

D9

SECTIONAL VALVE



TECHNICAL CATALOGUE



1st edition D9.05

*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

Ideal for mini-excavators between 1 t and 2.5 t. Especially limited size and weight. It can be equipped with:

- 2 or 3 pumps circuit
- flow addition on PTO function
- second travel speed
- regenerating system on the arm
- flow addition on the boom
- flow addition on the bucket
- flow addition on the arm
- straight travel
- built in boom anti-drift
- various kinds of hydraulic and manual controls
- any number of customisations and set-ups

Suitable for applications including Mini-backhoe loaders, Skid-steer loaders, Mini skid loaders, Mini dumpers and Forestry machines.

Different kind of manual and hydraulic remote controls. Countless configurations and custom made solutions.

Working sections have auxiliary valves and a broad range of interchangeable spools.





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 4 th 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						•		•	•	•	•



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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	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

D9/1: IR 001 150 A G03 W001A H004 F001A RP G03 01 PA 100 01 PB 100 TJ A G04

TYPE:

D9: product type

/1: working section number

1) INLET ARRANGEMENT: (page 10)

IR 001

inlet side and valve type

150

setting (bar)

A G03

inlet position and available thread type

2) WORK SECTION ARRANGEMENT: (page 13)

W001A

spool type

H004

spool actuation type

F001A

spool return action type

RP G03

type and thread section

01 PA 100

auxiliary valve (port A)

01 PB 100

auxiliary valve (port B)

3) OUTLET ARRANGEMENT: (page 25)

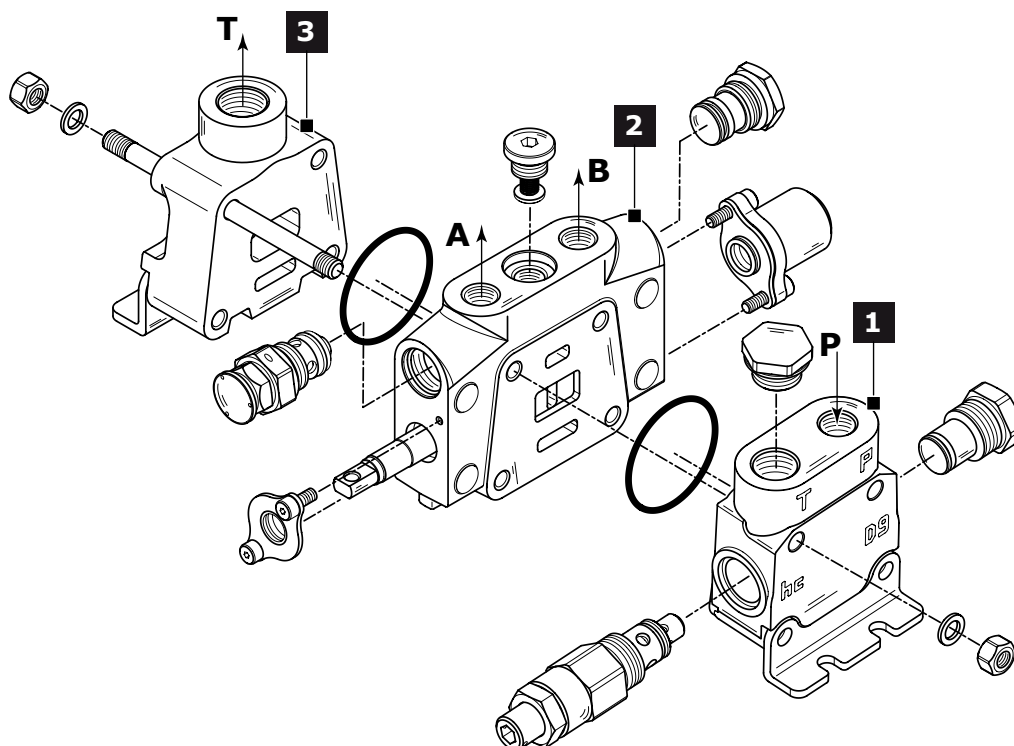
TJ

outlet type

A G04

outlet position and available thread type

Ordering row 2 must be repeated for every work section



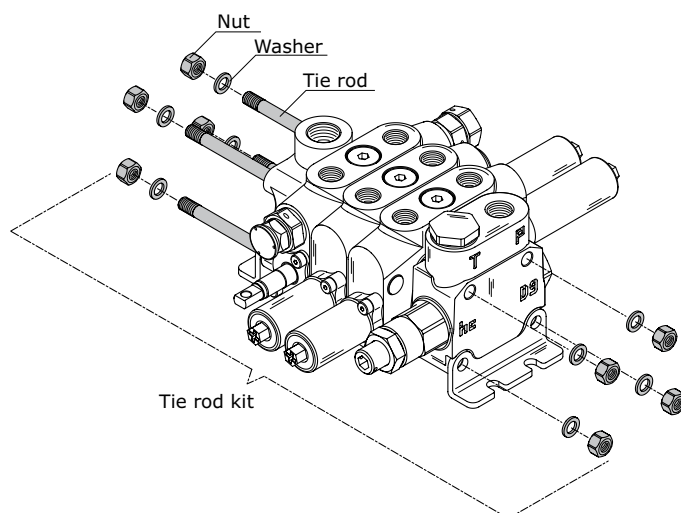
Standard thread

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 34.

Ports	BSP (ISO - 228)	Code	UN-UNF (ISO - 725)	Code
Inlet Port (P)	G 3/8	G03	3/4" - 16 UNF	U03
Ports (A - B)	G 3/8	G03	3/4" - 16 UNF	U03
Outlet (T) - Carry over (HPCO)	G 1/2	G04	7/8" - 14 UNF	U04
Hydraulic Pilot	G 1/4	G02	9/16" - 18 UNF	U02
Pneumatic Pilot	G 1/8	-	NPTF 1/8-27	-

**Tie-rod kit classification**

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. D9 requires 4 tie-rod kits.



Tie rod kit	Order Code	Lenght (mm)	Clamping Torque (Nm)	Quantity
D9/1	300146001	126	25	4
D9/2	300146002	157		
D9/3	300146003	188		
D9/4	300146004	219		
D9/5	300146005	259		
D9/6	300146006	281		
D9/7	300146007	312		
D9/8	300146008	343		
D9/9	300146009	374		
D9/10	300146010	405		
D9/11	300146011	436		
D9/12	300146012	467		

Painting

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

Order example of D9/1 painted:

D9/1

IR 001 150 A G03

W001A H004 F001A RP G03 01 PA 100 01 PB 120

TJ A G04

P006/1 N10

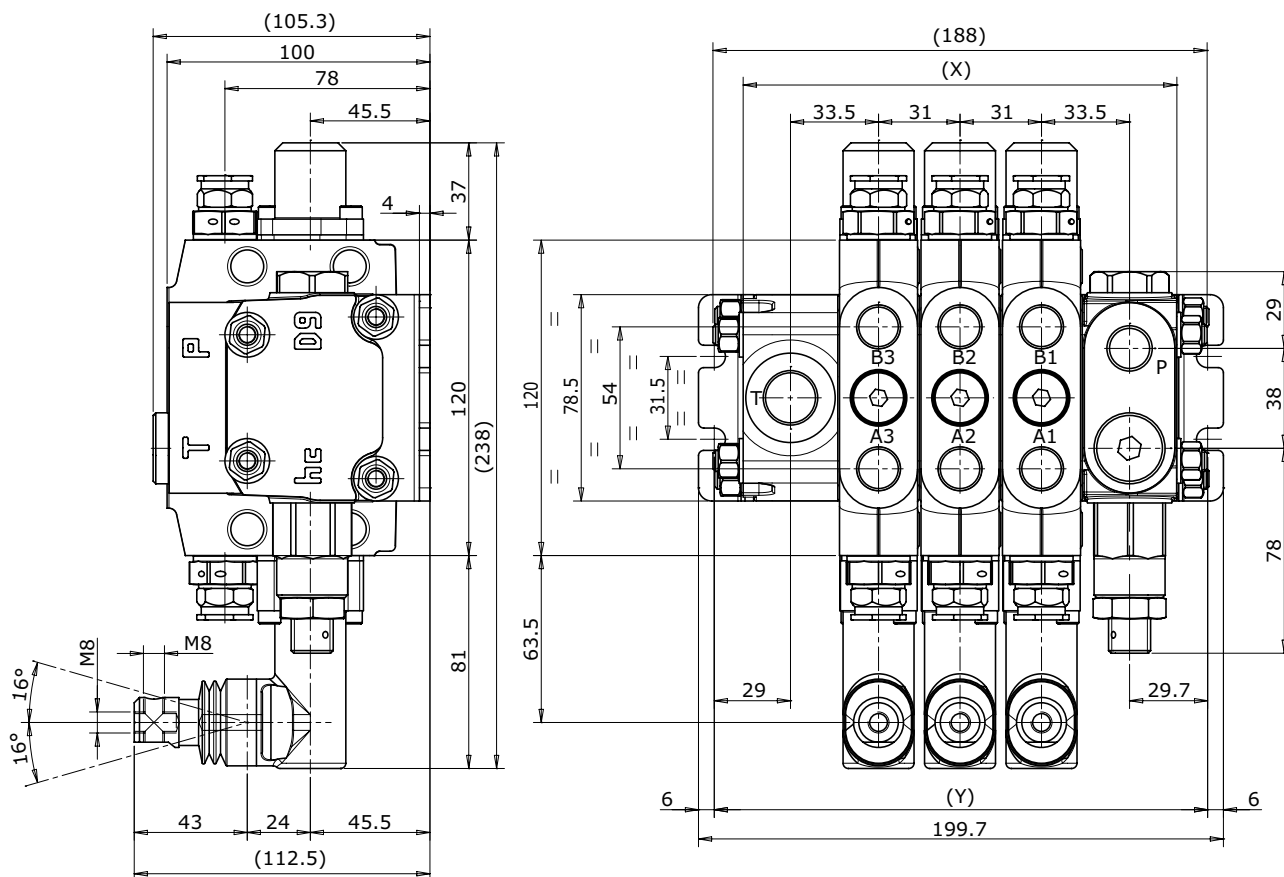
The painting is indicated with the following value:

P006 - /1 - N10

Color black
section number
Painted



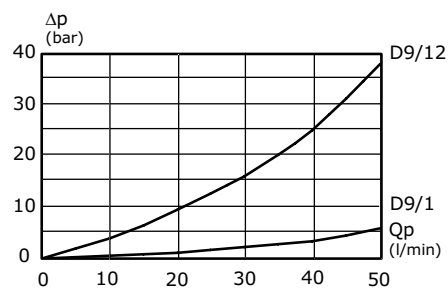
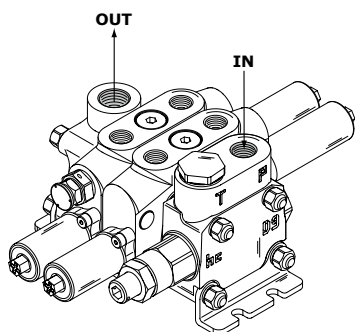
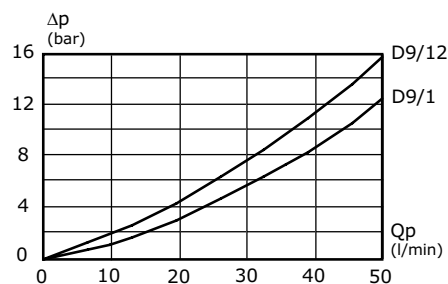
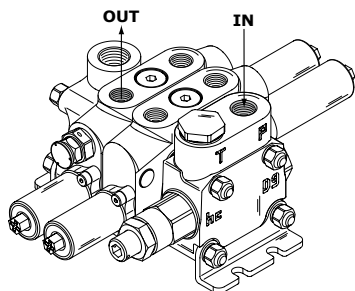
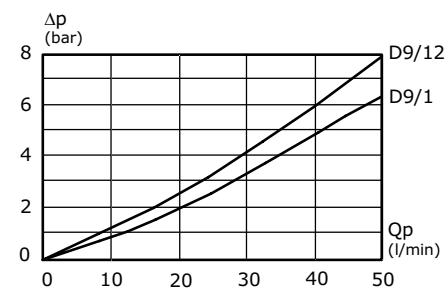
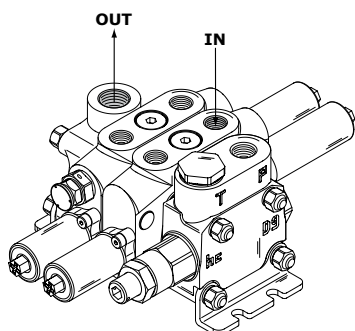
DIMENSIONS



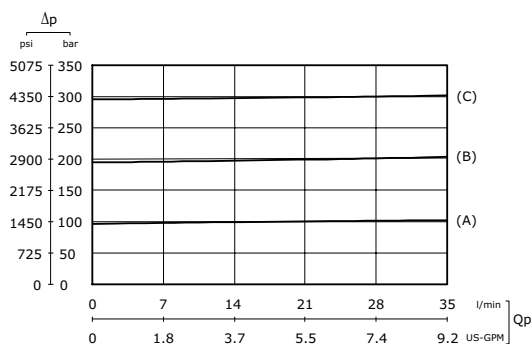
TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	125	156	187	218	249	280	311	342	373	404	435	466
Y (mm)	137	168	199	230	261	292	323	354	385	416	447	478
Weights (kg)	4,5	6,2	7,9	9,6	11,3	13	14,7	16,4	18,1	19,8	21,5	23,2

**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)****Direct relief valve curve**

Setting ranges	
type	pressure (bar)
A	30 - 110
B	111 - 220
C	221 - 350



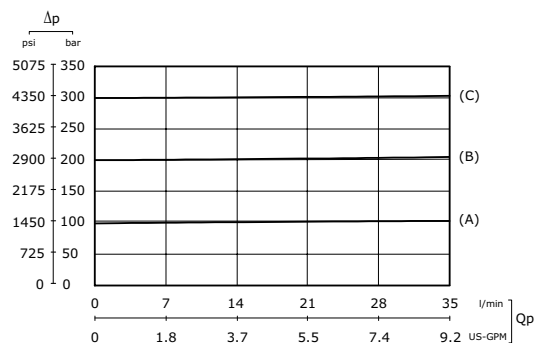


TYPICAL CURVES

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

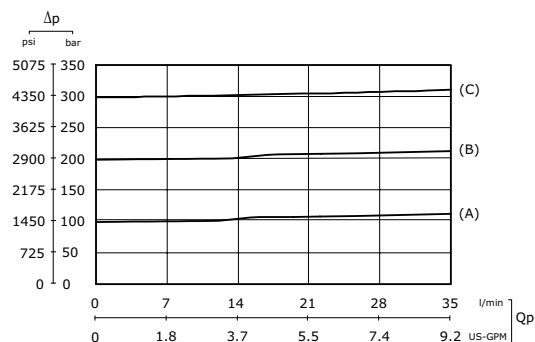
Antishock valve curve

type	Setting ranges pressure (bar)	
	at full flow	at min. flow
A	20 - 100	10-A / 80-A
B	101 - 220	81-A / 180-A
C	221 - 350	181-A / 350-A

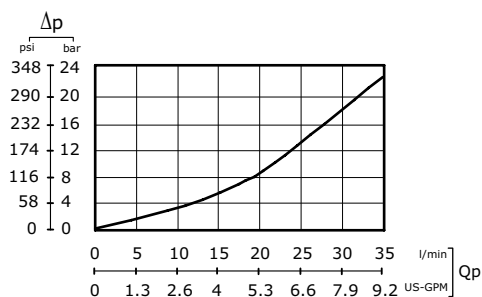


Combined valve curve

type	Setting ranges pressure (bar)	
	at full flow	at min. flow
A	20 - 60	10-A / 40-A
B	61 - 100	41-A / 80-A
C	101 - 220	81-A / 180-A
D	221 - 350	181-A / 350-A



