

# DVS20

SECTIONAL VALVE



TECHNICAL CATALOGUE

A member of



 **walvoil**  
FLUID POWER E|MOTION

**1<sup>st</sup> edition DVS20.00**

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*This catalogue shows the product in the most standard configurations.  
Please contact our Sales Dpt. for more detailed information or special requests.*

**WARNING!**

*All specifications of this catalogue refer to the standard product at this date.  
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INCORRECT USE OF THE PRODUCT.**



## Applications

DVS20 is a new family in the broad range of Hydrocontrol sectional valves. The valve is specially indicated for Garbage Refuse Trucks, Hook loaders and Wheel loaders. The innovative design allows it to manage very high flows comparing to the overall dimensions. This valve has high control characteristics, smooth and precise in operation.





**QUICK REFERENCE GUIDE**

<b>GENERAL SPECIFICATION</b>	<b>D9</b>	<b>D3M</b>	<b>DVS10</b>	<b>D4</b>	<b>D6</b>	<b>D16</b>	<b>D12</b>	<b>DVS20</b>	<b>D20</b>	<b>D25</b>	<b>D40</b>
Working sections number	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-10
<b>CIRCUIT</b>											
Parallel	•	•	•	•	•	•	•	•	•	•	•
Series	•	•	•	•	•	•	•		•	•	
Tandem	•	•	•	•	•	•		•	•		
Parallel circuit stroke (mm)	6	5	6	6	7	7	9,5	9,5	9,5	12	15
Series circuit stroke (mm)	6	5	6	6	5	7	6,5		6,5	8,5	
Float spool extra stroke (mm)	5	5	5	5,5	6	7	7	7	7	9,5	10
Spools pitch (mm)	31	38	35	40	46	46	56	56	64	75	91
<b>RATED FLOW</b>											
Max recommended flow rate (l/min)	35	55	45	80	100	150	180	250	250	380	700
Max recommended flow rate (GPM)	10	15	12	22	27	40	48	67	67	100	185
<b>RATED PRESSURE</b>											
Max working pressure (bar)	350	350	350	350	350	350	350	250	350	350	350
Max working pressure (PSI)	5000	5000	5000	5000	5000	5000	5000	4000	5000	5000	5000

<b>OPTION CHART</b>	<b>D9</b>	<b>D3M</b>	<b>DVS10</b>	<b>D4</b>	<b>D6</b>	<b>D16</b>	<b>D12</b>	<b>DVS20</b>	<b>D20</b>	<b>D25</b>	<b>D40</b>
Direct acting pressure relief valve	•	•	•	•							
Pilot operated pressure relief valve		•		•	•	•	•	•	•	•	•
2 stage pilot operated relief valve		•		•	•	•	•		•	•	•
Externally piloted valve	•	•	•	•	•	•	•		•	•	•
Solenoid dump valve (12 Vdc)	•	•	•	•	•	•	•				
Solenoid dump valve (24 Vdc)	•	•	•	•	•	•	•				
Main anticavitation check valve		•		•	•	•	•	•	•	•	•
Clamping valve		•	•	•							
<b>SPOOL ACTUATION</b>											
Manual control	•	•	•	•	•	•	•	•	•	•	•
Without lever	•	•	•	•	•	•	•	•	•	•	•
90° joystick control		•	•	•	•	•					
Hydraulic control	•	•	•	•	•	•	•	•	•	•	•
Direct electric control (12-24 Vdc)		•		•							
<b>SPOOL RETURN ACTION</b>											
Spring return	•	•	•	•	•	•	•	•	•	•	•
Detent in A - in B - in A/B	•	•	•	•	•	•	•	•	•	•	•
Detent in 4 <sup>th</sup> position	•	•	•	•	•	•	•	•	•	•	•
Arrangement for dual control	•	•		•	•	•	•		•		
Hydraulic load limit	•	•		•	•	•					
Pneumatic control ON - OFF		•	•	•	•	•	•	•	•		
Proportional pneumatic control		•	•	•	•	•	•	•	•		
Electrical load limit	•	•		•	•	•					
Electrohydraulic control ON-OFF (12-24 Vdc)		•	•	•	•	•	•	•	•		
Electrohydraulic control PROP. (12-24 Vdc)		•	•	•	•	•	•	•	•		
Electropneumatic control (12-24 Vdc)		•	•	•	•	•	•		•		
<b>AUXILIARY VALVES</b>											
Antishock valve	•	•	•	•	•	•	•	•	•	•	•
Anticavitation valve	•	•	•	•	•	•	•	•	•	•	•
Combined valve	•	•	•		•	•	•		•	•	•
Pilot combined valve						•		•	•	•	•



**GENERAL INDEX**

<b>4</b>	<p><b>General specifications</b>                  Standard working conditions                  Fluid options</p>
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## GENERAL SPECIFICATIONS

## Standard working conditions

Description	Value
Ambient operating temperature range	-40°C / +60°C
Kinematic viscosity range	10 ÷ 300 cSt
Max contamination level	9 (NAS 1638) - 20/18/15 (ISO 4406:1999)
Recommended filtration level	b10 > 75 (ISO 16889:2008)
Internal filter (on electroproportional valves pilot line)	30 µm

All information and diagrams in this catalogue refer to a mineral base oil VG46 at 50°C temperature (32 cSt kinematic viscosity)

## Fluid options

Types of fluid (according to ISO 6743/4) Oil and Solutions	Temperature (°C)		Compatible gasket
	min	max	
Mineral Oil HL, HM (or HLP acc. to DIN 51524)	-25	+80	NBR
Oil in water emulsions HFA	+5	+55	NBR
Water in oil emulsions HFB	+5	+55	NBR
Polyglycol-based aqueous solution HFC	-10	+60	NBR

For special applications and different fluids, please call our Technical Department.



**ORDER EXAMPLE**

DVS20/1: **IL 009 150 C G06 W001A H004 F001A RP G06 05 PA 01 PB 100 TJ C G07**

**TYPE:** \_\_\_\_\_  
**DVS20:** product type  
**/1:** working section number

**1) INLET ARRANGEMENT: pag. 9**

- 1.1 **IR 009** inlet side and valve type
- 150** setting (bar)
- 1.2 **A G06** inlet position and available thread type

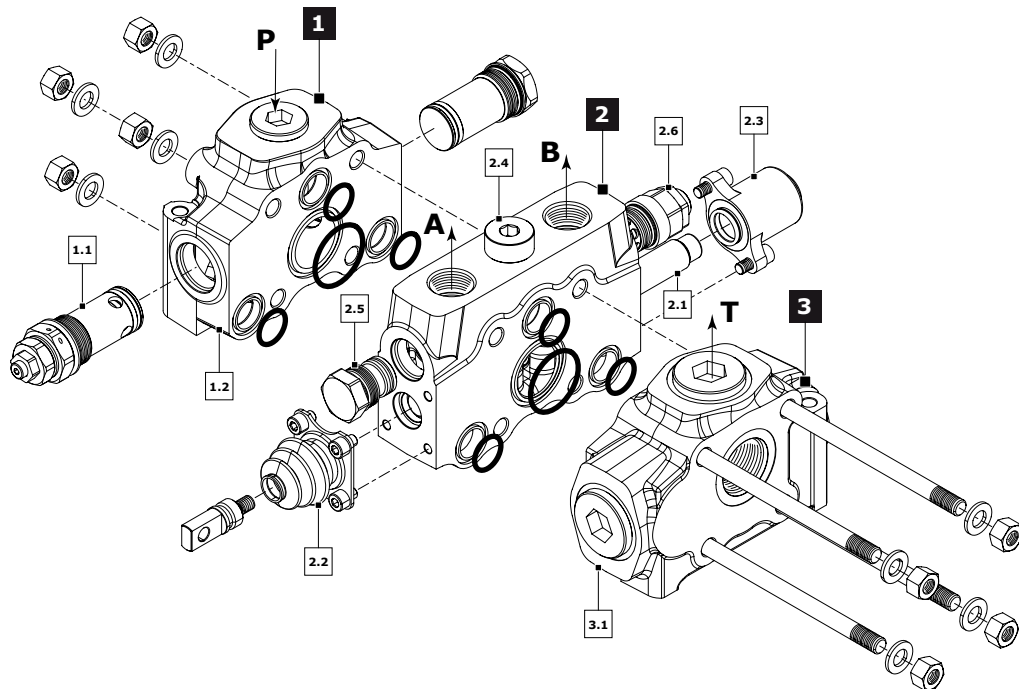
**2) WORK SECTION ARRANGEMENT: pag. 12**

- 2.1 **W001A** spool type
- 2.2 **H004** spool actuation type
- 2.3 **F001A** spool return action
- 2.4 **RP G06** type and thread section
- 2.5 **05 PA** auxiliary valve (port A)
- 2.6 **01 PB 100** auxiliary valve (port B)

**3) OUTLET ARRANGEMENT: pag. 23**

- 3.1 **TJ** outlet type
- C G07** outlet position and available thread type

Ordering row 2 must be repeated for every work section



**Standard thread**

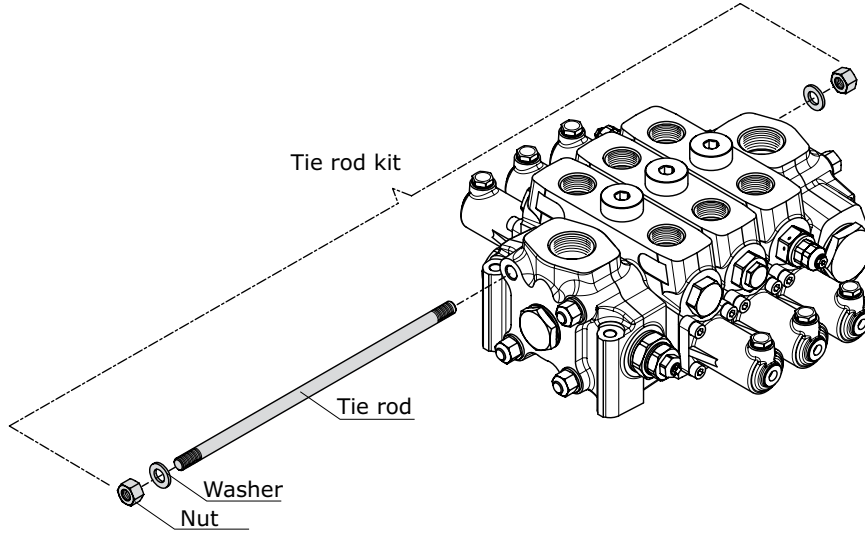
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections; for ordering code refer to table on page 32.

Ports	BSP (ISO - 228)	Code	UN-UNF (ISO - 725)	Code
<b>Inlet Port (P)</b>	G 1	<b>G06</b>	1"5/16 - 12 UNF	<b>U06</b>
<b>Ports (A - B)</b>	G 1	<b>G06</b>	1"5/16 - 12 UNF	<b>U06</b>
<b>Outlet (T) - Carry over (HPCO)</b>	G 1"1/4	<b>G07</b>	1"5/8 - 12 UNF	<b>U07</b>
<b>Hydraulic Pilot</b>	G 1/4	<b>G02</b>	9/16" - 18 UNF	<b>U02</b>
<b>Pneumatic Pilot</b>	G 1/8	-	NPTF 1/8-27	-



### Tie-rod kit classification (appendix "A")

Tie rod kit allows the correct assembly of sectional valves. Tie rod's length depends on the number of sections; each valve is assembled with tie rod kits including a tie rod, two nuts and two washers. DVS20 requires 4 tie-rod kits.



Tie rod kit	Order Code	Length (mm)	Clamping Torque (Nm)	Quantity
DVS20/1	300188004	232	70	4
DVS20/2	300188005	288		
DVS20/3	300188006	344		
DVS20/4	300188007	400		
DVS20/5	300188008	456		
DVS20/6	300108009	512		

### Painting

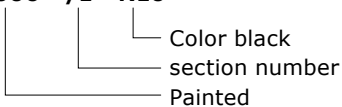
On request, all Hydrocontrol valves can be delivered painted (RAL 9005 black primer).

#### Order example of DVS20/1 painted:

DVS20/1  
 IL 009 150 A G06  
 W001A H004 F001A RP G06 05 PA 01 PB 120  
 TJ A G07  
**P006/1 N10**

The painting is indicated with the following value:

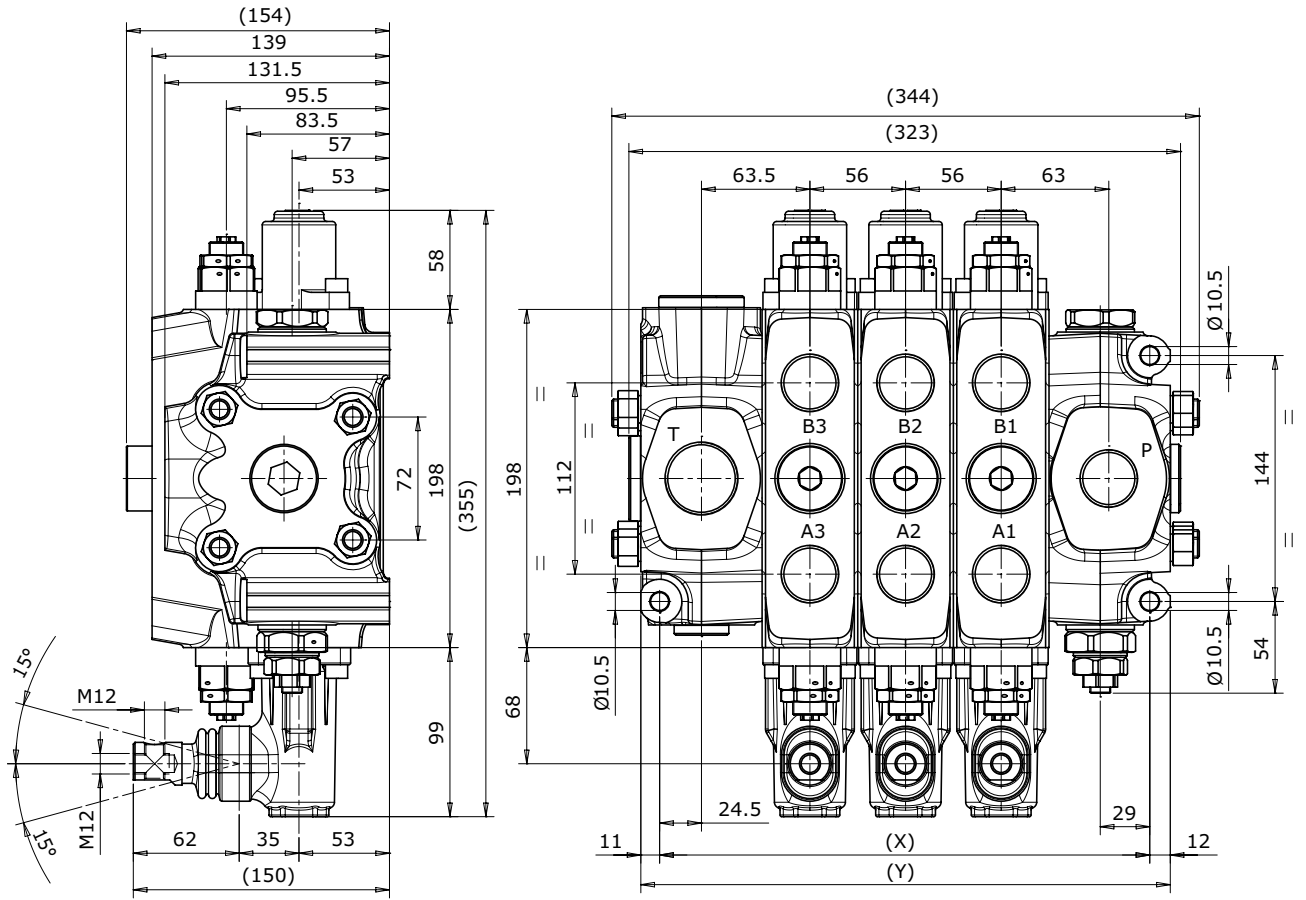
#### P006 - /1 - N10







**DIMENSIONS**



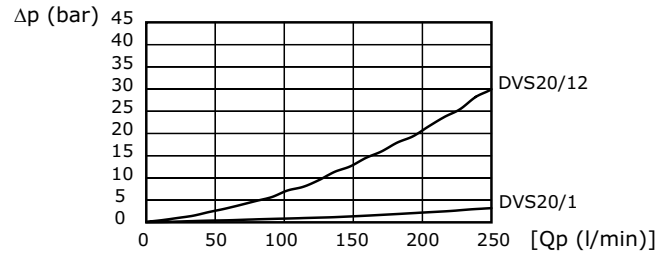
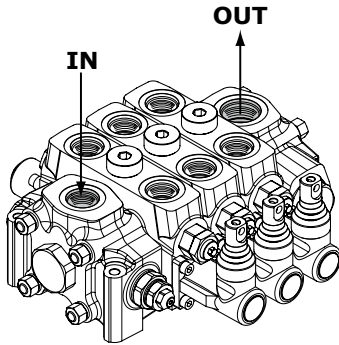
TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
<b>X (mm)</b>	173	229	285	341	397	453	509	565	621	677	733	789
<b>Y (mm)</b>	196	252	308	364	420	476	532	588	644	700	756	812
<b>Weights (kg)</b>	25	34	43	52	61	70	79	88	97	106	115	124



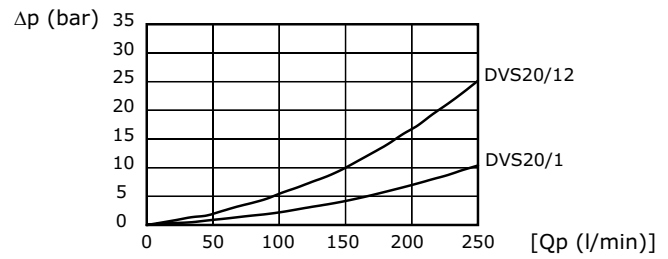
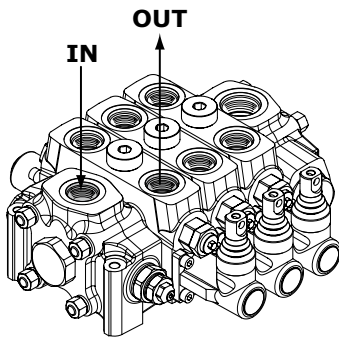
TYPICAL CURVES

Indicated values have been tested with standard sectional valve and W001A spool.

