



## DIVERTER VALVES

# DH

 **valvoil**  
HYDRAULIC CONTROL SYSTEMS

valvoilgroup

## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s – 46 cSt viscosity at 40°C temperature. DH rotary spool diverter valve position cannot be changed when valve is pressurized.

		DH5	DH10	DH20	DH25	DH30
N. of available ways		3-4-6-8	3-4-6-8	3-4-6-8	3-4-6-8	3-6
Nominal flow rating		60 l/min	90 l/min	140 l/min	200 l/min	280 l/min
Operating pressure (maximum)		315 bar 4600 psi	315 bar 4600 psi	315 bar 4600 psi	250 bar 3600 psi	210 bar 3050 psi
Internal leakage A(B)→T	$\Delta p = 100 \text{ bar } 1450 \text{ psi}$ with fluid and valve at 40°C	3 cm <sup>3</sup> /min 0.18 in <sup>3</sup> /min	3 cm <sup>3</sup> /min 0.18 in <sup>3</sup> /min	3 cm <sup>3</sup> /min 0.18 in <sup>3</sup> /min	3 cm <sup>3</sup> /min 0.18 in <sup>3</sup> /min	3 cm <sup>3</sup> /min 0.18 in <sup>3</sup> /min
Hydraulic fluid		Mineral base oil				
Fluid temperature	with NBR seals	from -20°C to 80°C				
	with FPM seals	from -20°C to 100°C				
Viscosity	operating range	from 15 to 75 mm <sup>2</sup> /s – from 15 to 75 cSt				
	minima	12 mm <sup>2</sup> /s – 12 cSt				
	massima	400 mm <sup>2</sup> /s – 400 cSt				
Max. level of contamination		-/19/16 – ISO 4406				
Ambient temperature for working conditions		from -40°C to 60°C				

NOTE - For different working conditions please contact Sales Dept

## Standard threads

### REFERENCE STANDARDS

		BSP	UN-UNF	METRIC	
THREAD ACCORDING TO		ISO 228/1	ISO 263	ISO 262	ISO 262
		BS 2779	ANSI B1.1 unified		
CAVITY ACCORDING TO	ISO	1179	11926	9974-1	6149
	SAE		J1926		J2244
	DIN	3852-2 shape X or Y		3852-1 shape X or Y	

### PORTS THREAD

ALL PORTS	BSP	UN-UNF
DH5	G 3/8	3/4-16 (SAE 8)
DH10	G 1/2	7/8-14 (SAE 10)
DH20	G 3/4	1 1/16-12 (SAE 12)
DH25	G 1	1 5/16-12 (SAE 16)
DH30	G 1 1/2	1 7/8-12 (SAE 24)

NOTE - For different thread contact Sales Department

## Designation

Diverter valve **DH10 / 3 A**

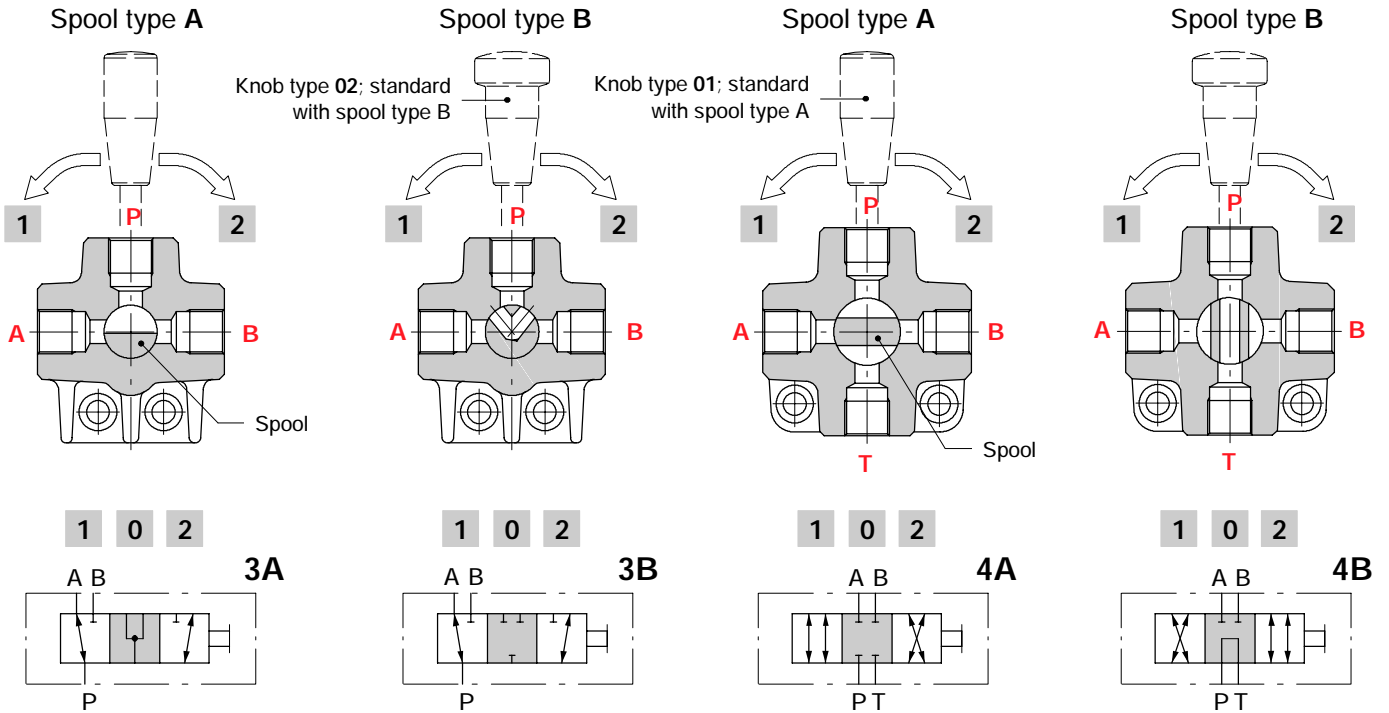
Valve type ————  
 Nr. of ways ————  
 Circuit type ————

**3-way and 6-way**

6-way diverter valve is obtained by coupling two 3-way bodies using assembling kit.

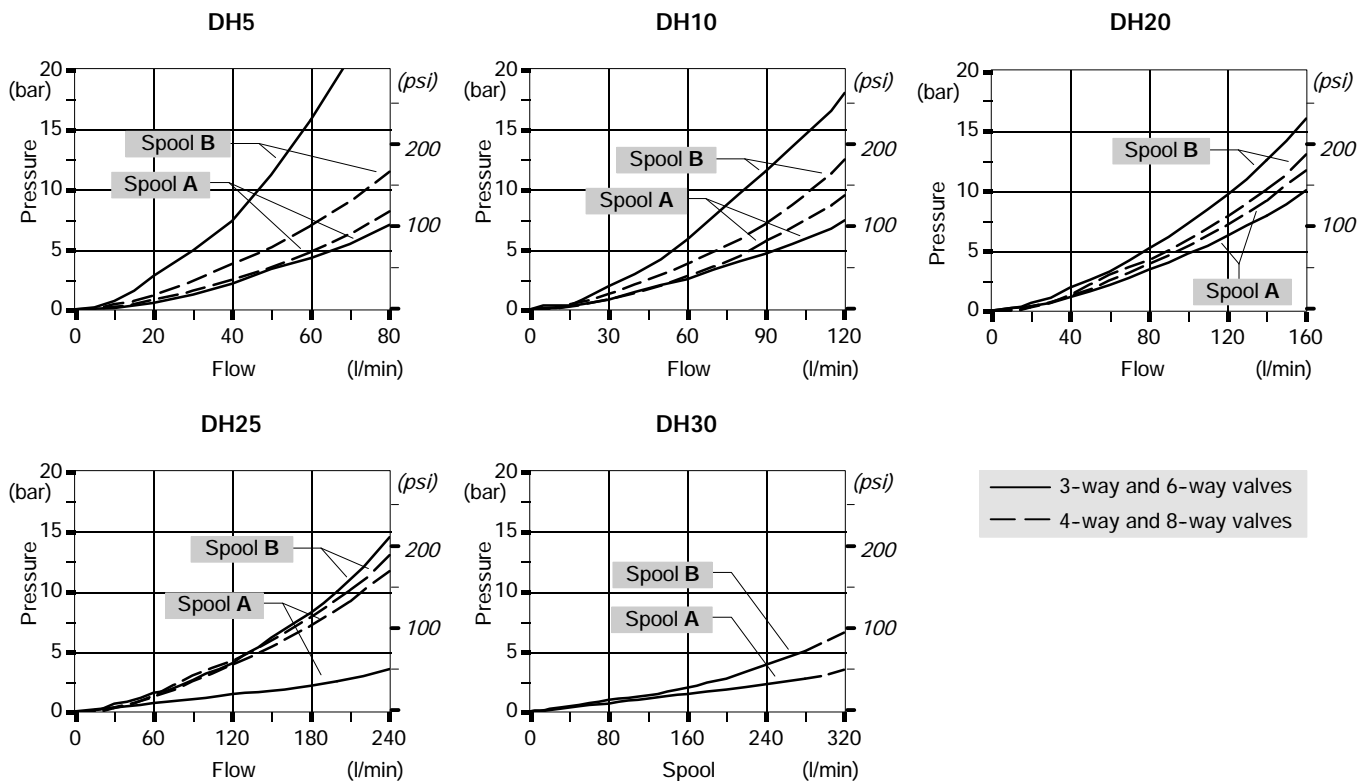
**4-way and 8-way**

8-way diverter valve is obtained by coupling two 4-way bodies using assembling kit.



