DVS20

SECTIONAL VALVE

hydro control

TECHNICAL CATALOGUE

A member of INTERPUMP GROUP

walvoil FLUID POWER E|MOTION

1st edition DVS20.00

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.

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DVS20

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 o manage of very high flows comparing to the overall dimensions.
This valvehas high control characteristics, smooth and precise in operation.

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
CIRCUIT											
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
RATED FLOW											
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
RATED PRESSURE											
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		●	●	●							
SPOOL ACTUATION											
Manual control	●	●	●	●	●	●	●	●	●	●	●
Without lever	●	●	●	●	●	●	●	●	●	●	●
90° joystick control		●	●	●	●	●					
Hydraulic control	●	●	●	●	●	●	●	●	●	●	●
Direct electric control (12-24 Vdc)		●		●							
SPOOL RETURN ACTION											
Spring return	●	●	●	●	●	●	●	●	●	●	●
Detent in A - in B - in A/B	●	●	●	●	●	●	●	●	●	●	●
Detent in 4th 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)		●	●	●	●	●	●		●		
AUXILIARY VALVES											
Antishock valve	●	●	●	●	●	●	●	●	●	●	●
Anticavitation valve	●	●	●	●	●	●	●	●	●	●	●
Combined valve	●	●	●		●	●	●		●	●	●
Pilot combined valve						●		●	●	●	●

GENERAL INDEX

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 IS0 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

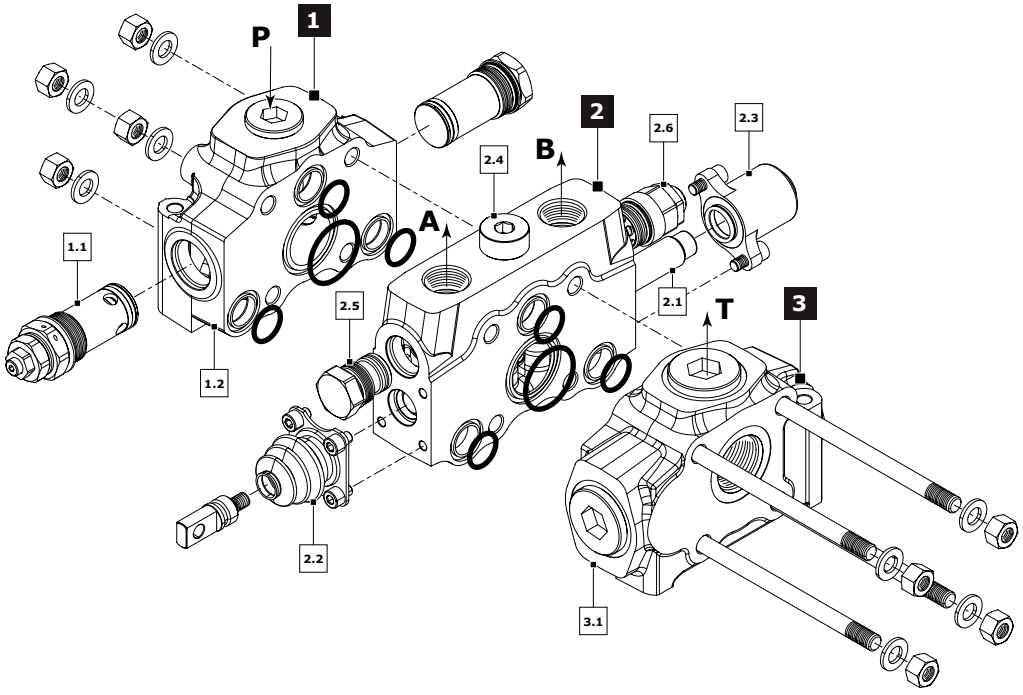
2) WORK SECTION ARRANGEMENT: pag. 12

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



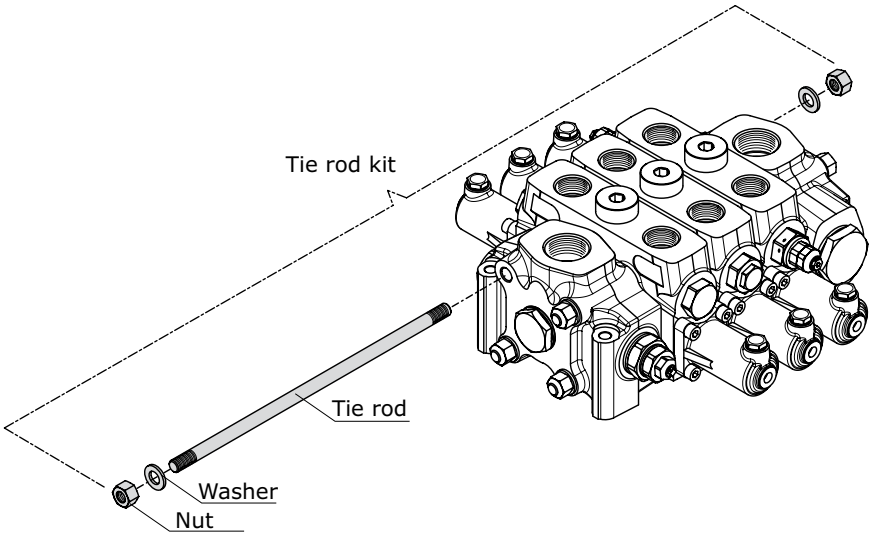
Standard thread

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
Inlet Port (P)	G 1	**G06**	1”5/16 - 12 UNF	**U06**
Ports (A - B)	G 1	**G06**	1”5/16 - 12 UNF	**U06**
Outlet (T) - Carry over (HPCO)	G 1”1/4	**G07**	1”5/8 - 12 UNF	**U07**
Hydraulic Pilot	G 1/4	**G02**	9/16” - 18 UNF	**U02**
Pneumatic Pilot	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	Lenght (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