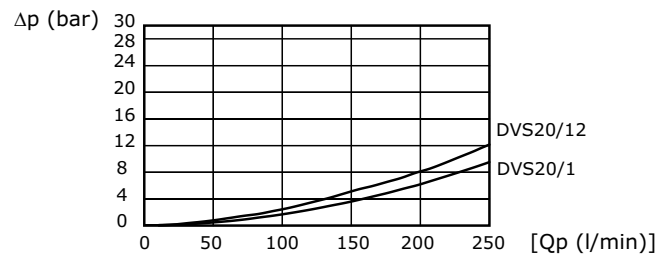
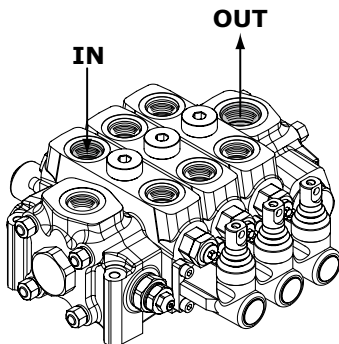
Pressure drop (P - T)



Pressure drop (P - A/B)



Pressure drop (A/B - T)



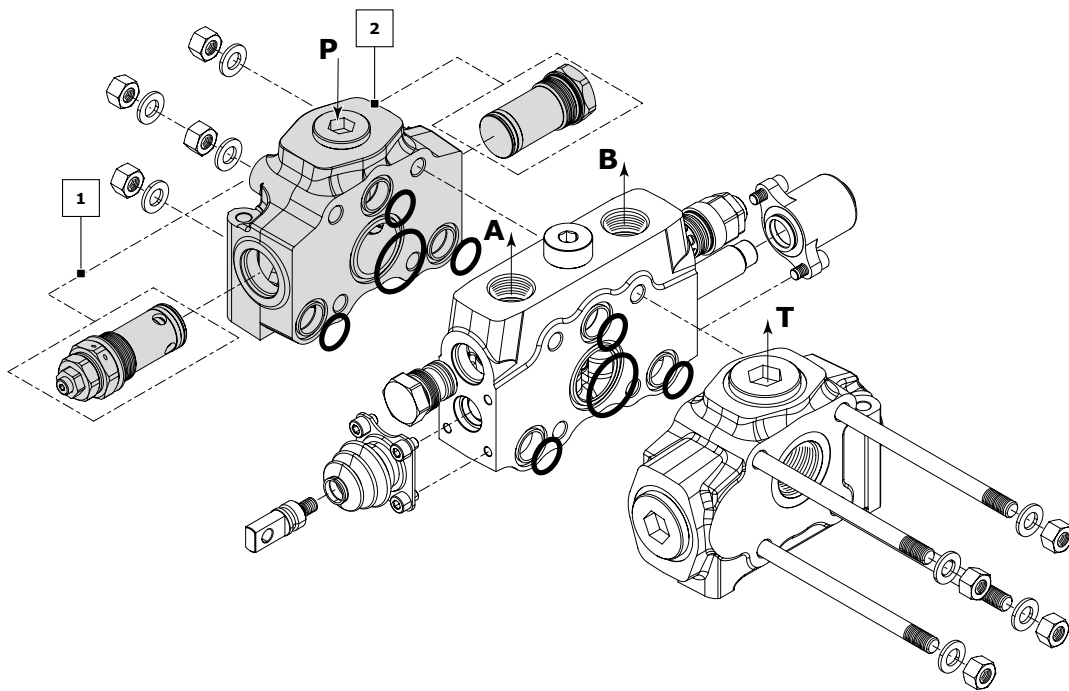


**INLET SECTION**

**Order example**

<b>IR</b>	<b>009</b>	<b>150</b>	<b>A G06</b>
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- 1. IR** inlet side classification
- 009** valve arrangement
- 150** setting (bar)
- 2. A G06** inlet position and available thread type



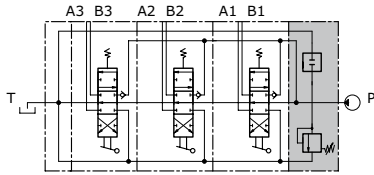
Rif.	Code	Description	Page
-	<b>IR</b>	Sectional valve with right inlet section	<b>10</b>
-	<b>IL</b>	Sectional valve with left inlet section	
<b>1</b>	<b>009</b>	Pilot operated pressure relief valve	<b>11</b>
	<b>010</b>	Pilot operated pressure relief valve and Main anticavitation check valve	
	<b>019</b>	Without valves	
<b>2</b>	<b>A G06</b>	Upper inlet (thread G 1)	<b>11</b>
	<b>C G06</b>	Central side inlet (thread G 1)	
	<b>A U06</b>	Upper inlet (thread 1"5/16 - 12 UNF)	
	<b>C U06</b>	Central side inlet (thread 1"5/16 - 12 UNF)	

**NOTE:** when ordering a relief valve it is necessary to specify factory setting (example 150).

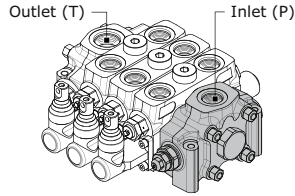


Inlet side classifications

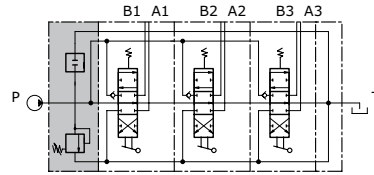
Sectional valve with **right inlet** section



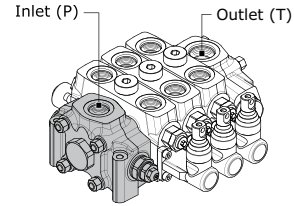
**IR**



Sectional valve with **right inlet** section



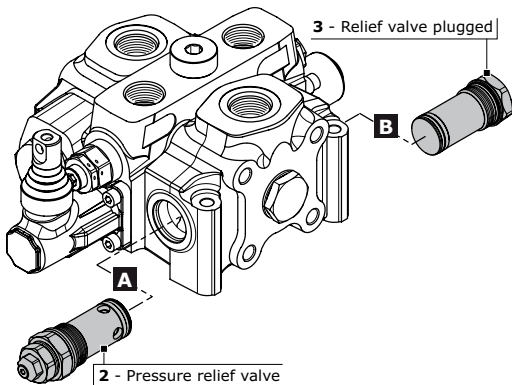
**IL**



Valve identification

type	schema	configuration	description	type	schema	configuration	description
<b>2</b>			Pilot operated pressure relief valve	<b>7</b>			Solenoid dump valve 12 Vdc
<b>3</b>			Relief valve plugged	<b>8</b>			Solenoid dump valve 24 Vdc
<b>4</b>			Main anticavitation check valve	<b>11</b>			Plug with pressure-gauge connection

Valve arrangement



Combination valve example: 009 = 2A - 3B

- 009** Combination valve
- 2A** Pressure relief valve in port A
- 3B** Relief valve plugged in port B

**The code identifies:**

with a number, the type of valve; with a letter its position on the inlet section.

(A) = spool action side

(B) = spool return action side

**NOTE:** when ordering a main relief valve it is necessary to specify setting



AVAILABLE COMBINATIONS INLET SECTION		Valve type on port B						
		2	3	4	7	8	11	
Valve type on port A		2		009	010	012	013	016
		3	018	019	020	023	024	027
		4	029	030		033	034	037
		7	054	055	056			059
		8	061	062	063			066
		11	085	086	087			

**Inlet position**

Inlet combination and thread available		
<b>A G06</b>	<p>Upper Inlet (P)</p>	Upper inlet (P)
<b>A U06</b>		
<b>C G06</b>	<p>Central side Inlet (P)</p>	Central side inlet (P)
<b>C U06</b>		
<b>B G06</b>	<p>Upper Inlet (P)</p> <p>Connection G1/4 (P1)</p>	Upper inlet (P) (P1) with pressure-gauge connection G 1/4
<b>B U06</b>		
<b>D G06</b>	<p>Connection G1/4 (P1)</p> <p>Central side Inlet (P)</p>	Central side inlet (P) (P1) with pressure-gauge connection G 1/4
<b>D U06</b>		

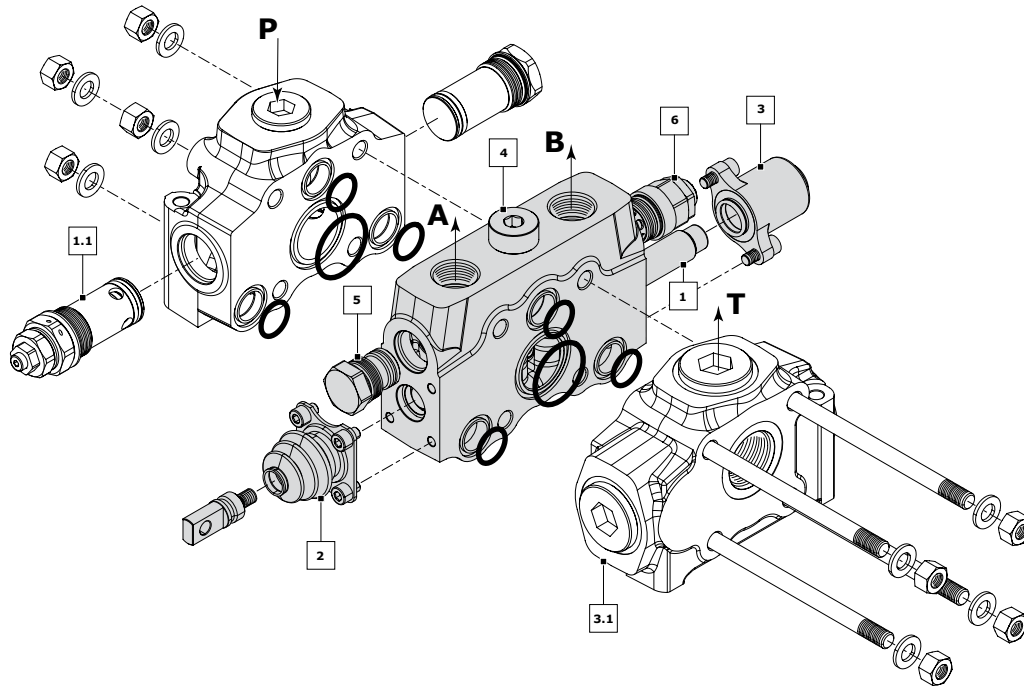


**WORK SECTION**

Order example:

<b>W001A</b>	<b>H004</b>	<b>F001A</b>	<b>RP G06</b>	<b>05 PA</b>	<b>01 PB 100</b>
--------------	-------------	--------------	---------------	--------------	------------------

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. <b>W001A</b></li> <li>2. <b>H004</b></li> <li>3. <b>F001A</b></li> <li>4. <b>RP G06</b></li> <li>5. <b>05 PA</b></li> <li>6. <b>01 PB 120</b></li> </ol> | <p>spool type _____</p> <p>spool actuation type _____</p> <p>spool return action _____</p> <p>section and thread type _____</p> <p>auxiliary valve (port A - handle side) _____</p> <p>auxiliary valve (port B - cap side) _____</p> |
|--|--|



Rif.	Code	Description	Page
1	<b>W001</b>	3 positions double-acting	<b>13</b>
	<b>W002</b>	3 positions double-acting A-B to tank	
2	<b>H001</b>	Protected lever	<b>15</b>
	<b>H004</b>	Control without lever	
3	<b>F001A</b>	3 positions spring-centred spool	<b>16</b>
	<b>F002A</b>	Detent in A and B	
4	<b>RP G06</b>	Parallel circuit (G 1)	<b>21</b>
	<b>RP U06</b>	Parallel circuit (1"5/16-12 UNF)	
	<b>RS G06</b>	Series circuit (G 1)	
	<b>RS U06</b>	Series circuit (1"5/16-12 UNF)	
5	<b>01 PA 100</b>	Antishock valve (port A)	<b>22</b>
	<b>05 PA</b>	Prerangement for auxiliary valve (port A)	
6	<b>01 PB 100</b>	Antishock valve (port B)	<b>22</b>
	<b>05 PB</b>	Prerangement for auxiliary valve (port B)	

**NOTE:**

Sections designed to house auxiliary valve option require double choice on work ports A and B.  
 Always indicate setting value when using antishock and pilot combined valve: **01 PA (100) - 04 PA (100)**



**Spool identification**

order example of spool: **W001 A J10**

**W001** spool schema 3 positions double-acting  
**A** spool type standard spool  
**J10** restricted service ports restriction on diameter (0,10 mm in A and B)

<b>W001</b>	3 positions double-acting	
<b>W002</b>	3 positions double-acting A and B to tank	
<b>W003</b>	3 positions double-acting A to tank B blocked	
<b>W004</b>	3 positions double-acting A blocked B to tank	
<b>W005</b>	3 positions single - acting on A	
<b>W006</b>	3 positions single - acting on B	
<b>W012</b>	4 positions double-acting with float in the 4 <sup>th</sup> position	

spools with restricted service ports				
code	circuit	restriction on diameter (mm)	section (mm <sup>2</sup> )	hydraulic schema
<b>J10</b>	A-B IN T	0,10	2,82	
<b>K10</b>	A IN T	0,10	2,82	
<b>Y10</b>	B IN T	0,10	2,82	



CODE	spool type available	
	STANDARD A	METERED B
<b>W001</b>	W001A	W001B
<b>W002</b>	W002A	W002B
<b>W003</b>	W003A	W003B
<b>W004</b>	W004A	W004B
<b>W005</b>	W005A	
<b>W006</b>	W006A	
<b>W012</b>	W012A	

**NOTE:**

- W012 spool need a special machining on the valve body.
- Float spool (W012) need special detent kit (F005).
- Different spools are available on request.

Plaese contact our Sales department for more information.





**Spool actuation classification**

code	description	dimensions	configuration
<b>H001</b>	Protected lever		
<b>H002</b>	Protected lever rotated 180°		
<b>H101</b>	Unprotected lever		
<b>H004</b>	Control without lever		

**Spool actuation classification for Hydraulic control**

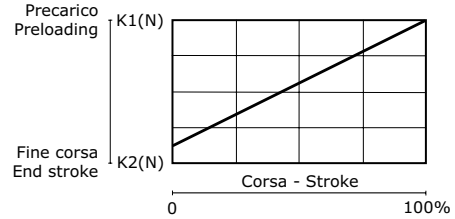
code	description	dimensions	configuration
<b>H005</b> <small>leave out the spool return action code</small>	Hydraulic actuation with side ports  BSP ports = G 1/4 UNF ports = 9/16-18 UNF		



### Spool return action classification - Springs load values

Spool return kits have three different spring types; following the codes depending on spring loads.

Spring type	
<b>Code</b>	<b>A</b> (standard spring)
<b>Preloading</b>	151 N
<b>End of stroke</b>	186.4 N
Spool return action identification example	
<b>Code</b>	<b>F001A</b>



### Spool return action classification

code	description	schema	dimensions	configuration
<b>F001A</b> <b>F001B</b> <b>F001C</b>	3 positions spring-centred spool			
<b>F002A</b>	3 positions spring-centred spool detent in A and B			
<b>F003A</b>	3 positions spring-centred spool detent in A			
<b>F004A</b>	3 positions spring-centred spool detent in B			
<b>F005A</b>	4 positions spring-centred spool detent in 4 <sup>th</sup> position (only for W012 spool)			
<b>F149</b>	Detent in A and B without return spring			



**Pneumatic control classification**

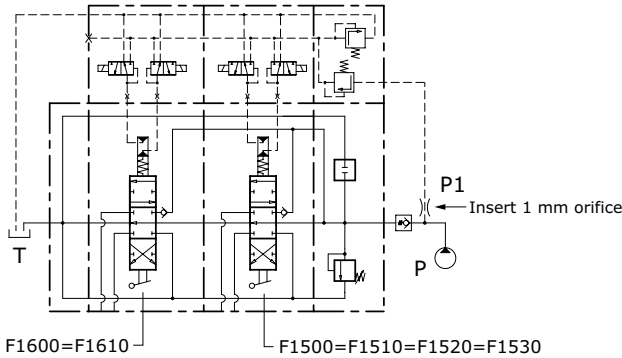
code	description	schema	dimensions	configuration
<b>F020A</b>	Pneumatic control ON - OFF			
<b>F021A</b>	Pneumatic control ON - OFF rotated 180°			
<b>F022A</b>	Proportional Pneumatic control		<p>Pneumatic control: PORT BSP = G 1/8</p>	
<b>F023A</b>	Proportional Pneumatic control rotated 180°			
<b>F135A</b>	Pneumatic control ON - OFF			
<b>F136A</b>	Pneumatic control ON - OFF rotated 180°			
<b>F126A</b>	Proportional Pneumatic control		<p>Pneumatic control: PORT NPTF = 1/8 -27</p>	
<b>F127A</b>	Proportional Pneumatic control rotated 180°			



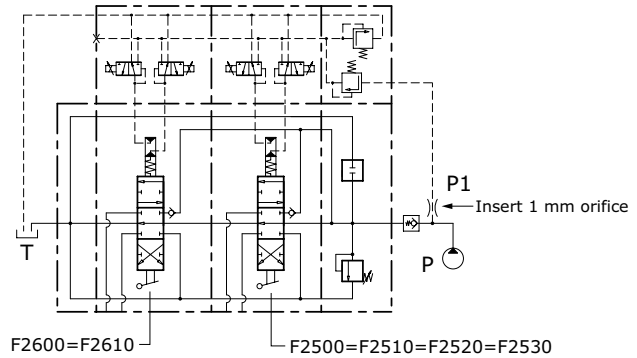
**Electrohydraulic control specifications**

Operating temperature range	-20°C / +80°C
Max inlet pressure	350 bar
Reduced pressure	16 bar
Back pressure on (T)	3 bar
Filtering degree	25 μ assoluti
Raccomanded pilot pipe size	Ø 6 mm - G 1/4

**Electrohydraulic ON-OFF control with fixed pressure reducing valve**



**Electrohydraulic PROPORTIONAL control with fixed pressure reducing valve**



Proportional control kit, mechanically retrooperated, allows the maximum precision of positioning, limiting the hysteresis. The control is operated with PWM control of the current. PWM frequency suggest: 60-80 Hz

regulation currents			
Nominal voltage (V)	Resistance R <sub>20</sub> (Ohm)	Current min (A)	Current max (A)
12 vdc	3,7	0,9	1,7
24 vdc	15,5	0,45	0,85

**Electrohydraulic control classification**

code	description	dimensions	configuration
<b>F1600</b>	3 positions electrohydraulic control ON - OFF 12 Vdc		
<b>F1610</b>	3 positions electrohydraulic control ON - OFF 24 Vdc		
<b>F2600</b>	3 positions electrohydraulic control PROPORTIONAL 12 Vdc		
<b>F2610</b>	3 positions electrohydraulic control PROPORTIONAL 24 Vdc		

Electrohydraulic ON-OFF control is stackable with electrohydraulic PROPORTIONAL control (F2600 = F2610). Control kit already includes orifice to make spool displacement more gradual.



**Electrohydraulic control with fixed pressure reducing valve classification**

code	description	configuration
<b>F1500</b>	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P - T inlet side (12 vdc)	<p>Port BSP (P - T) = G 1/4 Port UNF (P - T) = 9/16"18 UNF</p>
<b>F1510</b>	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P - T inlet side (24 vdc)	
<b>F2500</b>	Electrohydraulic control PROPORTIONAL (fixed pressure reducing valve) P - T inlet side (12 vdc)	
<b>F2510</b>	Electrohydraulic control PROPORTIONAL (fixed pressure reducing valve) P - T inlet side (24 vdc)	
<b>F1520</b>	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P inlet - T outlet (12 vdc)	<p>Port BSP (P - T) = G 1/4 Port UNF (P - T) = 9/16"18 UNF</p>
<b>F1530</b>	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P inlet - T outlet (24 vdc)	
<b>F2520</b>	Electrohydraulic control PROPORTIONAL (fixed pressure reducing valve) P inlet - T outlet (12 vdc)	
<b>F2530</b>	Electrohydraulic control PROPORTIONAL (fixed pressure reducing valve) P inlet - T outlet (24 vdc)	

**Control tie rod assembly**

The length of the control tie rod, will change depending on the section numbers; in this way it will be easy to install in the right way the sections and avoid any misassembly. Each kit is composed by 2 tie rods, 2 plugs, 2 connection ports and spacers according to the section number.

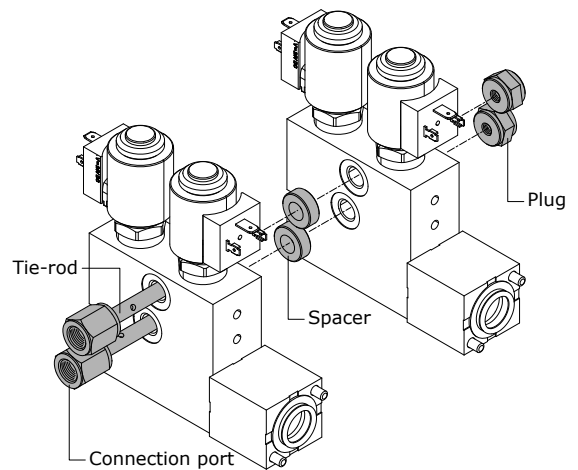
**NOTE:** the control tie rod kit has always to be ordered separately.

Reducing valve, combined with electrohydraulic control kit has to be calculated as a normal working section.

**ORDER EXAMPLE:**

Complete valves with 3 sections F1600 requires a complete tie-rod kit /3.

Complete valves with 2 sections F1600 and 1 section with F1500 (reducing valve) requires a complete tie-rod kit /4.