**Performance data**

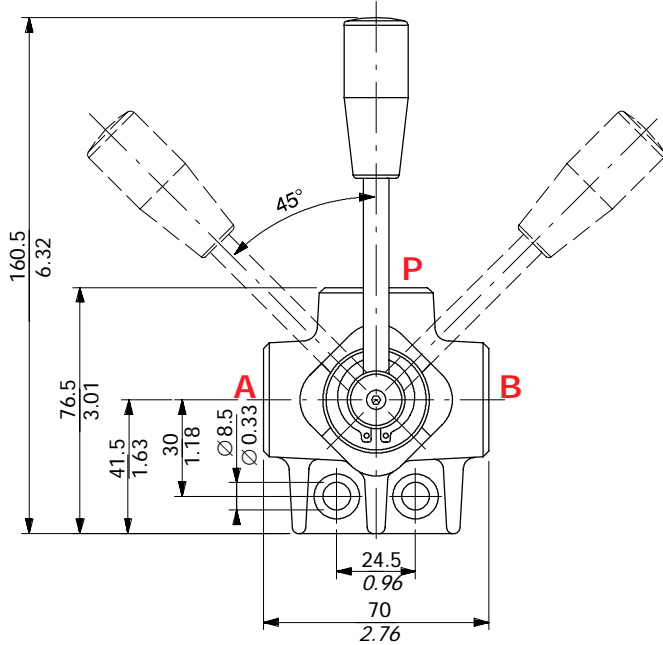
Pressure drop versus flow P→A(B): spool in position 1 (2)



Dimensional data

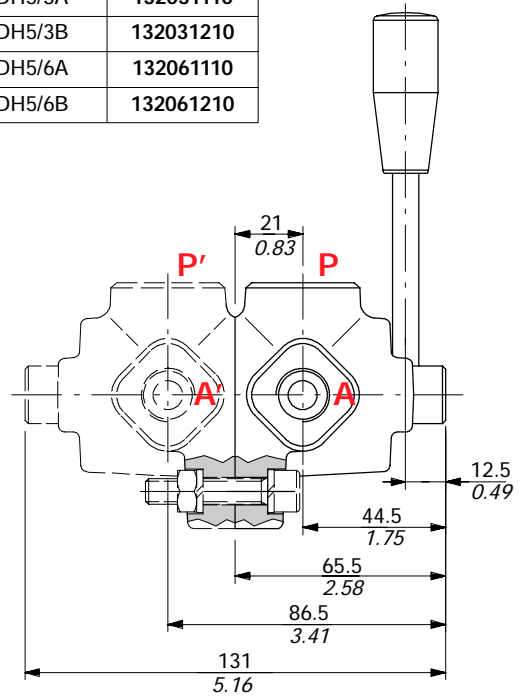
3-way DH5/3 and 6-way DH5/6 valves

Drawing is referred to valve with type A spool.



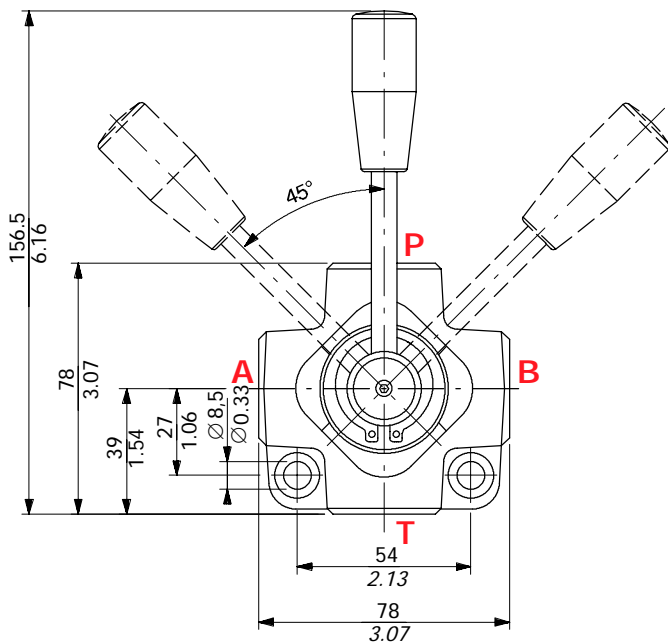
Ordering codes

DH5/3A	132031110
DH5/3B	132031210
DH5/6A	132061110
DH5/6B	132061210



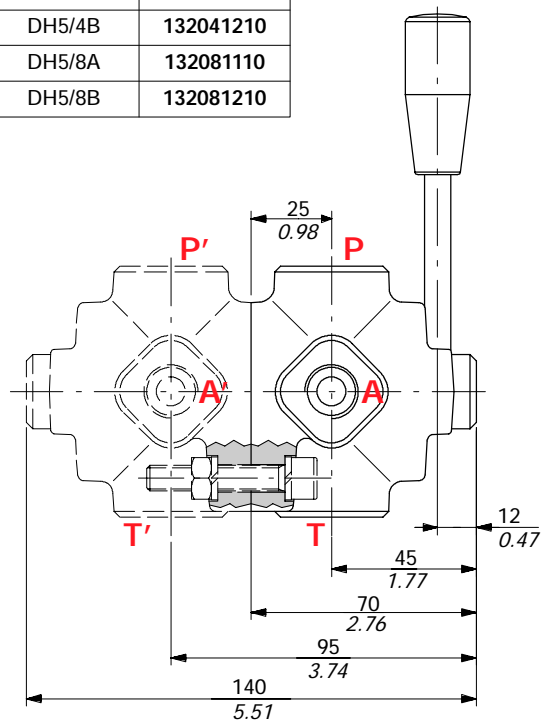
4-way DH5/4 and 8-way DH5/8 valves

Drawing is referred to valve with type A spool.



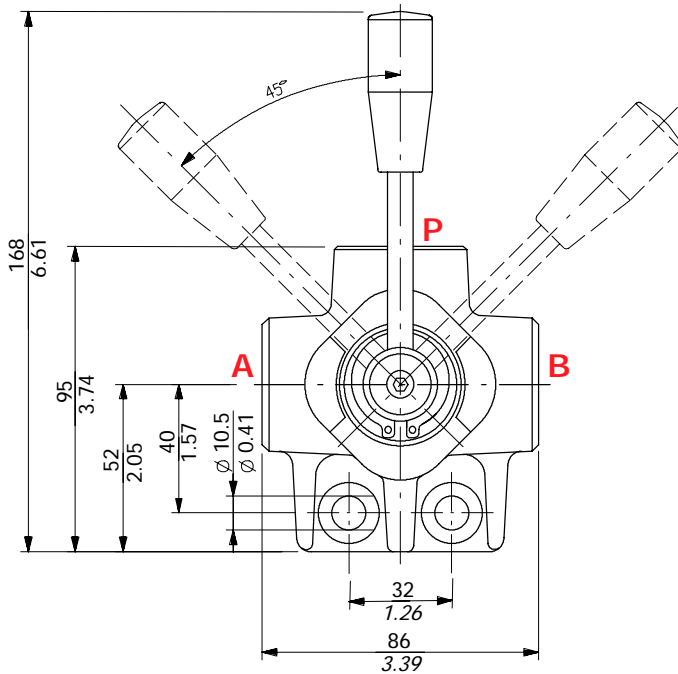
Ordering codes

DH5/4A	132041110
DH5/4B	132041210
DH5/8A	132081110
DH5/8B	132081210



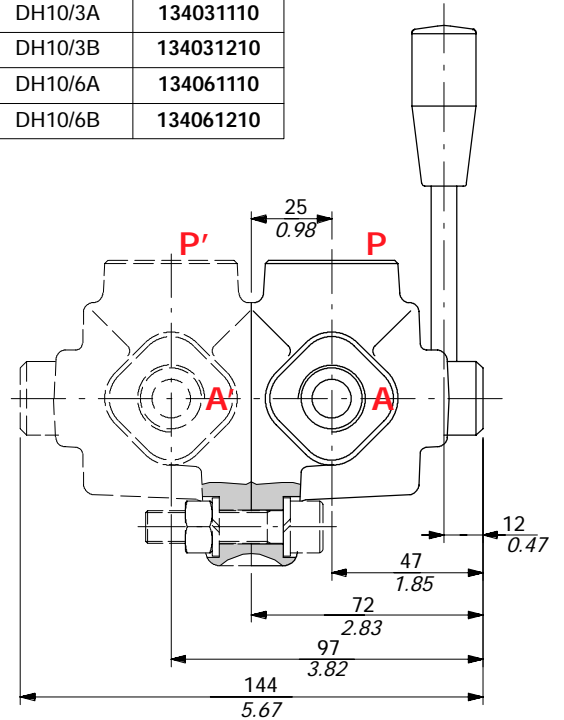
3-way DH10/3 and 6-way DH10/6 valves

Drawing is referred to valve with type A spool.