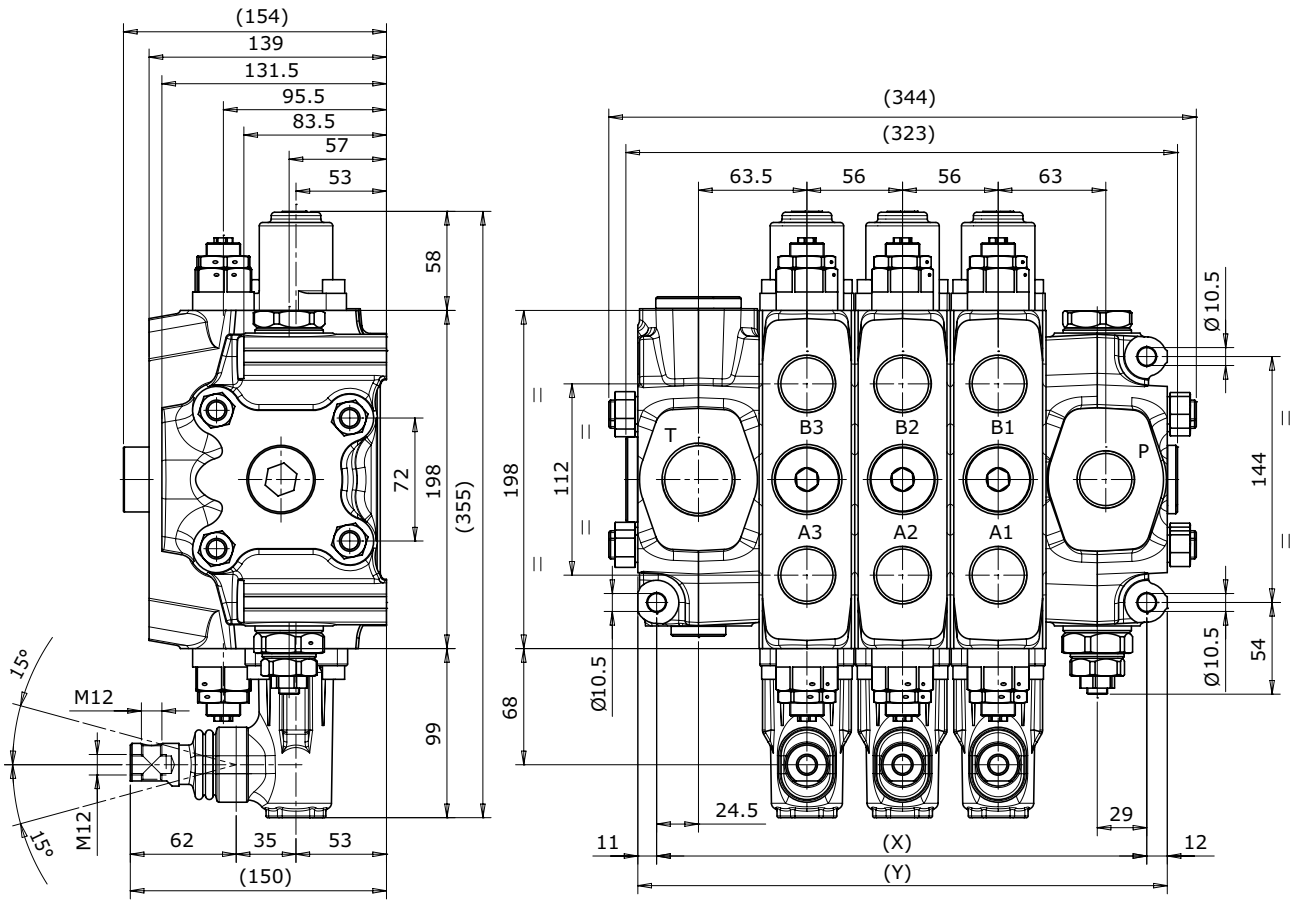
On request, all Hydrocontrol valves can be delivered painted (RAL 9005 black primer).

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
- Color black
- section number
- Painted

DIMENSIONS

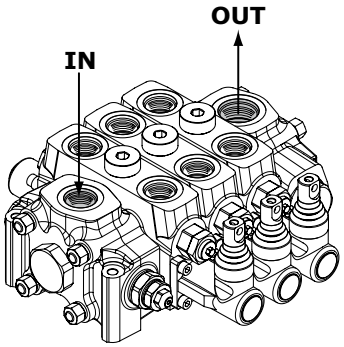


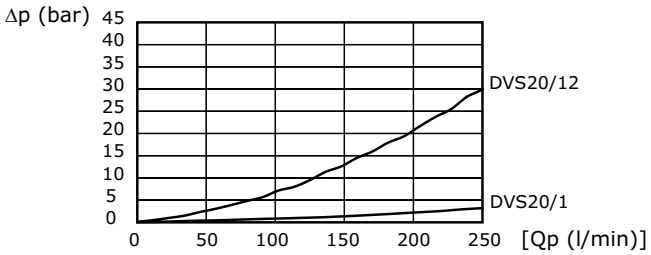
TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	173	229	285	341	397	453	509	565	621	677	733	789
Y (mm)	196	252	308	364	420	476	532	588	644	700	756	812
Weights (kg)	25	34	43	52	61	70	79	88	97	106	115	124

TYPICAL CURVES

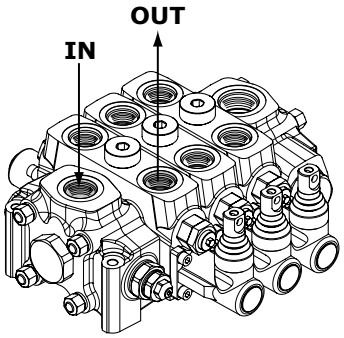
Indicated values have been tested with standard sectional valve and W001A spool.

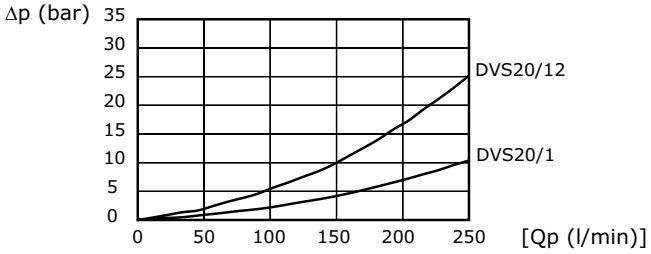
Pressure drop (P - T)



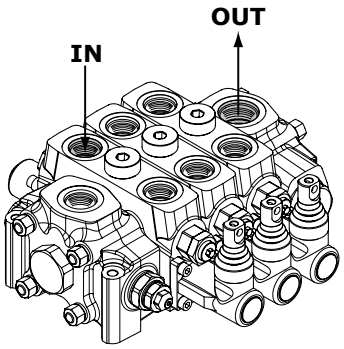


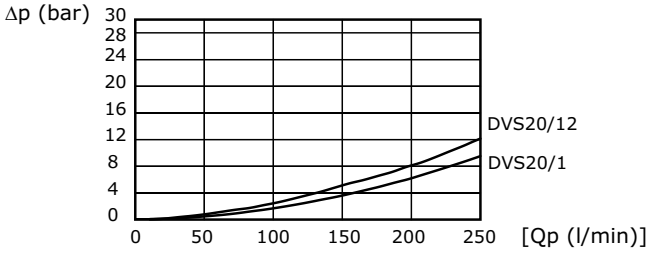
Pressure drop (P - A/B)





Pressure drop (A/B - T)