**Order code fixed pressure reducing valve:**

**915000303** = reducing valve for BSP ports

**915000312** = reducing valve for UNF ports

**Order code for control tie rod (BSP):**

- 320103001** = control tie rod /1
- 320107001** = control tie rod /2
- 320107002** = control tie rod /3
- 320107003** = control tie rod /4
- 320107004** = control tie rod /5
- 320107005** = control tie rod /6
- 320107006** = control tie rod /7
- 320107007** = control tie rod /8

**Order code for control tie rod (UNF):**

- 320103026** = control tie rod /1
- 320107026** = control tie rod /2
- 320107027** = control tie rod /3
- 320107028** = control tie rod /4
- 320107029** = control tie rod /5
- 320107030** = control tie rod /6
- 320107031** = control tie rod /7
- 320107032** = control tie rod /8

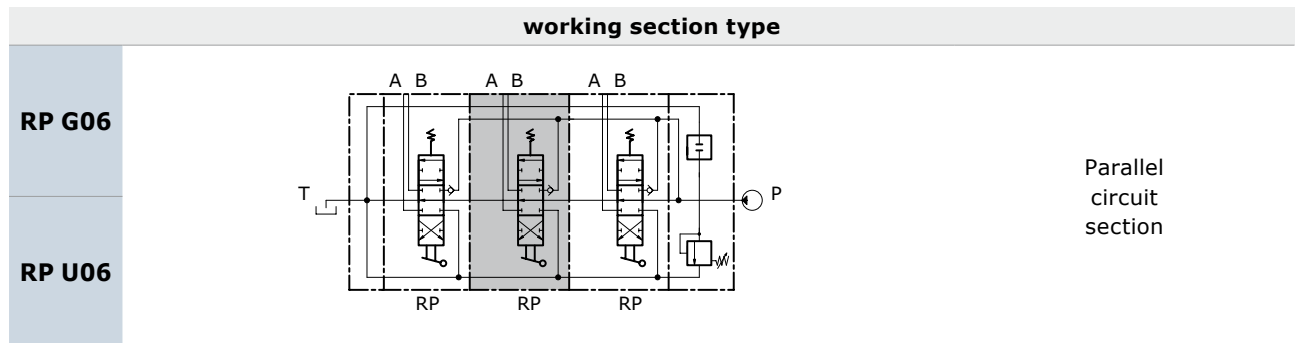


Compatibility table

SPOOL ACTION TYPE	SPOOL TYPE										
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W012A
H001	•	•	•	•	•	•	•	•	•	•	•
H002	•	•	•	•	•	•	•	•	•	•	•
H004	•	•	•	•	•	•	•	•	•	•	•
H101	•	•	•	•	•	•	•	•	•	•	•
H005	•	•	•	•	•	•	•	•	•	•	•
SPOOL RETURN ACTION TYPE	SPOOL TYPE										
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W012A
F001	•	•	•	•	•	•	•	•	•	•	
F002	•	•	•	•	•	•	•	•	•	•	
F003	•	•	•	•	•	•	•	•	•	•	
F004	•	•	•	•	•	•	•	•	•	•	
F005											•
F149	•	•	•	•	•	•	•	•	•	•	
F020=F021	•	•	•	•	•	•	•	•	•	•	
F022=F023	•	•	•	•	•	•	•	•	•	•	
F135=F136	•	•	•	•	•	•	•	•	•	•	
F126=F127	•	•	•	•	•	•	•	•	•	•	
F1500=F1510	•	•	•	•	•	•	•	•	•	•	
F1520=F1530	•	•	•	•	•	•	•	•	•	•	
F2500=F2510	•	•	•	•	•	•	•	•	•	•	
F2520=F2530	•	•	•	•	•	•	•	•	•	•	
F1600=F1610	•	•	•	•	•	•	•	•	•	•	
F2600=F2610	•	•	•	•	•	•	•	•	•	•	



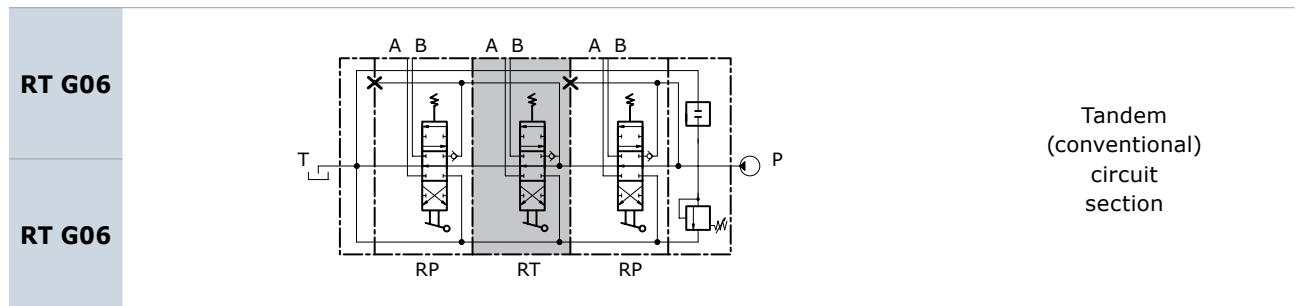
**Work section identification**



Parallel circuit section

**Parallel circuit**

When the spool is operated it intercepts the by-pass gallery by diverting the flow of oil to service port A or B. If two or more spools are actuated at the same time, the oil will power the service port that has the lower load; by throttling the spools, the flow of oil can be divided between two or more service ports.




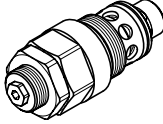

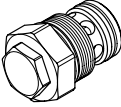

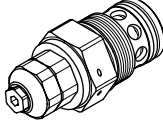

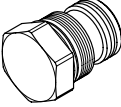
Tandem (conventional) circuit section


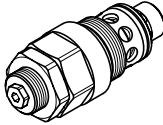

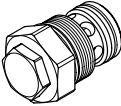

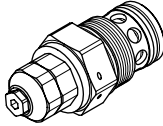

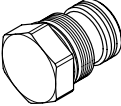
**Parallel-Tandem circuit**

When the spool is operated it intercepts the switch gallery by diverting the flow of oil to service port A or B. The Tandem circuit is powered by the switch gallery thus permitting the use of just one work section at a time. The section downstream from the tandem section that has been actuated does not operate, the upstream section has priority.



**Auxiliary valve identification**

code	description	schema	configuration	Setting range (bar)			
				type	at full flow	type	at min. flow
<b>01PA</b>	Antishock valve (port A)			<b>A</b>	60 / 100	<b>A</b>	10-A / 60-A
				<b>B</b>	101 / 160	<b>B</b>	61-A / 130-A
				<b>C</b>	161 / 250	<b>C</b>	131-A / 250-A
<b>02PA</b>	Anticavitation valve (port A)						
<b>04PA</b>	Pilot combined valve (port A)			<b>A</b>	50 / 275		
<b>05PA</b>	Prearrangement for auxiliary valve (port A)						

code	description	schema	configuration	setting range (bar)			
				type	at full flow	type	at min. flow
<b>01PB</b>	Antishock valve (port B)			<b>A</b>	60 / 100	<b>A</b>	10-A / 60-A
				<b>B</b>	101 / 160	<b>B</b>	61-A / 130-A
				<b>C</b>	161 / 250	<b>C</b>	131-A / 250-A
<b>02PB</b>	Anticavitation valve (port B)						
<b>04PB</b>	Pilot combined valve (port B)			<b>A</b>	50 / 275		
<b>05PB</b>	Prearrangement for auxiliary valve (port B)						

**Auxiliary valve - Setting range**

Sections designed to house auxiliary valve option require double choice on work ports A and B.

Always indicate setting value when using antishock valve and pilot combined valve:

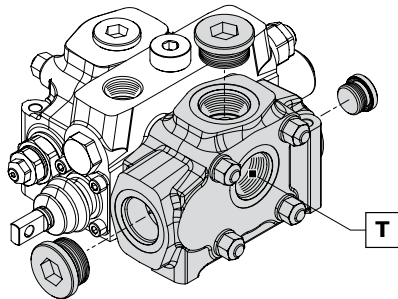
**01 PA (120) = setting at full flow    01 PA (120-A) = setting at min. flow    04 PA (120) = setting at min. flow**





**OUTLET SECTION - STANDARD VERSION**

**Order example**



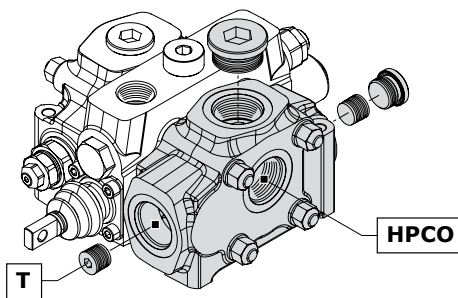
**TJ** | **A G07**

- 1. **TJ** outlet section type
- 2. **A G07** outlet position and available thread type

Rif.	Code	Description	Page
1	<b>TJ</b>	Outlet section with single return (T) right-side inlet (P)	
	<b>TK</b>	Outlet section with single return (T) left-side inlet (P)	
2	<b>A G07</b>	Upper outlet (thread G 1"1/4)	24
	<b>A U07</b>	Upper outlet (thread 1"5/8-12 UNF)	
	<b>C G07</b>	Central outlet (thread G 1"1/4)	
	<b>C U07</b>	Central outlet (thread 1"5/8-12 UNF)	

**OUTLET SECTION - HPCO VERSION**

**Order example - HPCO version Outlet**



**TM** | **M G07**

- 1. **TM** outlet section type
- 2. **M G07** outlet position and available thread type

Rif.	Code	Description	Page
1	<b>TM</b>	Outlet section with two return (T-HPCO) right-side inlet (P)	
	<b>TN</b>	Outlet section with two return (T-HPCO) left-side inlet (P)	
2	<b>M G07</b>	HPCO upper outlet T (tank) rear outlet side B (thread G 1"1/4)	25
	<b>M U07</b>	HPCO upper outlet T (tank) rear outlet side B (thread 1"5/8-12 UNF)	
	<b>N G07</b>	HPCO upper outlet T (tank) front outlet side A (thread G 1"1/4)	
	<b>N U07</b>	HPCO upper outlet T (tank) front outlet side A (thread 1"5/8-12 UNF)	

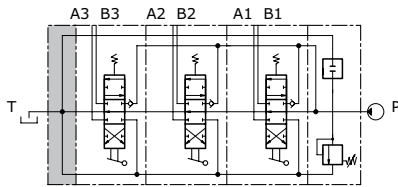


Outlet with single tank classification

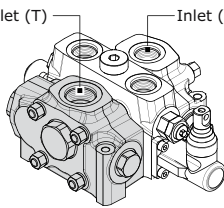
outlet identification

**TJ**

Outlet section with single return (T)  
right-side inlet (P)

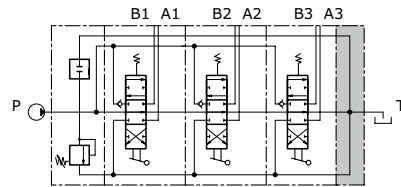


Outlet (T)      Inlet (P)

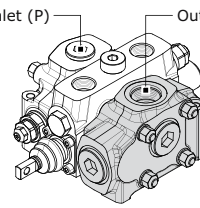


**TK**

Outlet section with single return (T)  
left-side inlet (P)

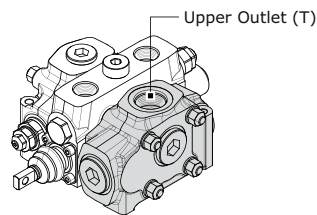


Inlet (P)      Outlet (T)



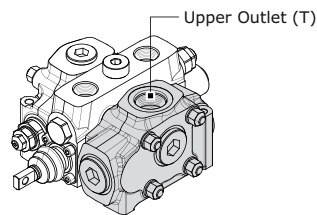
Inlet combination and thread available

**A G07**



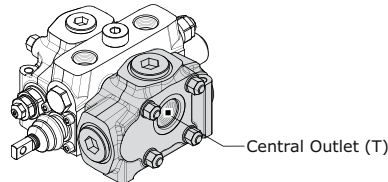
Upper outlet  
(thread G 1"1/4)

**A U07**



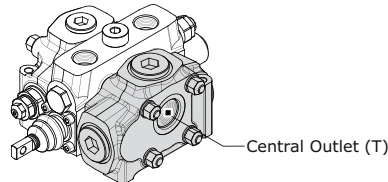
Upper outlet  
(thread 1"5/8 - 12 UNF)

**C G07**



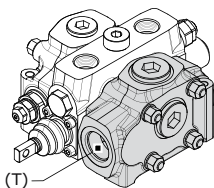
Central outlet  
(thread G 1"1/4)

**C U07**



Central outlet  
(thread 1"5/8 - 12 UNF)

**G G07**

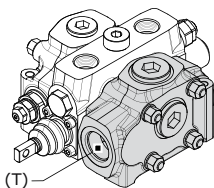


**only  
for  
TK**

Front outlet side A  
(thread G 1"1/4)

**G U07**

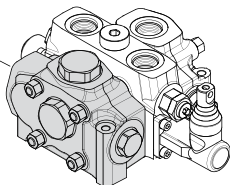
Front Outlet side A (T)



Front outlet side A  
(thread 1"5/8 - 12 UNF)

**H G07**

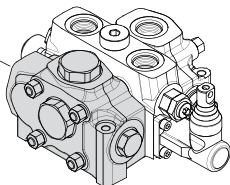
Rear Outlet side B (T)



**only  
for  
TJ**

Rear outlet side B  
(thread G 1"1/4)

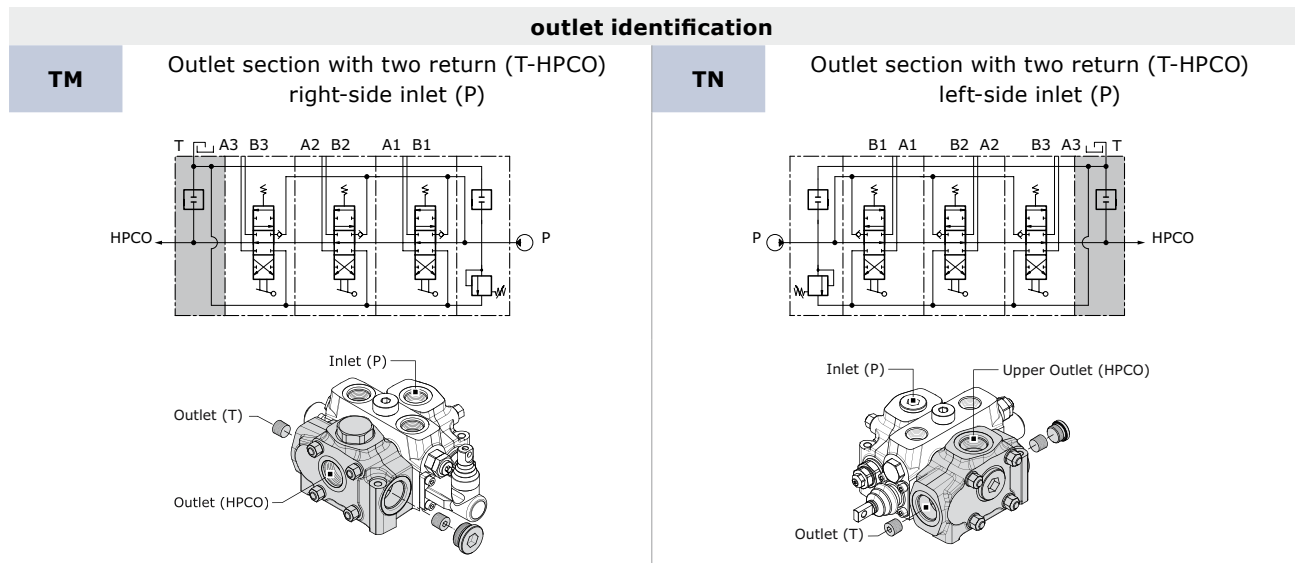
**H U07**



Rear outlet side B  
(thread 1"5/8 - 12 UNF)



Outlet with two tanks classification

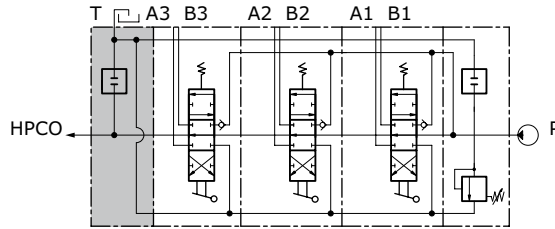


Inlet combination and thread available			
<b>M G07</b>		<b>only for TM</b>	HPCO upper outlet T rear side outlet B (thread G 1 1/4)
<b>M U07</b>			HPCO upper outlet T rear side outlet B (thread 1 5/8 - 12 UNF)
<b>N G07</b>		<b>only for TN</b>	HPCO upper outlet T front outlet side A (thread G 1 1/4)
<b>N U07</b>			HPCO upper outlet T front outlet side A (thread 1 5/8 - 12 UNF)
<b>P G07</b>		<b>only for TM</b>	HPCO central outlet T rear outlet side B (thread G 1 1/4)
<b>P U07</b>			HPCO central outlet T rear outlet side B (thread 1 5/8 - 12 UNF)
<b>Q G07</b>		<b>only for TN</b>	HPCO central outlet T front outlet side A (thread G 1 1/4)
<b>Q U07</b>			HPCO central outlet T front outlet side A (thread 1 5/8 - 12 UNF)

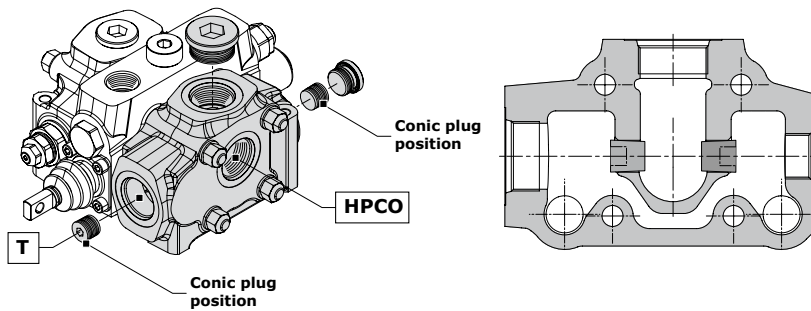


CARRY-OVER CONNECTION (HPCO)

This option, available on all D20, allows the sectional valve to feed a second valve, by extending the free flow channel. In this configuration, the valve need a separated port for connection to tank.



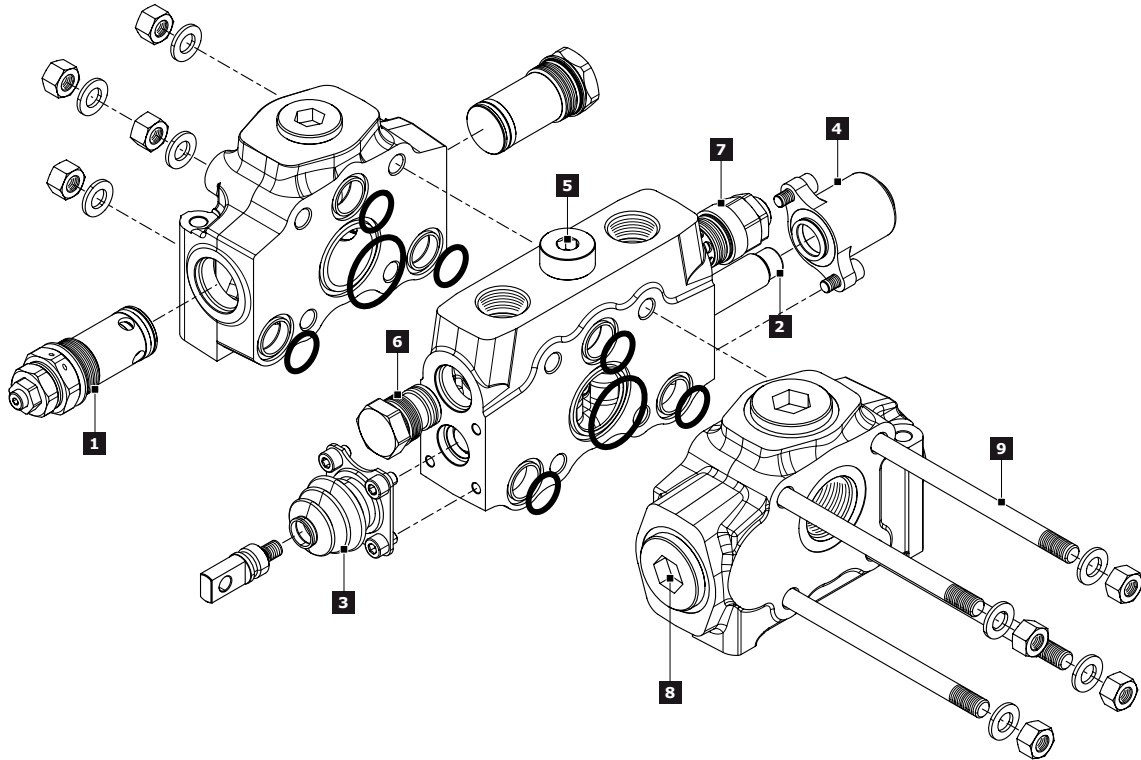
It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



code (HPCO Plug identification)	description	q.ty
413010201	G 1/2 x 17 plug	2



DVS20 SPARE PARTS LIST



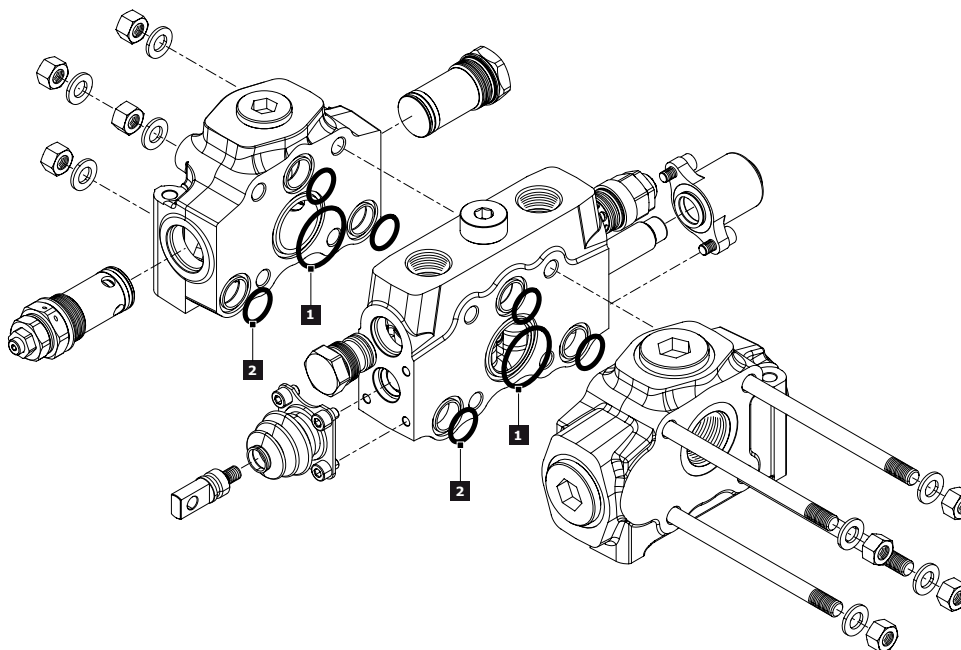
Ref.	Description	Order code	Q.ty	Code	Note
<b>1</b>	Pilot operated pressure relief valve	<b>89380</b>	1		Setting: 80 bar
		<b>89312</b>			Setting: 150 bar
		<b>89381</b>			Setting: 250 bar
	Relief valve plugged	<b>430188001</b>	1	-	
	Main Anticavitation check valve	<b>915058801</b>	1		
<b>2</b>	Plug with pressure-gauge connection	<b>430188002</b>	1		
	3 positions double-acting spool	<b>421288005</b>	1	<b>W001A</b>	
		<b>421288007</b>		<b>W001B</b>	
	3 positions double-acting A and B to tank spool	<b>421288013</b>	1	<b>W002A</b>	
		<b>421288014</b>		<b>W002B</b>	
	3 positions single-acting on A	<b>421288019</b>	1	<b>W005A</b>	
3 positions single-acting on B	<b>421288021</b>	1	<b>W006A</b>		
4 positions double-acting with float in the 4 <sup>th</sup> pos.	<b>421288027</b>	1	<b>W012A</b>		
<b>3</b>	Protected lever	<b>320388002</b>	1	<b>H001 = H002</b>	
		<b>320388003</b>			only for W012 spool
	Control without lever	<b>320388001</b>	1	<b>H004</b>	
		<b>320388004</b>			only for W012 spool
	Unprotected lever	<b>320388001</b>	1	<b>H101 = H102</b>	
Hydraulic actuation with side ports	<b>320507001</b>	2	<b>H005</b>	for BSP version	
	<b>320507023</b>			for UNF version	