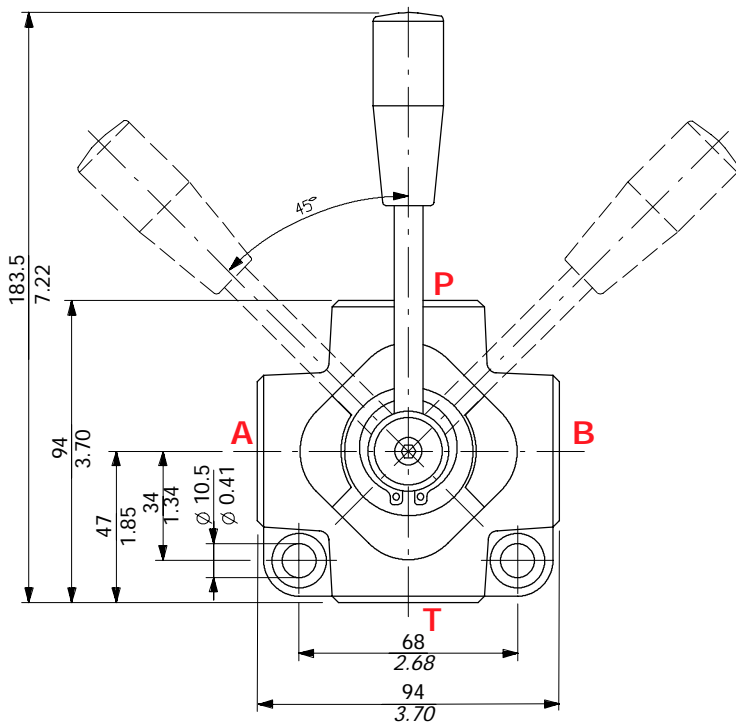
Ordering codes

DH10/3A	134031110
DH10/3B	134031210
DH10/6A	134061110
DH10/6B	134061210



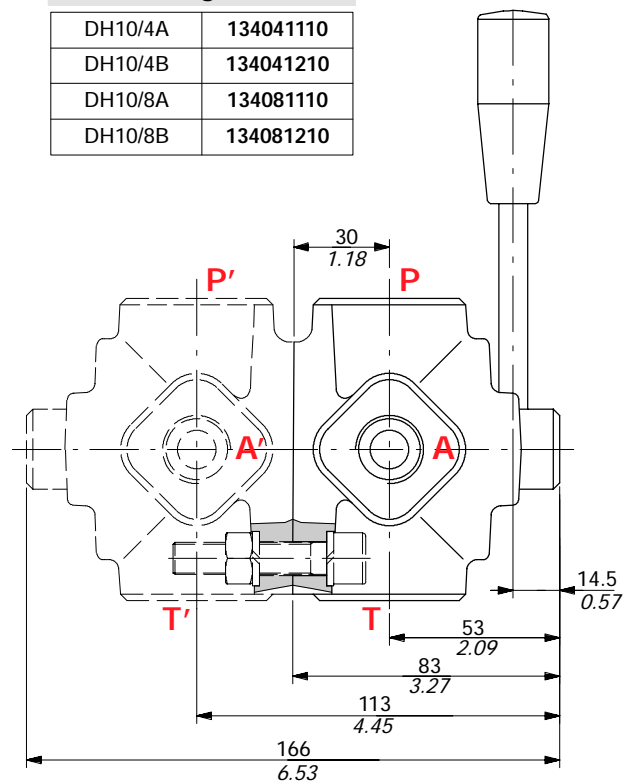
4-way DH10/4 and 8-way DH10/8 valves

Drawing is referred to valve with type A spool.



Ordering codes

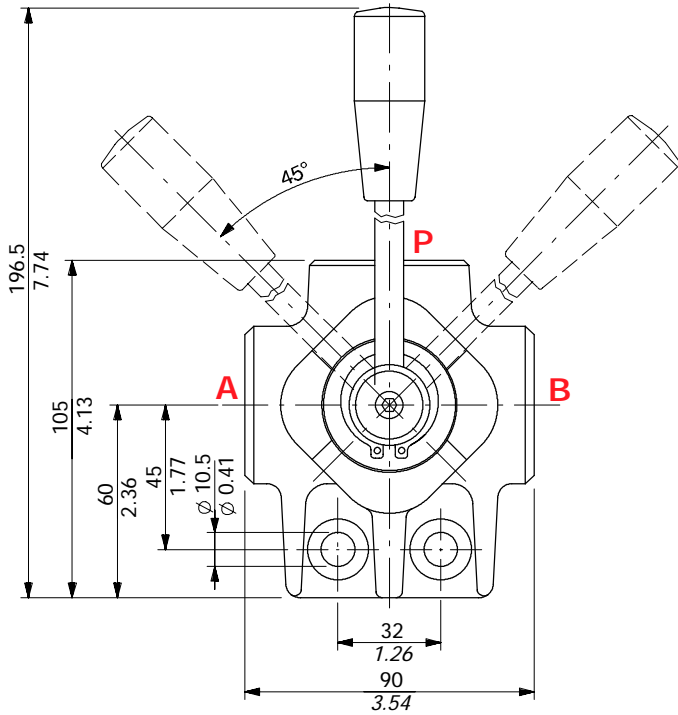
DH10/4A	134041110
DH10/4B	134041210
DH10/8A	134081110
DH10/8B	134081210



### Dimensional data

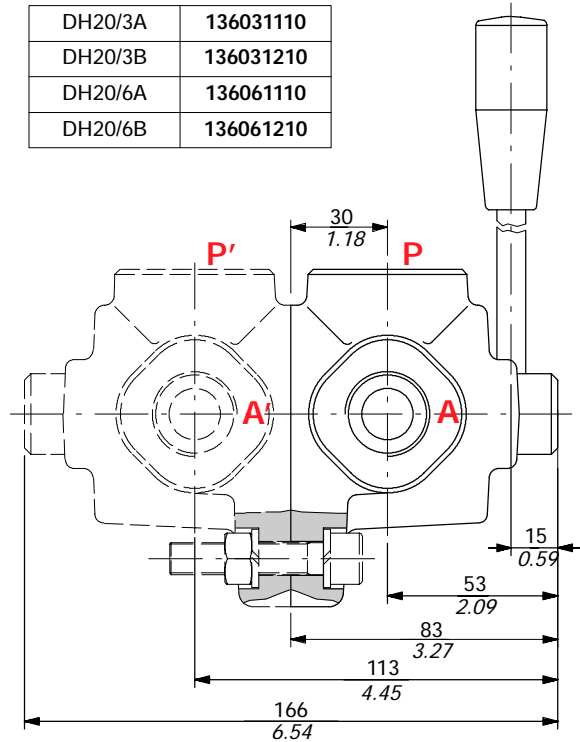
#### 3-way DH20/3 and 6-way DH20/6 valves

Drawing is referred to valve with type A spool.