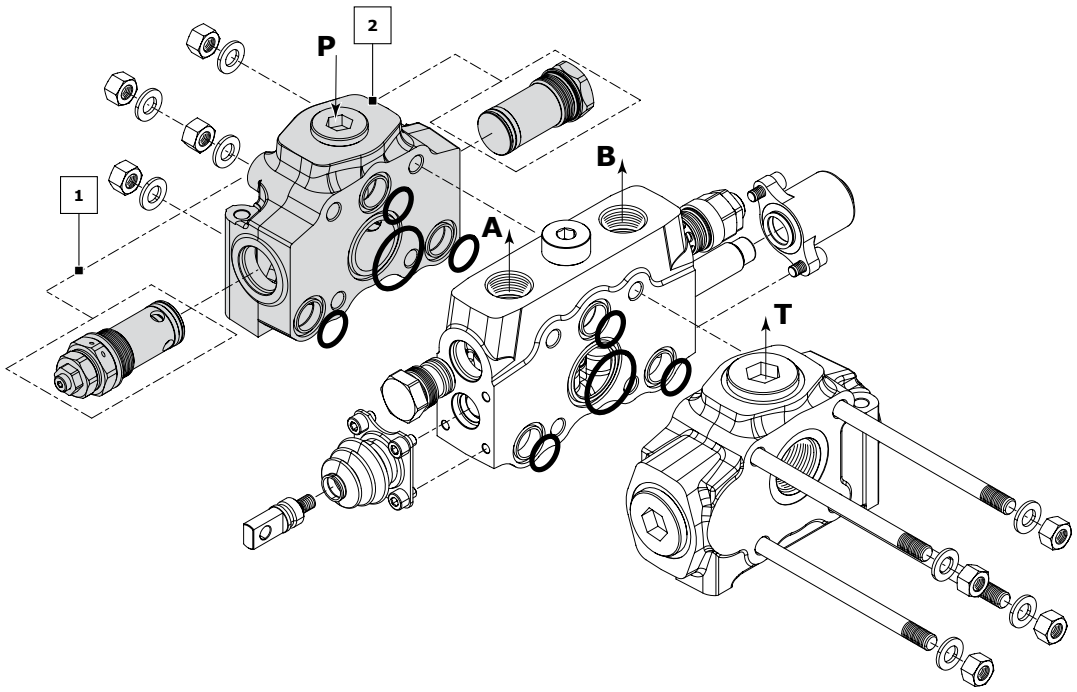




INLET SECTION

Order example

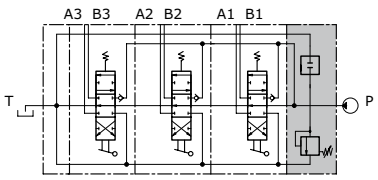
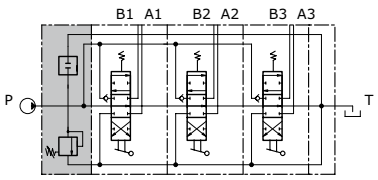
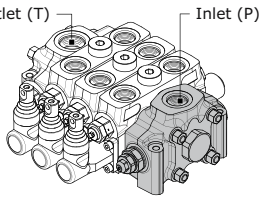
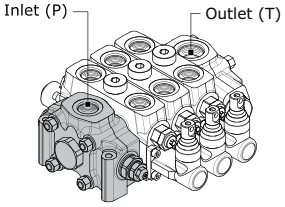
			IR	009	150	A G06
	IR	inlet side classification				
1.	**009**	valve arrangement				
	150	setting (bar)				
2.	**A G06**	inlet position and available thread type				



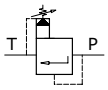
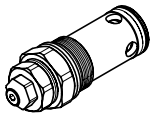
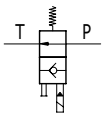
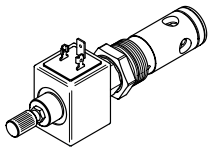
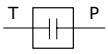
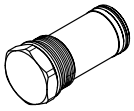
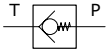
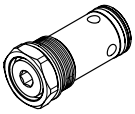
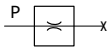
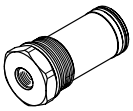
Rif.	Code	Description	Page
-	**IR**	Sectional valve with right inlet section	**10**
	IL	Sectional valve with left inlet section	
1	**009**	Pilot operated pressure relief valve	**11**
	010	Pilot operated pressure relief valve and Main anticavitation check valve	
	019	Without valves	
2	**A G06**	Upper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

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

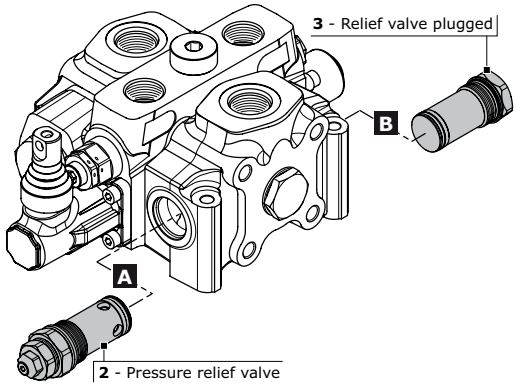
Inlet side classifications

	Sectional valve with **right inlet** section		Sectional valve with **right inlet** section
IR		**IL**	
			

Valve identification

type	schema	configuration	description	type	schema	configuration	description
2			Pilot operated pressure relief valve	**7**			Solenoid dump valve 12 Vdc
3			Relief valve plugged	**8**			Solenoid dump valve 24 Vdc
4			Main anticavitation check valve	**11**			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

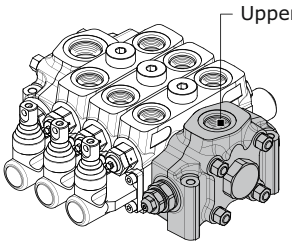
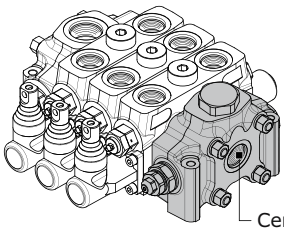
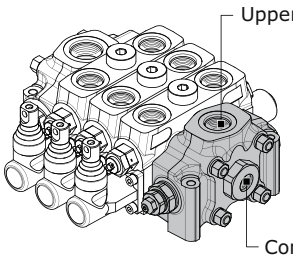
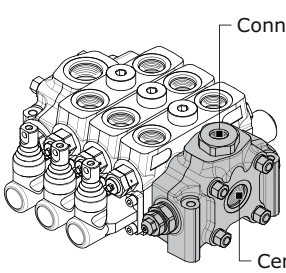
The code identifies:
with a number, the type of valve; with a letter its position on the inlet section.

(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

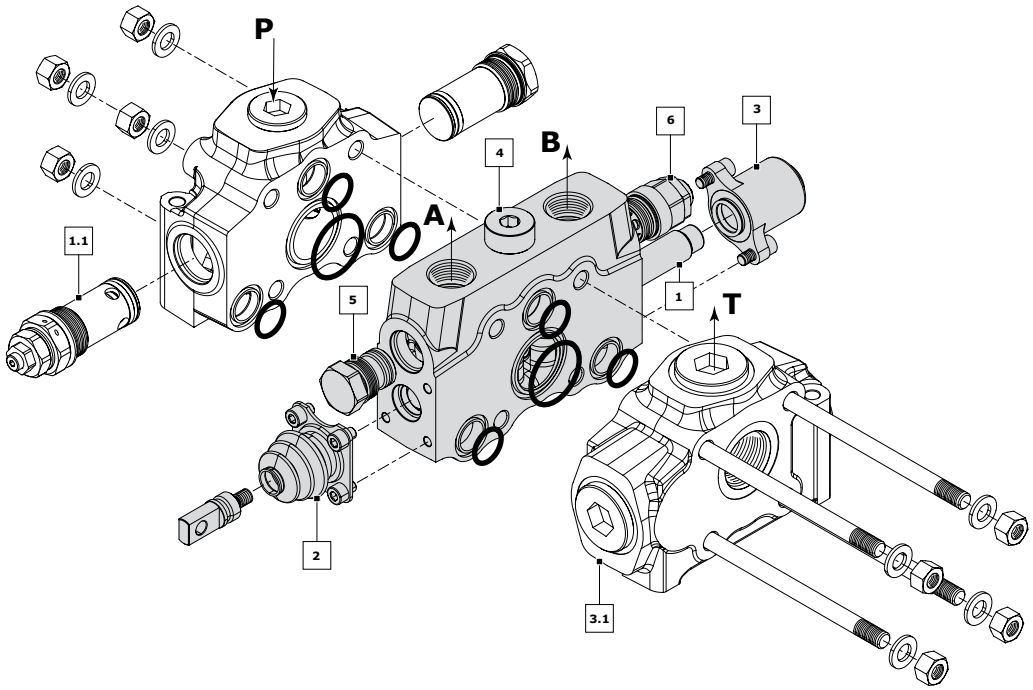
Inlet combination and thread available			
A G06		Upper inlet (P)
A U06		
C G06		Central side inlet (P)
C U06		
B G06		Upper inlet (P) (P1) with pressure-gauge connection G 1/4
B U06		
D G06		Central side inlet (P) (P1) with pressure-gauge connection G 1/4
D U06		