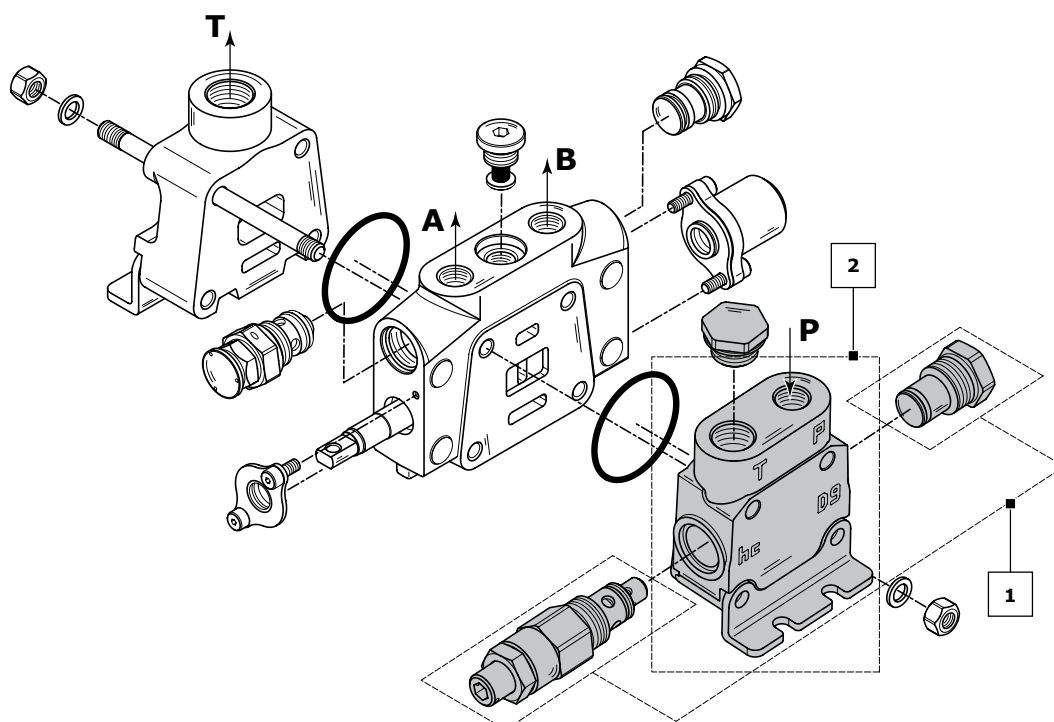
Anticavitation check valve curve



**INLET SECTION**

Order example

		IR	001	150	A G03
	IR	inlet side _____			
1.	001	valve arrangement _____			
	150	setting (bar) _____			
2.	A G03	inlet position and available thread type _____			



Rif.	Code	Description	Page
-	IR	Sectional valve with right inlet section	11
	IL	Sectional valve with left inlet section	
1	001	Direct acting pressure relief valve	12
	004	Direct acting pressure relief valve and Solenoid dump valve 12 Vdc	
	005	Direct acting pressure relief valve and Solenoid dump valve 24 Vdc	
	019	without valves	
2	A G03	Upper inlet (thread G 3/8)	
	A U03	Upper inlet (thread 3/4" - 16 UNF)	
	E G03	Upper inlet-Outlet (thread G 3/8)	
	E U03	Upper inlet-Outlet (tthread 3/4" - 16 UNF)	

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



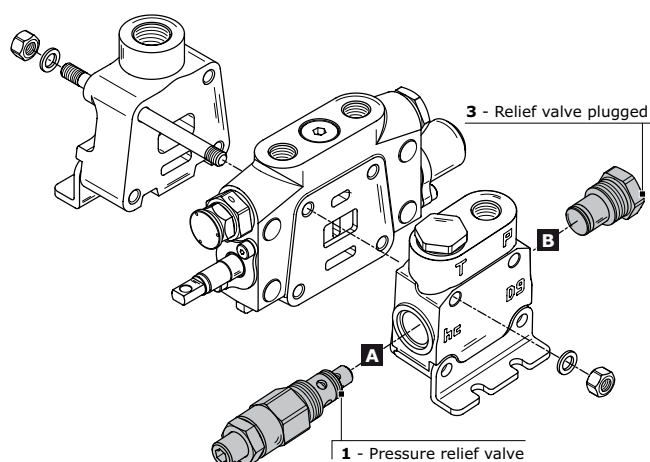
Inlet side classifications

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

Valve identification

type	schema	layout	description	type	schema	layout	description
1			Direct acting pressure relief valve	7			Solenoid dump valve 12 Vdc
3			Relief valve plugged	8			Solenoid dump valve 24 Vdc
6			Externally piloted valve	11			Plug with pressure-gauge connection

Valve arrangement



Combination valve example: 001 = 1A - 3B

- 001** Combination valve
1A 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

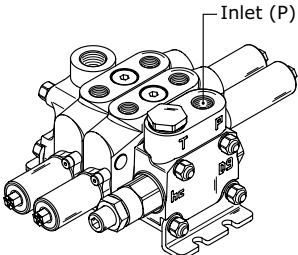
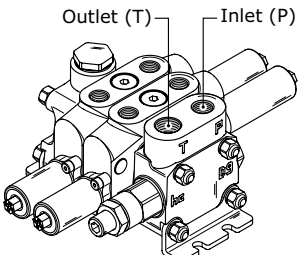
(B) = spool return action side

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



VALVE COMBINATION INLET SECTION			Valve type on port B					
								
			1	3	6	7	8	11
Valve type on port A		1		001	003	004	005	008
		3	017	019	022	023	024	027
		6	046	048				052
		7	053	055				059
		8	060	062				066
		11	084	086	089	090	091	

Inlet position and available thread type

Inlet position and thread available	
A G03	
A U03	
E G03	
E U03	

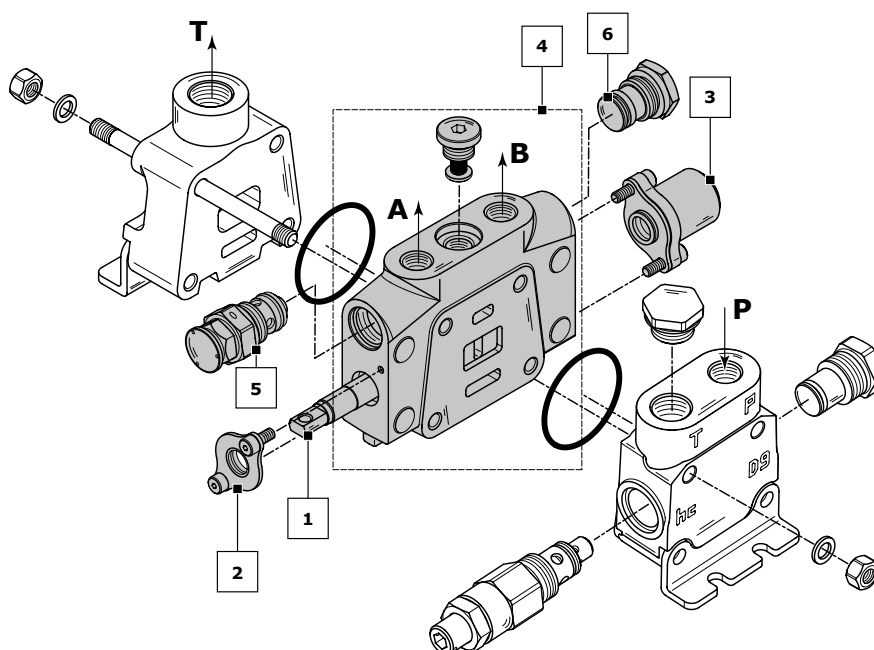
NOTE: code "E" on inlet section obliges to choice "E" or "W" on outlet section.



WORKING SECTION

Order example:

	W001A	H004	F001A	RP G03	01 PA 100	01 PB 100
1. W001A	spool type					
2. H004	spool actuation type					
3. F001A	spool return action type					
4. RP G03	section type					
5. 01 PA 100	auxiliary valve (port A - handle side)					
6. 01 PB 100	auxiliary valve (port B - cap side)					



Rif.	Code	Description	Page
1	W001A W002A	3 positions double-acting 3 positions double-acting A-B to tank	14
2	H001 H004 H006	Protected lever Control without lever hydraulic actuation	16
3	F001A F002A	3 positions spring-centred spool (spring A) 3 positions spring-centred spool detent in A and B (spring A)	17
4	RP G03 RP U03 RT G03 RT U03	Parallel circuit (G 3/8) Parallel circuit (3/4"-16 UNF) Parallel-Tandem circuit (G 3/8) Parallel-Tandem circuit (3/4"-16 UNF)	18
5	01 PA 100 05 PA	Antishock valve (port A) Prearrangement for auxiliary valve (port A)	19
6	01 PB 100 05 PB	Antishock valve (port B) Prearrangement for auxiliary valve (port B)	

NOTE: (*) Leave out the spool return action code when choosing H006.

