



# BFD\*

## SIX WAYS BANKABLE FLOW DIVERTER SERIES 10

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

### OPERATING PRINCIPLE

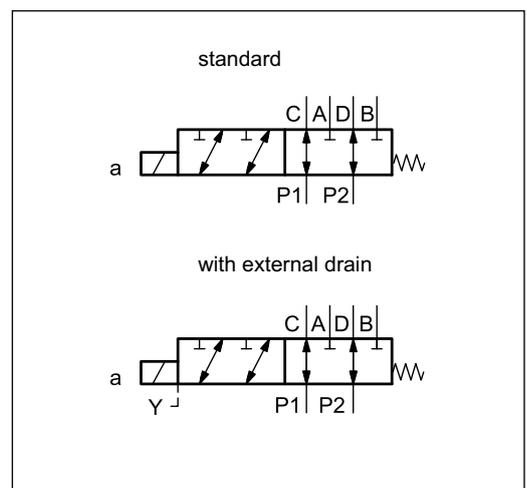
- BFD\* is a 6 ways bankable flow diverter that allows the simultaneous connection of two utilities, alternating the direction of flow through a solenoid operated directional valve.
- It is available in two sizes, depending on the requested flow, and is used mainly for compact applications for the mobile sector.
- The BFD\* valve is also suitable for series mounting, lining up to max 5 modules.
- The external drain is available as an option on both sizes.
- The BFD\* diverters are supplied with a finishing surface treatment zinc-nickel, suitable to ensure a salt spray resistance up to 240 hours. Versions with plastic coil or with zinc-nickel finished coil reach 600 hour resistance.

### PERFORMANCES

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

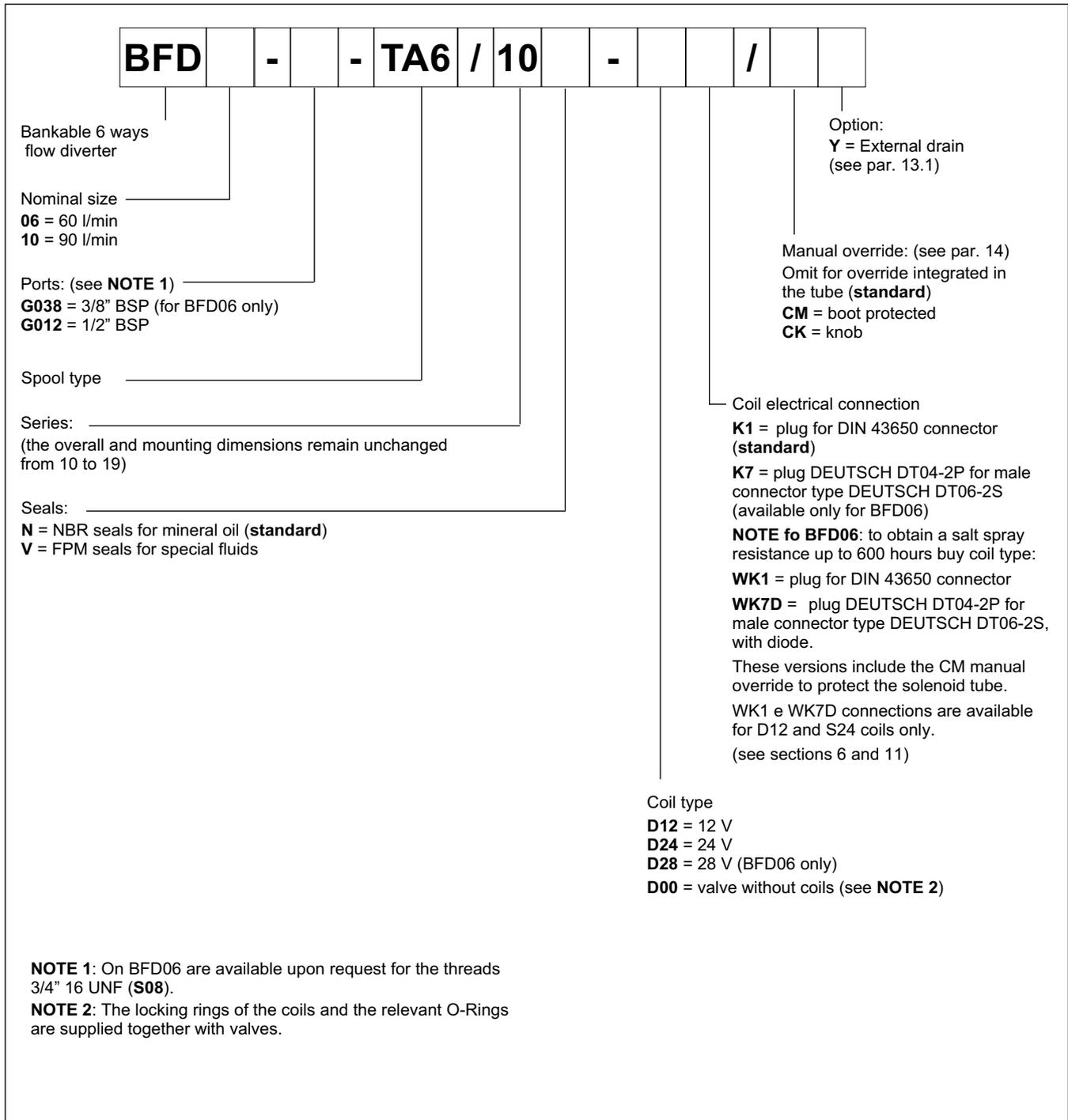
		BFD06	BFD10
Maximum operating pressure: - with drain Y	bar	250 320	
Maximum flow	l/min	60	90
Pressure drops $\Delta p - Q$	see paragraph 3		
Electrical features	see paragraph 6		
Operating limits	see paragraph 4		
Electrical connections	see paragraph 11		
Ambient temperature range	°C	-20 / +50	
Fluid 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
Surface treatment	zinc-nickel		