WORK SECTION

Order example:

W001A	H004	F001A	RP G06	05 PA	01 PB 100

1. **W001A** spool type
2. **H004** spool actuation type
3. **F001A** spool return action
4. **RP G06** section and thread type
5. **05 PA** auxiliaty valve (port A - handle side)
6. **01 PB 120** auxiliaty valve (port B - cap side)



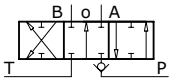
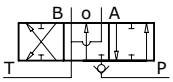
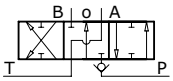
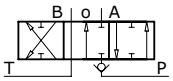
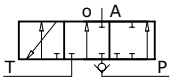
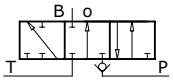
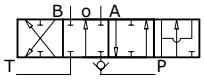
Rif.	Code	Description	Page
1	**W001**	3 positions double-acting	**13**
	W002	3 positions double-acting A-B to tank	
2	**H001**	Protected lever	**15**
	H004	Control without lever	
3	**F001A**	3 positions spring-centred spool	**16**
	F002A	Detent in A and B	
4	**RP G06**	Parallel circuit (G 1)	**21**
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

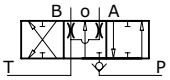
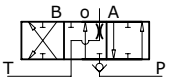
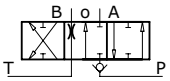
Spool identification

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)

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

spools with restricted service ports

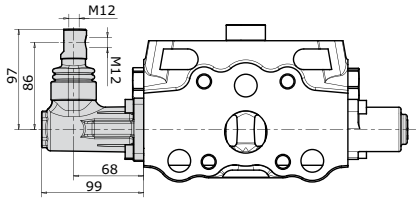
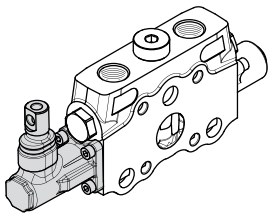
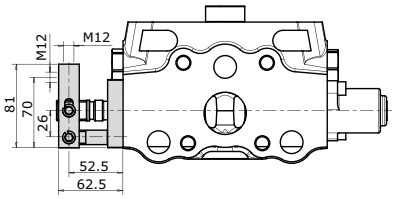
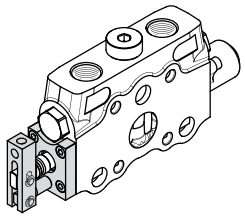
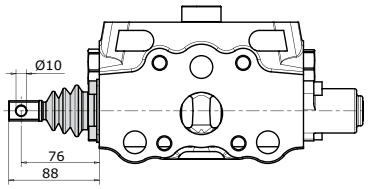
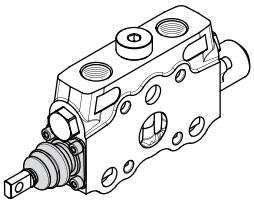
code	circuit	restriction on diameter (mm)	section (mm²)	hydraulic schema
J10	A-B IN T	0,10	2,82	
K10	A IN T	0,10	2,82	
Y10	B IN T	0,10	2,82	

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

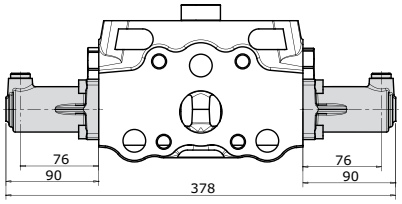
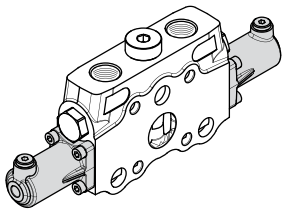
NOTE:
- W012 spool need a special machining on the valve body.
- Float spool (W012) need special detent kit (F005).
- Different spools are available on request.

Plaese contact our Sales department for more information.

Spool actuation classification

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

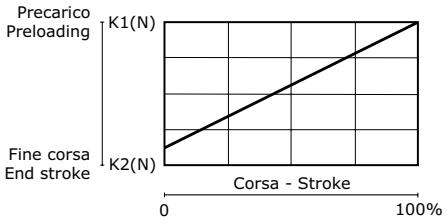
Spool actuation classification for Hydraulic control

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

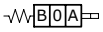
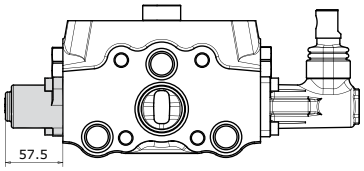
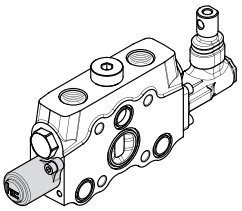
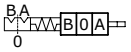
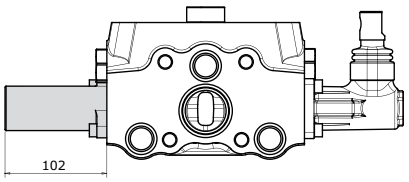
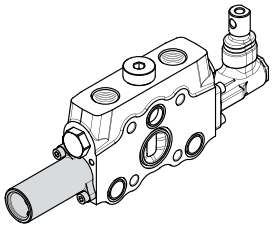
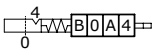
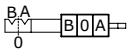
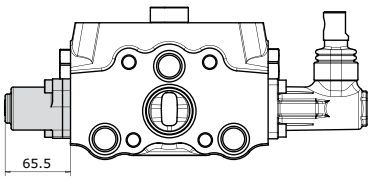
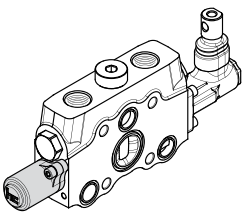
Spool return action classification - Springs load values

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

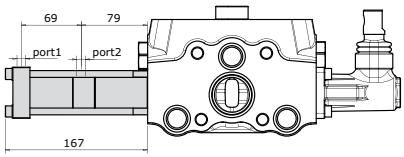
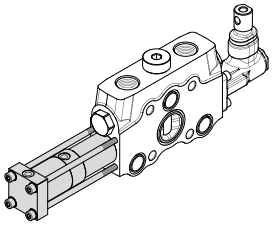
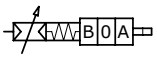
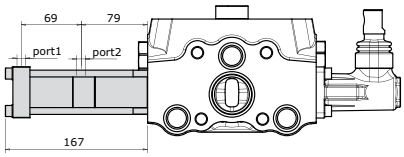
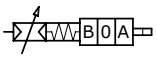
Spring type	
Code	**A** (standard spring)
Preloading	151 N
End of stroke	186.4 N
Spool return action identification example	
Code	**F001A**



Spool return action classification

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

Pneumatic control classification

code	description	schema	dimensions	configuration
F020A	Pneumatic control ON - OFF			
F021A	Pneumatic control ON - OFF rotated 180°			
F022A	Proportional Pneumatic control			
F023A	Proportional Pneumatic control rotated 180°			
F135A	Pneumatic control ON - OFF			
F136A	Pneumatic control ON - OFF rotated 180°			
F126A	Proportional Pneumatic control			
F127A	Proportional Pneumatic control rotated 180°			