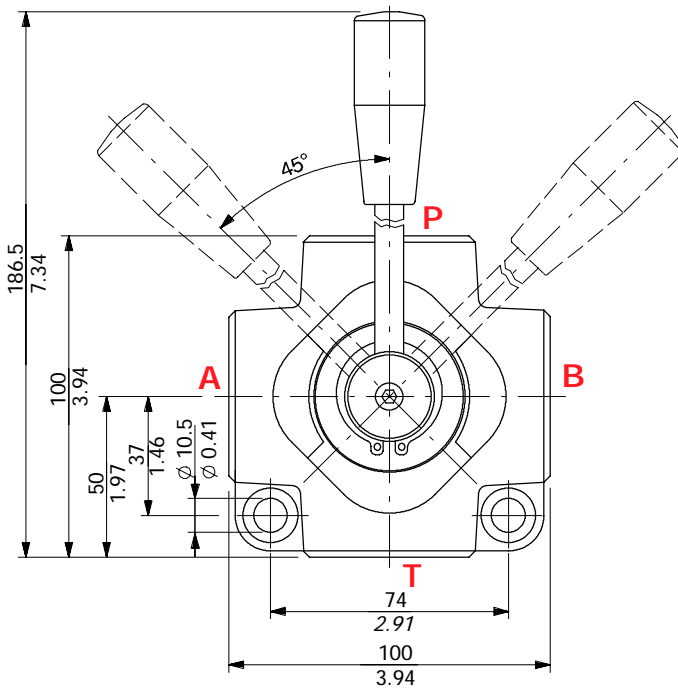
#### Ordering codes

DH20/3A	136031110
DH20/3B	136031210
DH20/6A	136061110
DH20/6B	136061210



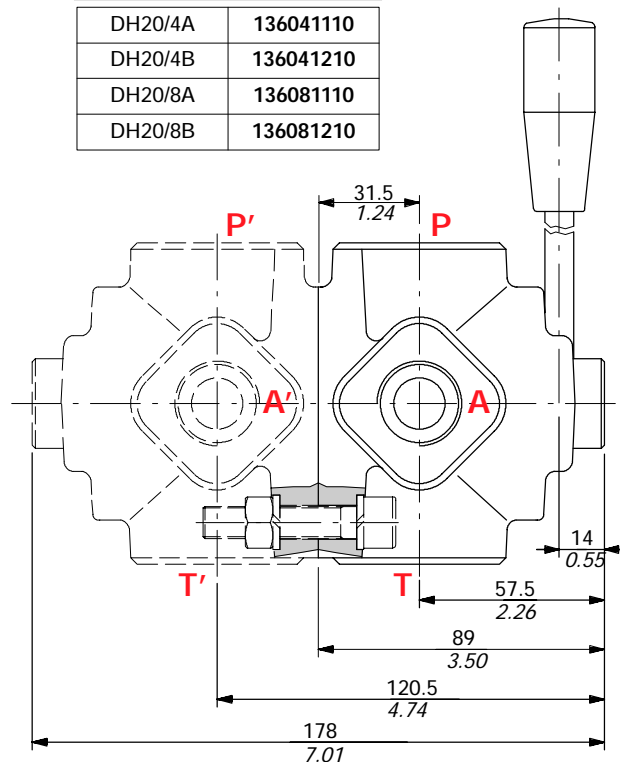
#### 4-way DH20/4 and 8-way DH20/8 valves

Drawing is referred to valve with type A spool.



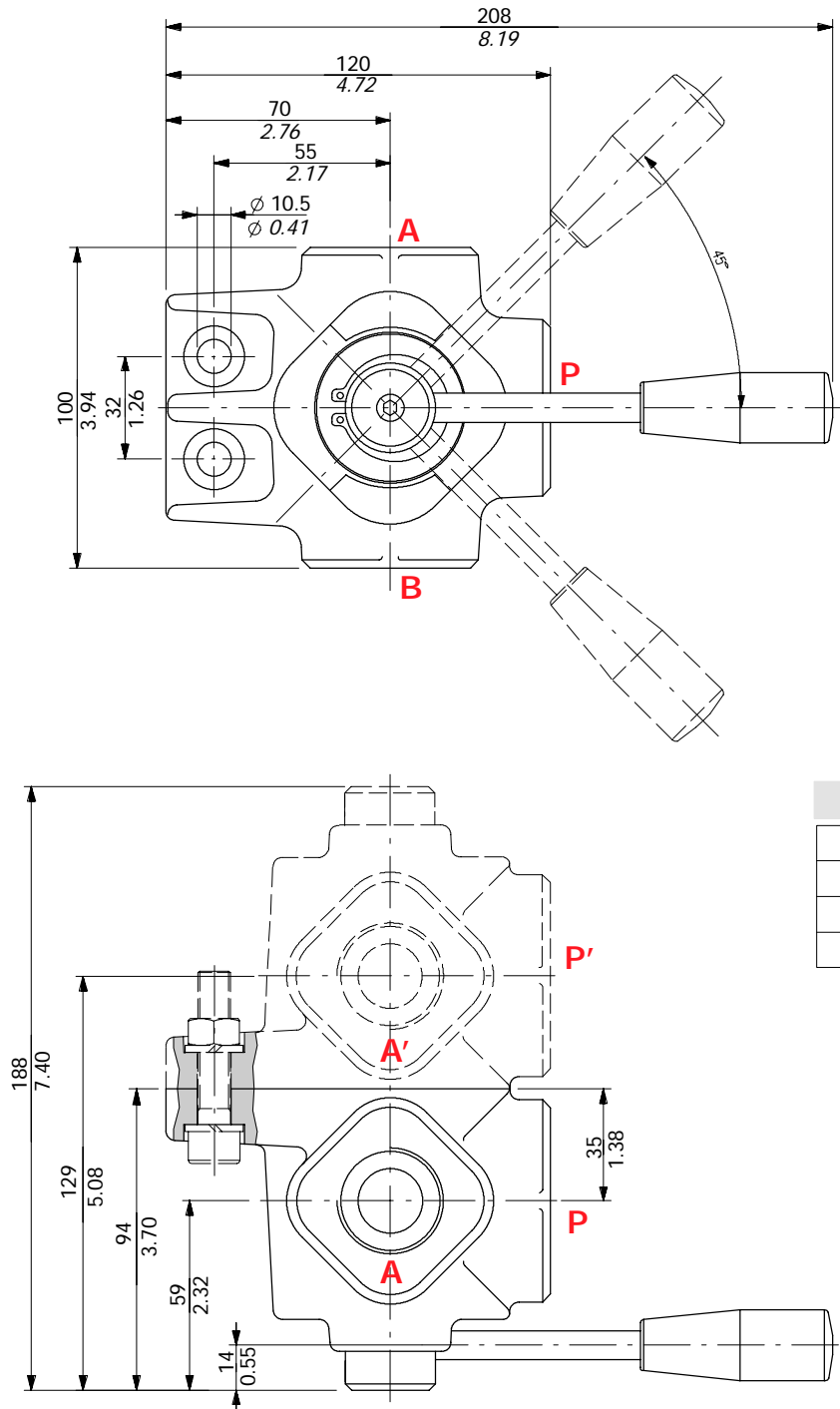
#### Ordering codes

DH20/4A	136041110
DH20/4B	136041210
DH20/8A	136081110
DH20/8B	136081210



3-way DH25/3 and 6-way DH25/6 valves

Drawing is referred to valve with type A spool.