### HYDRAULIC SYMBOL





**1 - IDENTIFICATION CODE**



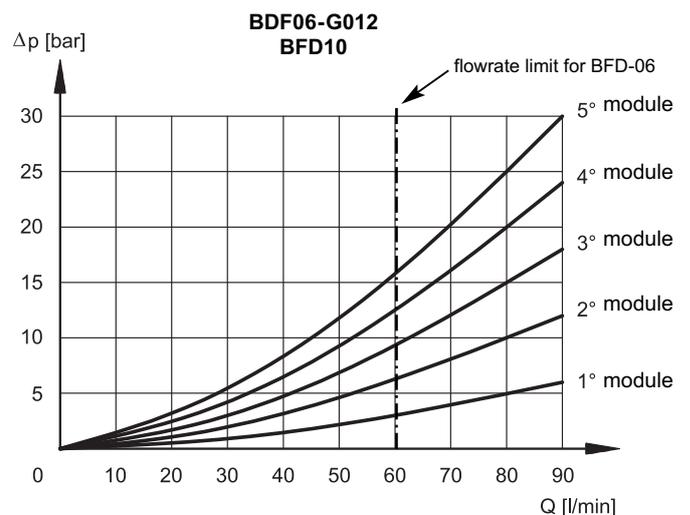
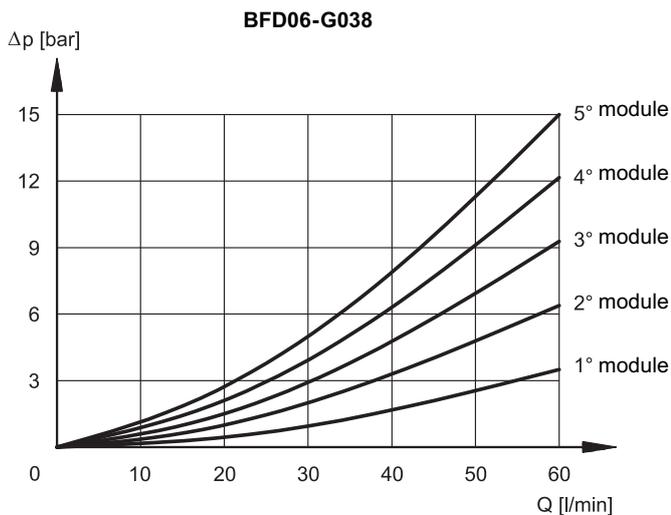
## 2 - HYDRAULIC FLUIDS