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

Always indicate setting value when using antishock and combined valve: **01 PA (100) - 03 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 4 th position	
W013	3 positions double-acting regenerative	
W015	3 positions double-acting series	
W016	3 positions double-acting series A and B to tank	

spools with restricted service ports				
code	circuit	restriction on diameter (mm)	section (mm ²)	hydraulic schema
J10	A-B IN T	0,10	1,88	
K10	A IN T	0,10	1,88	
Y10	B IN T	0,10	1,88	



CODE	spool type available	
	STANDARD A	METERED B
W001	W001A	W001B
W002	W002A	W002B
W003	W003A	W003B
W004	W004A	W004B
W005	W005A	W005B
W006	W006A	W006B
W012	W012A	
W013	W013A	
W015	W015A	
W016	W016A	

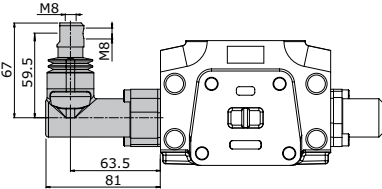
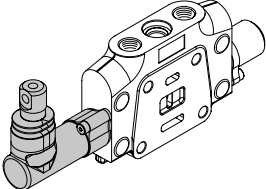
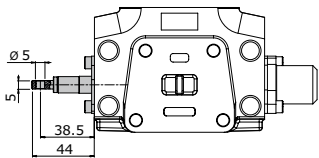
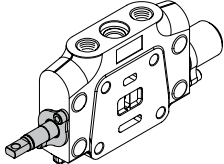
NOTE:

- W012, W013, spools need a special machining on the valve body.
- W015, W016, spools need RS type body.
- Float spool (W012) need special detent kit (F005).
- Regenerative spool (W013) need special return spring kits.
- Different spools are available on request.

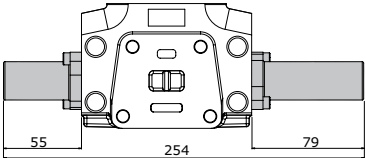
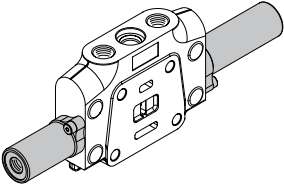
Plaese contact our Sales department for more information.



Spool actuation classification for manual control

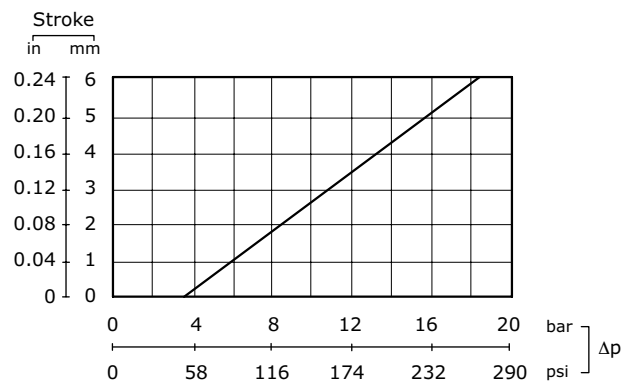
code	description	dimensions	configuration
H001	Protected lever		
H002	Protected lever rotated 180°		
H004	Control without lever		

Spool actuation classification for Hydraulic control

code	description	dimensions	configuration
H006 leave out the spool return action code	Hydraulic actuation with side ports BSP ports = G 1/4 UNF ports = 9/16-18 UNF		

Hydraulic pilot control curve

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

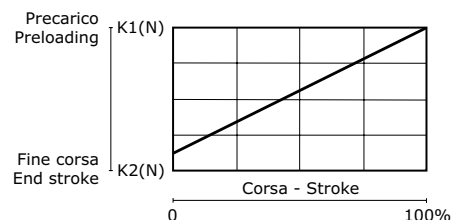




Spool return action classification - Springs load values

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

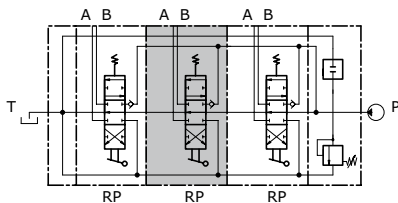
Spring type			
Type - Code	A (standard spring)	B (soft spring)	C (heavy spring)
Preloading	100 N	80 N	120 N
End of stroke	150 N	130 N	180 N
Spool return action identification example			
Type - Code	F001A	F001B	F001C



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 4 th position (only for W012 spool)			
F013A F013B F013C	3 positions spring-centred spool prearrangement dual command			



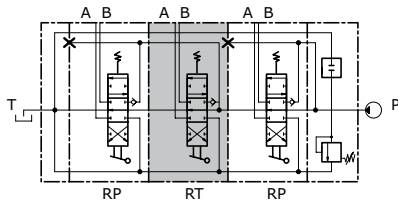
Work section identification

working section type	
RP G03	
RP U03	

Parallel
circuit
section

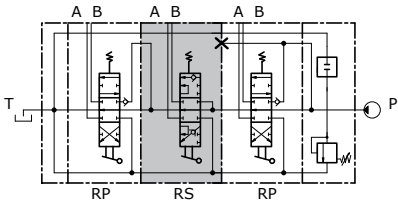
Parallel circuit

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 G03		Tandem (conventional) circuit section
RT U03		

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.

RS G03		Series circuit section
RS U03		

Series circuit

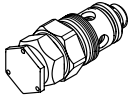
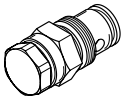
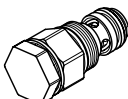
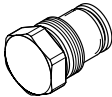
When the spool is operated it intercepts the switch gallery by diverting the flow of oil to service port A or B. The oil that flows back from the actuator is carried to the switch gallery thus making it available to the service ports downstream from the series section. The pressure drop downstream is added to the pressure drop of the section itself.

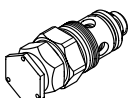
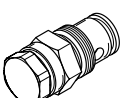
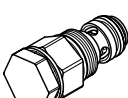
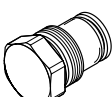
Compatibility table

SPOOL ACTION TYPE	SPOOL TYPE															
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W005B	W006A	W006B	W012A	W013A	W015A	W016A
H001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H002	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H004	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H006	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SPOOL RETURN ACTION TYPE	SPOOL TYPE															
	W001A	W001B	W002A	W002B	W003A	W003B	W004A	W004B	W005A	W005B	W006A	W006B	W012A	W013A	W015A	W016A
F001	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
F002	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
F003	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
F004	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
F005													•			
F013	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•



Auxiliary valve identification

code	description	schema	configuration	setting range (bar)			
				type	at full flow	type	at min. flow
01PA	Antishock valve (port A)			A	20 / 100	A	10-A / 80-A
				B	101 / 220	B	81-A / 180-A
				C	221 / 350	C	181-A / 350-A
02PA	Anticavitation valve (port A)						
03PA	Combined valve (port A)			A	20 / 60	A	10-A / 40-A
				B	61 / 100	B	41-A / 80-A
				C	101 / 220	C	81-A / 180-A
				D	221 / 350	D	181-A / 350-A
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 A)			A	20 / 100	A	10-A / 80-A
				B	101 / 220	B	81-A / 180-A
				C	221 / 350	C	181-A / 350-A
02PB	Anticavitation valve (port A)						
03PB	Combined valve (port A)			A	20 / 60	A	10-A / 40-A
				B	61 / 100	B	41-A / 80-A
				C	101 / 220	C	81-A / 180-A
				D	221 / 350	D	181-A / 350-A
05PB	Prearrangement for auxiliary valve (port A)						

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 combined valve:

01PA (120) = setting at full flow

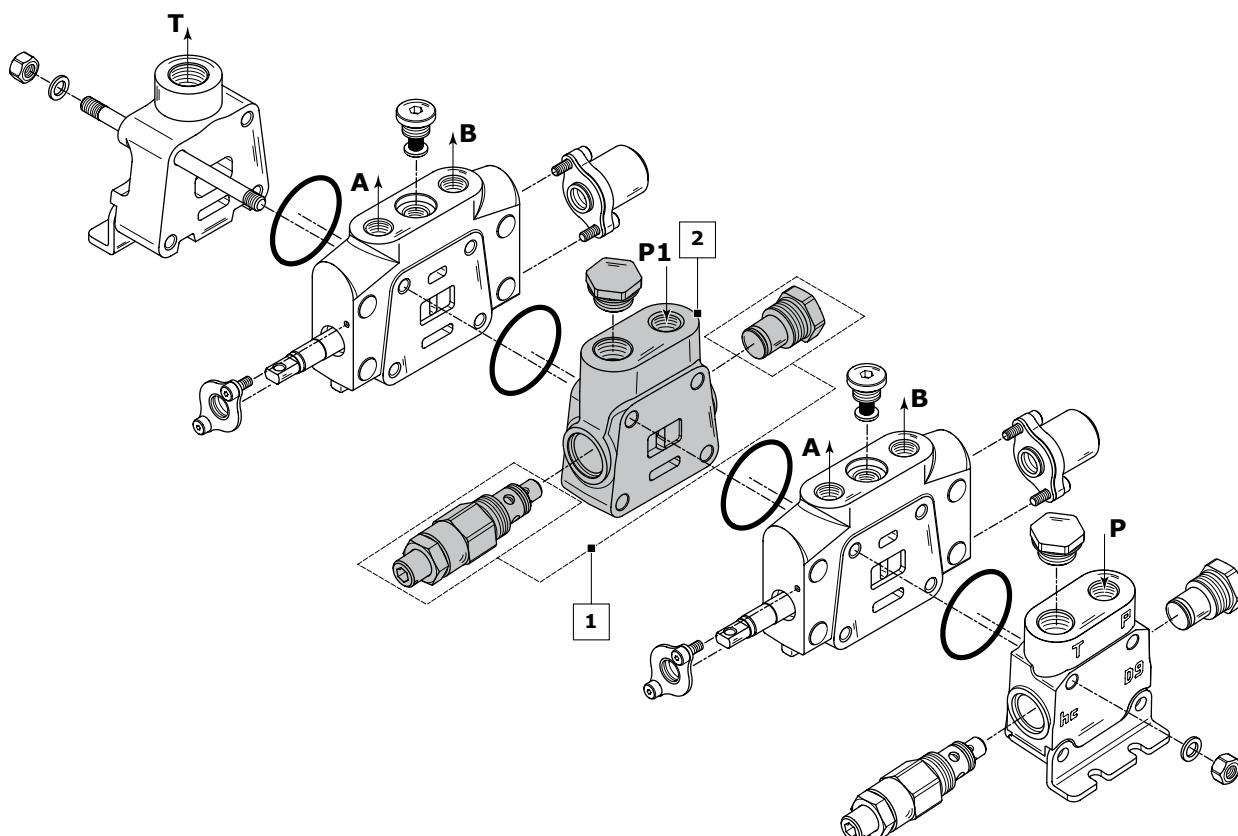
01PA (120-A) = setting at min. flow



INTERMEDIATE INLET SECTION

Order example

	BE	001	150	A G04
	inlet side			
1.	009	valve arrangement		
	150	setting (bar); when ordering a main relief valve it is necessary to specify setting		
2.	A G03	inlet position and available thread type		



Rif.	Code	Description	Page
-	BE BV*	Intermediate inlet section Intermediate inlet section with pressure relief valve	21
1	001 019	Direct acting pressure relief valve without valves	
2	A G03 A U03	Upper inlet (thread G 3/8) Upper inlet (thread 3/4"-16 UNF)	22

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		
BE		

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.

BV		
-----------	--	--

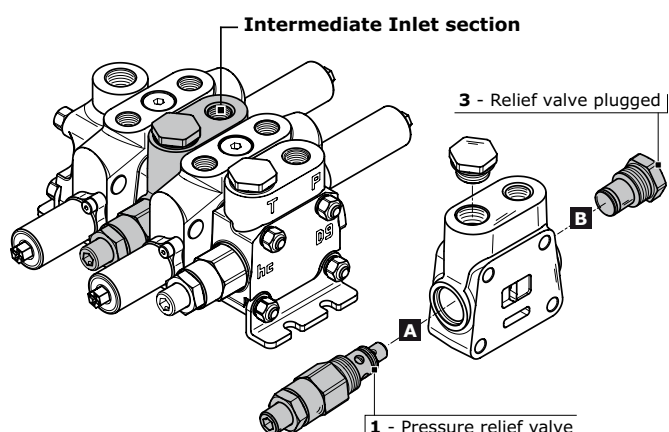
Intermediate inlet section with pressure relief valve

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
1			Direct acting pressure relief valve	11			Plug with pressure-gauge connection
3			Relief valve plugged				

Valve arrangement on intermediate inlet section



Combination valve example: 001 = 1A - 3B

- 001** Combination valve
1A 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.

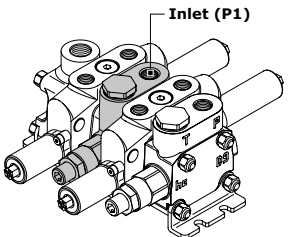
- (A) = spool action side
 (B) = spool return action side

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



AVAILABLE COMBINATIONS ON INLET SECTION		Valve type on port B		
				
Valve type on port A		1		
		3		
		11		
	1		001	008
	3	017	019	027
	11	084	086	

Inlet position and available thread type

Inlet position and thread available	
A G03	 Inlet (P1) Upper inlet (P1)
A U03	

Complete configuration samples for D9/2 with intermediate inlet section (BE)

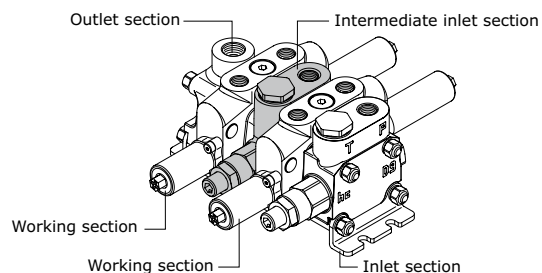
IR 001 150 A G03..... Right inlet section

W001A H006 RP G03 Working section

BE 001 120 A G03.....Intermediate inlet section

W001A H006 RP G03 Working section

TJ A G04 Outlet section



Complete configuration samples for D9/2 with intermediate inlet section (BV)

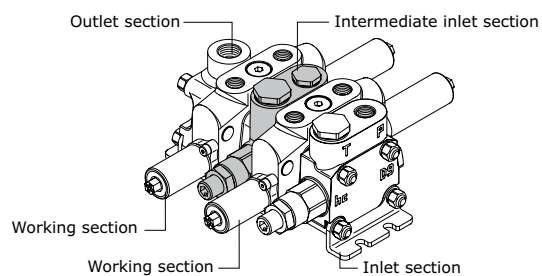
IR 001 150 A G03..... Right inlet section

W001A H006 RP G03 Working section

BV 009 120Intermediate inlet section

W001A H006 RP G03 Working section

TJ A G04 Outlet section

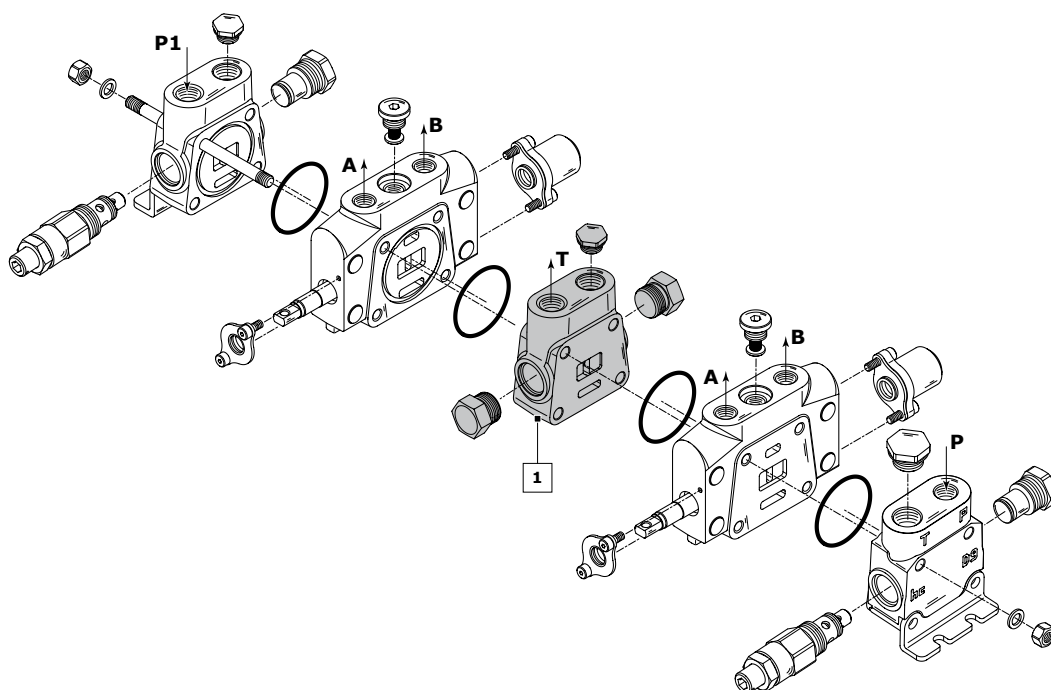




INTERMEDIATE OUTLET SECTION

Order example

	BF	A G04
BF	intermediate outlet type	
1. A G04	outlet position and available thread type	