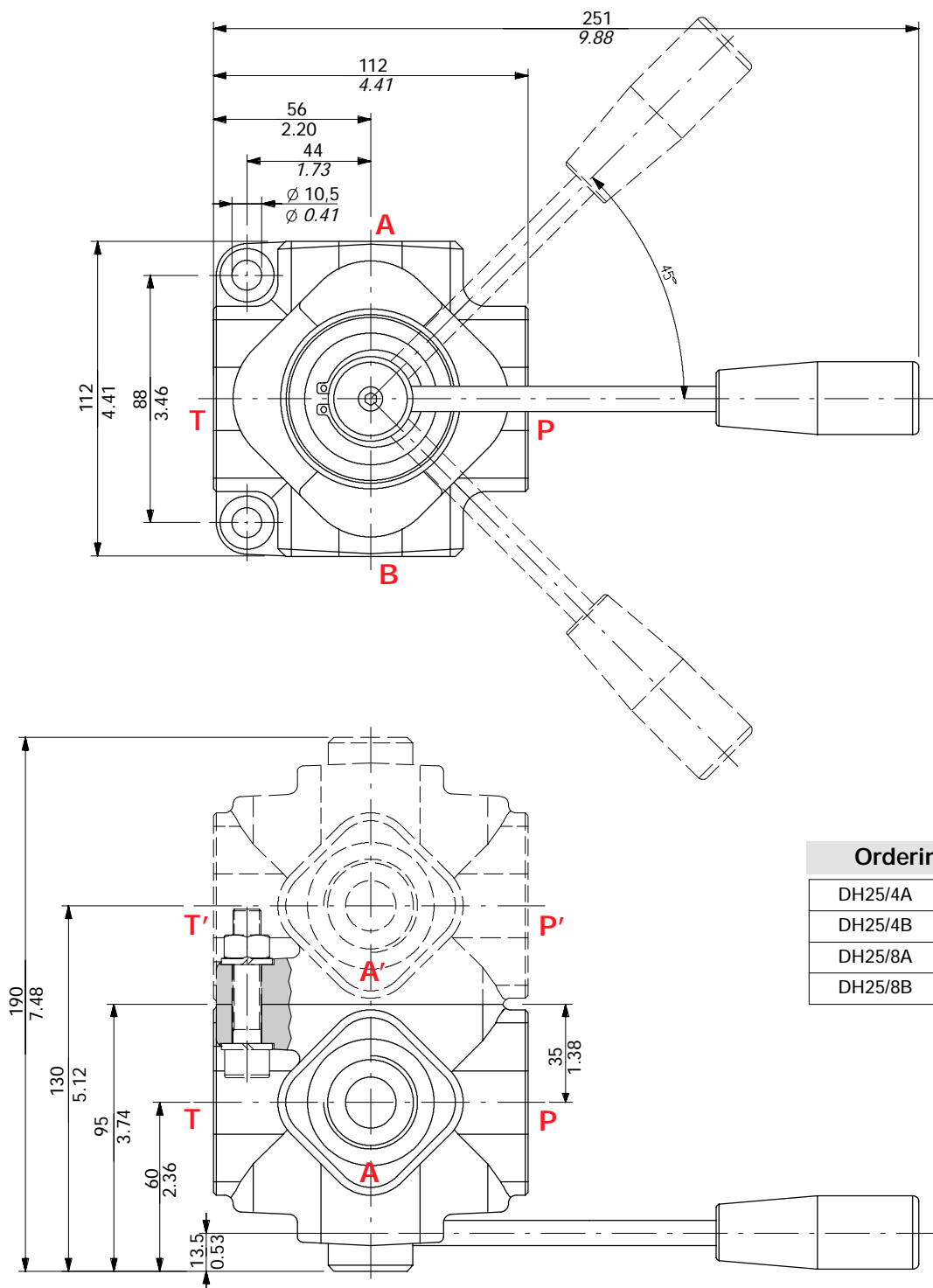
Ordering codes

DH25/3A	137031110
DH25/3B	137031210
DH25/6A	137061110
DH25/6B	137061210

Dimensional data

4-way DH25/4 and 8-way DH25/8 valves

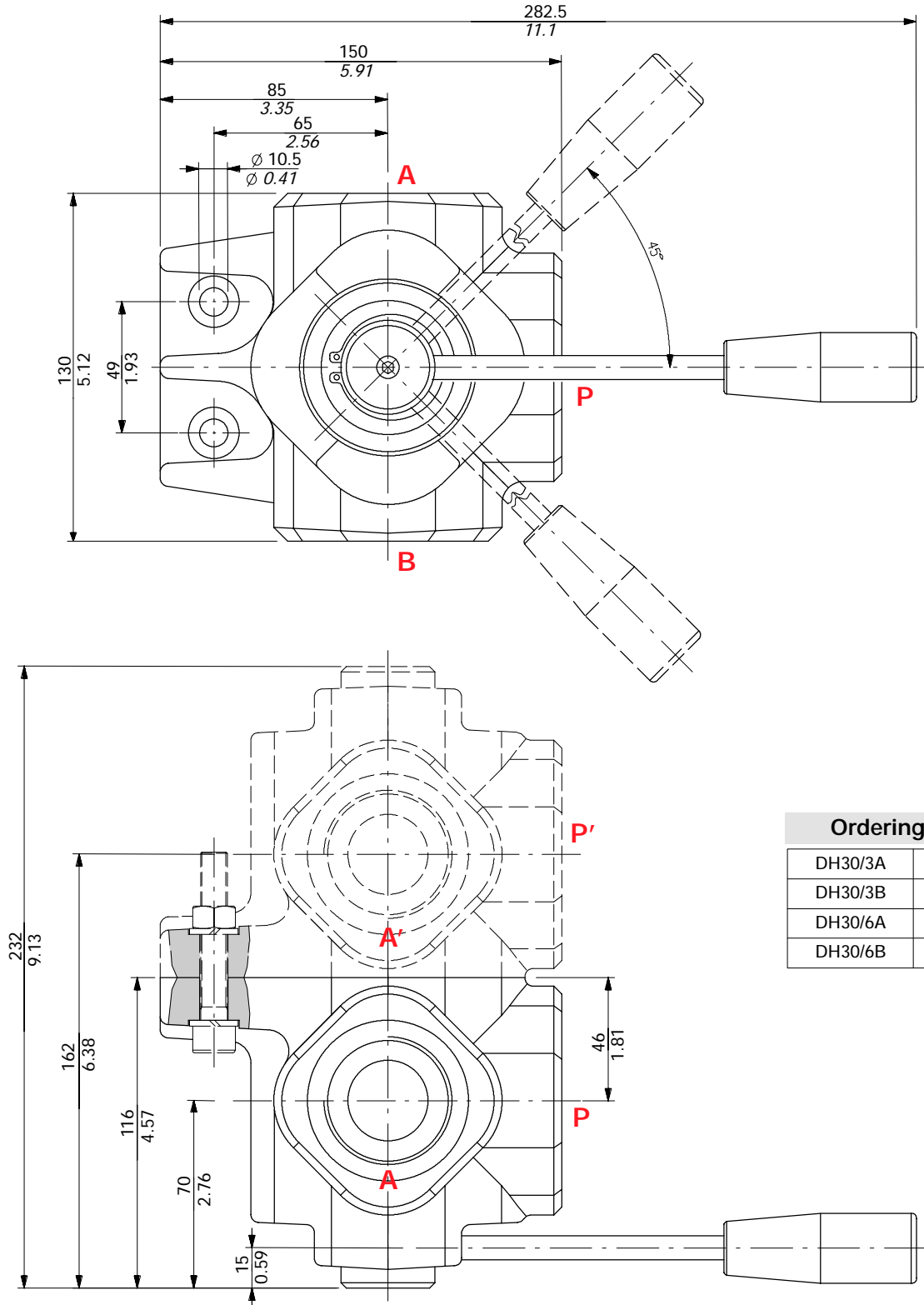
Drawing is referred to valve with type A spool.





3-way DH30/3 and 6-way DH30/6 valves

Drawing is referred to valve with type A spool.



Ordering codes

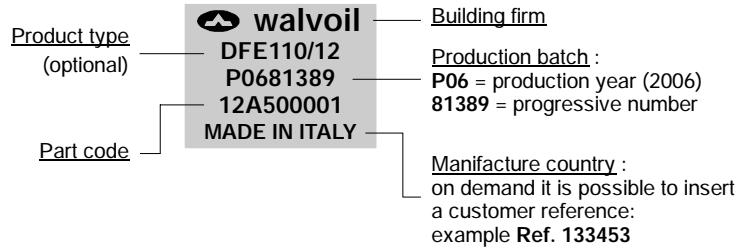
DH30/3A	139031110
DH30/3B	139031210
DH30/6A	139061110
DH30/6B	139061210

## Product marking

All Walvoil diverter valves are marked according to EN 982 normative.

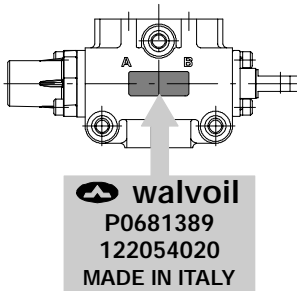
This marking includes: building firm, part code, production batch and manufacture country.

### Marking example

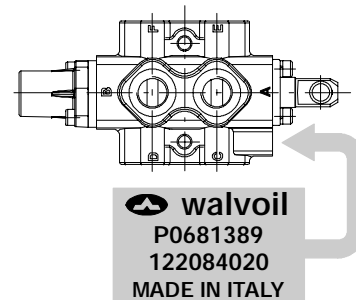


Marking zone depending on valve type, as indicate below.