Ref.	Description	Order code	Q.ty	Code	Note
4	3 position spring centred spool	320788001	1	F001A	
	Detent in A and B	320807001	1	F002A	
	Detent in A	320807002	1	F003A	
	Detent in B	320807003	1	F004A	
	Detent in 4 <sup>th</sup> position	320807004	1	F005A	only for W012 spool
	Pneumatic control ON-OFF	321107004	1	F020A=F021A	BSP ports
	Proportional Pneumatic control	321207007	1	F022A=F023A	BSP ports
		321207013	1	F126A=F127A	NPT ports
	Electrohydraulic ON-OFF (12 vdc)	321407021	1	F1600	
	Electrohydraulic ON-OFF (24 vdc)	321407022	1	F1610	
	Electrohydraulic Proportional (12 vdc)	322007001	1	F2600	
	Electrohydraulic Proportional (24 vdc)	322007002	1	F2610	
	Electrohydraulic ON-OFF (12 vdc) with reducing valve	321407023	1	F1500=F1520	BSP ports
	Electrohydraulic ON-OFF (24 vdc) with reducing valve	321407024	1	F1510=F1530	BSP ports
	Electrohydraulic Proportional (12 vdc) with reducing valve	322007003	1	F2500=F2520	BSP ports
	Electrohydraulic Proportional (24 vdc) with reducing valve	322007004	1	F2510=F2530	BSP ports
Electrohydraulic ON-OFF (12 vdc) with reducing valve	321407031	1	F1500=F1520	UNF ports	
Electrohydraulic ON-OFF (24 vdc) with reducing valve	321407032	1	F1510=F1530	UNF ports	
Electrohydraulic Proportional (12 vdc) with reducing valve	322007009	1	F2500=F2520	UNF ports	
Electrohydraulic Proportional (24 vdc) with reducing valve	322007010	1	F2510=F2530	UNF ports	
5	Check valve on the work section	320288001	1	-	only for RP and RT section
6	Antishock valve on port A	84433	1		Setting: 100 bar
		84434		01 PA	Setting: 150 bar
		85007			Setting: 200 bar
	915088801	02 PA			
	84438			Setting: 100 bar	
Pilot combined valve on port A	84439	04 PA	Setting: 200 bar		
	84440		Setting: 300 bar		
Prearrangement for auxiliary valve on port A	430488001		05 PP		
7	Antishock valve on port B	84433	1		Setting: 100 bar
		84434		01 PB	Setting: 200 bar
		85007			Setting: 300 bar
	915088801	02 PB			
	84438			Setting: 100 bar	
	Pilot combined valve on port B	84439		04 PB	Setting: 200 bar
		84440			Setting: 300 bar
	Prearrangement for auxiliary valve on port B	430488001			05 PB
8	Plug kit (G 1)	430000021	1	G06	
	Plug kit (G 1"1/4)	430000022		G07	
	Plug kit (1"5/16-12 UNF)	300008002		U06	
	Plug kit (1"5/8-12 UNF)	300009002		U07	



Gasket kits



Inlet and work section			
Rif.	Order code	Description	Q.ty
1	412020615	O.R. 90SH 48,90 x 2,62 (2-135)	1
2	412020614	O.R. 90SH 26,65 x 2,62 (2-121)	3

**Complete Gasket kit: order code - 350988001**

**Guidelines**

- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock relief valves.
- Clean piping materials sufficiently before use.
- Make sure to prevent the port openings from being entered with dust or foreign matters.
- Tighten the port connectors surely with the recommended fastening torques.
- Do not direct the jet of a pressure washing unit directly to the valve.

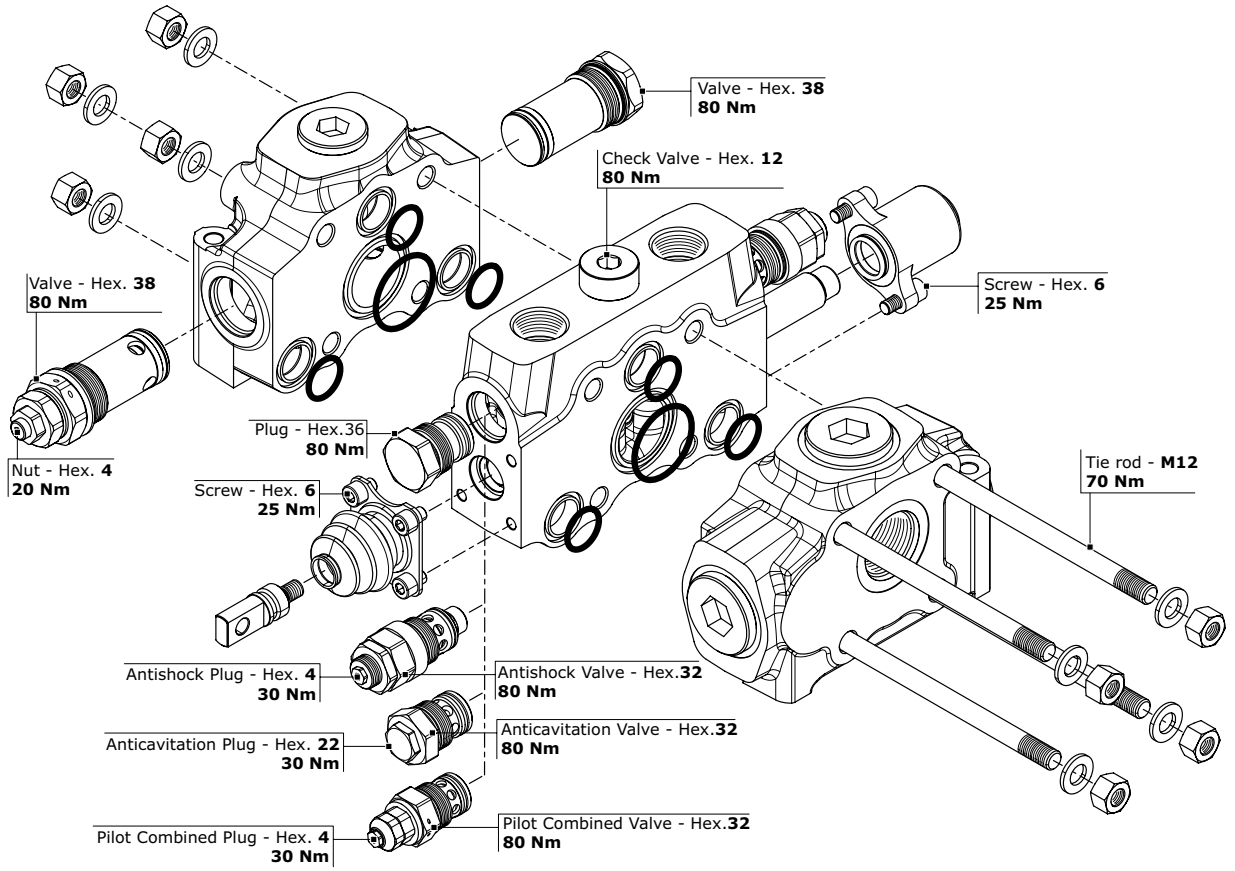
**Fittings tightening torque (Nm)**

thread type	port P	Port A - B	Port T
<b>BSP (ISO - 228)</b>	<b>G 1</b>	<b>G 1</b>	<b>G 1 1/4</b>
with rubber sealing (DIN 3869)	120	120	120
with copper or steel and rubber washer	120	120	120
<b>UN-UNF (ISO - 725)</b>	<b>1 5/16 - 12 UN</b>	<b>1 5/16 - 12 UNF</b>	<b>1 5/8 - 12 UNF</b>
with O.R.	120	120	120





General clamping torque





## Dimensions - Thread codes

The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections.

## METRIC THREAD (ISO 9974-1)

Type	M18x1,5	M22x1,5	M27x2
Code	<b>M01</b>	<b>M02</b>	<b>M03</b>

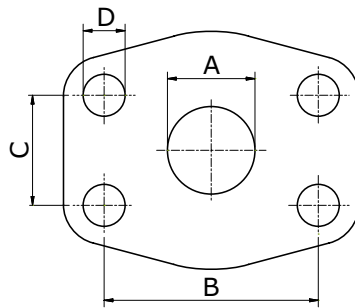
## BSP THREAD (ISO 1179-1)

Type	1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"
Code	<b>G02</b>	<b>G03</b>	<b>G04</b>	<b>G05</b>	<b>G06</b>	<b>G07</b>	<b>G08</b>	<b>G09</b>

## UN / UNF THREAD (ISO 11926-1)

Type	9/16" 18 UNF SAE6	3/4" 16 UNF SAE8	7/8" 14 UNF SAE10	1"1/16 12 UNF SAE12	1"5/16 12 UNF SAE16	1"5/8 12 UNF SAE20
Code	<b>U02</b>	<b>U03</b>	<b>U04</b>	<b>U05</b>	<b>U06</b>	<b>U07</b>

## Dimensions - SAE Flange codes



## SAE / 3000 FLANGE (ISO 6162-1)

Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)	2" (MA)	2" (UNC)	3" (MA)	3" (UNC)
Code	<b>S03</b>	<b>S04</b>	<b>S05</b>	<b>S06</b>	<b>S07</b>	<b>S08</b>	<b>S09</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>S15</b>	<b>S16</b>
A	19	19	25	25	32	32	38	38	51	51	76	76
B	47,6	47,6	52,4	52,4	58,7	58,7	69,9	69,9	77,8	77,8	106,4	106,4
C	22,3	22,3	26,2	26,2	30,2	30,2	35,7	35,7	42,9	42,9	61,9	61,9
D	M10	3/8-16	M10	3/8-16	M10	7/16-14	M12	1/2-13	M12	1/2-13	M16	5/8-11

## SAE / 6000 FLANGE (ISO 6162-2)

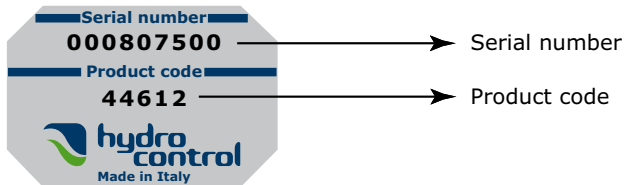
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)
Code	<b>S33</b>	<b>S34</b>	<b>S35</b>	<b>S36</b>	<b>S37</b>	<b>S38</b>	<b>S39</b>	<b>S40</b>
A	19	19	25	25	32	32	38	38
B	50,8	50,8	57,2	57,2	66,6	66,6	79,3	79,3
C	23,8	23,8	27,8	27,8	31,8	31,8	36,5	36,5
D	M10	3/8-16	M12	7/16-14	M14	1/2-13	M16	5/8-11



## GENERAL CONDITIONS AND PATENTS

### Product identification

All Hydrocontrol products have an identifying plate placed in specific position.



#### Serial number:

It univocally identifies the physical valve: this provides an easy way to find all sales and production details.

#### Product code:

It is a number univocally identifying the configuration and pressure settings of a valve.

### Introduction

These general conditions apply to all general supplies from Hydrocontrol s.p.a., after receiving orders from the Customer. Should commercial terms such as EXW, DDP, etc be mentioned, of course the Incoterms of the International Chamber of Commerce must be referred to, according to the test existing when the general supply conditions are agreed on.

### Management of orders

No Customer's order is binding to Hydrocontrol s.p.a. if Hydrocontrol s.p.a. has not confirmed the order in writing. Hydrocontrol s.p.a. commits to supplying the orders in compliance with the order confirmation that has been issued. Any disagreement with the content of the order confirmation must be communicated in writing to Hydrocontrol s.p.a. within and no later than 5 days from the delivery of the order confirmation. The Customer commits to paying for the goods supplied by Hydrocontrol s.p.a., according to the prices indicated on the order confirmation.

### Payment conditions

The Parties agree on the payment terms at the beginning of the supply. The terms will be indicated on the order confirmation. Should the Customer be late with the payments, Hydrocontrol S.p.a. will be entitled to require the payment of interests on arrears based on the exiting Prime Rate increased by 2%. Should there be any payment delay, Hydrocontrol s.p.a. will be entitled not to process the Customer's purchase order, even if it has already been confirmed.

### Delivery and shipment

The goods are always supplied Ex Works, even when Hydrocontrol s.p.a. agrees with the Customer that the shipment, or a part of it, will be arranged by Hydrocontrol s.p.a. It is agreed that the Customer will bear the risk of goods deterioration or damaging from the moment the goods are handed by Hydrocontrol s.p.a. to the first carrier.

### Product characteristics

Hydrocontrol s.p.a. commits to supplying good quality products, compliant with the technical specifications declared on the technical tables and on the catalogue. Hydrocontrol s.p.a, even without notice, at its own discretion, reserves the right to modify the products as necessary, without these changes altering the main characteristics of the products.

### Claims

Any claims about defects on delivered products (just as an example: claims about the packaging, the number, the quantity or the external product characteristics) will have to be notified to Hydrocontrol s.p.a. in writing, within and no later than 7 days from reception of the goods, otherwise the claims will be considered as null and void. Occult defects (the defects of the goods that cannot be spotted with a careful control of the goods received by the Customer), will have to be notified in writing to Hydrocontrol s.p.a. within 7 days from the discovery of the defect, and anyhow no later than 12 months from the delivery of the goods, otherwise the claim will be considered as null and void. Even in case of claim or objection, the Customer will never be entitled to suspend or delay the payments to Hydrocontrol s.p.a. for the products subject to claim or objection nor for any other supply.



## GENERAL CONDITIONS AND PATENTS

### Warranty

Should the products supplied by Hydrocontrol not be compliant or have the required quality and should this defect be due to Hydrocontrol, Hydrocontrol s.p.a. commits, at its choice, to replace or repair the faulty products, as long as the defect or lack of compliance is notified to Hydrocontrol s.p.a. in writing, as specified at point 6, within and no later than 18 months from product delivery. On the products that have been fixed or replaced in accordance with what specified above, the above-mentioned warranty applies. The 12 month duration starts from the date of repair or replacement. In case of defects, lack of quality or in case of lack of compliance for the supplied products, with the exception of fraud or serious offence, Hydrocontrol s.p.a. only commits to repairing or replacing the faulty products, according to what specified above. This warranty replaces any other Supplier's warranty or liability established by the law. This warranty excludes any other liability contractual or extra-contractual by Hydrocontrol s.p.a. on the products supplied by Hydrocontrol (as a mere example: damage refund, loss of profit, product recall campaign, etc). Hydrocontrol s.p.a. has signed a product civil liability police, with a suitable maximum coverage.

### Ownership retention

The products supplied by Hydrocontrol s.p.a. will be owned by the latter until Hydrocontrol receives the complete payment for the supplied goods.

### Obligation confidentiality

Hydrocontrol s.p.a. commits to not disclosing the technical and commercial information it receives from the Customer, unless this information has already been publicly disclosed.

### Patents

The Customer is not allowed to use the provided Products, or a part of them, their descriptions or drawings protected or not protected by Patent or registered trademark in order to design or make similar products, unless Hydrocontrol s.p.a. previously issues its written authorization. Should Hydrocontrol s.p.a. give its written authorization, all patents, trademarks, registered designs, copyrights and intellectual property rights related or connected to the Products provided by Hydrocontrol s.p.a. will stay Hydrocontrol's property. The Customer commits to respecting the highest confidentiality.

### Applicable law and court of jurisdiction

Hydrocontrol s.p.a.'s supplies are regulated by these General Supply Conditions and, for anything not defined here, by the Italian law. Any controversy related, generated or connected to the supply of Products by Hydrocontrol s.p.a., where Hydrocontrol s.p.a. is involved, will be exclusively dealt with by the Court of Bologna.

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1<sup>st</sup> edition DVS20.00

[www.hydrocontrol-inc.com](http://www.hydrocontrol-inc.com)



D1WHEB11E



# D40

SECTIONAL VALVE



TECHNICAL CATALOGUE

A member of



 **walvoil**  
FLUID POWER EMOTION

**1<sup>st</sup> edition D40.05**

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*This catalogue shows the product in the most standard configurations.  
Please contact our Sales Dpt. for more detailed information or special requests.*

**WARNING!**

*All specifications of this catalogue refer to the standard product at this date.  
Walvoil, oriented to a continuous improvement, reserves the right to  
discontinue, modify or revise the specifications, without notice.*

**WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN  
INCORRECT USE OF THE PRODUCT.**





### Applications

The valve is available with manual and hydraulic remote controls.  
Working sections have auxiliary valves and a broad range of interchangeable spools.  
Suitable for applications including Wheel loaders, Truck cranes, Sea platform cranes, Drilling machines, Presses.