Rif.	Code	Type	Description	Page
-	BF		Intermediate outlet section with single tank return	23
-	BG		Intermediate outlet section with two tank returns	
1	A G04	for BF	Upper outlet (thread G 1/2)	24
	J G04	for BG	Upper outlet HPCO - front side A and rear side B to T (thread G 1/2)	

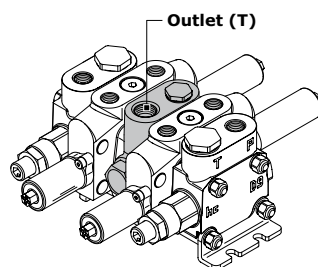
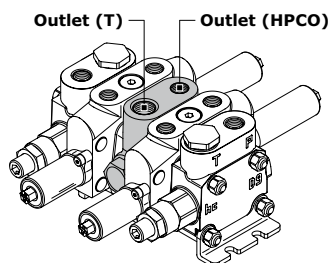
Intermediate outlet section classifications

intermediate outlet type		
BF		Intermediate outlet section with single tank return

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.

BG		Intermediate outlet section with two tank returns
-----------	--	--

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 position and available thread type (for BF intermediate)****Outlet combination and thread available****A G04**Upper
outlet (T)**Outlet position and available thread type (for BG intermediate)****Inlet combination and thread available****W G04**HPCO
upper intermediate
outlet section
T (TANK) upper
intermediate
outlet section**Complete configuration samples for D9/2 with intermediate outlet section (BF)**

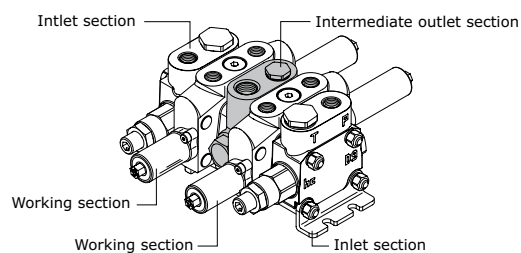
IR 001 150 A G03..... Right inlet section

W001A H006 RP G03 Working section

BF A G04Intermediate outlet section

W001A H006 RP G03 Working section

IL 001 150 A G03 Left inlet section

**Complete configuration samples for D9/2 with intermediate outlet section (BG)**

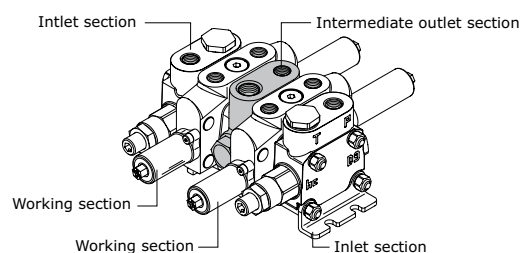
IR 001 150 A G03..... Right inlet section

W001A H006 RP G03 Working section

BG W G04Intermediate outlet section

W001A H006 RP G03 Working section

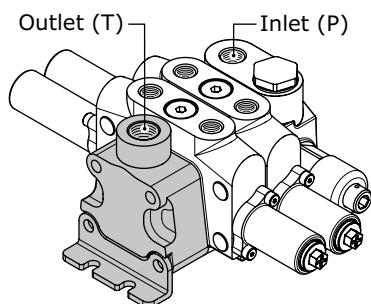
IL 001 150 A G03 Left inlet section





OUTLET SECTION (VERSION 1 OUTLET)

Order example

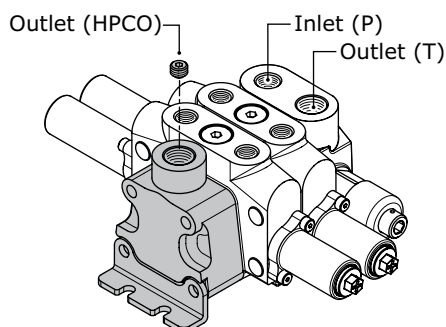


- | | TJ | A G04 |
|----------|---|-------|
| 1. TJ | outlet section type | |
| 2. A G04 | outlet position and available thread type | |

Rif.	Code	Description	Page
1	TJ	Outlet section with single return (T) right-side inlet (P)	
	TK	Outlet section with single return (T) left-side inlet (P)	
2	A G04	Upper outlet (thread G 1/2)	26
	A U04	Upper outlet (thread 7/8" - 14 UNF)	
	E G04	Upper outlet (inlet-outlet) (thread G 1/2)	
	E U04	Upper outlet (inlet-outlet) (thread 7/8" - 14 UNF)	

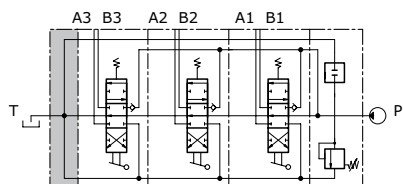
OUTLET SECTION (HPCO VERSION OUTLET)

Order example - HPCO version Outlet

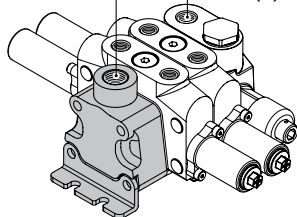
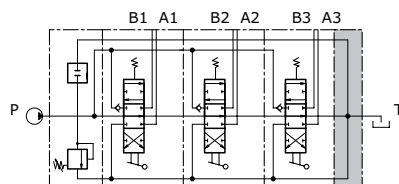


- | | TM | W G04 |
|----------|---|-------|
| 1. TM | outlet section type | |
| 2. W G04 | outlet position and available thread type | |

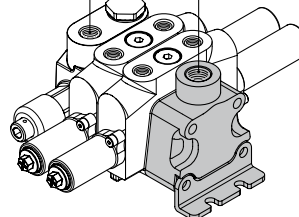
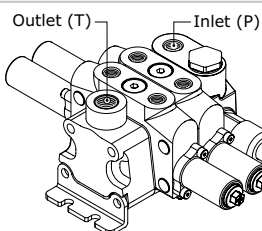
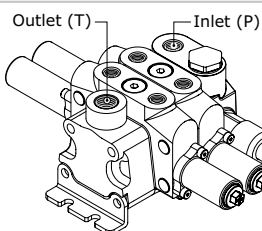
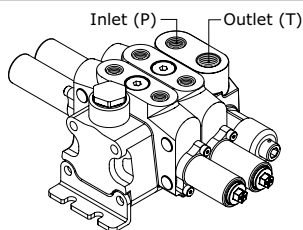
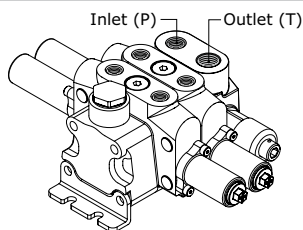
Rif.	Code	Description	Page
1	TM	Outlet section with two return (T-HPCO) right-side inlet (P)	27
	TN	Outlet section with two return (T-HPCO) left-side inlet (P)	
2	W G04	HPCO upper inlet outlet - T (tank) upper outlet section (thread G 1/2)	

**Outlet with single tank classification****outlet identification****TJ**Outlet section with single return (T)
right-side inlet (P)

Outlet (T) Inlet (P)

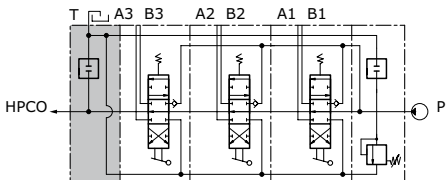
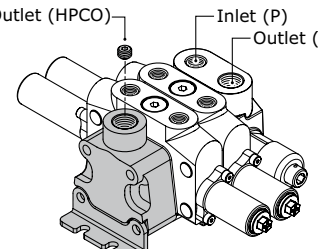
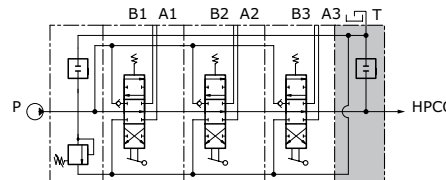
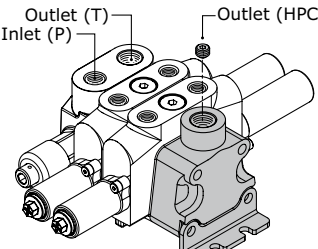
**TK**Outlet section with single return (T)
left-side inlet (P)