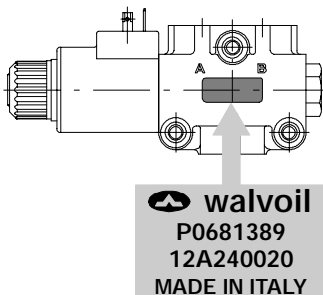
### 2-way and 3-way DF mechanical control type



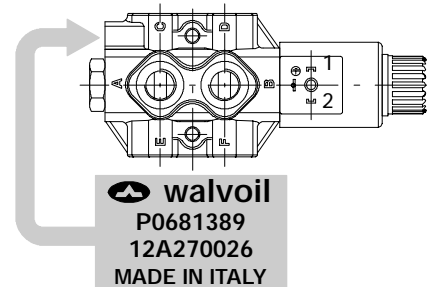
### 6-way DF mechanical control type



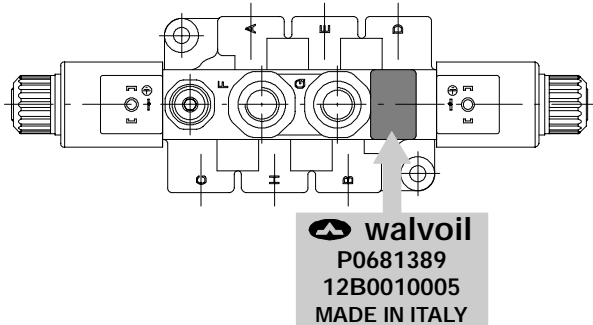
### 2-way and 3-way DFE solenoid control monoblock type



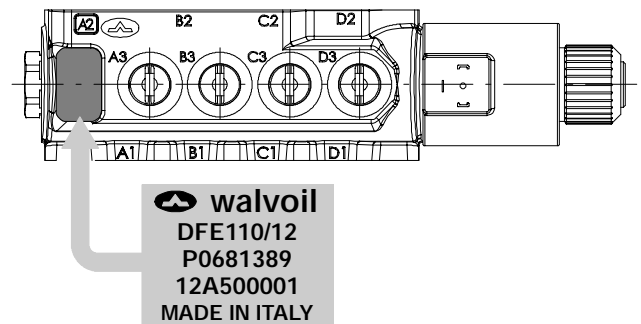
### 6-way DFE solenoid control monoblock type



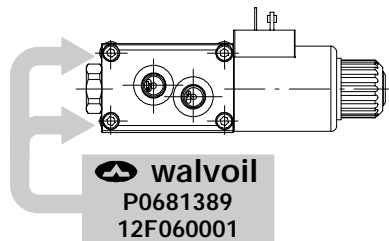
8-way DFE solenoid control monoblock type



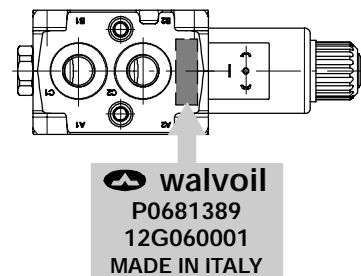
DFE110 solenoid control monoblock type



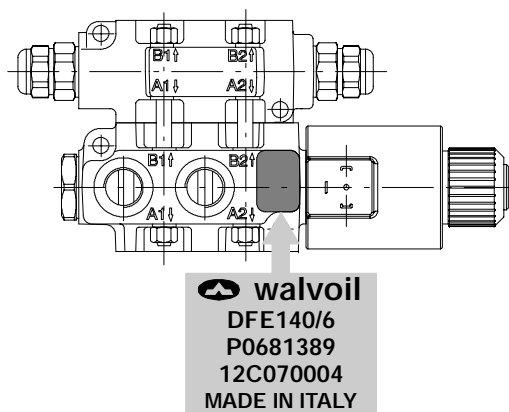
DFE080 solenoid control sectional type



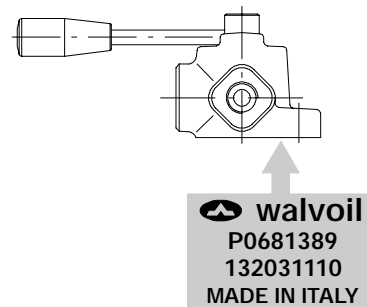
DFE100 solenoid control sectional type



DFE140 solenoid control sectional type



DH rotary control type



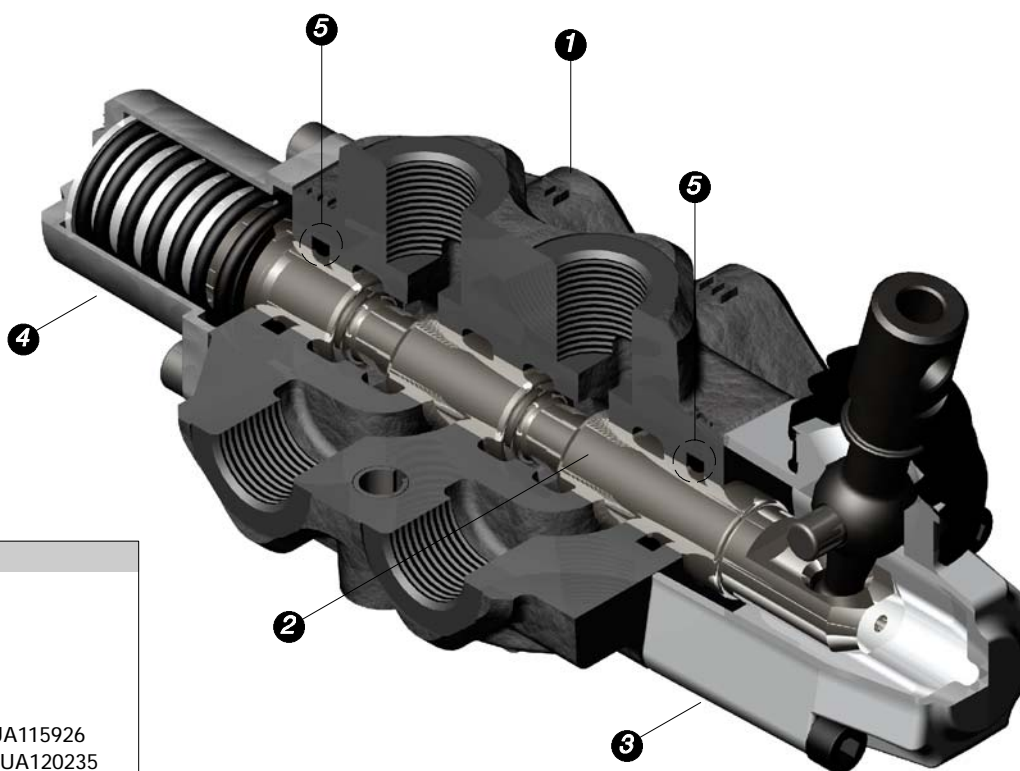
## Installation and maintenance

The DF-DFE-DH diverter valves are assembled and tested as per the technical specification of this catalogue.

Before the final installation on your equipment, follow the below recommendations:

- the diverter valves can be assembled in any position, in order to prevent body deformation and spool sticking mount the product on a flat surface;
- in order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the diverter valves;
- prior to painting, ensure plastic port plugs are tightly in place.

### With mechanical control series DF



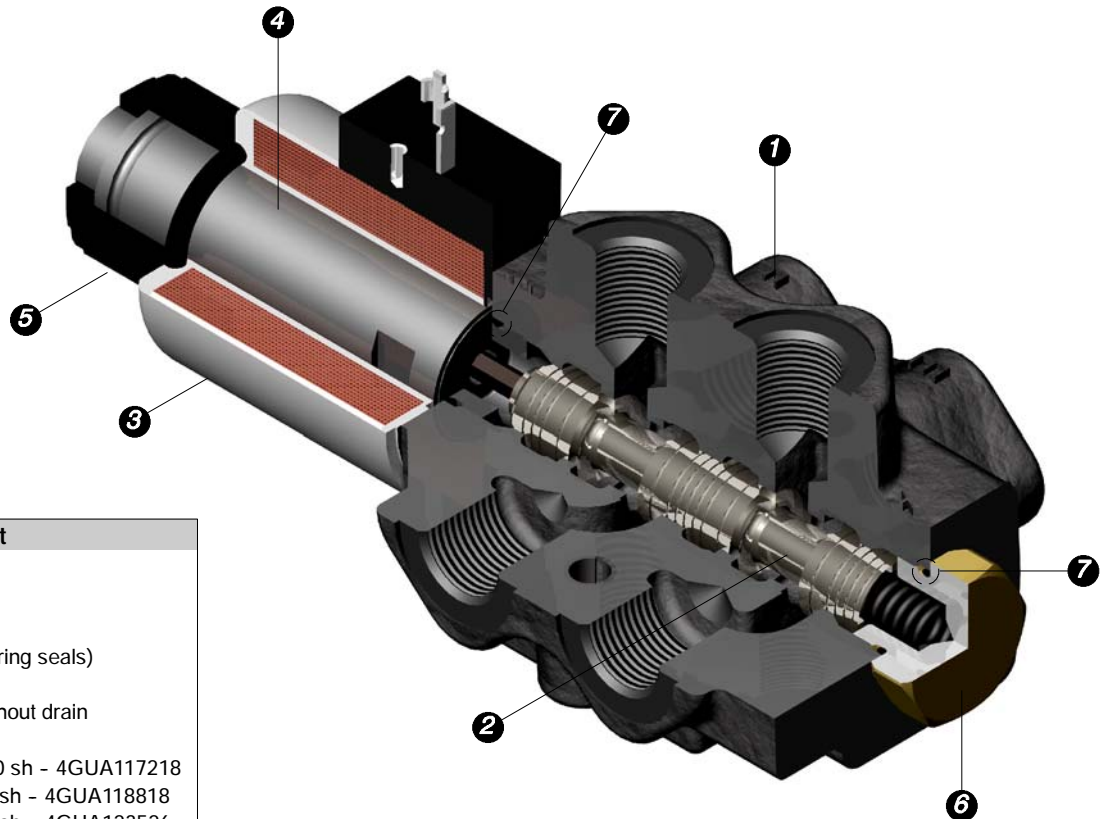
#### Item list

- 1) Diverter valve body
  - 2) Spool
  - 3) Control kit: lever box
  - 4) Positioner kit
  - 5) O-ring seals on spool
- DF5: 15.88x2.62 NBR 70 sh - 4GUA115926  
 DF10: 20.22x3.53 NBR 70 sh - 4GUA120235  
 DF20: 24.99x3.53 NBR 70 sh - 4GUA125035  
 DF25: 29.75x3.53 NBR 70 sh - 4GUA129835

NOTE - All articulated parts inside cap, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2.