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 initial position

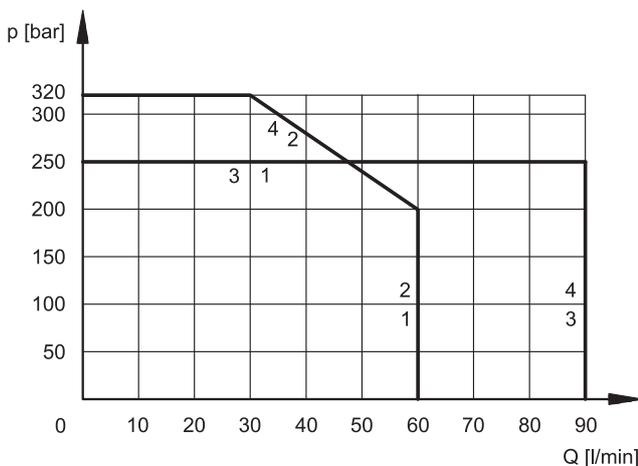


## 4 - OPERATING LIMITS

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 ( $\pm 10\%$ )	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 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/EC
<b>LOW VOLTAGE</b>	In compliance with 2006/95/EC
<b>CLASS OF PROTECTION :</b> Coil insulation (VDE 0580) Impregnation	class H class F (BFD06) class H (BFD10)

### 6.2 - Current and absorbed power

WK1 and WK7D coils have a zinc-nickel surface treatment and are specific for the high resistant version to salt spray.

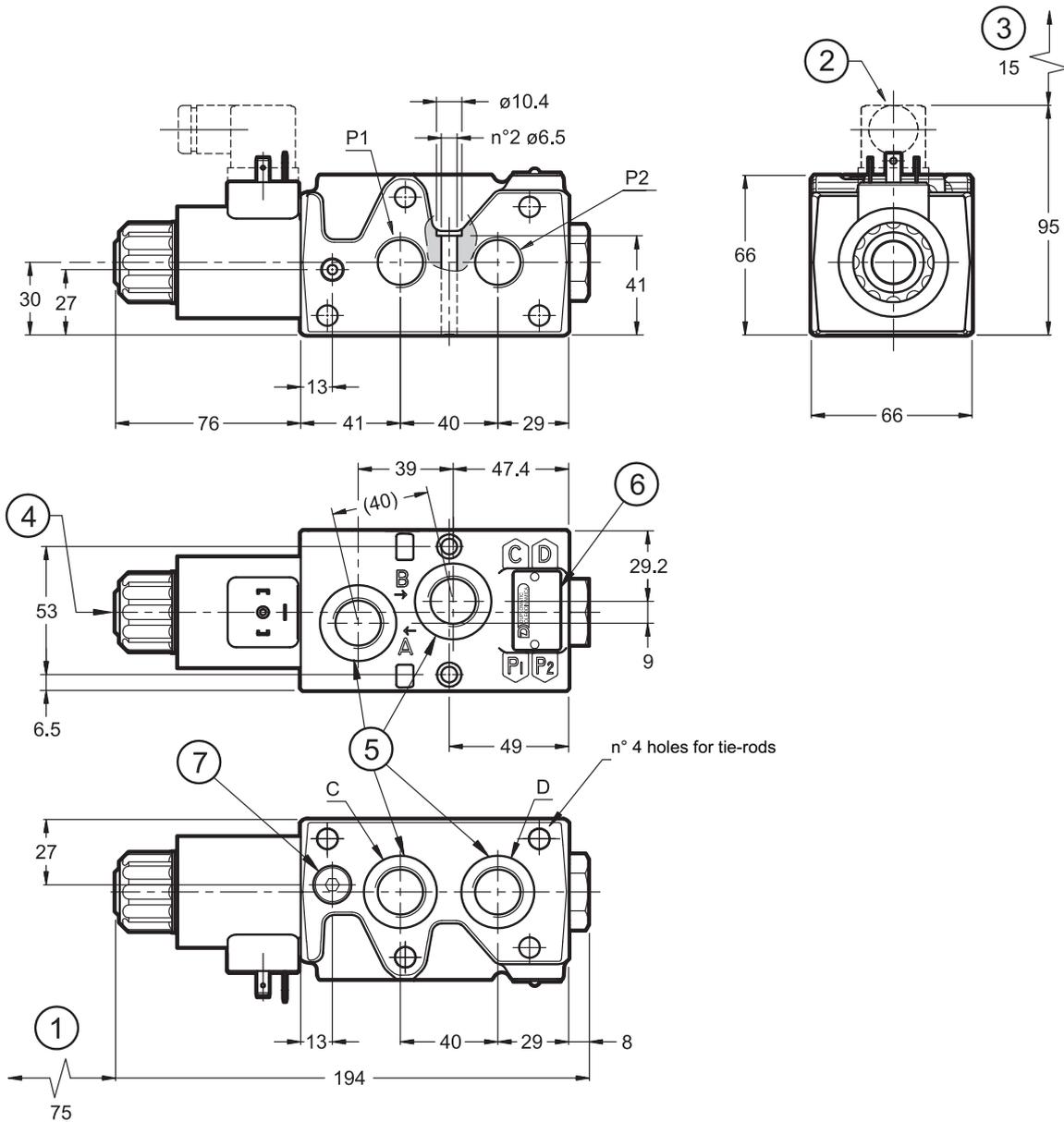
The WK7D coil includes a suppressor diode of pulses for protection from voltage peaks during switching. During the switching the diode significantly reduces the energy released by the winding, by limiting the voltage to 31.4V in the D12 coil and to 58.9 V in the D24 coil.