QUICK REFERENCE GUIDE

GENERAL SPECIFICATION	D9	D3M	DVS10	D4	D6	D16	D12	DVS20	D20	D25	D40
Working sections number	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-10
<b>CIRCUIT</b>											
Parallel	•	•	•	•	•	•	•	•	•	•	•
Series	•	•	•	•	•	•	•		•	•	
Tandem	•	•	•	•	•	•		•	•		
Parallel circuit stroke (mm)	6	5	6	6	7	7	9,5	9,5	9,5	12	15
Series circuit stroke (mm)	6	5	6	6	5	7	6,5		6,5	8,5	
Float spool extra stroke (mm)	5	5	5	5,5	6	7	7	7	7	9,5	10
Spools pitch (mm)	31	38	35	40	46	46	56	56	64	75	91
<b>RATED FLOW</b>											
Max recommended flow rate (l/min)	35	55	45	80	100	150	180	250	250	380	700
Max recommended flow rate (GPM)	10	15	12	22	27	40	48	67	67	100	185
<b>RATED PRESSURE</b>											
Max working pressure (bar)	350	350	350	350	350	350	350	250	350	350	350
Max working pressure (PSI)	5000	5000	5000	5000	5000	5000	5000	4000	5000	5000	5000

OPTION CHART	D9	D3M	DVS10	D4	D6	D16	D12	DVS20	D20	D25	D40
Direct acting pressure relief valve	•	•	•	•							
Pilot operated pressure relief valve		•		•	•	•	•	•	•	•	•
2 stage pilot operated relief valve		•		•	•	•	•		•	•	•
Externally piloted valve	•	•	•	•	•	•	•		•	•	•
Solenoid dump valve (12 Vdc)	•	•	•	•	•	•	•				
Solenoid dump valve (24 Vdc)	•	•	•	•	•	•	•				
Main anticavitation check valve		•		•	•	•	•	•	•	•	•
Clamping valve		•	•	•							
<b>SPOOL ACTUATION</b>											
Manual control	•	•	•	•	•	•	•	•	•	•	•
Without lever	•	•	•	•	•	•	•	•	•	•	•
90° joystick control		•	•	•	•	•					
Hydraulic control	•	•	•	•	•	•	•	•	•	•	•
Direct electric control (12-24 Vdc)		•		•							
<b>SPOOL RETURN ACTION</b>											
Spring return	•	•	•	•	•	•	•	•	•	•	•
Detent in A - in B - in A/B	•	•	•	•	•	•	•	•	•	•	•
Detent in 4 <sup>th</sup> position	•	•	•	•	•	•	•	•	•	•	•
Arrangement for dual control	•	•		•	•	•	•		•		
Hydraulic load limit	•	•		•	•	•					
Pneumatic control ON - OFF		•	•	•	•	•	•	•	•		
Proportional pneumatic control		•	•	•	•	•	•	•	•		
Electrical load limit	•	•		•	•	•					
Electrohydraulic control ON-OFF (12-24 Vdc)		•	•	•	•	•	•	•	•		
Electrohydraulic control PROP. (12-24 Vdc)		•	•	•	•	•	•	•	•		
Electropneumatic control (12-24 Vdc)		•	•	•	•	•	•		•		
<b>AUXILIARY VALVES</b>											
Antishock valve	•	•	•	•	•	•	•	•	•	•	•
Anticavitation valve	•	•	•	•	•	•	•	•	•	•	•
Combined valve	•	•	•		•	•	•		•	•	•
Pilot combined valve						•		•	•	•	•



**GENERAL INDEX**

<b>4</b>	<b>General specifications</b> Standard working conditions Fluid options
<b>5</b>	<b>Order example</b> Standard thread Thread codes Tie-rod kit classification Painting
<b>7</b>	<b>Dimensions</b>
<b>8</b>	<b>Typical curves</b> Pressure drop (P - T) Pressure drop (P - A/B) Pressure drop (A/B - T) Pilot operated relief valve curve Pilot combined valve curve Main anticavitation check valve curve Anticavitation check valve curve Hydraulic pilot control curve
<b>10</b>	<b>Inlet Section</b> Order example Inlet side classification Valve identification Valve arrangement
<b>13</b>	<b>Working section</b> Order example Spool identification Spool actuation classification for manual control Spool actuation classification for hydraulic control Spool return action classification - Spring load values Work section identification Auxiliary valves identification
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<b>25</b>	<b>Outlet section (version 1 outlet)</b> Order example
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<b>31</b>	<b>Installation</b>
<b>35</b>	<b>General conditions and patents</b>



## GENERAL SPECIFICATIONS

## Standard working conditions

Description	Value
Ambient operating temperature range	-40°C / +60°C
Kinematic viscosity range	10 ÷ 300 cSt
Max contamination level	9 (NAS 1638) - 20/18/15 (ISO 4406:1999)
Recommended filtration level	β10 > 75 (ISO 16889:2008)
Internal filter (on electroproportional valves pilot line)	30 μm

All information and diagrams in this catalogue refer to a mineral base oil VG46 at 50°C temperature (32 cSt kinematic viscosity)

## Fluid options

Types of fluid (according to ISO 6743/4) Oil and Solutions	Temperature (°C)		Compatible gasket
	min	max	
Mineral Oil HL, HM (or HLP acc. to DIN 51524)	-25	+80	NBR
Oil in water emulsions HFA	+5	+55	NBR
Water in oil emulsions HFB	+5	+55	NBR
Polyglycol-based aqueous solution HFC	-10	+60	NBR

For special applications and different fluids, please call our Technical Department.



**ORDER EXAMPLE**

**D40/1: IR 009 150 A G09 W001A H006 RP G09 04 PA 100 04 PB 100 TJ A G09**

**TYPE:**

D40: product type  
/1: working section number

**1) INLET ARRANGEMENT: pag. 10**

**IR 009** inlet side and valve type  
**150** setting (bar)  
**A G09** inlet position and available thread type

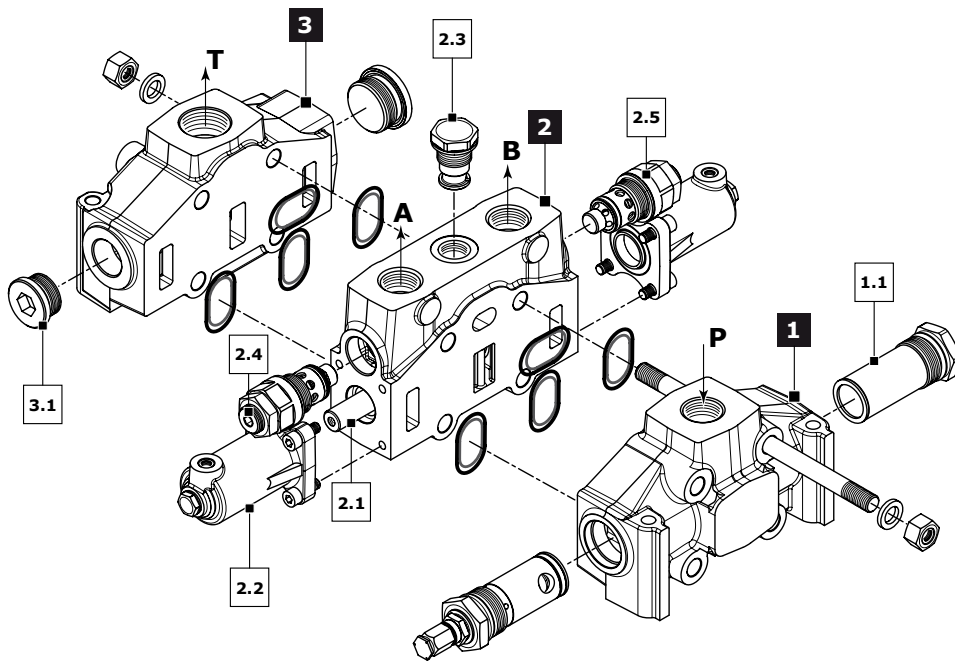
**2) WORK SECTION ARRANGEMENT: pag. 14**

**W001A** spool type  
**H005** spool actuation type  
**RP G09** type and thread section  
**04 PA 100** auxiliary valve (port A)  
**04 PB 100** auxiliary valve (port B)

**3) OUTLET ARRANGEMENT: pag. 25**

**TJ** outlet type  
**A G09** outlet position and available thread type

Ordering row 2 must be repeated for every work section



**Standard thread**

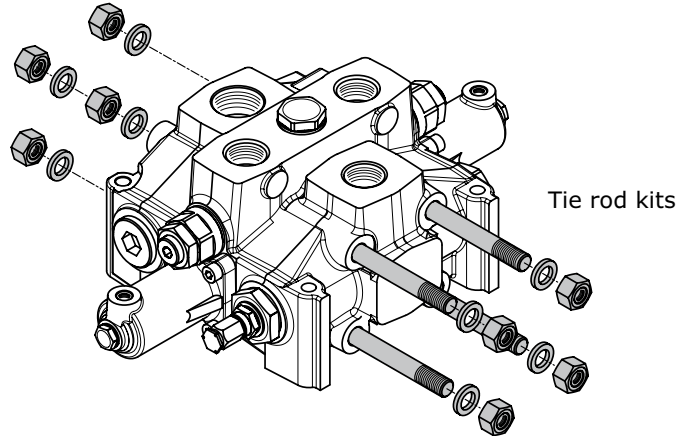
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections; for ordering code refer to table on page 32.

ports	BSP (ISO-228)		SAE 3000 (ISO 6162-1)		SAE 6000 (ISO 6162-6)	
<b>Inlet Port (P)</b>	G 2"	<b>G09</b>	1 1/2 MA - 1 1/2 UNC 2" MA - 2" UNC	<b>S09-S10</b> <b>S11-S12</b>	1 1/2 MA - 1 1/2 UNC	<b>S39-S40</b>
<b>Ports (A - B)</b>	G 2"	<b>G09</b>	1 1/2 MA - 1 1/2 UNC 2" MA - 2" UNC	<b>S09-S10</b> <b>S11-S12</b>	1 1/2 MA - 1 1/2 UNC	<b>S39-S40</b>
<b>Outlet (T)</b>	G 2"	<b>G09</b>	2" MA - 2" UNC	<b>S11-S12</b>	-	
<b>Carry over (HPCO)</b>	G 2"	<b>G09</b>	2" MA - 2" UNC	<b>S11-S12</b>	1 1/2 MA - 1 1/2 UNC	<b>S39-S40</b>
<b>Hydraulic Pilot</b>	G 1/4	<b>G02</b>	-		-	
<b>Pneumatic Pilot</b>	G 1/8					



**Tie-rod kit classification (appendix "A")**

Tie rod kit allows the correct assembly of sectional valves. Tie rod's length depends on the number of sections; each valve is assembled with tie rod kits including a tie rod, two nuts and two washers. D40 requires 4 tie-rod kits.



Tie rod kit	Order Code	Lenght (mm)	Clamping Torque (Nm)	Quantity
D40/1	300110001	334	250	4
D40/2	300110002	425		
D40/3	300110003	516		
D40/4	300110004	607		
D40/5	300110005	698		
D40/6	300110006	789		
D40/7	300110007	880		
D40/8	300110008	971		
D40/9	300110009	1062		
D40/10	300110010	1153		

**Painting**

On request, all Hydrocontrol valves can be delivered painted (RAL 9005 black primer).

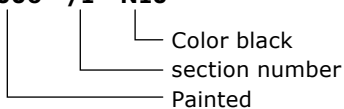
**Order example of D40/1 painted:**

D40/1  
 IR 009 150 A G09  
 W001A H005 RP G09 04 PA 100 04 PB 100  
 TJ A G09

**P006/1 N10**

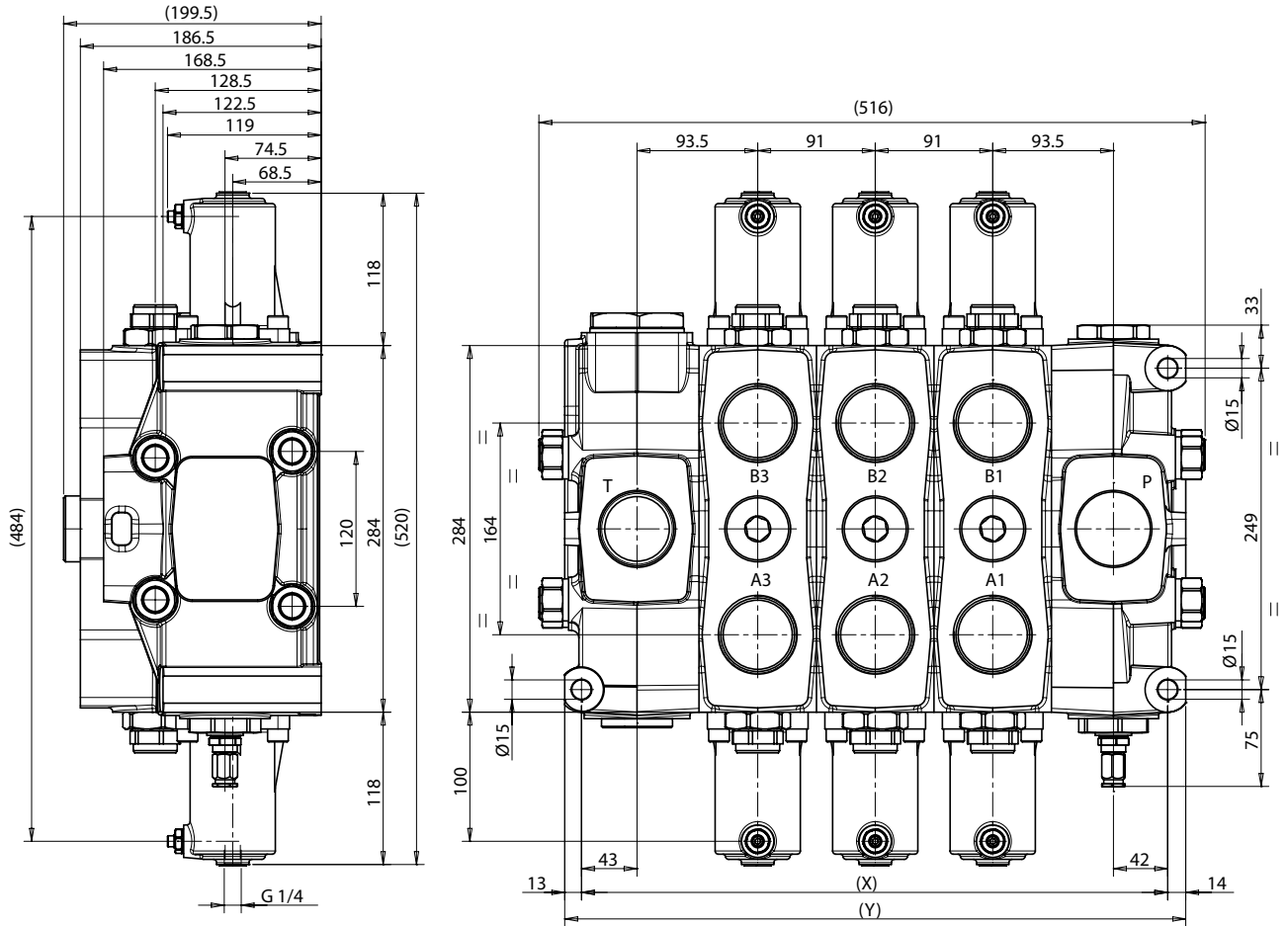
The painting is indicated with the following value:

**P006 - /1 - N10**





**DIMENSIONS**



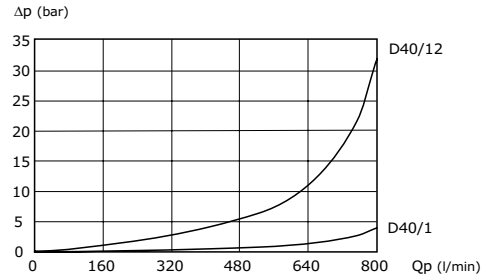
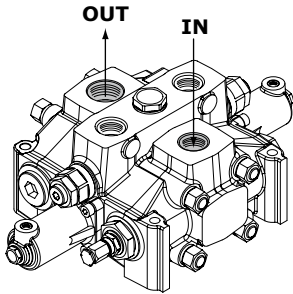
TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10
<b>X (mm)</b>	272	363	454	545	636	727	818	909	1000	1091
<b>Y (mm)</b>	299	390	481	572	663	754	845	936	1027	1118
<b>Weights (kg)</b>	75	104	133	162	191	220	249	278	307	336



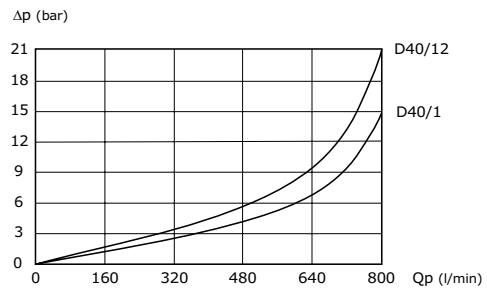
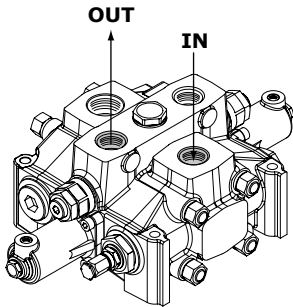
TYPICAL CURVES

Indicated values have been tested with standard sectional valve and W001A spool.

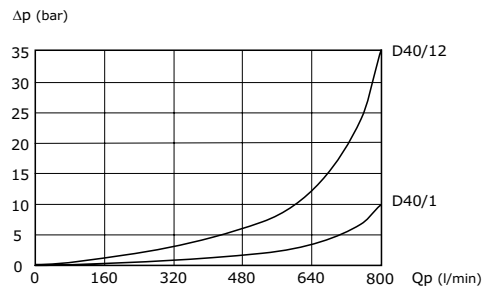
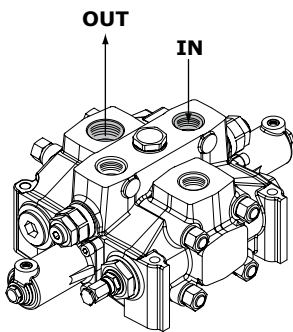
Pressure drop (P - T)



Pressure drop (P - A/B)

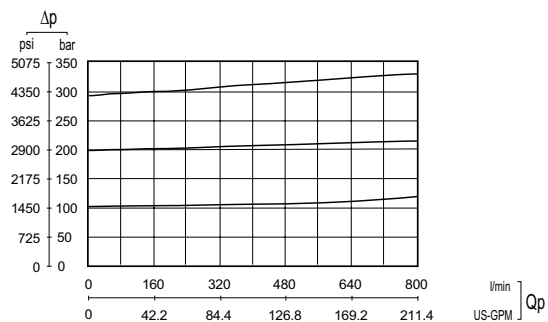


Pressure drop (A/B - T)



Pilot operated relief valve curve

Setting ranges	
type	pressure (bar)
A	0 - 350





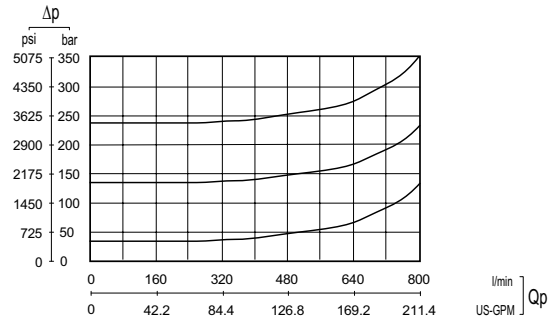


**TYPICAL CURVES**

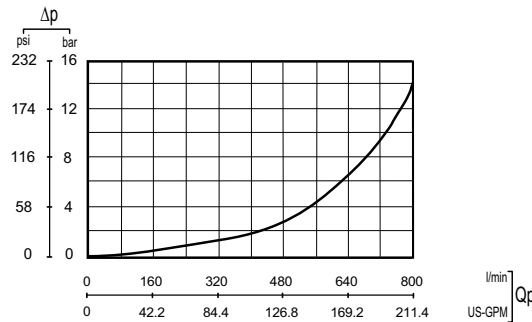
Indicated values have been tested with standard sectional valve and W001A spool.

**Pilot combined valve curve**

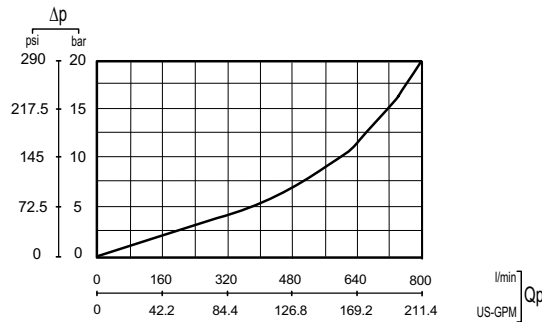
Setting ranges	
type	pressure (bar)
A	45 - 65
B	66 - 350



**Main anticavitation check valve curve**

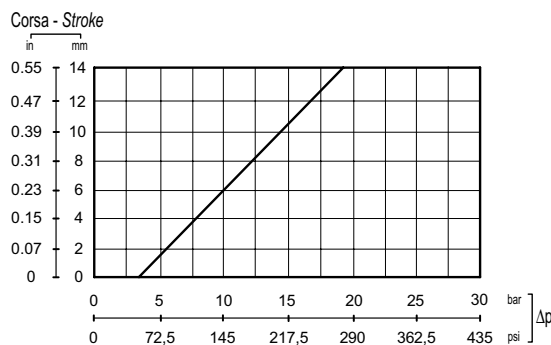


**Anticavitation check valve curve**



**Hydraulic pilot control curve**

The diagram shows the spool stroke as a function of the pressure operating.