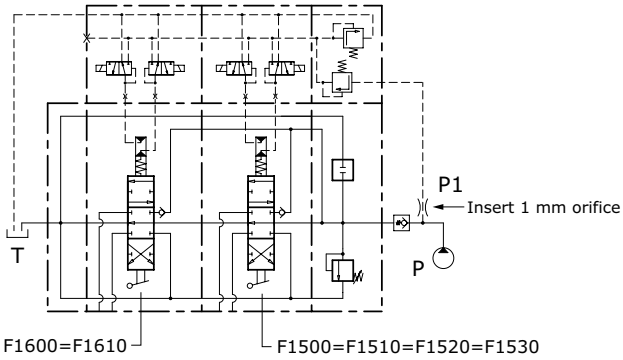
Pneumatic control:
PORT BSP = G 1/8

Pneumatic control:
PORT NPTF = 1/8 -27

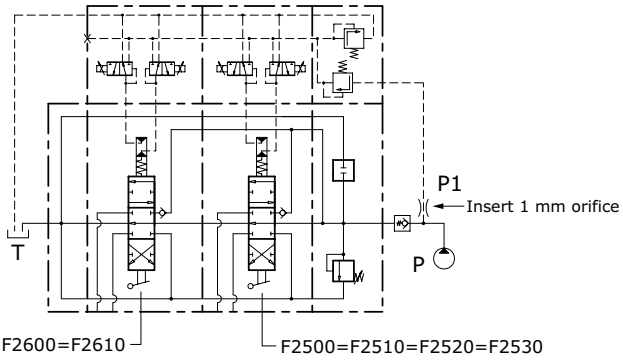
Electrohydraulic control specifications

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
Racommended pilot pipe size	Ø 6 mm - G 1/4

Electrohydraulic ON-OFF control with fixed pressure reducing valve



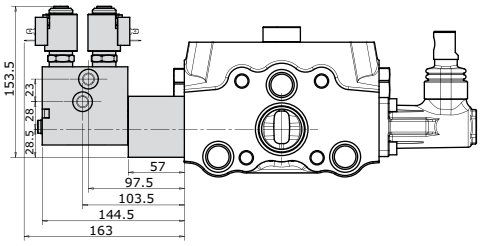
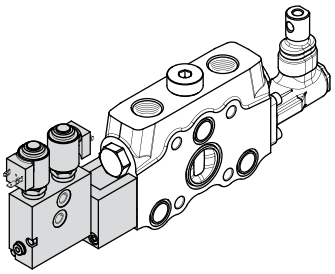
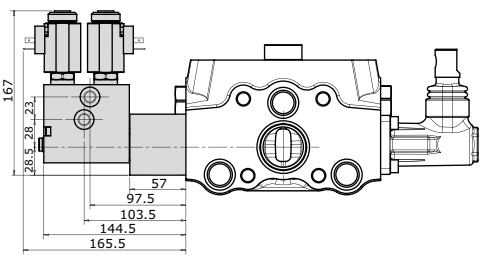
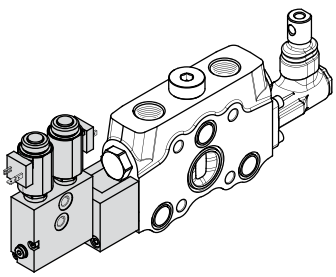
Electrohydraulic PROPORTIONAL control with fixed pressure reducing valve



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

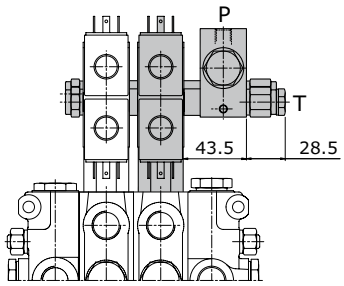
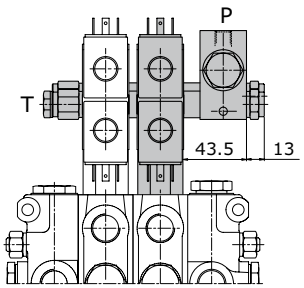
	regolation currents		
Nominal voltage (V)	**Resistance R_{20} (Ohm)**	**Current min (A)**	**Current max (A)**
12 vdc	3,7	0,9	1,7
24 vdc	15,5	0,45	0,85

Electrohydraulic control classification

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

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

Electrohydraulic control with fixed pressure reducing valve classification

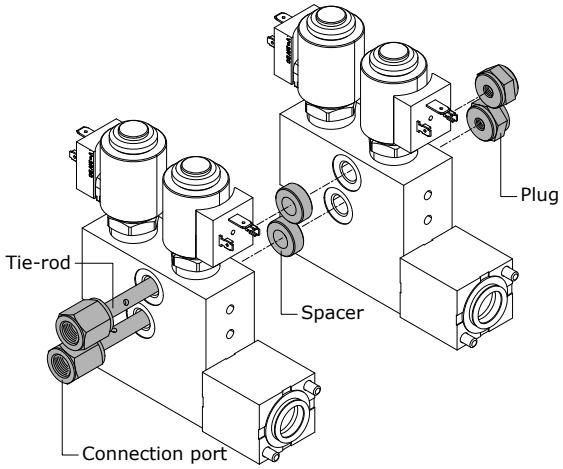
code	description	configuration
F1500	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P - T inlet side (12 vdc)	 Port BSP (P - T) = G 1/4 Port UNF (P - T) = 9/16”18 UNF
F1510	Electrohydraulic control ON - OFF (fixed pressure reducing valve) P - T inlet side (24 vdc)	
F2500	Electrohydraulic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

Control tie rod assembly

The lenght 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 oedered 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):

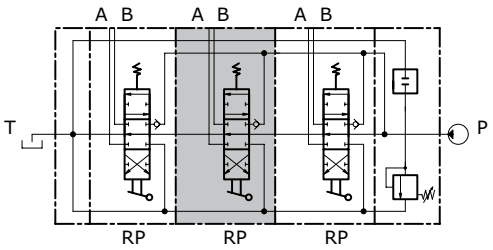
320103026 = control tie rod /1
320107026 = control tie rod /2
320107027 = control tie rod /3
320107028 = control tie rod /4
320107029 = control tie rod /5
320107030 = control tie rod /6
320107031 = control tie rod /7
320107032 = control tie rod /8

Compatibility table

SPOOL ACTION TYPE	SPOOL TYPE										
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W012A
H001	•	•	•	•	•	•	•	•	•	•	•
H002	•	•	•	•	•	•	•	•	•	•	•
H004	•	•	•	•	•	•	•	•	•	•	•
H101	•	•	•	•	•	•	•	•	•	•	•
H005	•	•	•	•	•	•	•	•	•	•	•

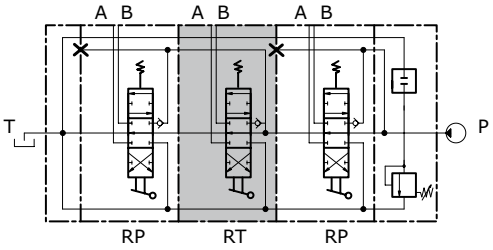
SPOOL RETURN ACTION TYPE	SPOOL TYPE										
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W006A	W012A
F001	•	•	•	•	•	•	•	•	•	•	
F002	•	•	•	•	•	•	•	•	•	•	
F003	•	•	•	•	•	•	•	•	•	•	
F004	•	•	•	•	•	•	•	•	•	•	
F005											•
F149	•	•	•	•	•	•	•	•	•	•	
F020=F021	•	•	•	•	•	•	•	•	•	•	
F022=F023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

Work section identification

	working section type	
RP G06 **RP U06**		Parallel circuit section

Parallel circuit

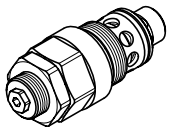
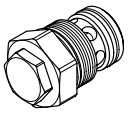
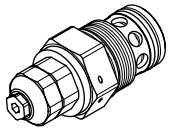
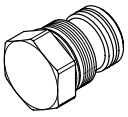
When the spool is operated it intercepts the by-pass gallery by diverting the flow of oil to service port A or B. If two or more spools are actuated at the same time, the oil will power the service port that has the lower load; by throttling the spools, the flow of oil can be divided between two or more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

