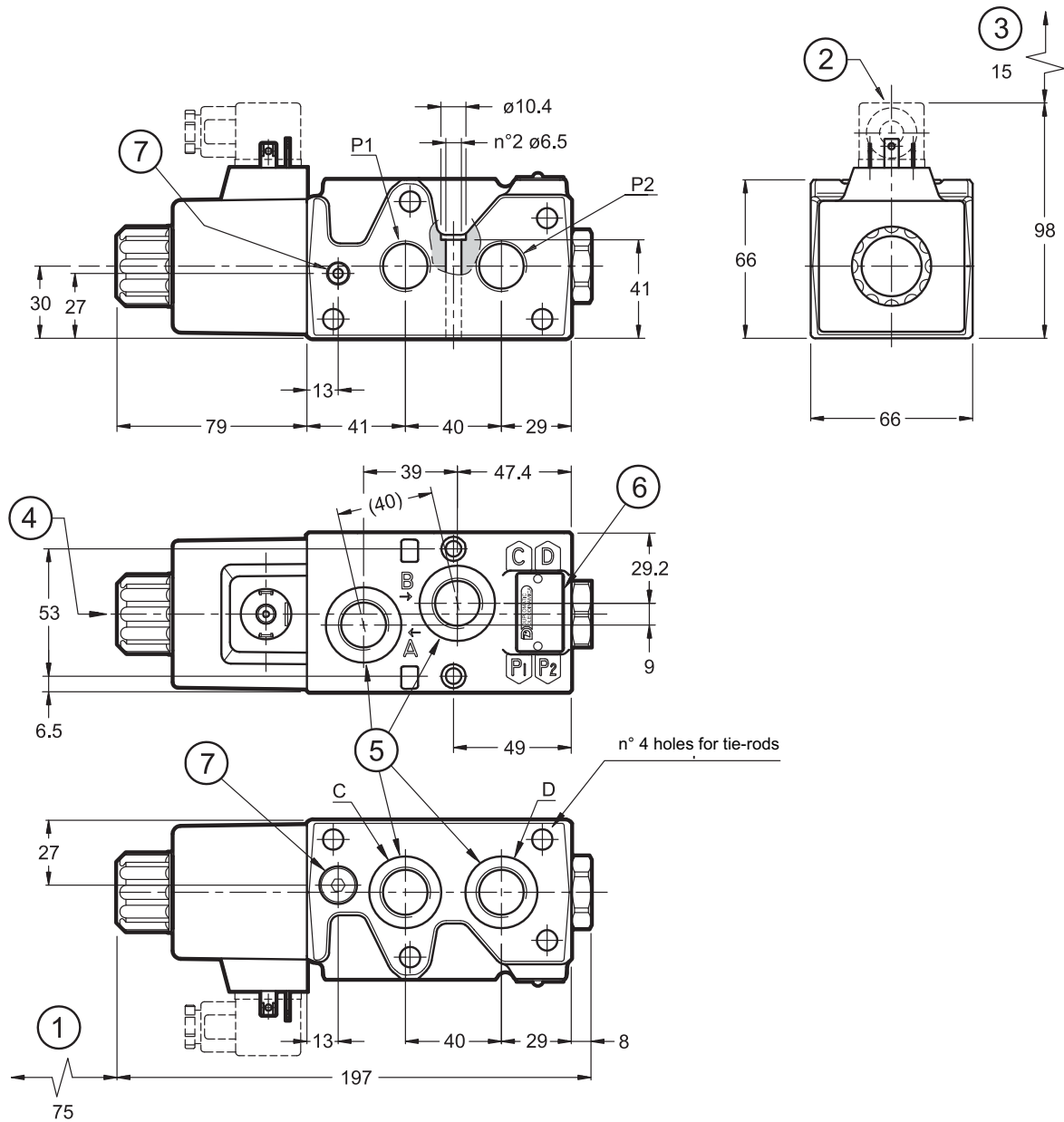


1	Coil removal space
2	DIN 43650 electrical connector
3	Connector removal space (representation with standard connection type K1 - for connection K7 see par. 10)
4	Standard manual override included in the solenoid tube
5	Ports: 3/8" BSP
6	Identification label
7	Option: external drain port Y 1/8" BSP

Fastening bolts: n°2 M6x50

**8 - BFD10 OVERALL AND MOUNTING DIMENSIONS**

dimensions in mm



1	Coil removal space
2	DIN 43650 electrical connector
3	Connector removal space
4	Standard manual override included in the solenoid tube
5	Ports: 1/2" BSP
6	Identification label
7	Option: external drain port Y 1/8" BSP

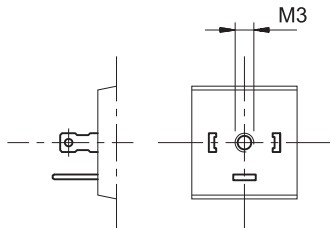
Fastening bolts: n°2 M6x50

## 9 - INSTALLATION

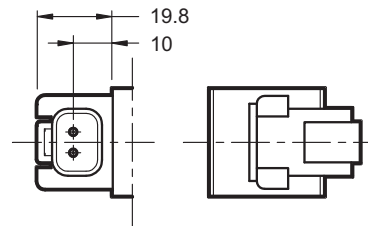
The solenoid operated valve can be installed in any position without undermining the proper functioning.