Inlet (P) Outlet (T)

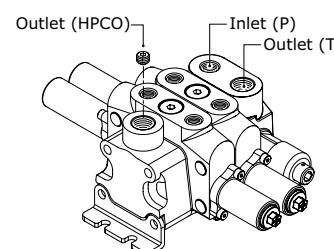
**Outlet position****outlet combination and thread available****A G04**Upper outlet
(thread G 1/2)**A U04**Upper outlet
(thread 7/8" - 14 UNF)**E G04**Upper outlet
(inlet - outlet)
(thread G 1/2)**E U04**Upper outlet
(inlet - outlet)
(thread 7/8" - 14 UNF)**NOTE: code "E" on outlet section obliges to choice "E" on inlet section.**



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)  

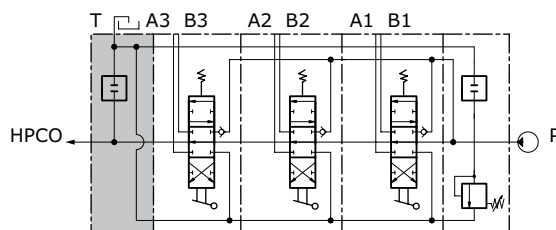
Outlet position

outlet combination and thread available	
W G04	 HPCO upper inlet outlet T (TANK) upper outlet section (thread G 1/2)
W U04	HPCO upper inlet outlet T (TANK) upper outlet section (thread 7/8" - 14 UNF)

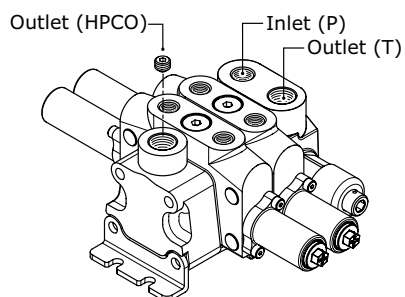
NOTE: code "W" on outlet section obliges to choice "E" on inlet section.

**Carry-over connection (HPCO)**

This option, available on all D9, 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.



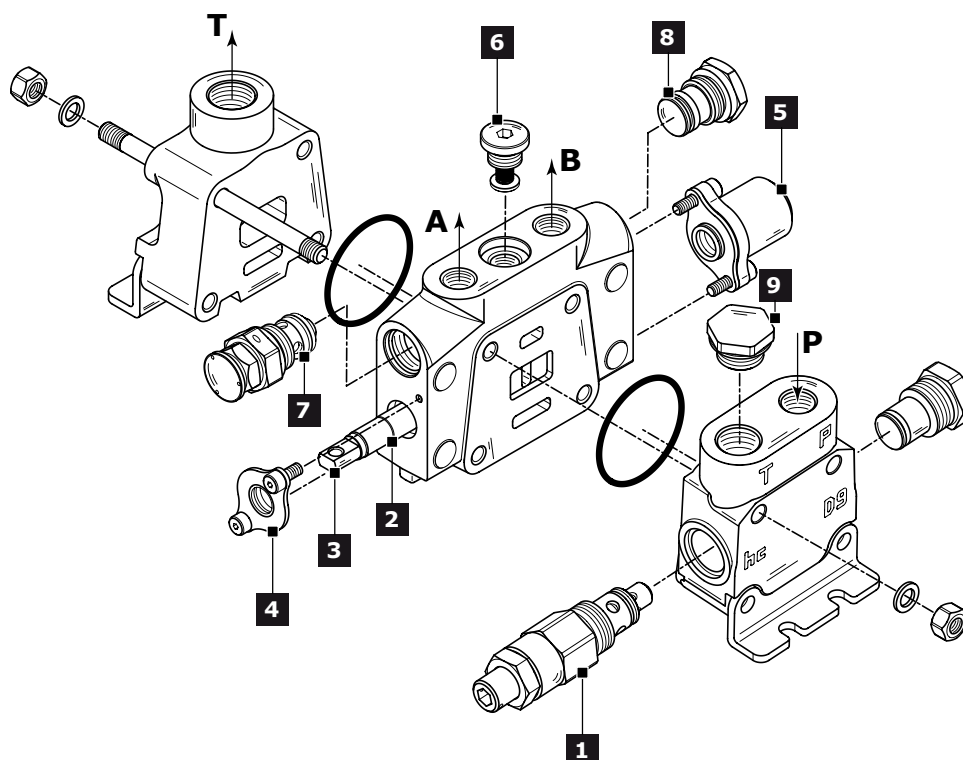
It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



code (HPCO Plug identification)	description	q.ty
413010203	conic plug G 1/4 x 13	1



D9 SPARE PARTS LIST



Ref.	Description	Order code	Q.ty	Code	Note
1	Direct acting pressure relief valve (*)	84642	1		Setting: 100 bar
		29005			Setting: 200 bar
		38339			Setting: 300 bar
	Relief valve plugged	430146001	1	-	
	External piloted valve	915044604	1		
	Solenoid dump valve (12 vdc) (**)	915044601	1		
2	Solenoid dump valve (24 vdc) (**)	915044602	1		
	Plug with pressure-gauge connection	430146002	1		
	3 positions double-acting spool	421246059	1	W001A	
		421246055		W001B	
	3 positions double-acting A and B to tank spool	421246060		W002A	
	3 positions single-acting on A	421246005		W005A	
	3 positions single-acting on B	421246064		W006A	
	4 positions double-acting with float in the 4 th pos.	421246065		W012A	
3	Spool end kit	422501119	1		only for protected lever
		422501132			only for control without lever
4	Protected lever	320346001	1	H001 = H002	
		320346002			only for W012 spool
	Control without lever	320346003	1	H004	
		320346004			only for W012 spool
	Hydraulic actuation with side ports	320546001	2	H006	BSP ports
		320546035	2		UNF ports
		320546004	2		BSP ports for W012 spool
5	3 position spring centres spool	320746002	1	F001A	
	Detent in A and B	320846001		F002A	
	Detent in A	320846002		F003A	
	Detent in B	320846003		F004A	
	Detent in 4 th position	320846004		F005A	only for W012 spool
	Prearrangement dual command	320746005		F013A	



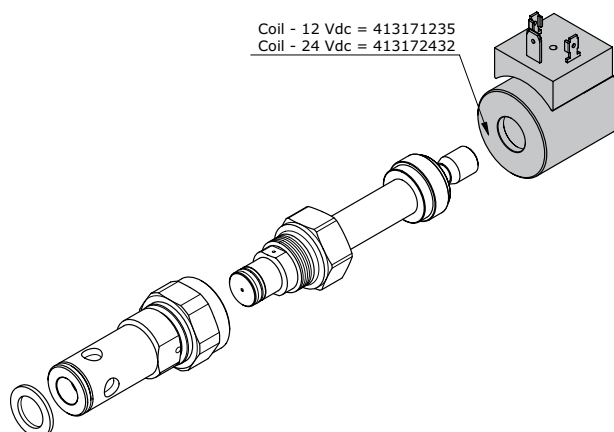
Ref.	Description	Order code	Q.ty	Code	Note
6	Check valve on the work section	320246001	1	-	only for RP and RT section
7	Antishock valve on port A	4044	1	01 PA	Setting: 100 bar
		6891			Setting: 200 bar
		9778			Setting: 300 bar
	Anticavitation valve on port A	915083001		02 PA	
	Combined valve on port A	23504		03 PA	Setting: 100 bar
		14779			Setting: 200 bar
		38346			Setting: 300 bar
	Prearrangement for auxiliary valve on port A	430404001		05 PA	
8	Antishock valve on port B	7478	1	01 PB	Setting: 100 bar
		2695			Setting: 200 bar
		2827			Setting: 300 bar
	Anticavitation valve on port B	915080401		02 PB	
	Combined valve on port B	23504		03 PB	Setting: 100 bar
		14779			Setting: 200 bar
		38346			Setting: 300 bar
	Prearrangement for auxiliary valve on port B	430404001		05 PB	
9	Plug kit (G 3/8)	430000018	1	G03	
	Plug kit (G 1/2)	430000019		G04	
	Plug kit (3/4"-16 UNF)	300001006		U03	
	Plug kit (7/8"-14 UNF)	300004003		U04	