Malfunction	Cause	Remedy
External leakage.	Worn spool seal due to mechanical actuation.	Locate the leakage and replace the seal.
Excessive internal leakage.	Increase clearance between spools and body due to high wear.	Replace the diverter valve and check the oil contamination level.
Diverter valve don't commute.	Spool blocked.	Remove the spool, clean it and check the oil contamination level.
	High pressure and/or flow.	Verify that pressure and flow values are within working conditions limits.

With ON/OFF solenoid control series DFE monoblock type

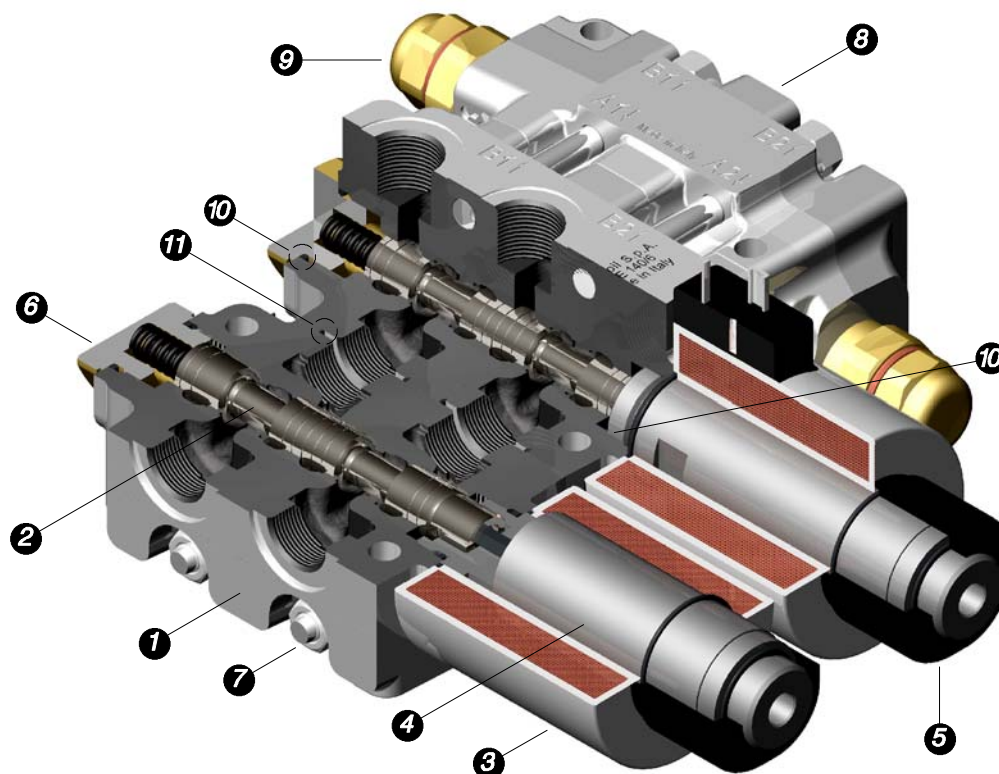


Item list
1) Diverter valve body
2) Spool
3) Coil
4) Tube assembly (with O-ring seals)
5) Lock ring
6) Positioner kit, with or without drain
7) O-ring seals on body
DFE052: 17.17x1.78 NBR 70 sh - 4GUA117218
DFE10: 18.77x1.78 NBR 70 sh - 4GUA118818
DFE20: 23.47x2.62 NBR 70 sh - 4GUA123526
DFE110: 23.47x2.62 NBR 70 sh - 4GUA123526

Malfunction	Cause	Remedy
External leakage.	Worn body seal due to mechanical actuation	Locate the leakage and replace the seal.
Excessive internal leakage.	Increase clearance between spools and body due to high wear.	Replace the diverter valve and check the oil contamination level.
	Spool blocked.	Remove the spool, clean it and check the oil contamination level.
Diverter valve don't commute.	Coil winding burnt.	Replace the coil and check the supply voltage value.
	Uncorrected supply voltage.	Test the electric circuit and check the supply voltage value.
	High pressure and/or flow.	Verify that pressure and flow values are within working conditions limits.

Installation and maintenance

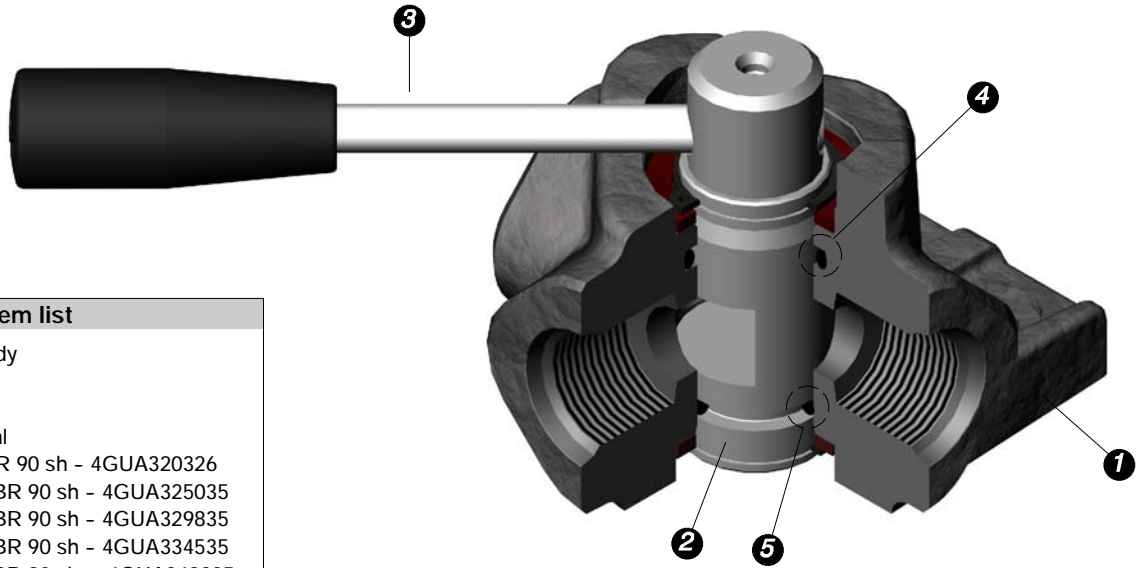
With ON/OFF solenoid control series DFE sectional type



Item list	
1) Diverter valve body	10) O-ring seals on body
2) Spool	DFE080: 17.17x1.78 NBR 70 sh - 4GUA117218
3) Coil	DFE100: 17.17x1.78 NBR 70 sh - 4GUA117218
4) Tube assembly (with O-ring seals)	DFE140: 23.47x2.62 NBR 70 sh - 4GUA123526
5) Lock ring	11) O-ring seals between sections
6) Positioner kit, with or without drain	DFE080: 18.77x1.78 NBR 90 sh - 4GUA318818
7) Tie rods kit	DFE100: 26.70x1.78 NBR 90 sh - 4GUA326718
8) Valves block (only for DFE140)	DFE140: 28.30x1.78 NBR 90 sh - 4GUA328318
9) Anti-shock valves (only for DFE140)	

Malfunction	Cause	Remedy
External leakage.	Worn body seal.	Locate the leakage and replace the seal.
	Worn section seal.	Locate the leakage and replace the seal. Be sure to tighten the tie rods to correct value.
Excessive internal leakage.	Increase clearance between spools and body due to high wear.	Replace the diverter valve and check the oil contamination level.
	Spool blocked.	Remove the spool, clean it and check the oil contamination level.
Diverter valve don't commute.	Coil winding burnt.	Replace the coil and check the supply voltage value.
	Uncorrected supply voltage.	Test the electric circuit and check the supply voltage value.
	High pressure and/or flow.	Verify that pressure and flow values are within working conditions limits.