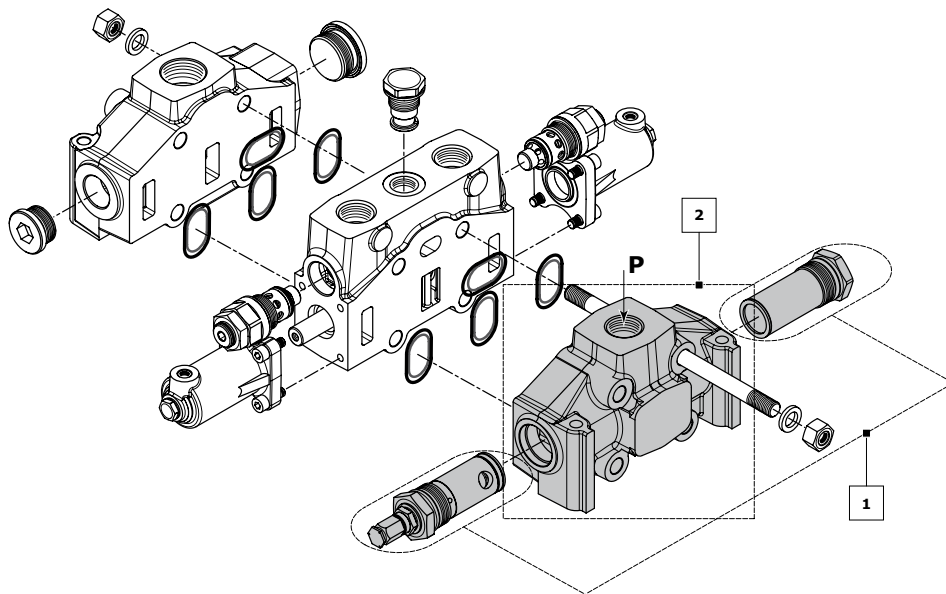


INLET SECTION

Order example

<b>IR</b>	<b>009</b>	<b>150</b>	<b>A G09</b>
-----------	------------	------------	--------------

- 1. IR** inlet side classification \_\_\_\_\_
- 009** valve arrangement \_\_\_\_\_
- 150** setting (bar) \_\_\_\_\_
- 2. A G09** inlet position and available thread type \_\_\_\_\_



Rif.	Code	Description	Page
-	<b>IR</b>	Sectional valve with right inlet section	<b>11</b>
	<b>IL</b>	Sectional valve with left inlet section	
<b>1</b>	<b>009</b>	Pilot operated pressure relief valve	
	<b>010</b>	Pilot operated pressure relief valve and Main anticavitation check valve	<b>12</b>
	<b>019</b>	Without valves	
<b>2</b>	<b>A G09</b>	Upper inlet (thread G 2")	
	<b>A S09</b>	Upper inlet (thread SAE 3000 1"1/2 MA)	<b>13</b>
	<b>A S39</b>	Upper inlet (thread SAE 6000 1"1/2 MA)	

**NOTE:** when ordering a relief valve it is necessary to specify factory setting (example 150).



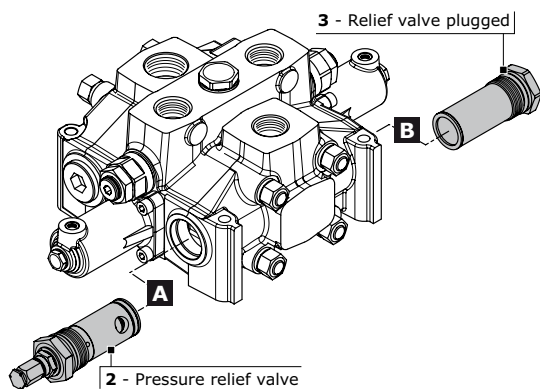
**Inlet side classifications**

	Sectional valve with <b>right inlet</b> section	Sectional valve with <b>right inlet</b> section
<b>IR</b>		<b>IL</b>

**Valve identification**

type	schema	layout	description	type	schema	layout	description
<b>2</b>			Pilot operated pressure relief valve	<b>5</b>			2 stage pilot operated relief valve
<b>3</b>			Relief valve plugged	<b>6</b>			Externally piloted valve
<b>4</b>			Main anticavitation check valve	<b>11</b>			Plug with pressure-gauge connection

**Valve arrangement**















**Combination valve example: 009 = 2A - 3B**

- 009** Combination valve
- 2A** Pressure relief valve in port A
- 3B** Relief valve plugged in port B

**The code identifies:**  
 with a number, the type of valve; with a letter its position on the inlet section.  
 (A) = spool action side  
 (B) = spool return action side  
**NOTE:** when ordering a main relief valve it is necessary to specify setting



VALVE COMBINATION INLET SECTION		Valve type on port B						
								
		2	3	4	5	6	11	
Valve type on port A		2		009	010		011	016
		3	018	019	020	021	022	027
		4	029	030		031	032	037
		5		038				
		6	047	048				
		11	085					

NOTE: Valve combinations 021, and 038 requires double setting (see example).

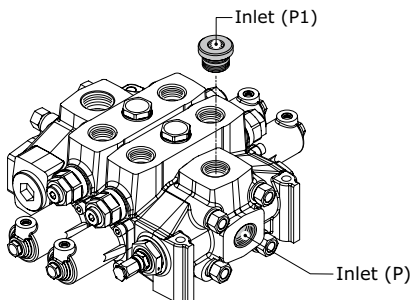
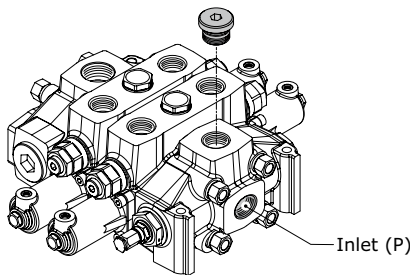
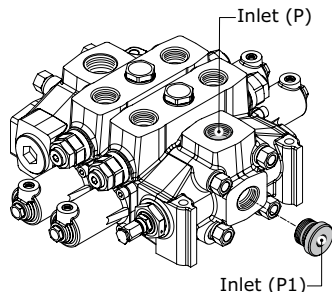
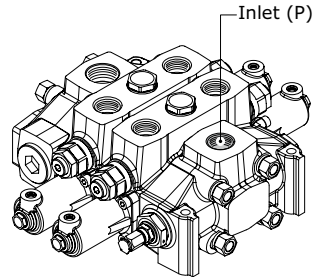
Order example for inlet section: IR **038 200\*280** A G05

**038**  
**200\*380**

valve combination \_\_\_\_\_  
double range setting (bar) \_\_\_\_\_



Inlet combination and thread available	
<b>A G09</b>	Upper inlet (thread G 2")
<b>A S09</b>	Upper inlet (thread SAE 3000 - 1"1/2 MA)
<b>A S10</b>	Upper inlet (thread SAE 3000 - 1"1/2 UNC)
<b>A S11</b>	Upper inlet (thread SAE 3000 - 2" MA)
<b>A S12</b>	Upper inlet (thread SAE 3000 - 2" UNC)
<b>A S39</b>	Upper inlet (thread SAE 6000 - 1"1/2 MA)
<b>A S40</b>	Upper inlet (thread SAE 6000 - 1"1/2 UNC)
<b>B G09</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread G 2")
<b>B S09</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 1"1/2 MA)
<b>B S10</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 1"1/2 UNC)
<b>B S11</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 2" MA)
<b>B S12</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 2" UNC)
<b>B S39</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 6000 - 1"1/2 MA)
<b>B S40</b>	Upper inlet P1 with pressure-gauge connection G 1/4 (thread SAE 6000 - 1"1/2 UNC)
<b>C G09</b>	Central side inlet (thread G 2")
<b>C S09</b>	Central side inlet (thread SAE 3000 - 1"1/2 MA)
<b>C S10</b>	Central side inlet (thread SAE 3000 - 1"1/2 UNC)
<b>C S11</b>	Central side inlet (thread SAE 3000 - 2" MA)
<b>C S12</b>	Central side inlet (thread SAE 3000 - 2" UNC)
<b>C S39</b>	Central side inlet (thread SAE 6000 - 1"1/2 MA)
<b>C S40</b>	Central side inlet (thread SAE 6000 - 1"1/2 UNC)
<b>D G09</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread G 2")
<b>D S09</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 1"1/2 MA)
<b>D S10</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 1"1/2 UNC)
<b>D S11</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 2" MA)
<b>D S12</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 3000 - 2" UNC)
<b>D S39</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 6000 - 1"1/2 MA)
<b>D S40</b>	Central side inlet P1 with pressure-gauge connection G 1/4 (thread SAE 6000 - 1"1/2 UNC)



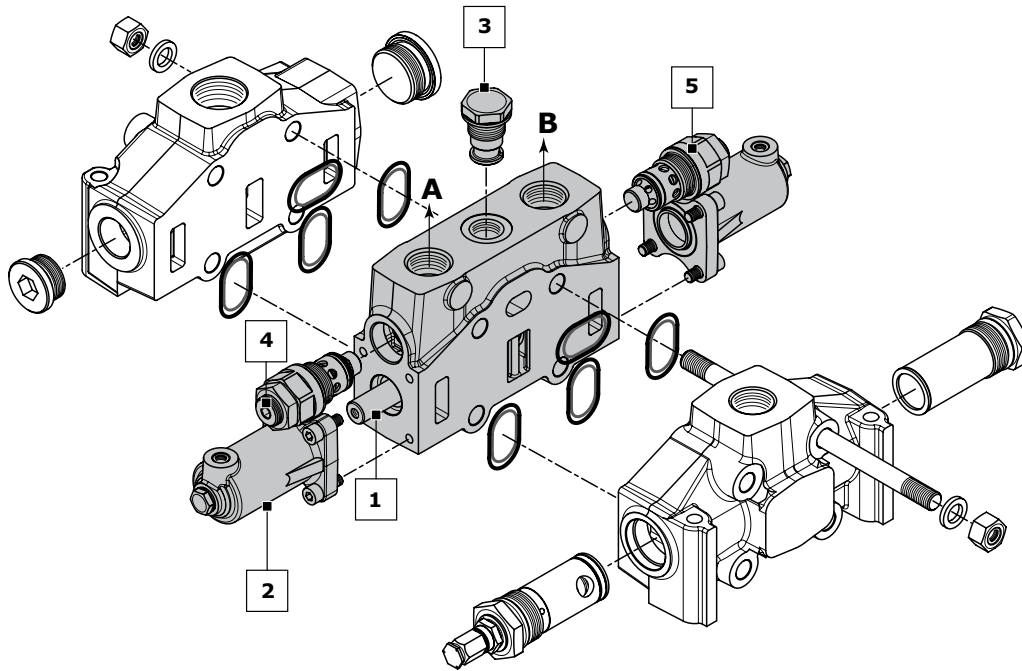


WORKING SECTION

Order example:

<b>W001A</b>	<b>H005</b>	<b>RP G09</b>	<b>04 PA 100</b>	<b>04 PB 100</b>
--------------	-------------	---------------	------------------	------------------

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. <b>W001A</b></li> <li>2. <b>H005</b></li> <li>3. <b>RP G09</b></li> <li>4. <b>04 PA 100</b></li> <li>5. <b>04 PB 100</b></li> </ol> | <p>spool type _____</p> <p>spool actuation type _____</p> <p>section and thread type _____</p> <p>auxiliary valve (port A - handle side) _____</p> <p>auxiliary valve (port B - cap side) _____</p> |
|---|---|



Rif.	Code	Description	Page
1	<b>W001</b>	3 positions double-acting	<b>15</b>
	<b>W002</b>	3 positions double-acting A-B to tank	
2	<b>H101</b>	Unprotected lever	<b>16</b>
	<b>H005*</b>	hydraulic actuation	
3	<b>RP G09</b>	Parallel circuit (thread G 2")	
	<b>RP S09</b>	Parallel circuit (thread SAE 3000 1"1/2 MA)	
	<b>RP S39</b>	Parallel circuit (thread SAE 6000 1"1/2 MA)	
4	<b>04 PA 100</b>	Pilot combined valve (port A)	<b>18</b>
	<b>05 PA</b>	Prearrangement for auxiliary valve (port A)	
5	<b>04 PB 100</b>	Pilot combine valve (port B)	
	<b>05 PB</b>	Prearrangement for auxiliary valve (port B)	

**NOTE:** (\*) Leave out the spool return action code when choosing H005.  
 Sections designed to house auxiliary valve option require double choice on work ports A and B.  
 Always indicate setting value when using Pilot combined valve: **04 PA (100)**



**Spool identification**

order example of spool: **W001 A J10**

- W001** spool schema 3 positions double-acting
- A** spool type standard spool
- J10** restricted service ports restriction on diameter (0,10 mm in A and B)

<b>W001</b>	3 positions double-acting	
<b>W002</b>	3 positions double-acting A and B to tank	
<b>W003</b>	3 positions double-acting A to tank B blocked	
<b>W004</b>	3 positions double-acting A blocked B to tank	
<b>W005</b>	3 positions single - acting on A	
<b>W006</b>	3 positions single - acting on B	
<b>W009</b>	3 positions double-acting with anticavitation valves	
<b>W012</b>	4 positions double-acting with float in the 4th position	

spools with restricted service ports				
code	circuit	restriction on diameter (mm)	section (mm <sup>2</sup> )	hydraulic schema
<b>J10</b>	A-B IN T	0,10	5,65	
<b>K10</b>	A IN T	0,10	5,65	
<b>Y10</b>	B IN T	0,10	5,65	



CODE	spool type available	
	STANDARD A	METERED B
W001	W001A	W001B
W002	W002A	W002B
W003	W003A	W003B
W004	W004A	W004B
W005	W005A	
W006	W006A	
W009	W009A	
W012	W012A	

NOTE:

- W012 spool need a special machining on the valve body.
- Float spool (W012) need special detent kit (F005).
- Different spools are available on request.

Plaease contact our Sales department for more information.

Spool actuation classification for manual control

code	description	dimensions	configuration
H101	Unprotected lever		
H102	Unprotected lever rotated 180°		

Spool actuation classification for Hydraulic control

code	description	dimensions	configuration
H005	Hydraulic actuation with side ports  BSP ports = G 1/4 UNF ports = 9/16-18 UNF		

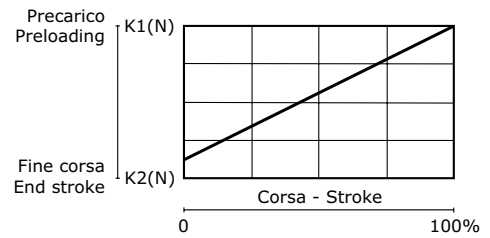




**Spool return action classification - Springs load values**

Spool return kits have three different sprong types; following the codes depending on spring loads.

Spring type	
Code	A (standard spring)
<b>Preloading</b>	272.6 N
<b>End of stroke</b>	593.5 N
Spool return action identification example	
<b>Code</b>	<b>F001A</b>



**Spool return action classification**

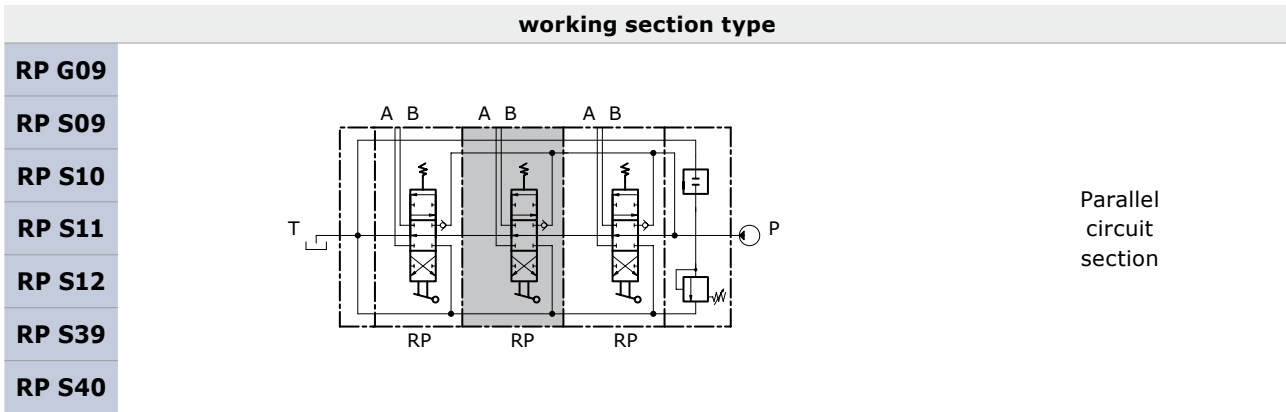
code	description	schema	dimensions	configuration
<b>F001A</b>	3 positions spring-centred spool			
<b>F002A</b>	3 positions spring-centred spool detent in A and B			
<b>F003A</b>	3 positions spring-centred spool detent in A			
<b>F004A</b>	3 positions spring-centred spool detent in B			
<b>F005A</b>	4 positions spring-centred spool detent in 4 <sup>th</sup> position  (only for W012 spool)			

**Compatibility table**

SPOOL ACTION TYPE	SPOOL TYPE											
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W009A	W012A
H101	•	•	•	•	•	•	•	•	•	•	•	•
H102	•	•	•	•	•	•	•	•	•	•	•	•
H005	•	•	•	•	•	•	•	•	•	•	•	•
SPOOL RETURN ACTION TYPE	SPOOL TYPE											
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W009A	W012A
F001	•	•	•	•	•	•	•	•	•	•	•	
F002	•	•	•	•	•	•	•	•	•	•	•	
F003	•	•	•	•	•	•	•	•	•	•	•	
F004	•	•	•	•	•	•	•	•	•	•	•	
F005												•



**Work section identification**



Parallel circuit section

When the spool is operated it intercepts the by-pass gallery by diverting the flow of oil to service port A or B. If two or more spools are actuated at the same time, the oil will power the service port that has the lower load; by throttling the spools, the flow of oil can be divided between two or more service ports.

**Auxiliary valve identification**

code	description	schema	configuration	type	setting range (bar) at full flow
02 PA	Anticavitation valve (port A)				
04 PA	Pilot combined valve (port A)			A	45 / 65
				B	66 / 350
05 PA	Prearrangement for auxiliary valve (port A)				

code	description	schema	configuration	type	setting range (bar) at full flow
02 PB	Anticavitation valve (port B)				
04 PB	Pilot combined valve (port B)			A	45 / 65
				B	66 / 350
05 PB	Prearrangement for auxiliary valve (port B)				

**Auxiliary valve - Setting range**

Sections designed to house auxiliary valve option require double choice on work ports A and B. Always indicate setting value when using pilot combined valve: **04 PA 100**

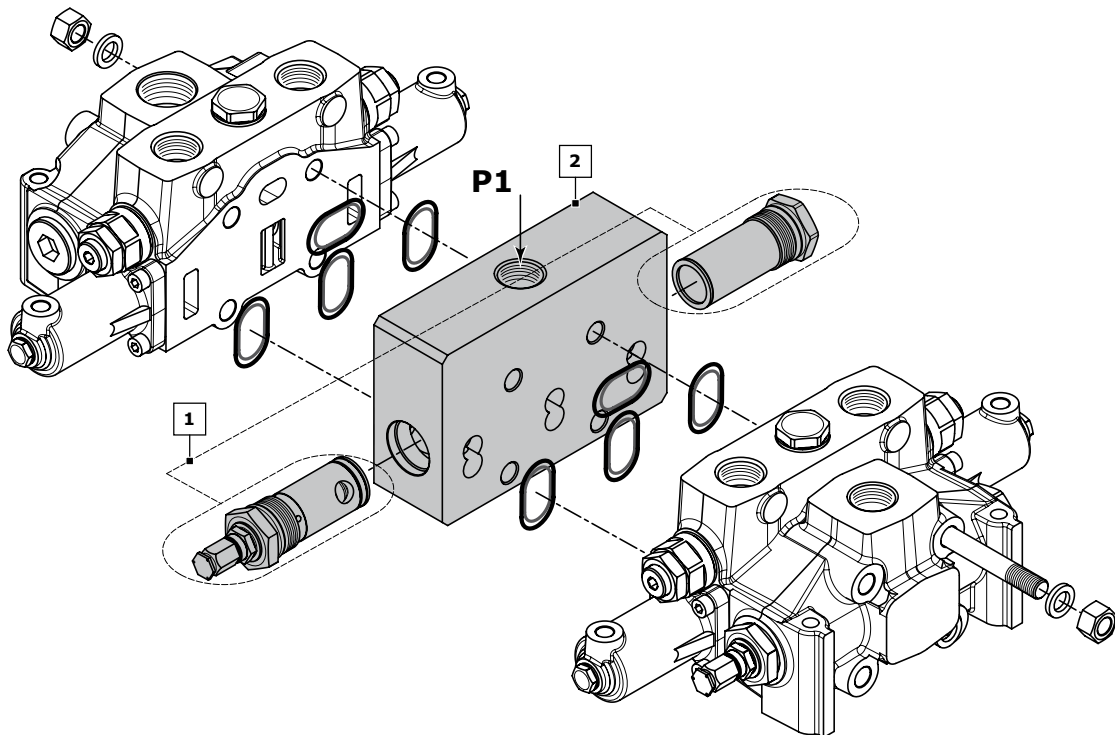


**INTERMEDIATE INLET SECTION**

**Order example**

<b>BE</b>	<b>009</b>	<b>150</b>	<b>A G09</b>
-----------	------------	------------	--------------

- 1. BE** inlet side \_\_\_\_\_
- 009** valve arrangement \_\_\_\_\_
- 150** setting (bar); when ordering a main relief valve it is necessary to specify setting \_\_\_\_\_
- 2. A G09** inlet position and available thread type \_\_\_\_\_



Rif.	Code	Description	Page
-	<b>BE</b>	Intermediate inlet section	<b>20</b>
	<b>BV*</b>	Intermediate inlet section with pressure relief valve	
<b>1</b>	<b>009</b>	Pilot operated pressure relief valve	<b>21</b>
	<b>010</b>	Pilot operated pressure relief valve and Main anticavitation check valve	
	<b>019</b>	Without valves	
	<b>020</b>	Main anticavitation check valve	
<b>2</b>	<b>A G09</b>	Upper inlet (thread G 2")	
	<b>A S09</b>	Upper inlet (thread SAE 3000 1"1/2 MA)	

**NOTE:** when ordering a relief valve it is necessary to specify factory setting (example 150).  
 \* = omit the code for inlet positioning and thread



### Intermediate inlet section classifications

**intermediate inlet type**

<b>BE</b>			Intermediate inlet section
-----------	--	--	----------------------------

The intermediate inlet section is driven by two pumps (P + P1). The downstream elements can be set to a lower pressure than the upstream ones by adjusting the pressure relief valve of the intermediate section in question.