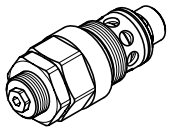
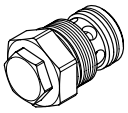
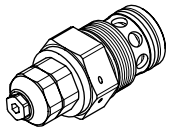
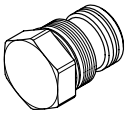
RT G06 **RT G06**		Tandem (conventional) circuit section

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
01PA	Antishock valve (port A)			**A**	60 / 100	**A**	10-A / 60-A
				B	101 / 160	**B**	61-A / 130-A
				C	161 / 250	**C**	131-A / 250-A
02PA	Anticavitation valve (port A)						
04PA	Pilot combined valve (port A)			**A**	50 / 275		
05PA	Prearrangement for auxiliary valve (port A)						

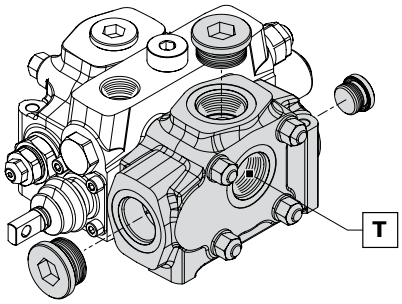
code	description	schema	configuration	setting range (bar) type	at full flow	type	at min. flow
01PB	Antishock valve (port B)			**A**	60 / 100	**A**	10-A / 60-A
				B	101 / 160	**B**	61-A / 130-A
				C	161 / 250	**C**	131-A / 250-A
02PB	Anticavitation valve (port B)						
04PB	Pilot combined valve (port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

Auxiliary valve - Setting range

Sections designed to house auxiliary valve option require double choise 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



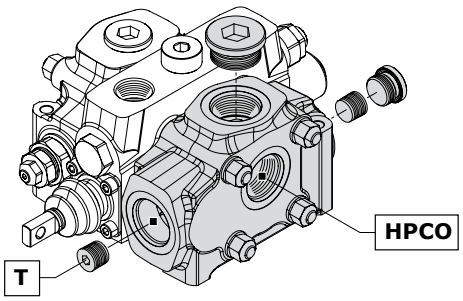
TJ	A G07

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

Rif.	Code	Description	Page
1	**TJ**	Outlet section with single return (T) right-side inlet (P)	24
	TK	Outlet section with single return (T) left-side inlet (P)	
2	**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)	

OUTLET SECTION - HPCO VERSION

Order example - HPCO version Outlet



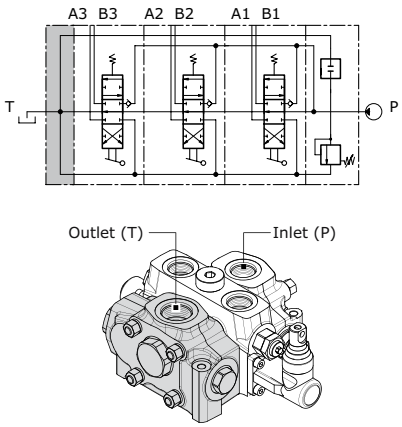
TM	M G07

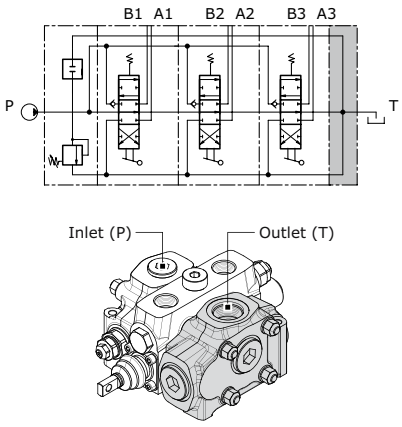
1. **TM** outlet section type
2. **M G07** outlet position and available thread type

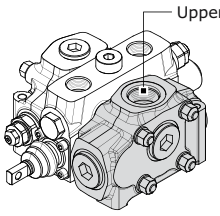
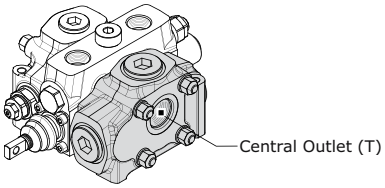
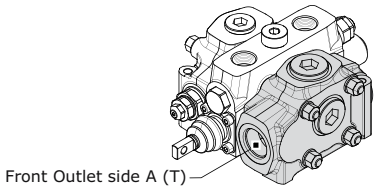
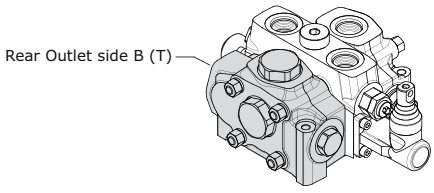
Rif.	Code	Description	Page
1	**TM**	Outlet section with two return (T-HPCO) right-side inlet (P)	25
	TN	Outlet section with two return (T-HPCO) left-side inlet (P)	
2	**M G07**	HPCO upper outlet T (tank) rear outlet side B (thread G 1”1/4)	
	M U07	HPCO upper outlet T (tank) rear outlet side B (thread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

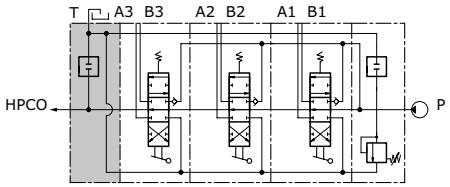


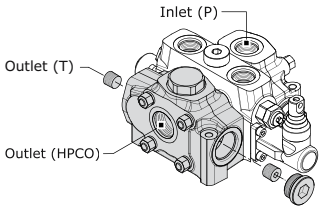


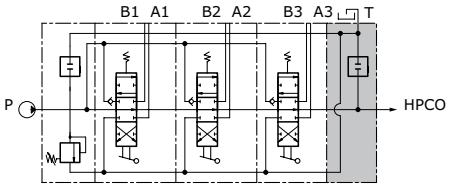
Inlet combination and thread available			
A G07			Upper outlet (thread G 1”1/4)
A U07			Upper outlet (thread 1”5/8 - 12 UNF)
C G07			Central outlet (thread G 1”1/4)
C U07			Central outlet (thread 1”5/8 - 12 UNF)
G G07		**only for TK**	Front outlet side A (thread G 1”1/4)
G U07			Front outlet side A (thread 1”5/8 - 12 UNF)
H G07		**only for TJ**	Rear outlet side B (thread G 1”1/4)
H U07			Rear outlet side B (thread 1”5/8 - 12 UNF)