With rotary control series DH



**Item list**

- 1) Diverter valve body
- 2) Rotative spool
- 3) Handlever
- 4) Upper O-ring seal  
DH5: 20.29X2.62 NBR 90 sh - 4GUA320326  
DH10: 24.99X3.53 NBR 90 sh - 4GUA325035  
DH20: 29.75X3.53 NBR 90 sh - 4GUA329835  
DH25: 34.52X3.53 NBR 90 sh - 4GUA334535  
DH30: 49.21X3.53 NBR 90 sh - 4GUA349235
- 5) Bottom O-ring seal  
DH5: 15.08X2.62 NBR 90 sh - 4GUA315126  
DH10: 18.64X3.53 NBR 90 sh - 4GUA318635  
DH20: 23.39X3.53 NBR 90 sh - 4GUA323435  
DH25: 28.17X3.53 NBR 90 sh - 4GUA328235  
DH30: 42.86X3.53 NBR 90 sh - 4GUA342935

Malfunction	Cause	Remedy
External leakage.	Worn spool seal due to mechanical actuation.	Locate the leakage and replace the seal.
Excessive internal leakage.	Increase clearance between spools and body due to high wear.	Replace the diverter valve and check the oil contamination level.
Diverter valve don't commute.	Spool blocked.	Remove the spool, clean it and check the oil contamination level.
	High pressure and/or flow.	Verify that pressure and flow values are within working conditions limits.

## Installation and maintenance

### Fittings tightening torque - Nm / lbft

These torque are recommended.

Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.

#### MECHANICAL CONTROL DIVERTER VALVE VALVES

THREADS TYPE	DF5	DF10	DF20	DF25
BSP	G 3/8	G 1/2	G 3/4	G 1
With O-Ring seal	35 / 25.8	50 / 37	90 / 66.4	100 / 73.8
With copper washer	40 / 29.5	60 / 44.3	60 / 44.3	90 / 66.4
With steel and rubber washer	30 / 22	60 / 44.3	70 / 51.6	100 / 73.8
UN-UNF	3/4-16 (SAE 8)	7/8-14 (SAE 10)	1 1/16-12 (SAE 12)	1 5/16-12 (SAE 16)
With O-Ring seal	50 / 37	60 / 44.3	95 / 70	150 / 111

#### SOLENOID CONTROL MONOBLOCK DIVERTER VALVES

THREADS TYPE	DFE052			DFE10		DFE110		DFE20	
	Ports	Drain	Drain *	Ports	Drain	Ports	Drain	Ports	Drain
BSP	G 3/8	G 1/4	G 1/4	G 1/2	G 1/4	G 1/2	G 1/4	G 3/4	G 1/4
With O-Ring seal	35 / 25.8	20 / 14.8	20 / 14.8	50 / 37	20 / 14.8	50 / 37	20 / 14.8	90 / 66.4	20 / 14.8
With copper washer	40 / 29.5	25 / 18.4	25 / 18.4	60 / 44.3	25 / 18.4	60 / 44.3	25 / 18.4	60 / 44.3	25 / 18.4
With steel and rubber washer	30 / 22	16 / 11.8	16 / 11.8	60 / 44.3	16 / 11.8	60 / 44.3	16 / 11.8	70 / 51.6	16 / 11.8
UN-UNF	3/4-16 (SAE 8)	9/16-18 (SAE 6)	7/16-20 (SAE4)	7/8-14 (SAE 10)	9/16-18 (SAE 6)	7/8-14 (SAE 10)	9/16-18 (SAE 6)	1 1/16-12 (SAE 12)	7/16-20 (SAE4)
With O-Ring seal	50 / 37	30 / 22.1	15 / 11	60 / 44.3	30 / 22.1	60 / 44.3	30 / 22.1	95 / 70	15 / 11

(\*) drain only for DFE052/8

#### SOLENOID CONTROL SECTIONAL DIVERTER VALVES

THREADS TYPE	DFE080		DFE100		DFE140	
	Bocche	Drenaggio	Bocche	Drenaggio	Bocche	Drenaggio
BSP	G 1/4	G 1/4	G 3/8	G 1/4	G 1/2	G 1/4
With O-Ring seal	20 / 14.8	20 / 14.8	35 / 25.8	20 / 14.8	50 / 37	20 / 14.8
With copper washer	25 / 18.4	25 / 18.4	40 / 29.5	25 / 18.4	60 / 44.3	25 / 18.4
With steel and rubber washer	16 / 11.8	16 / 11.8	30 / 22	16 / 11.8	60 / 44.3	16 / 11.8
UN-UNF	7/16-20 (SAE 4)	7/16-20 (SAE 4)	7/8-14 (SAE 10)	9/16-18 (SAE 6)	7/8-14 (SAE 10)	9/16-18 (SAE 6)
With O-Ring seal	15 / 11	15 / 11	50 / 37	30 / 22.1	60 / 44.3	30 / 22.1

#### ROTARY CONTROL DIVERTER VALVES

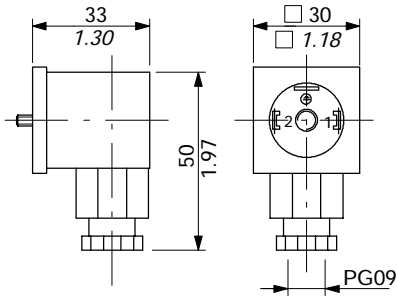
THREADS TYPE	DH5	DH10	DH20	DH25	DH30
BSP	G 3/8	G 1/2	G 3/4	G 1	G 1 1/2
With O-Ring seal	35 / 25.8	50 / 37	90 / 66.4	100 / 73.8	120 / 44.3
With copper washer	40 / 29.5	60 / 44.3	60 / 44.3	90 / 66.4	100 / 73.8
With steel and rubber washer	30 / 22	60 / 44.3	70 / 51.6	100 / 73.8	120 / 44.3
UN-UNF	3/4-16 (SAE 8)	7/8-14 (SAE 10)	1 1/16-12 (SAE 12)	1 5/16-12 (SAE 16)	1 7/8-12 (SAE 24)
With O-Ring seal	50 / 37	60 / 44.3	95 / 70	150 / 111	210 / 155



Optional connectors

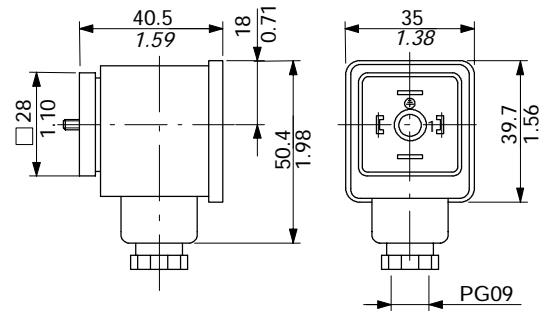
**Type C02 code: 2X1001010**

2P+T according to  
ISO4400 / EN175301-803



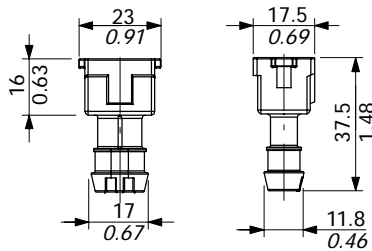
**Type C04 code: 2X1001040**

2P+T according to ISO4400 / EN175301-803  
With bridge rectifier, to use with VAC supply.



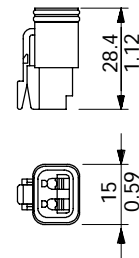
**Type C08 code: 5CON003**

2P female case with female end  
type AMP "Junior-Power-Timer"



**Type C19 code: 5CON007**

2P male case with female end  
type Deutsch DT06-2S



Type	Poles	Nominal voltage	Nominal current	Permitted conductor section range	Permitted cable diameter range	Weather protection
C02	2P + T	250 VAC / 300 VDC	10 A	max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>	6-8 mm / 0.24-0.31 in	IP65
C04	2P + T	/	10 A	max.1.5 mm <sup>2</sup> / max.0.0023 in <sup>2</sup>	6-8 mm / 0.24-0.31 in	IP65
C08	2P	250 VAC	12 A	0.5-1 mm <sup>2</sup> / 0.00077-0.00155 in <sup>2</sup>	1.4-1.6 mm / 0.055-0.063 in	IP65
C19	2P	/	13 A	1-1.2 mm <sup>2</sup> / 0.00155-0.00186 in <sup>2</sup>	2.2-3.5 mm / 0.088-0.14 in	IP67



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