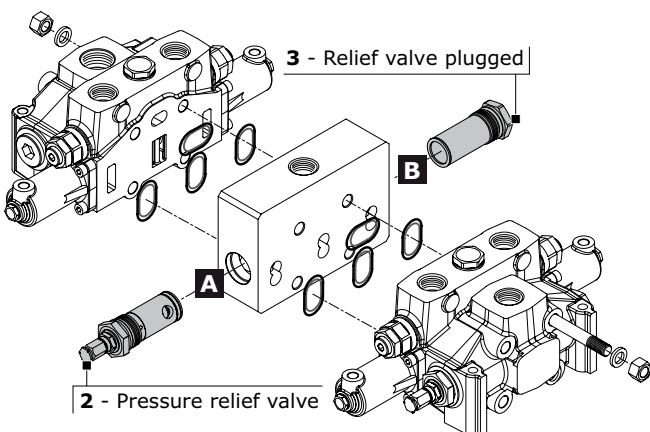
<b>BV</b>			Intermediate inlet section with pressure relief valve
-----------	--	--	---

The intermediate inlet section and the elements are driven by a single pump (P). The downstream elements can be set to a lower pressure than the upstream ones by adjusting the pressure relief valve of the intermediate section in question.

### Valve identification on intermediate inlet section

type	schema	layout	description	type	schema	configurazione	descrizione
<b>2</b>			Pilot operated pressure relief valve	<b>4</b>			Externally piloted valve
<b>3</b>			Relief valve plugged	<b>11</b>			Plug with pressure-gauge connection

### Valve arrangement on intermediate inlet section



#### Combination valve example: 009 = 2A - 3B

- 009** Combination valve
- 2A** Pressure relief valve in port A
- 3B** Relief valve plugged in port B

**The code identifies:**

with a number, the type of valve; with a letter its position on the inlet section.

(A) = spool action side

(B) = spool return action side

**NOTE:** when ordering a main relief valve it is necessary to specify setting



VALVE COMBINATION INLET SECTION		Valve type on port B			
		2	3	4	11
Valve type on port A	2		009	010	016
	3	018	019	020	027
	4	029	030		
	11	085	086		

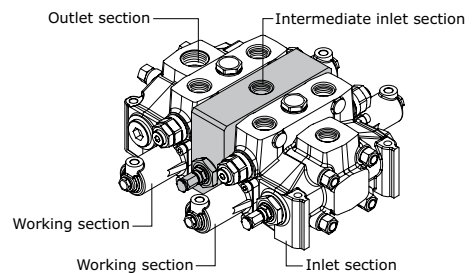
**Inlet combination and thread available**

<b>A G09</b>		
<b>A S09</b>		
<b>A S10</b>		
<b>A S11</b>		
<b>A S12</b>		
<b>A S39</b>		
<b>A S40</b>		

Upper inlet

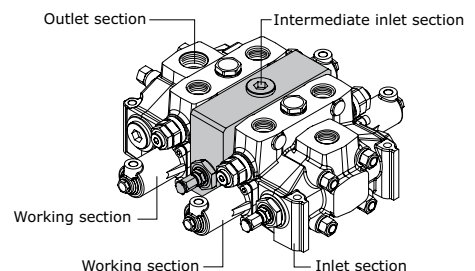
**Complete configuration samples for D40/2 with intermediate inlet section (BE)**

- IR 009 150 A G09 ..... Right inlet section
- W001A H005 RP G09 ..... Working section
- BE 009 150 A G09 .....Intermediate inlet section**
- W001A H005 RP G09 ..... Working section
- TJ A G09 ..... Outlet section



**Complete configuration samples for D40/2 with intermediate inlet section (BV)**

- IR 009 150 A G09 ..... Right inlet section
- W001A H005 RP G09 ..... Working section
- BV 009 150 .....Intermediate inlet section**
- W001A H005 RP G09 ..... Working section
- TJ A G09 ..... Outlet section



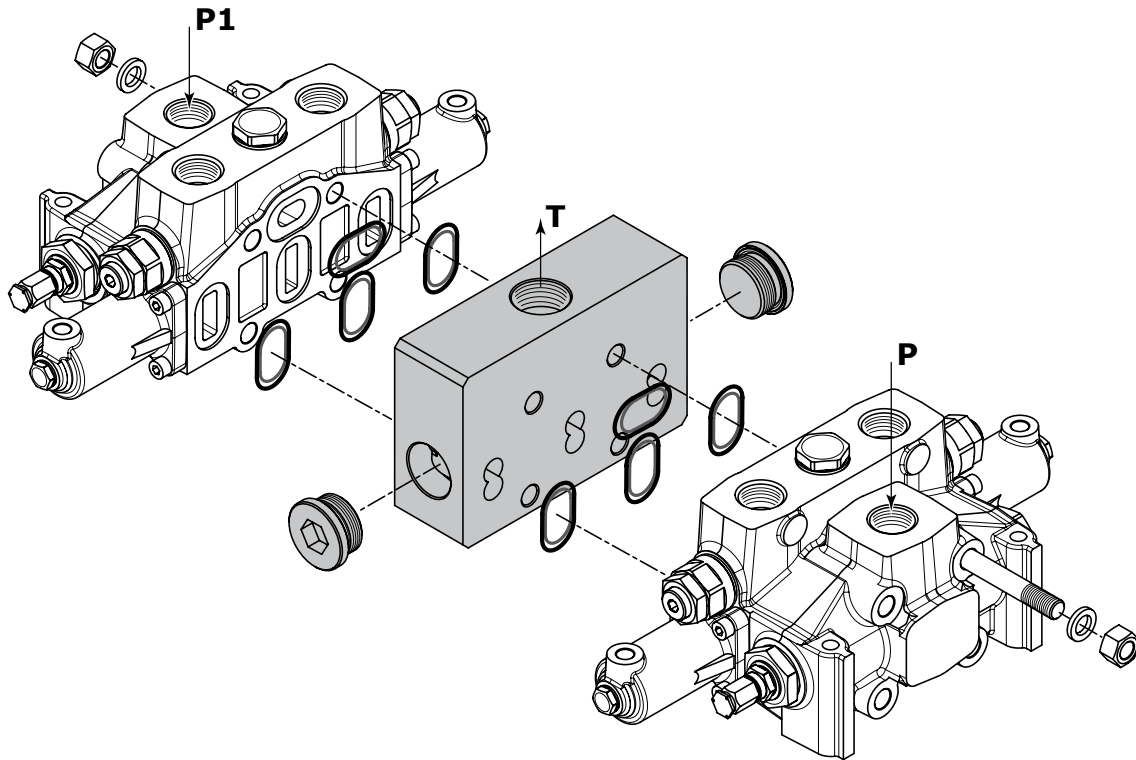


INTERMEDIATE OUTLET SECTION

Order example

**BF** | **A G09**

1. **BF** inlet side \_\_\_\_\_  
**A G09** inlet position and available thread type \_\_\_\_\_



Rif.	Code	Type	Description	Page
-	<b>BF</b>		Intermediate outlet section with single tank return	
-	<b>BG</b>		Intermediate outlet section with two tank returns	
1	<b>A G09</b>		Upper outlet (thread G 2")	23
	<b>A S11</b>		Upper outlet (thread SAE 3000 2" MA)	
	<b>G G09</b>	for	Front outlet side A (thread G 2")	
	<b>G S11</b>	BF	Front outlet side A (thread SAE 3000 2" MA)	
	<b>H G09</b>		Rear outlet side B (thread G 2")	
	<b>H S11</b>		Rear outlet side B (thread SAE 3000 2" MA)	
	<b>J G09</b>	for	Upper outlet HPCO - front side A and rear side B to T (thread G 2")	
	<b>J S11</b>	BG	Upper outlet HPCO-front side A and rear side B to T (thread SAE 3000 2" MA)	



Intermediate outlet section classifications

intermediate outlet type			
<b>BF</b>			<p>Intermediate outlet section with <b>single tank return</b></p>

The above outlet section allows the flow of oil of the two pumps and the tank ports to be piped to a single outlet T.

<b>BG</b>			<p>Intermediate outlet section with <b>two tank returns</b></p>
-----------	--	--	---

The section in question allows the flow of oil of the two pumps to be piped in two outlets: HPCO for powering another directional control valve, T for discharge of the work ports. In order to obtain this, the two T need to be linked.

Outlet combination and thread available			
<b>A G09</b>		Upper outlet (T)	
<b>A S11</b>			
<b>A S12</b>			
<b>G G09</b>		available only for <b>BF</b>	Front outlet side A (T)
<b>G S11</b>			
<b>G S12</b>			
<b>H G09</b>		available only for <b>BF</b>	Rear outlet side B (T)
<b>H S11</b>			
<b>H S12</b>			
<b>J G09</b>		available only for <b>BG</b>	Upper outlet HPCO front side A and rear side B to T
<b>J S11</b>			
<b>J S12</b>			



**Complete configuration samples for D40/2 with intermediate outlet section (BF)**

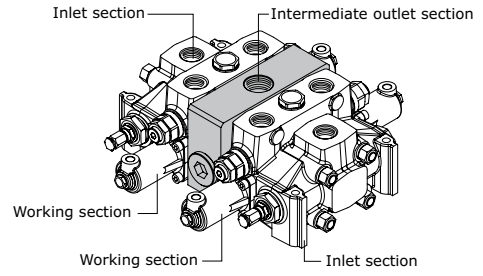
IR 009 150 A G09 ..... Right inlet section

W001A H005 RP G09 ..... Working section

**BF A G09 .....Intermediate outlet section**

W001A H005 RP G09 ..... Working section

IL 009 150 A G09 ..... Left inlet section



**Complete configuration samples for D40/2 with intermediate outlet section (BG)**

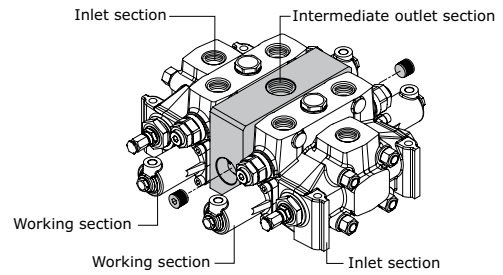
IR 009 150 A G09 ..... Right inlet section

W001A H005 RP G09 ..... Working section

**BG J G09 .....Intermediate outlet section**

W001A H005 RP G09 ..... Working section

IL 009 150 A G09 ..... Left inlet section

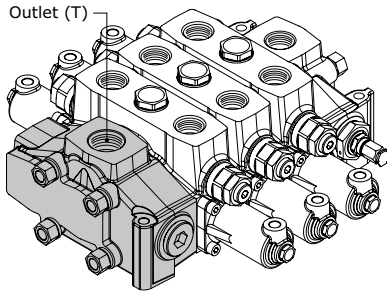






**OUTLET SECTION (VERSION 1 OUTLET)**

**Order example**



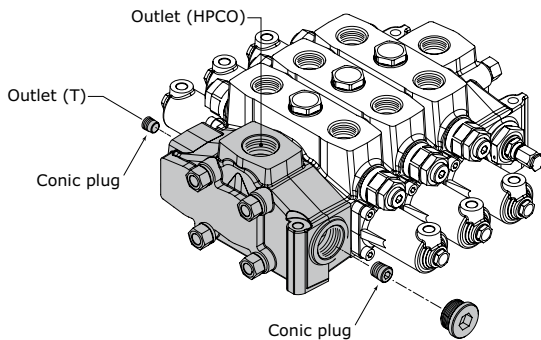
**TJ** | **A G09**

- 1. **TJ** outlet section type
- 2. **A G09** outlet position and available thread type

Rif.	Code	Description	Page
1	<b>TJ</b>	Outlet section with single return (T) right-side inlet (P)	
	<b>TK</b>	Outlet section with single return (T) left-side inlet (P)	
2	<b>A G09</b>	Upper outlet (thread G 2")	26
	<b>A S11</b>	Upper outlet (thread SAE 3000 - 2" MA)	
	<b>A S12</b>	Upper outlet (thread SAE 3000 - 2" UNC)	
	<b>C G09</b>	Central outlet (thread G 2")	
	<b>C S11</b>	Central outlet (thread SAE 3000 - 2" MA)	
	<b>C S12</b>	Central outlet (thread SAE 3000 - 2" UNC)	

**OUTLET SECTION (HPCO VERSION OUTLET)**

**Order example - HPCO version Outlet**



**TM** | **M G09**

- 1. **TM** outlet section type
- 2. **M G09** outlet position and available thread type

Rif.	Code	Description	Page
1	<b>TM</b>	Outlet section with two return (T-HPCO) right-side inlet (P)	
	<b>TN</b>	Outlet section with two return (T-HPCO) left-side inlet (P)	
2	<b>M G09</b>	HPCO upper outlet T (tank) rear outlet side B (thread G 2")	27
	<b>M S11</b>	HPCO upper outlet T (tank) rear outlet side B (thread SAE 3000 - 2" MA)	
	<b>M S12</b>	HPCO upper outlet T (tank) rear outlet side B (thread SAE 3000 - 2" UNC)	
	<b>N G09</b>	HPCO upper outlet T (tank) front outlet side A (thread G 1 1/2")	
	<b>N S11</b>	HPCO upper outlet T (tank) front outlet side A (thread SAE 3000 - 2" MA)	
	<b>N S12</b>	HPCO upper outlet T (tank) front outlet side A (thread SAE 3000 - 2" UNC)	

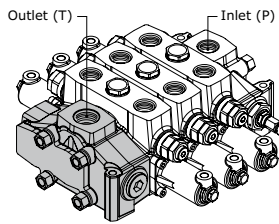
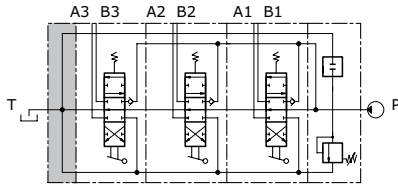


Outlet with single tank classification

outlet identification

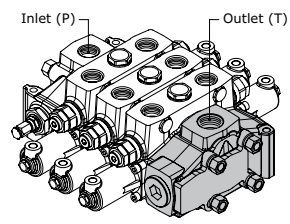
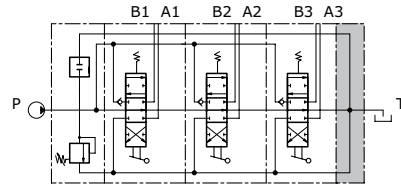
TJ

Outlet section with single return (T)  
right-side inlet (P)



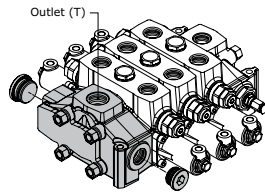
TK

Outlet section with single return (T)  
left-side inlet (P)



outlet combination and thread available

A G09



Upper outlet  
(thread G 2")

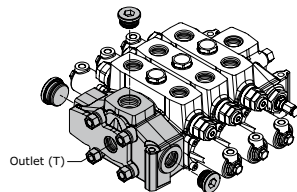
A S11

Upper outlet  
(thread SAE 3000 - 2" MA)

A S12

Upper outlet  
(thread SAE 3000 - 2" UNC)

C G09



Central outlet  
(thread G 2")

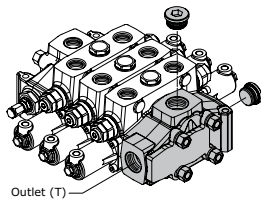
C S11

Central outlet  
(thread SAE 3000 - 2" MA)

C S12

Central outlet  
(thread SAE 3000 - 2" UNC)

G G09



Front outlet side A  
(thread G 2")

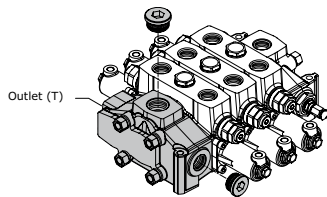
G S11

Front outlet side A  
(thread SAE 3000 - 2" MA)

G S12

Front outlet side A  
(thread SAE 3000 - 2" UNC)

H G09



Rear outlet side B  
(thread G 2")

H S11

Rear outlet side B  
(thread SAE 3000 - 2" MA)

H S12

Rear outlet side B  
(thread SAE 3000 - 2" UNC)

only for  
TK

only for  
TJ



Outlet with two tanks classification

**outlet identification**

	<b>TM</b>		<b>TN</b>
	<p>Outlet section with two return (T-HPCO) right-side inlet (P)</p>		<p>Outlet section with two return (T-HPCO) left-side inlet (P)</p>

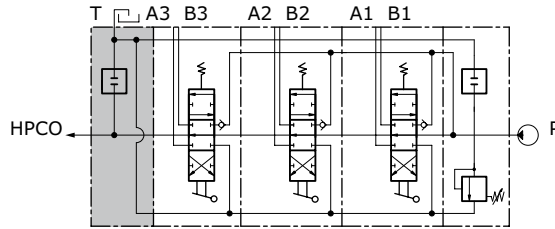
**outlet combination and thread available**

<b>M G09</b>			HPCO Upper outlet T rear outlet side B (G 2")	<b>P G09</b>	HPCO Central outlet T rear outlet side B (thread G 2")
<b>M S11</b>		<b>only for TM</b>	HPCO Upper outlet T rear outlet side B (SAE 3000 2" MA)	<b>P S11</b>	HPCO Central outlet T rear outlet side B (SAE 3000 2" MA)
<b>M S12</b>			HPCO Upper outlet T rear outlet side B (SAE 3000 2" UNC)	<b>P S12</b>	HPCO Central outlet T rear outlet side B (SAE 3000 2" UNC)
<b>M S39</b>			HPCO Upper outlet T rear outlet side B (SAE 6000 1 1/2 MA)	<b>P S39</b>	HPCO Central outlet T rear outlet side B (SAE 6000 1 1/2 MA)
<b>M S40</b>			HPCO Upper outlet T rear outlet side B (SAE 6000 1 1/2 UNC)	<b>P S40</b>	HPCO Central outlet T rear outlet side B (SAE 6000 1 1/2 UNC)
<b>N G09</b>			HPCO Upper outlet T front outlet side A (G 2")	<b>Q G09</b>	HPCO Central outlet T front outlet side A (G 2")
<b>N S11</b>		<b>only for TN</b>	HPCO Upper outlet T front outlet side A (SAE 3000 2" MA)	<b>Q S11</b>	HPCO Central outlet T front outlet side A (SAE 3000 2" MA)
<b>N S12</b>			HPCO Upper outlet T front outlet side A (SAE 3000 2" UNC)	<b>Q S12</b>	HPCO Central outlet T front outlet side A (SAE 3000 2" UNC)
<b>N S39</b>			HPCO Upper outlet T front outlet side A (SAE 6000 1 1/2 MA)	<b>Q S39</b>	HPCO Central outlet T front outlet side A (SAE 6000 1 1/2 MA)
<b>N S40</b>			HPCO Upper outlet T front outlet side A (SAE 6000 1 1/2 UNC)	<b>Q S40</b>	HPCO Central outlet T front outlet side A (SAE 6000 1 1/2 UNC)

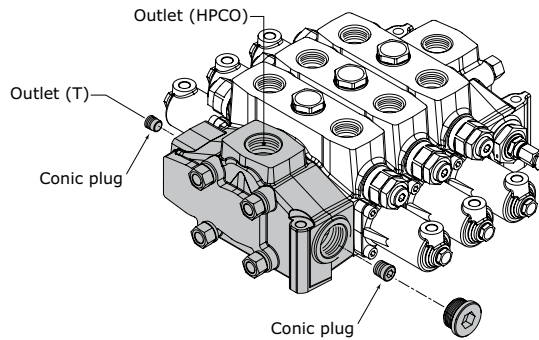


**Carry-over connection (HPCO)**

This option, available on all D40, allows the sectional valve to feed a second valve, by extending the free flow channel. In this configuration, the valve need a separated port for connection to tank.