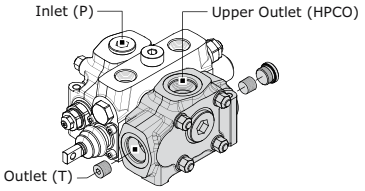
Outlet with two tanks classification

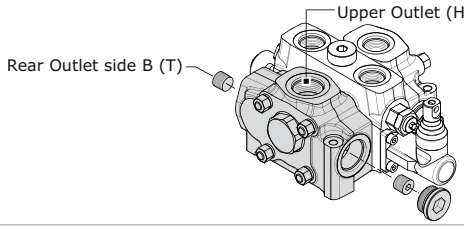
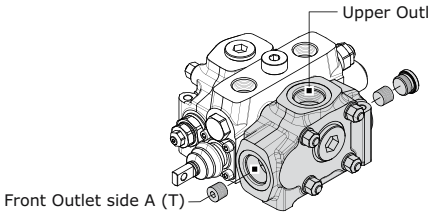
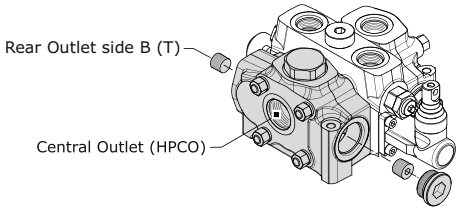
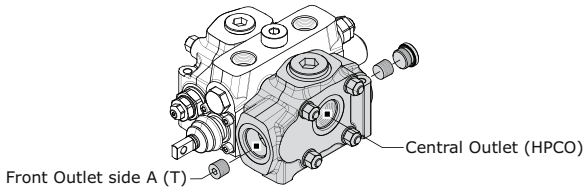
outlet identification			
TM	Outlet section with two return (T-HPCO) right-side inlet (P)	**TN**	Outlet section with two return (T-HPCO) left-side inlet (P)





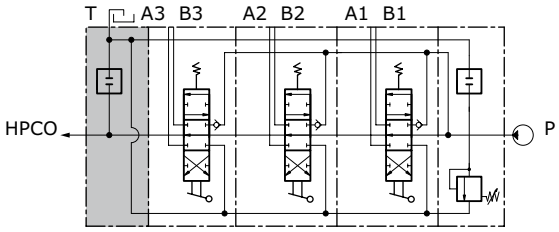




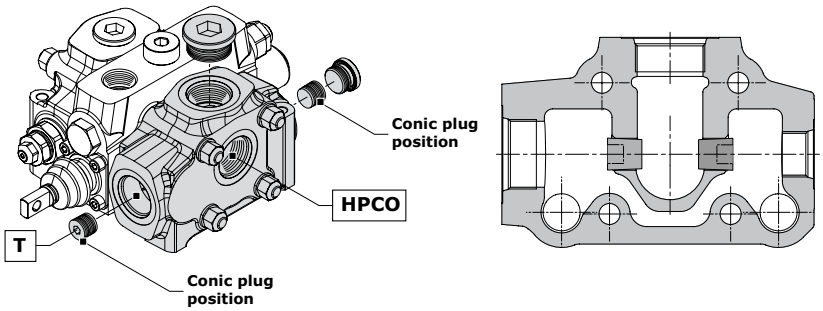
Inlet combination and thread available			
M G07		**only for TM**	HPCO upper outlet T rear side outlet B (thread G 1”1/4)
M U07			HPCO upper outlet T rear side outlet B (thread 1”5/8 - 12 UNF)
N G07		**only for TN**	HPCO upper outlet T front outlet side A (thread G 1”1/4)
N U07			HPCO upper outlet T front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