Valve	Coil	Resistance at 20°C [Ω] (±5%)	Current consumption [A] (±10%)	Absorbed power [W] (±10%)	Coil code			
					K1	WK1	K7	WK7D
BFD06*	D12	4 ÷ 5	2,72	32,7	1903080	1903050	1902940	1903400
	D24	18 ÷ 19,5	1,29	31	1903081	1903051	1902941	1903401
	D28	24,5 ÷ 27	1,11	31	1903082	-		
BFD10*	D12	2,9	4,14	50	1903150	-		
	D24	12,3	1,95	47	1903151	-		



**8 - BFD06-G012 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. 11)
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

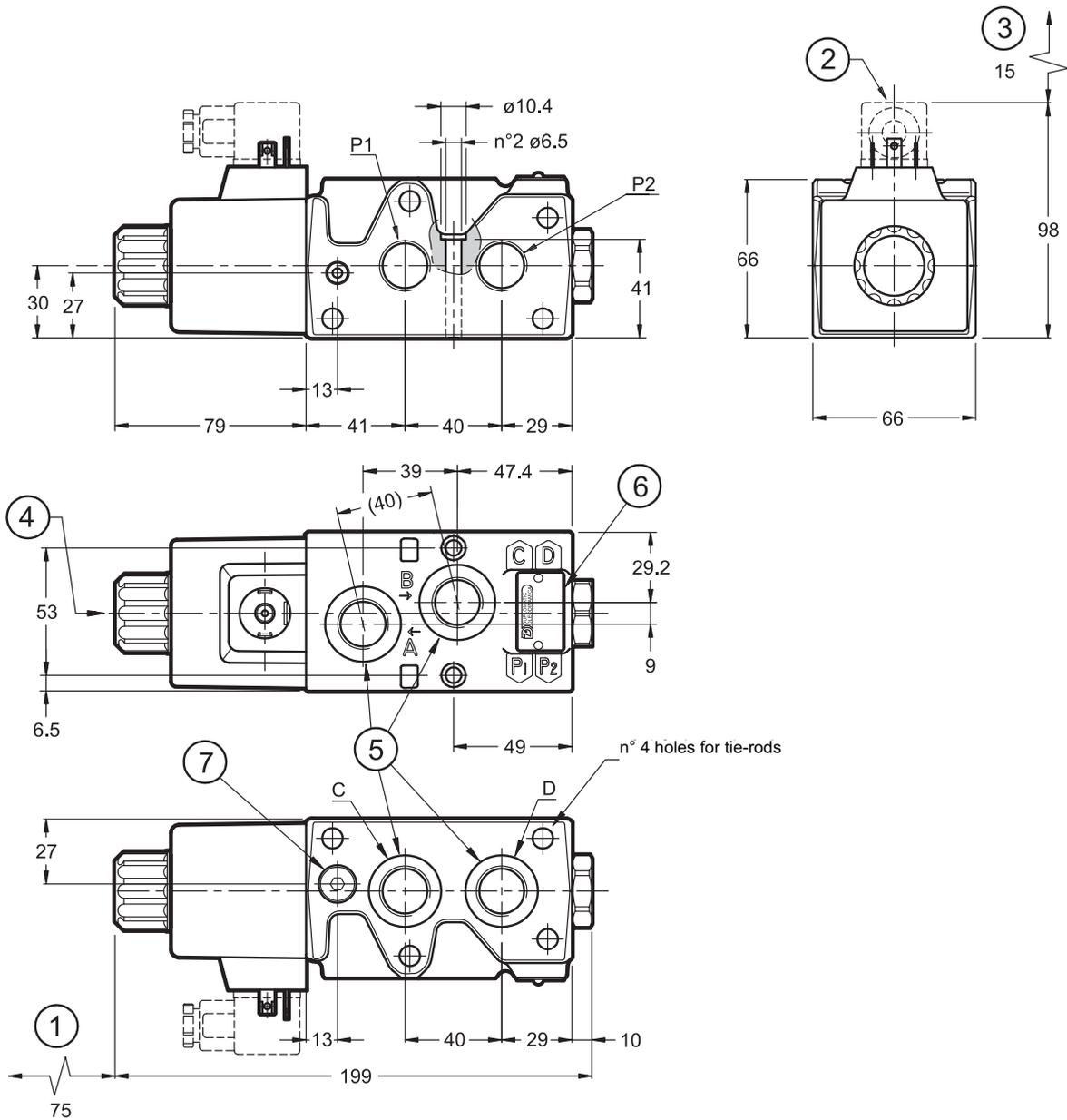
Fastening of single valve: 4 SHC screws ISO 4762 M6x50