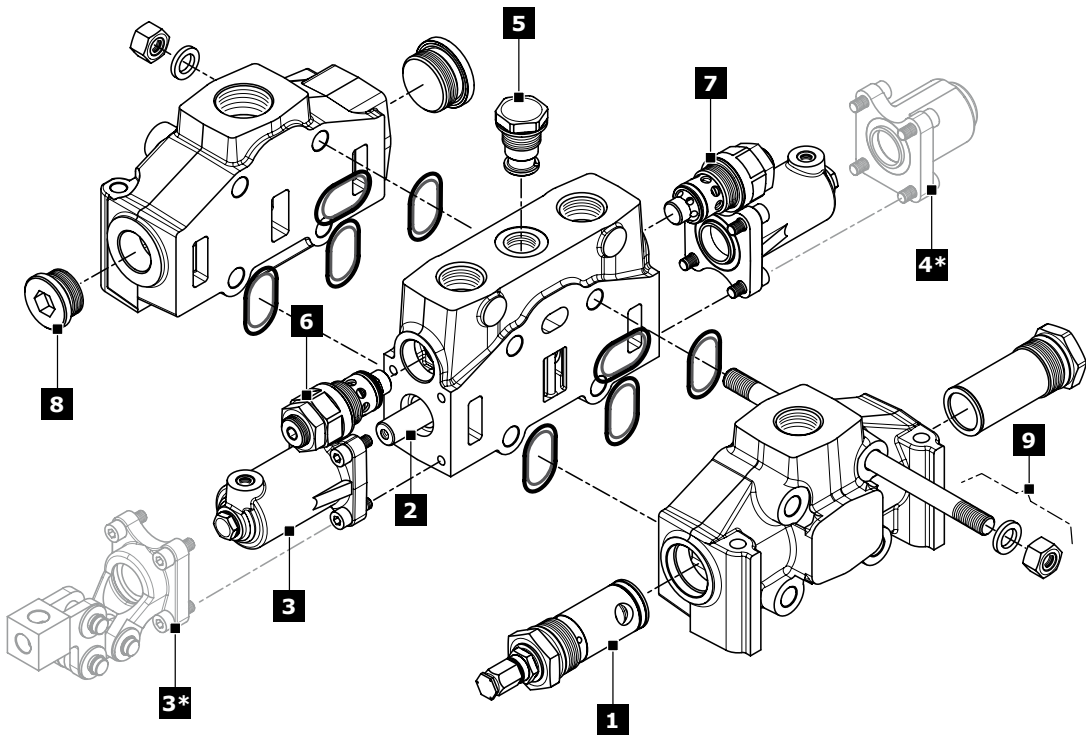
It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



code (HPCO Plug identification)	description	q.ty
413010205	conic plug G 3/4 x 20,5	2



D40 SPARE PARTS LIST

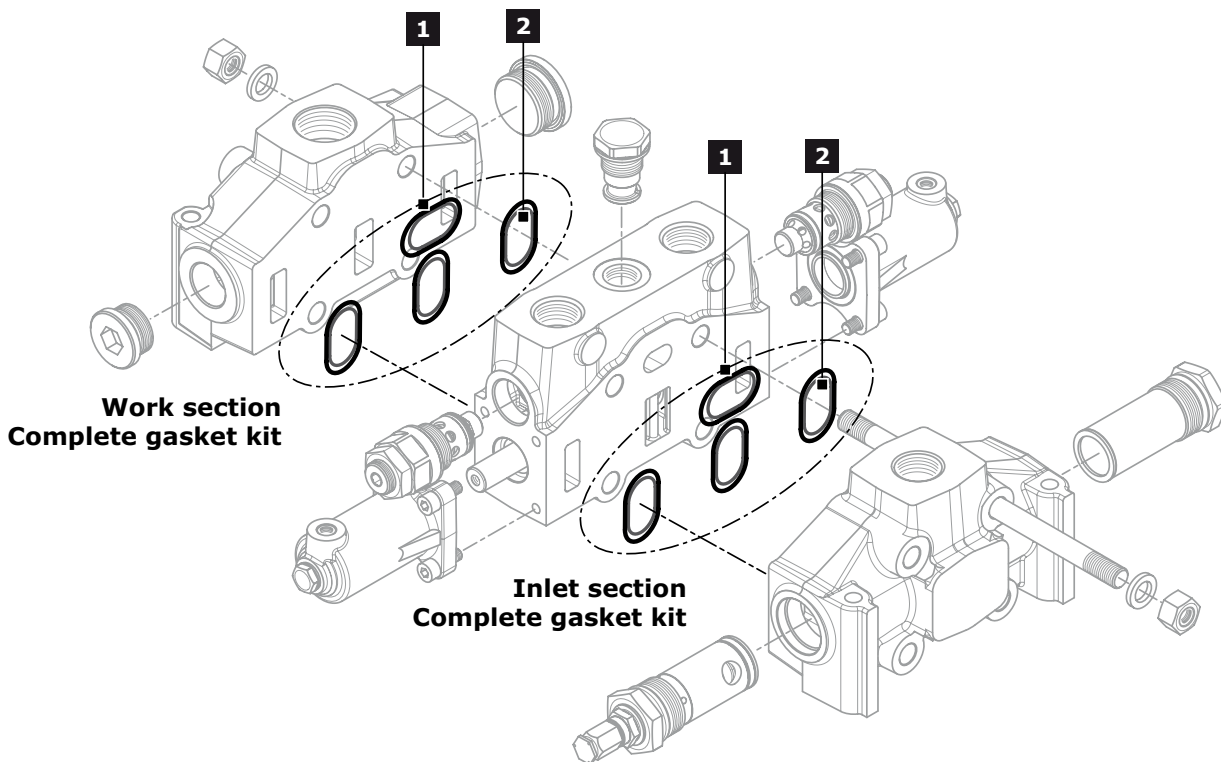


Ref.	Description	Order code	Q.ty	Code	Note	
<b>1</b>	Pilot operated pressure relief valve (*)	5622	1		Setting: 150 bar	
		10969			Setting: 200 bar	
		6848			Setting: 300 bar	
	Relief valve plugged	430110001	1	-		
	Main Anticavitation check valve	915051001	1			
External piloted valve	915041001	1				
Plug with pressure-gauge connection	430110003	1				
<b>2</b>	3 positions double-acting spool	421210007	1	W001A		
		421210033		W001B		
		421210006		W001A	for hydraulic actuation	
	3 positions double-acting A and B to tank spool	421210002	1	W002A	for hydraulic actuation	
	3 positions single-acting on A	421210019	1	W005A		for hydraulic actuation
		421210013				
	3 positions single-acting on B	421210012	1	W006A		for hydraulic actuation
421210013						
4 positions double-acting with float in the 4 <sup>th</sup> pos.	421210010	1	W012A		for hydraulic actuation	
	421210009					
<b>3*</b>	Unprotected lever	320310001	1	H101 = H102	only for W012 spool	
		320310003				
<b>3</b>	Hydraulic actuation with side ports	320510001	2	H005	for BSP version	



Ref.	Description	Order code	Q.ty	Code	Note
<b>4*</b>	3 position spring centred spool	<b>320710001</b>	1	<b>F001A</b>	
	Detent in A and B	<b>320810001</b>	1	<b>F002A</b>	
	Detent in A	<b>320810002</b>	1	<b>F003A</b>	
	Detent in B	<b>320810003</b>	1	<b>F004A</b>	
	Detent in 4 <sup>th</sup> position	<b>320810004</b>	1	<b>F005A</b>	only for W012 spool
<b>5</b>	Check valve on the work section	<b>320210002</b>	1	-	only for RP and RT section
	Anticavitation valve on port A	<b>915081001</b>		<b>02 PA</b>	
		<b>17067</b>			Setting: 100 bar
	Pilot combined valve on port A	<b>7125</b>	1	<b>04 PA</b>	Setting: 200 bar
		<b>4707</b>			Setting: 300 bar
	Prearrangement for auxiliary valve on port A	<b>430410001</b>		<b>05 PA</b>	
	Anticavitation valve on port B	<b>915081001</b>		<b>02 PB</b>	
		<b>17067</b>			Setting: 100 bar
	Pilot combined valve on port B	<b>7125</b>	1	<b>04 PB</b>	Setting: 200 bar
		<b>4707</b>			Setting: 300 bar
	Prearrangement for auxiliary valve on port B	<b>430410001</b>		<b>05 PB</b>	
<b>8</b>	Plug kit (G 2)	<b>300010001</b>	1	<b>G09</b>	
	Plug kit (G 1"1/2)	<b>300009001</b>		<b>G08</b>	

**Gasket kit**



Inlet and work section			
Rif.	Order code	Description	Q.ty
<b>1</b>	423401018	Ring	4
<b>2</b>	412020604	O.R. 90SH (2-137)	4

**Complete Gasket kit: order code - 350910001**



**INSTALLATION**

**Guidelines**

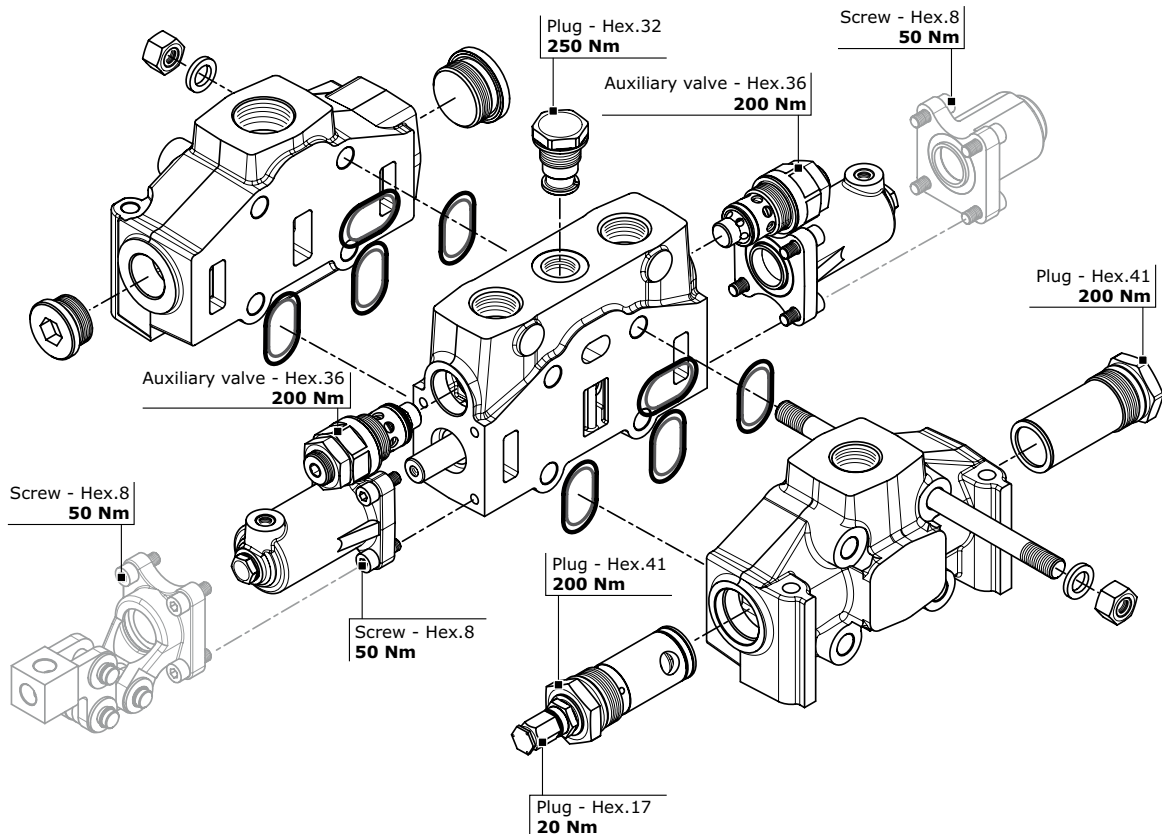
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock relief valves.
- Clean piping materials sufficiently before use.
- Make sure to prevent the port openings from being entered with dust or foreign matters.
- Tighten the port connectors surely with the recommended fastening torques.
- Do not direct the jet of a pressure washing unit directly to the valve.

**Fittings tightening torque (Nm)**

thread type	port P	Port A - B	Port T
<b>BSP (ISO - 228)</b>	<b>G 2</b>	<b>G 2</b>	<b>G 2</b>
with rubber sealing (DIN 3869)	200	200	200
with copper or steel and rubber washer	200	200	200

**General clamping torque**

The following table provides the main tightening torques of the distributor D40:





**Dimensions - Thread codes**

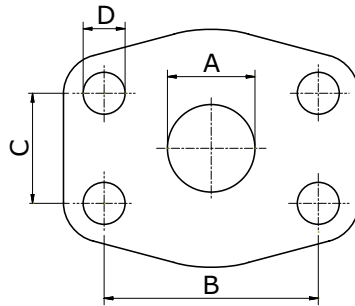
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections.

<b>METRIC THREAD (ISO 9974-1)</b>			
Type	M18x1,5	M22x1,5	M27x2
Code	<b>M01</b>	<b>M02</b>	<b>M03</b>

<b>BSP THREAD (ISO 1179-1)</b>								
Type	1/4"	3/8"	1/2"	3/4"	1"	1"1/4	1"1/2	2"
Code	<b>G02</b>	<b>G03</b>	<b>G04</b>	<b>G05</b>	<b>G06</b>	<b>G07</b>	<b>G08</b>	<b>G09</b>

<b>UN / UNF THREAD (ISO 11926-1)</b>						
Type	9/16" 18 UNF SAE6	3/4" 16 UNF SAE8	7/8" 14 UNF SAE10	1"1/16 12 UNF SAE12	1"5/16 12 UNF SAE16	1"5/8 12 UNF SAE20
Code	<b>U02</b>	<b>U03</b>	<b>U04</b>	<b>U05</b>	<b>U06</b>	<b>U07</b>

**Dimensions - SAE Flange codes**



<b>SAE / 3000 FLANGE (ISO 6162-1)</b>												
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)	2" (MA)	2" (UNC)	3" (MA)	3" (UNC)
Code	<b>S03</b>	<b>S04</b>	<b>S05</b>	<b>S06</b>	<b>S07</b>	<b>S08</b>	<b>S09</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>S15</b>	<b>S16</b>
A	19	19	25	25	32	32	38	38	51	51	76	76
B	47,6	47,6	52,4	52,4	58,7	58,7	69,9	69,9	77,8	77,8	106,4	106,4
C	22,3	22,3	26,2	26,2	30,2	30,2	35,7	35,7	42,9	42,9	61,9	61,9
D	M10	3/8-16	M10	3/8-16	M10	7/16-14	M12	1/2-13	M12	1/2-13	M16	5/8-11

<b>SAE / 6000 FLANGE (ISO 6162-2)</b>								
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)
Code	<b>S33</b>	<b>S34</b>	<b>S35</b>	<b>S36</b>	<b>S37</b>	<b>S38</b>	<b>S39</b>	<b>S40</b>
A	19	19	25	25	32	32	38	38
B	50,8	50,8	57,2	57,2	66,6	66,6	79,3	79,3
C	23,8	23,8	27,8	27,8	31,8	31,8	36,5	36,5
D	M10	3/8-16	M12	7/16-14	M14	1/2-13	M16	5/8-11

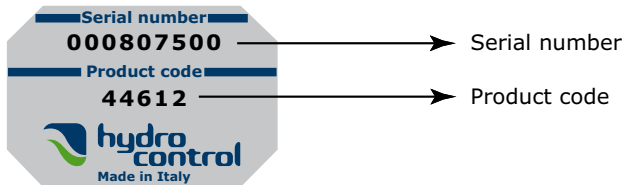




## GENERAL CONDITIONS AND PATENTS

### Product identification

All Hydrocontrol products have an identifying plate placed in specific position.



#### Serial number:

It univocally identifies the physical valve: this provides an easy way to find all sales and production details.

#### Product code:

It is a number univocally identifying the configuration and pressure settings of a valve.

### Introduction

These general conditions apply to all general supplies from Hydrocontrol s.p.a., after receiving orders from the Customer. Should commercial terms such as EXW, DDP, etc be mentioned, of course the Incoterms of the International Chamber of Commerce must be referred to, according to the test existing when the general supply conditions are agreed on.

### Management of orders

No Customer's order is binding to Hydrocontrol s.p.a. if Hydrocontrol s.p.a. has not confirmed the order in writing. Hydrocontrol s.p.a. commits to supplying the orders in compliance with the order confirmation that has been issued. Any disagreement with the content of the order confirmation must be communicated in writing to Hydrocontrol s.p.a. within and no later than 5 days from the delivery of the order confirmation. The Customer commits to paying for the goods supplied by Hydrocontrol s.p.a., according to the prices indicated on the order confirmation.

### Payment conditions

The Parties agree on the payment terms at the beginning of the supply. The terms will be indicated on the order confirmation. Should the Customer be late with the payments, Hydrocontrol S.p.a. will be entitled to require the payment of interests on arrears based on the exiting Prime Rate increased by 2%. Should there be any payment delay, Hydrocontrol s.p.a. will be entitled not to process the Customer's purchase order, even if it has already been confirmed.

### Delivery and shipment

The goods are always supplied Ex Works, even when Hydrocontrol s.p.a. agrees with the Customer that the shipment, or a part of it, will be arranged by Hydrocontrol s.p.a. It is agreed that the Customer will bear the risk of goods deterioration or damaging from the moment the goods are handed by Hydrocontrol s.p.a. to the first carrier.

### Product characteristics

Hydrocontrol s.p.a. commits to supplying good quality products, compliant with the technical specifications declared on the technical tables and on the catalogue. Hydrocontrol s.p.a, even without notice, at its own discretion, reserves the right to modify the products as necessary, without these changes altering the main characteristics of the products.

### Claims

Any claims about defects on delivered products (just as an example: claims about the packaging, the number, the quantity or the external product characteristics) will have to be notified to Hydrocontrol s.p.a. in writing, within and no later than 7 days from reception of the goods, otherwise the claims will be considered as null and void. Occult defects (the defects of the goods that cannot be spotted with a careful control of the goods received by the Customer), will have to be notified in writing to Hydrocontrol s.p.a. within 7 days from the discovery of the defect, and anyhow no later than 12 months from the delivery of the goods, otherwise the claim will be considered as null and void. Even in case of claim or objection, the Customer will never be entitled to suspend or delay the payments to Hydrocontrol s.p.a. for the products subject to claim or objection nor for any other supply.



## GENERAL CONDITIONS AND PATENTS

### Warranty

Should the products supplied by Hydrocontrol not be compliant or have the required quality and should this defect be due to Hydrocontrol, Hydrocontrol s.p.a. commits, at its choice, to replace or repair the faulty products, as long as the defect or lack of compliance is notified to Hydrocontrol s.p.a. in writing, as specified at point 6, within and no later than 18 months from product delivery. On the products that have been fixed or replaced in accordance with what specified above, the above-mentioned warranty applies. The 12 month duration starts from the date of repair or replacement. In case of defects, lack of quality or in case of lack of compliance for the supplied products, with the exception of fraud or serious offence, Hydrocontrol s.p.a. only commits to repairing or replacing the faulty products, according to what specified above. This warranty replaces any other Supplier's warranty or liability established by the law. This warranty excludes any other liability contractual or extra-contractual by Hydrocontrol s.p.a. on the products supplied by Hydrocontrol (as a mere example: damage refund, loss of profit, product recall campaign, etc). Hydrocontrol s.p.a. has signed a product civil liability police, with a suitable maximum coverage.

### Ownership retention

The products supplied by Hydrocontrol s.p.a. will be owned by the latter until Hydrocontrol receives the complete payment for the supplied goods.

### Obligation confidentiality

Hydrocontrol s.p.a. commits to not disclosing the technical and commercial information it receives from the Customer, unless this information has already been publicly disclosed.

### Patents

The Customer is not allowed to use the provided Products, or a part of them, their descriptions or drawings protected or not protected by Patent or registered trademark in order to design or make similar products, unless Hydrocontrol s.p.a. previously issues its written authorization. Should Hydrocontrol s.p.a. give its written authorization, all patents, trademarks, registered designs, copyrights and intellectual property rights related or connected to the Products provided by Hydrocontrol s.p.a. will stay Hydrocontrol's property. The Customer commits to respecting the highest confidentiality.

### Applicable law and court of jurisdiction

Hydrocontrol s.p.a.'s supplies are regulated by these General Supply Conditions and, for anything not defined here, by the Italian law. Any controversy related, generated or connected to the supply of Products by Hydrocontrol s.p.a., where Hydrocontrol s.p.a. is involved, will be exclusively dealt with by the Court of Bologna.

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