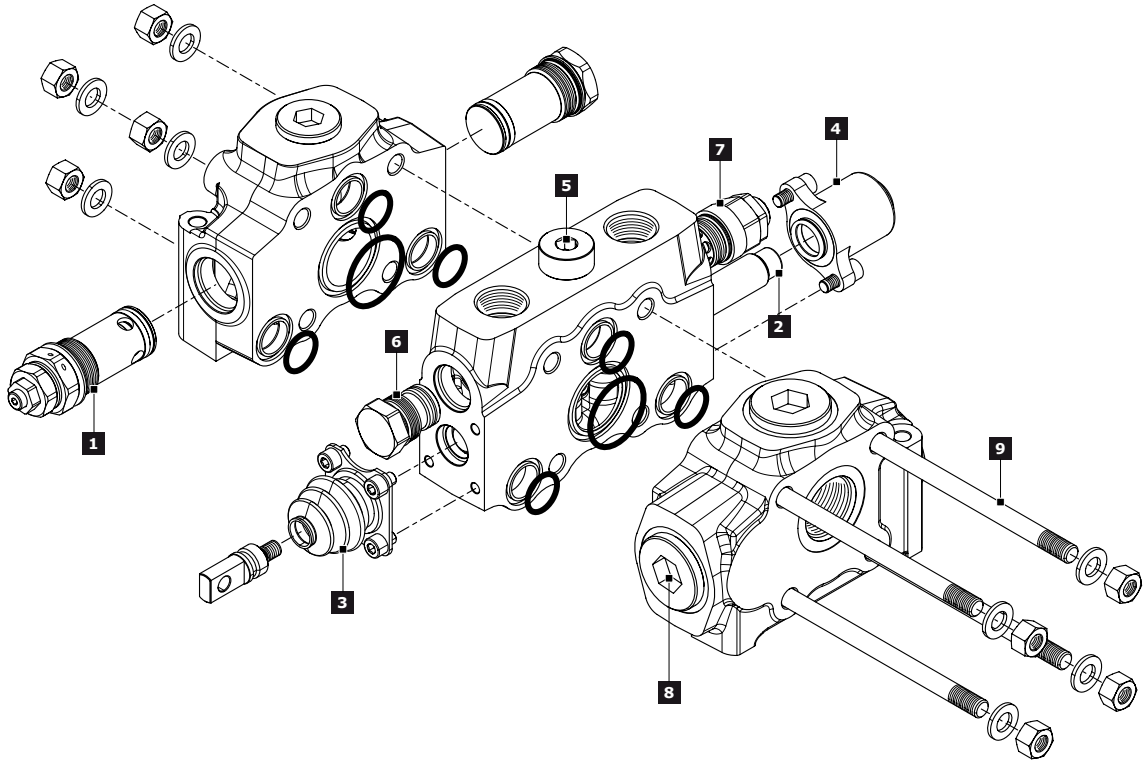


It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



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

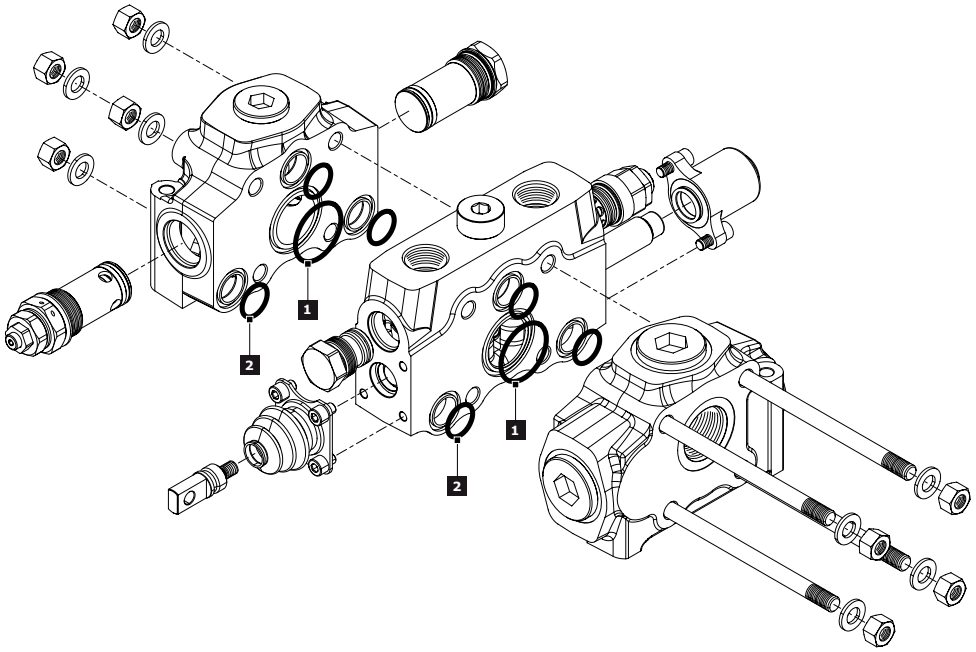
DVS20 SPARE PARTS LIST



Ref.	Description	Order code	Q.ty	Code	Note
1	Pilot operated pressure relief valve	**89380**	1	-	Setting: 80 bar
		89312			Setting: 150 bar
		89381			Setting: 250 bar
	Relief valve plugged	**430188001**	1		
	Main Anticavitation check valve	**915058801**	1		
	Plug with pressure-gauge connection	**430188002**	1		
2	3 positions double-acting spool	**421288005**	1	**W001A**	
		421288007		**W001B**	
	3 positions double-acting A and B to tank spool	**421288013**	1	**W002A**	
		421288014		**W002B**	
	3 positions single-acting on A	**421288019**	1	**W005A**	
	3 positions single-acting on B	**421288021**	1	**W006A**	
	4 positions double-acting with float in the 4th pos.	**421288027**	1	**W012A**	
3	Protected lever	**320388002**	1	**H001 = H002**	
		320388003			only for W012 spool
	Control without lever	**320388001**	1	**H004**	
		320388004			only for W012 spool
	Unprotected lever	**320388001**	1	**H101 = H102**	
	Hydraulic actuation with side ports	**320507001**	2	**H005**	for BSP version
		320507023			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 4th 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	**01 PA**	Setting: 100 bar
		84434			Setting: 150 bar
		85007			Setting: 200 bar
	Anticavitation valve on port A	**915088801**		**02 PA**	
	Pilot combined valve on port A	**84438**		**04 PA**	Setting: 100 bar
		84439			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	**01 PB**	Setting: 100 bar
		84434			Setting: 200 bar
		85007			Setting: 300 bar
	Anticavitation valve on port B	**915088801**		**02 PB**	
	Pilot combined valve on port B	**84438**		**04 PB**	Setting: 100 bar
		84439			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			

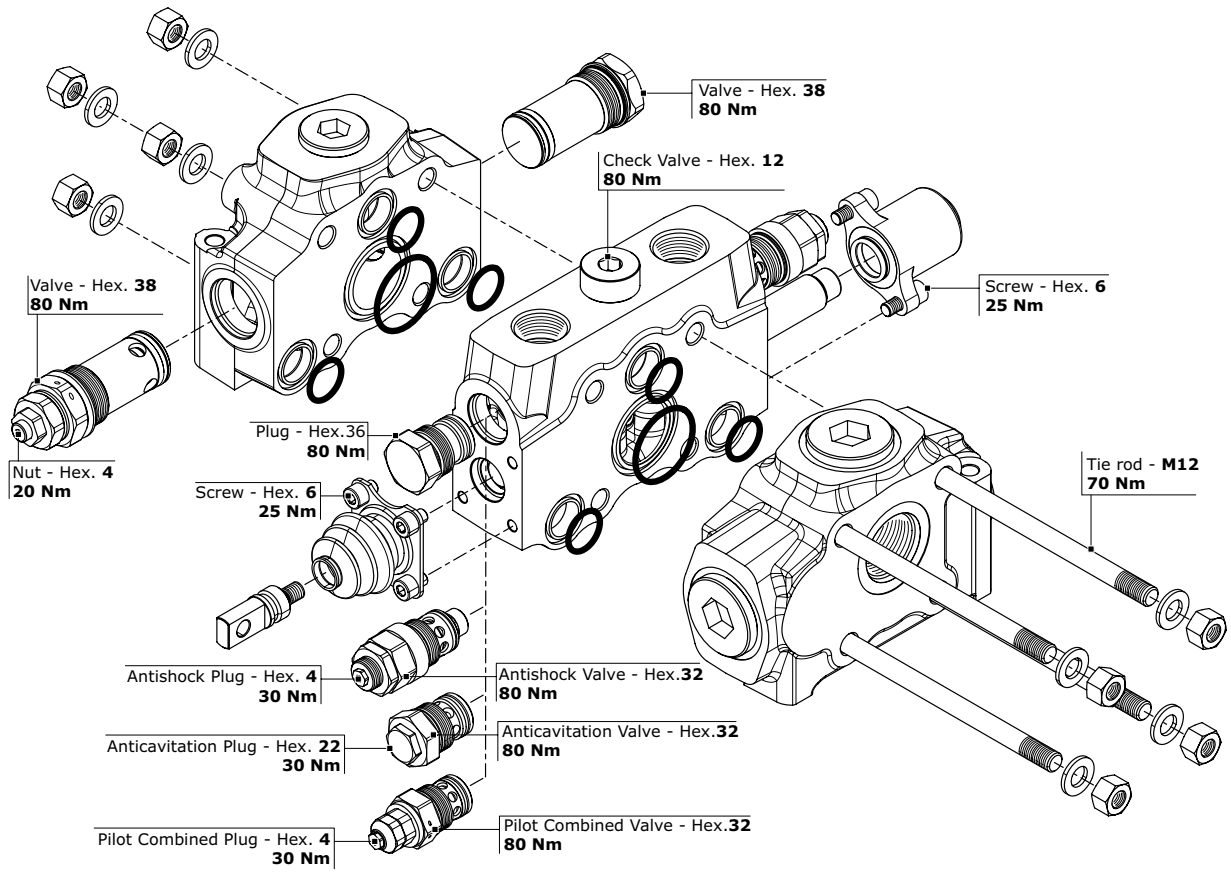
Guidelines

- 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
BSP (ISO - 228)	**G 1**	**G 1**	**G 1”1/4**
with rubber sealing (DIN 3869)	120	120	120
with copper or steel and rubber washer	120	120	120
UN-UNF (ISO - 725)	**1”5/16 - 12 UN**	**1”5/16 - 12 UNF**	**1”5/8 - 12 UNF**
with O.R.	120	120	120

General clamping torque



Dimensions - Thread codes

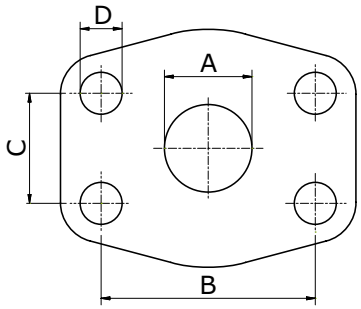
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections.

METRIC THREAD (ISO 9974-1)			
Type	M18x1,5	M22x1,5	M27x2
Code	**M01**	**M02**	**M03**

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

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	**U02**	**U03**	**U04**	**U05**	**U06**	**U07**

Dimensions - SAE Flange codes



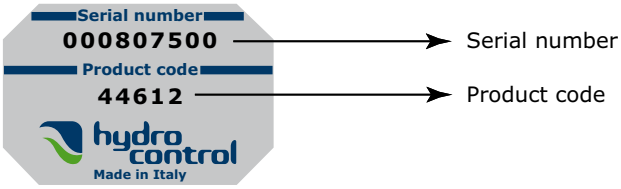
SAE / 3000 FLANGE (ISO 6162-1)												
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)	2" (MA)	2" (UNC)	3" (MA)	3" (UNC)
Code	**S03**	**S04**	**S05**	**S06**	**S07**	**S08**	**S09**	**S10**	**S11**	**S12**	**S15**	**S16**
A	19	19	25	25	32	32	38	38	51	51	76	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	**S33**	**S34**	**S35**	**S36**	**S37**	**S38**	**S39**	**S40**
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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