Tightening torque: 8 Nm (A8.8 screws)

Threads of mounting holes: M6x12

**9 - 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 of single valve: 4 SHC screws ISO 4762 M6x50
Tightening torque: 8 Nm (A8.8 screws)
Threads of mounting holes: M6x12

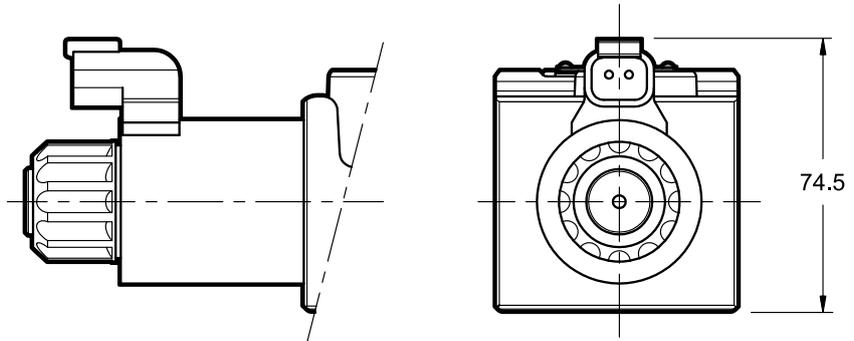
## 10 - INSTALLATION

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

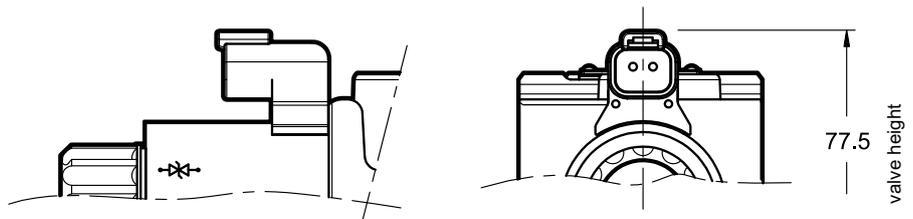
## 11 - ELECTRICAL CONNECTIONS

The standard connection K1 (for connector DIN 43650) is described in the dimension drawings. The K7 and WK7D connections are only available for BFD06\* valves.