Note

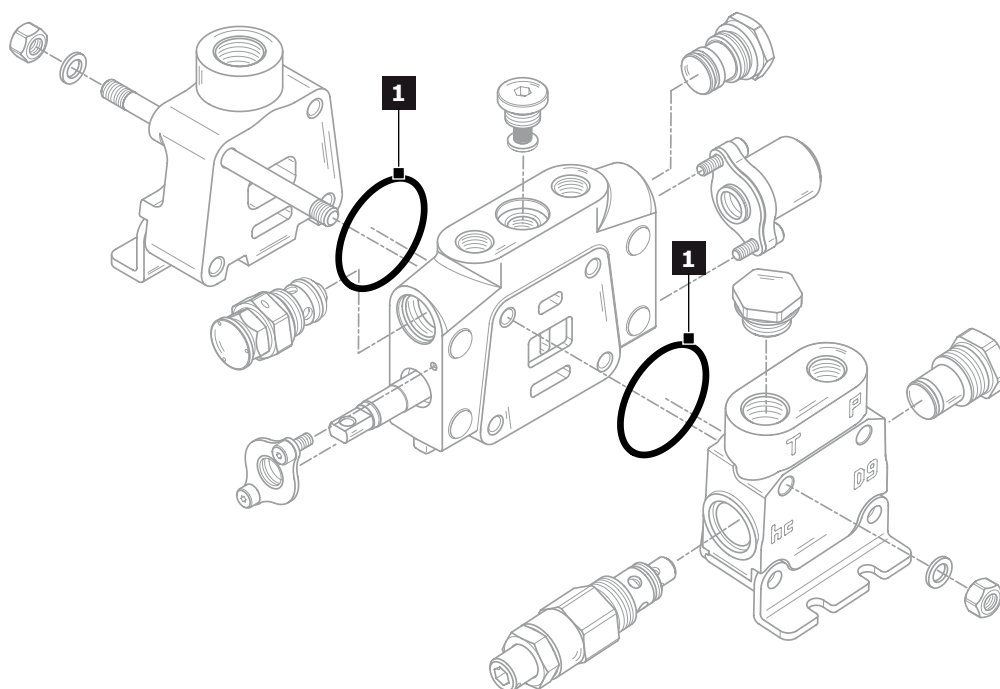
(*) = for different settings please contact our Sales Dpt.

(**) = electric dump valve coil can be ordered separately as spare part: (see drawing "A")
 Ordering code Coil 12 vdc: **413171235**
 Ordering code Coil 24 vdc: **413172432**





Gasket kit



INLET AND WORK SECTION

Rif.	ORDER CODE	DESCRIPTION	Q.ty
1	412010634	O.R. 70SH 50,47 x 2,62 (2-136)	1
Complete Gasket kit: order code - 350946001			



INSTALLATION AND MAINTENANCE

Guidelines

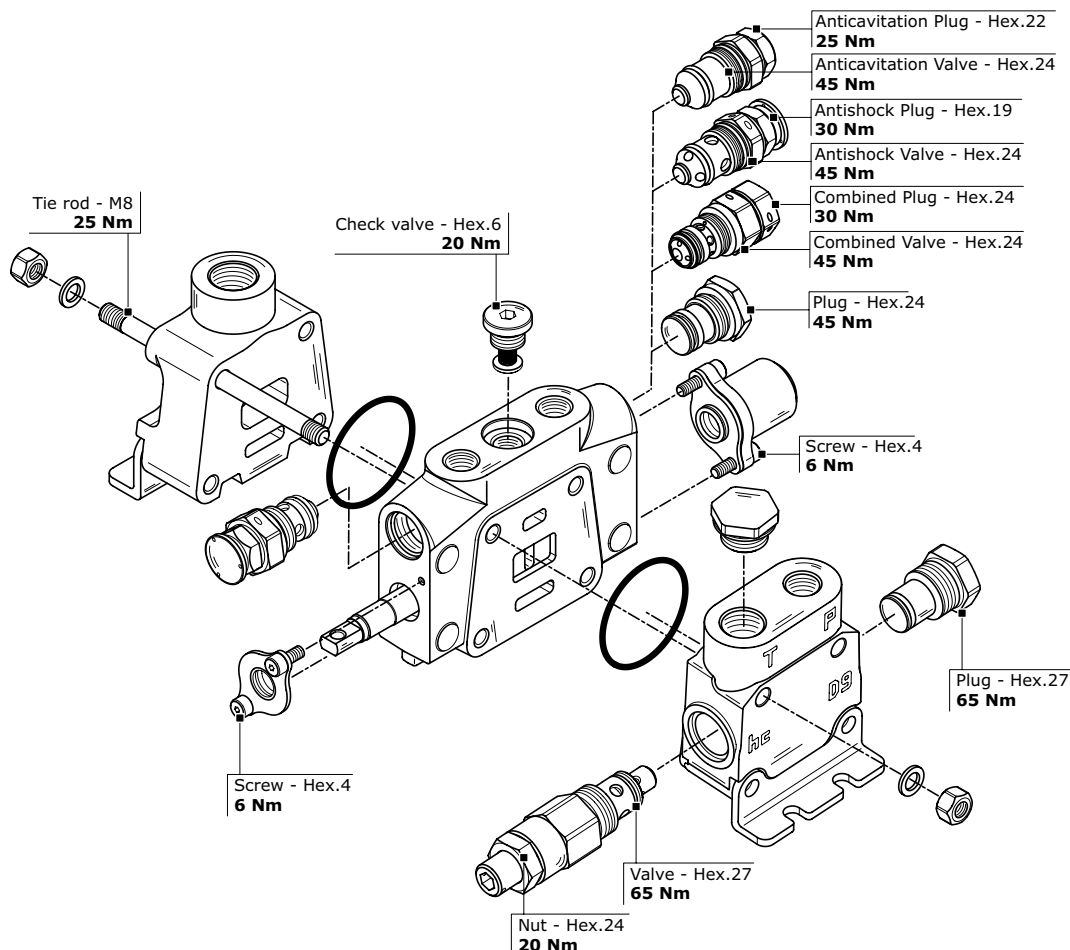
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock 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 3/8	G 3/8	G 3/8
with rubber sealing (DIN 3869)	40	40	40
with copper or steel and rubber washer	40	40	40
BSP (ISO - 228)	G 1/2	G 1/2	G 1/2
with rubber sealing (DIN 3869)	70	70	70
with copper or steel and rubber washer	70	70	70
UN-UNF (ISO - 725)	3/4" - 16 UNF	3/4" - 16 UNF	3/4" - 16 UNF
with O.R.	40	40	40
UN-UNF (ISO - 725)	7/8" - 14 UNF	7/8" - 14 UNF	7/8" - 14 UNF
with O.R.	90	90	90

General clamping torque

The following table provides the main tightening torques of the distributor D9:



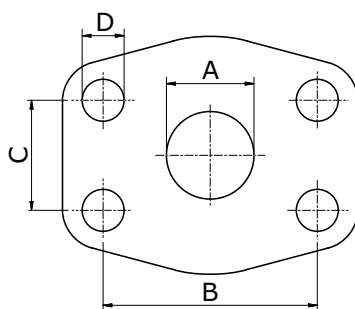
**Dimensions - Thread codes**

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

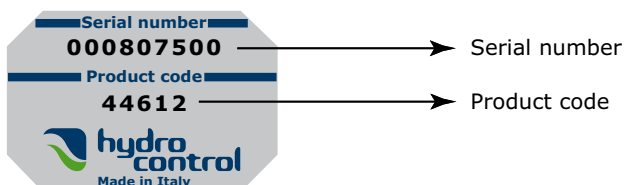
SAE / 6000 FLANGE (ISO 6162-2)								
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1 1/4" (MA)	1 1/4" (UNC)	1 1/2" (MA)	1 1/2" (UNC)
Code	S33	S34	S35	S36	S37	S38	S39	S40
A	19	19	25	25	32	32	38	38
B	50,8	50,8	57,2	57,2	66,6	66,6	79,3	79,3
C	23,8	23,8	27,8	27,8	31,8	31,8	36,5	36,5
D	M10	3/8-16	M12	7/16-14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