## 10 - ELECTRICAL CONNECTIONS

Connection type connector DIN 43650 - Code **K1**



Connection type connector DEUTSCH DT04-2P male  
Code **K7** (for BFD06 only)



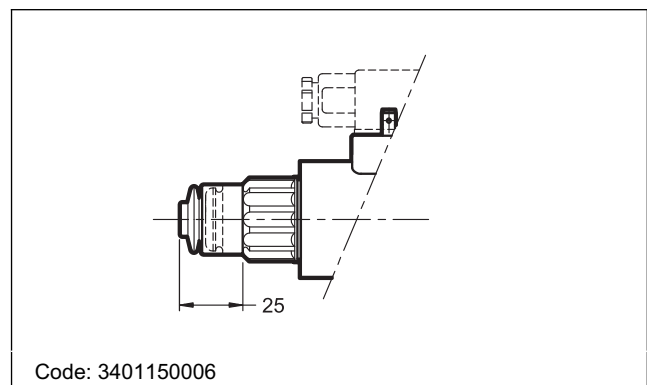
## 11 - ELECTRICAL CONNECTORS

The solenoid valves are supplied without connectors. For coils with electrical connection type K1 (DIN 43650) connectors can be ordered separately. To identify the type of connector to be ordered catalog to see 49 000.  
For connections K7 its connectors are not available.

## 12 - OPTIONS

### 12.1 Boot manual override

The standard valve has solenoids whose pin for the manual operation is integrated in the tube. The operation of this control must be executed with a suitable tool, minding not to damage the sliding surface. Option is available on both versions.



### 12.2 - Subplate external drain port (option Y)

This version allows the operation with pressures up to 320 bar on the ports.

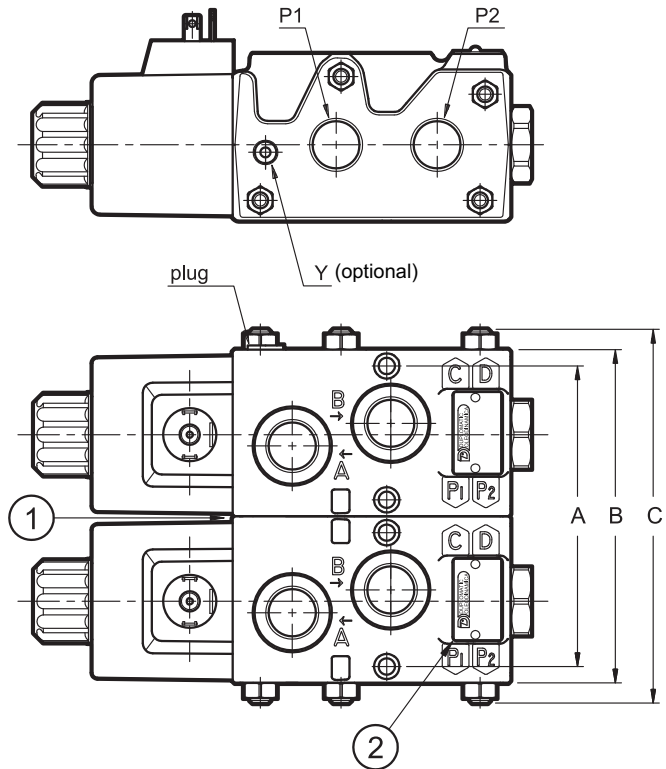
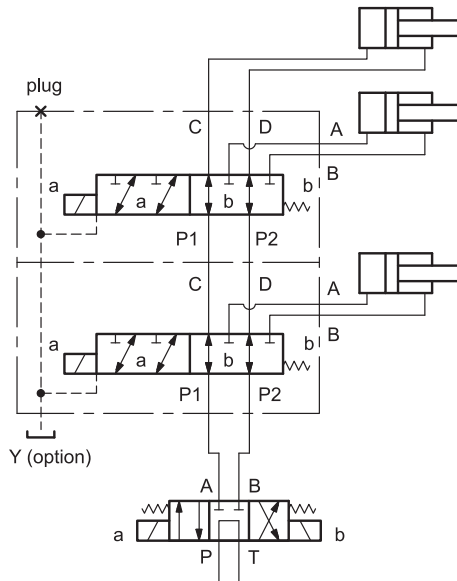
It consists in a Y drain hole realized on the valve coupling interface, where the Y port is connected with the solenoid tubes: in this way the tubes are not stressed by the pressure operating on the valve ports.

### 13 - SERIES CONFIGURATION

The BFD\* valve can also be mounted in series, bundled up to 5 individual modules. The fixing kit must be ordered separately. It includes: rods and screws, nuts, security washers and OR, as indicated in the table below.

#### 13.1 Hydraulic scheme, dimensions and installation

MOUNTING EXAMPLE



**BFD06:** 3/8" BSP ports  
**BFD10:** 1/2" BSP ports

1	Mounting surface with sealing rings: OR 2106 (26.7x1.78) 90 shore
2	Identification label

Tightening torque: 17 Nm

module s no.	ways no.	A	B	C	bolts or tie-rods	nuts & washers	n° OR 2106	kit BFD*/10N	kit BFD*/10V
2	8	119	132	156	n° 4 bolts M8x145	4+4	2	3404200002	3404200012
3	10	185	198	220	n° 4 tie-rods M8x200	8+8	4	3404200003	3404200013
4	12	251	264	285	n° 4 tie-rods M8x265	8+8	6	3404200004	3404200014
5	14	317	330	350	n° 4 tie-rods M8x330	8+8	8	3404200005	3404200015



**BFD\***  
SERIES 10



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