connection for plug DEUTSCH DT04-2P  
 for male connector type DEUTSCH  
 DT06-2S  
 code **K7**



connection for plug DEUTSCH DT04-2P  
 for male connector type DEUTSCH  
 DT06-2S  
 code **WK7D** (W7 version only)



## 12 - ELECTRICAL CONNECTORS

The solenoid valves are supplied without connectors. For coils with standard electrical connection K1 type (DIN 43650) the connectors can be ordered separately: see catalogue 49 000.

## 13 - OPTIONS

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

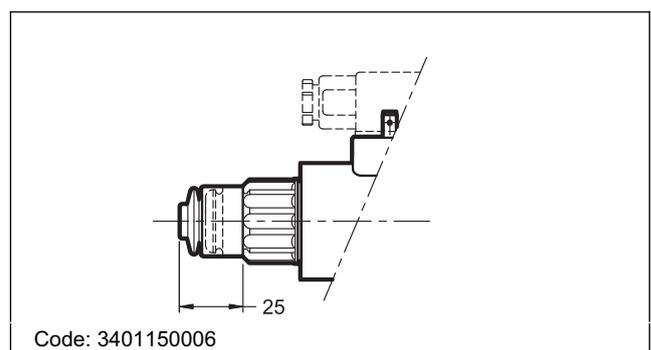
This version allows the operation with pressures up to 320 bar on the ports.

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.

## 14 - MANUAL OVERRIDES

### 14.1 - Boot manual override

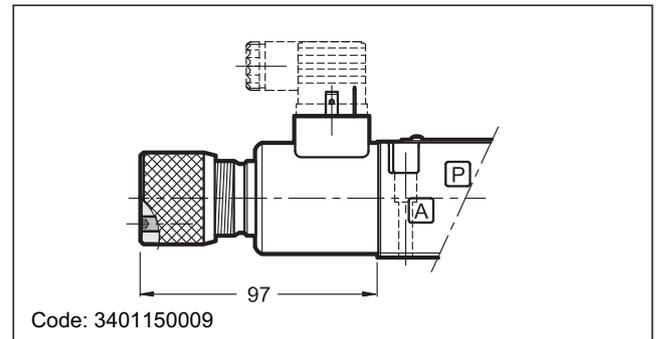
The standard valve has solenoids whose pin for the manual operation is integrated in the tube. The operation of this control must be executed with a suitable tool, minding not to damage the sliding surface. Option is available on both versions.



### 14.2 - Knob

When the set screw is screwed and its point is aligned with the edge of the knob, tighten the knob till it touches the spool: in this position the override is not engaged and the valve is de-energized. After adjusting the override, tighten the set screw in order to avoid the knob loosening.

Spanner: 3 mm



## 15 - SERIES CONFIGURATION

The BFD\* valve can also be assembled 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.

### 15.1 - Hydraulic scheme, dimensions and installation

**MOUNTING EXAMPLE**

1	Mounting surface with sealing rings: OR 2106 (26.7x1.78) 90 shore additional just for Y version: OR 2050 (12.42x1.78) 90 shore										
2	Identification label										

Tightening torque: 17 Nm

modules no.	ways no.	A	B	C	bolts or tie-rods	nuts & washers	Qty. OR 2106	Qty. OR 2050	kit BFD*/10N	kit BFD*/10V
2	8	119	132	156	4 bolts M8x145	4+4	2	1	3404200002	3404200012
3	10	185	198	220	4 tie-rods M8x200	8+8	4	2	3404200003	3404200013
4	12	251	264	285	4 tie-rods M8x265	8+8	6	3	3404200004	3404200014
5	14	317	330	350	4 tie-rods M8x330	8+8	8	4	3404200005	3404200015



**BFD\***  
SERIES 10



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