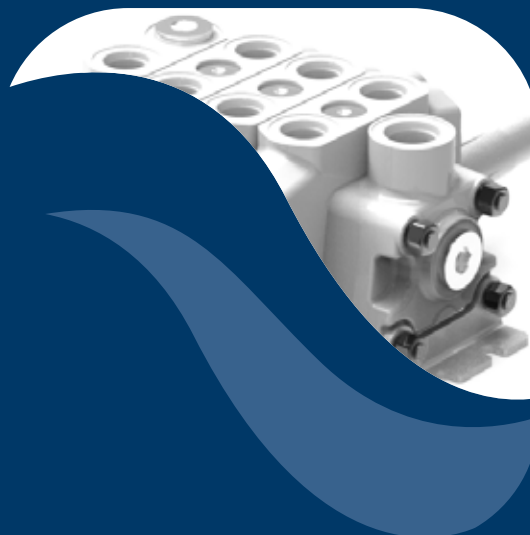


DVS10

SECTIONAL VALVE



TECHNICAL CATALOGUE

A member of



 **walvoil**
FLUID POWER E|MOTION

1st edition DVS10.00

*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.*

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



Applications

DVS10 is a new family in the broad range of Hydrocontrol sectional valves.

Specifically designed for mini skid loaders and mini dumper applications, DVS10 can include different components normally assembled on the machine.

The Valve has very exact control characteristics, smooth and precise in operation, with compact light weight design. Numerous configurations and solutions are possible.

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						•		•	•	•	•



GENERAL INDEX

4	General specifications Standard working conditions Fluid options
5	Order example Standard thread Tie-rod kit classification Painting
7	Dimensions
8	Typical curves Pressure drop (P - T) Pressure drop (P - A/B) Pressure drop (A/B - T) Direct relief valve curve Antishock valve curve Combined valve curve
10	Inlet Section Order example Inlet side classification Valve identification Valve arrangement Inlet position and available thread type
13	Working section Order example Spool identification Spool actuation classification Spool return action classification - Spring load values Work section identification Auxiliary valves identification
24	Outlet section (version 1 outlet) Order example Outlet section (HPCO version outlet) Order example - HPCO version outlet Carry-over connection (HPCO)
28	DVS10 Spare parts list Gasket kits
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33	General conditions and patents



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	$\beta_{10} > 75$ (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

DVS10/1: IR 001 150 A U03 W001A H001 F001A RP U03 01 PA 100 05 PB TJ A U04

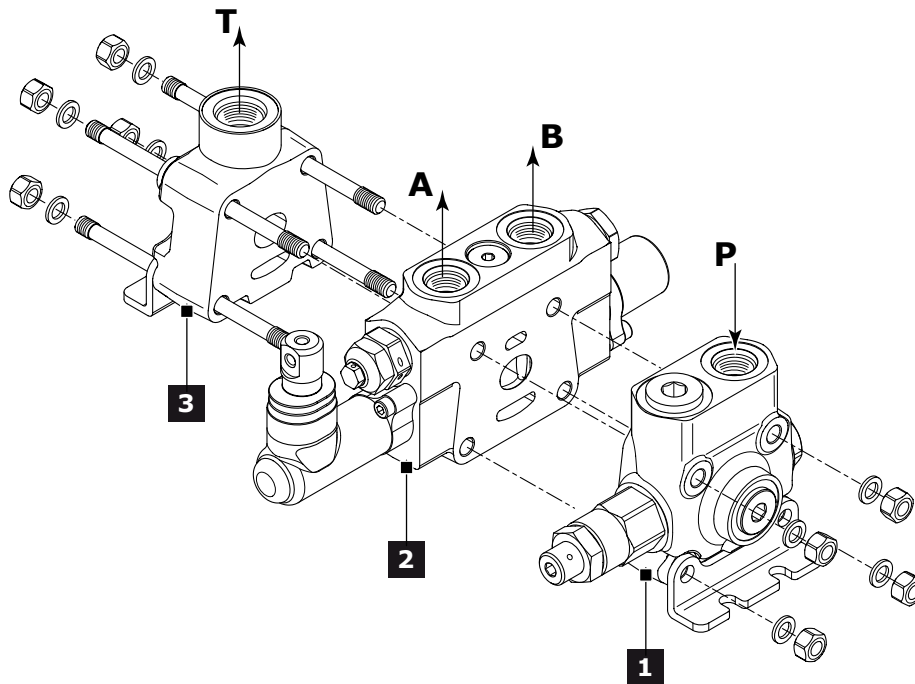
TYPE:
 DVS10: product type
 /1: working section number

- 1) INLET ARRANGEMENT: pag. 10**
IR 001 inlet side and valve type
150 setting (bar)
A U03 inlet position and available thread type

- 2) WORK SECTION ARRANGEMENT: pag. 13**
W001A spool type
H001 spool actuation type
F001A spool return action type
RP U03 type and thread section
01 PA 100 auxiliary valve (port A)
05 PB auxiliary valve (port B)

- 3) OUTLET ARRANGEMENT: pag. 24**
TJ outlet type
A U04 outlet position and available thread type

Ordering row 2 must be repeated for every work section



Standard thread

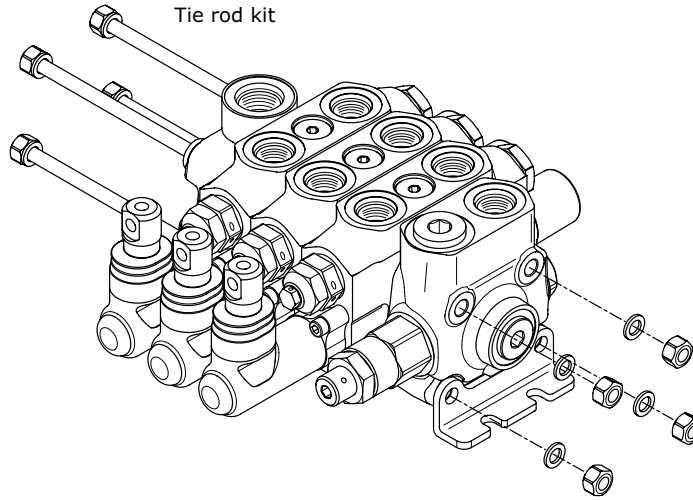
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections; for ordering code refer to table on page 32.

Ports	BSP (ISO - 228)	Code	UN-UNF (ISO - 725)	Code
Inlet Port (P)	G 3/8 - G 1/2	G03 - G04	3/4" - 16 UNF / 7/8" - 14 UNF	U03 - U04
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	
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. DVSD10 requires 4 tie-rod kits.



Tie rod kit	Order Code	Lenght (mm)	Clamping Torque (Nm)	Quantity
DVS10/1	300166001	135		
DVS10/2	300166002	170		
DVS10/3	300166003	205		
DVS10/4	300166004	240		
DVS10/5	300166005	275		
DVS10/6	300166006	310		
DVS10/7	300166007	345		
DVS10/8	300166008	380		
DVS10/9	300166009	415		
DVS10/10	300166010	450		
DVS10/11	300166011	485		
DVS10/12	300166012	520		
			35	4

Painting

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

Order example of DVS10/1 painted:

DVS10/1
 IR 001 150 A U03
 W001A H001 F001A RP U03 01 PA 100 05 PB
 TJ A U04
P006/1 N10

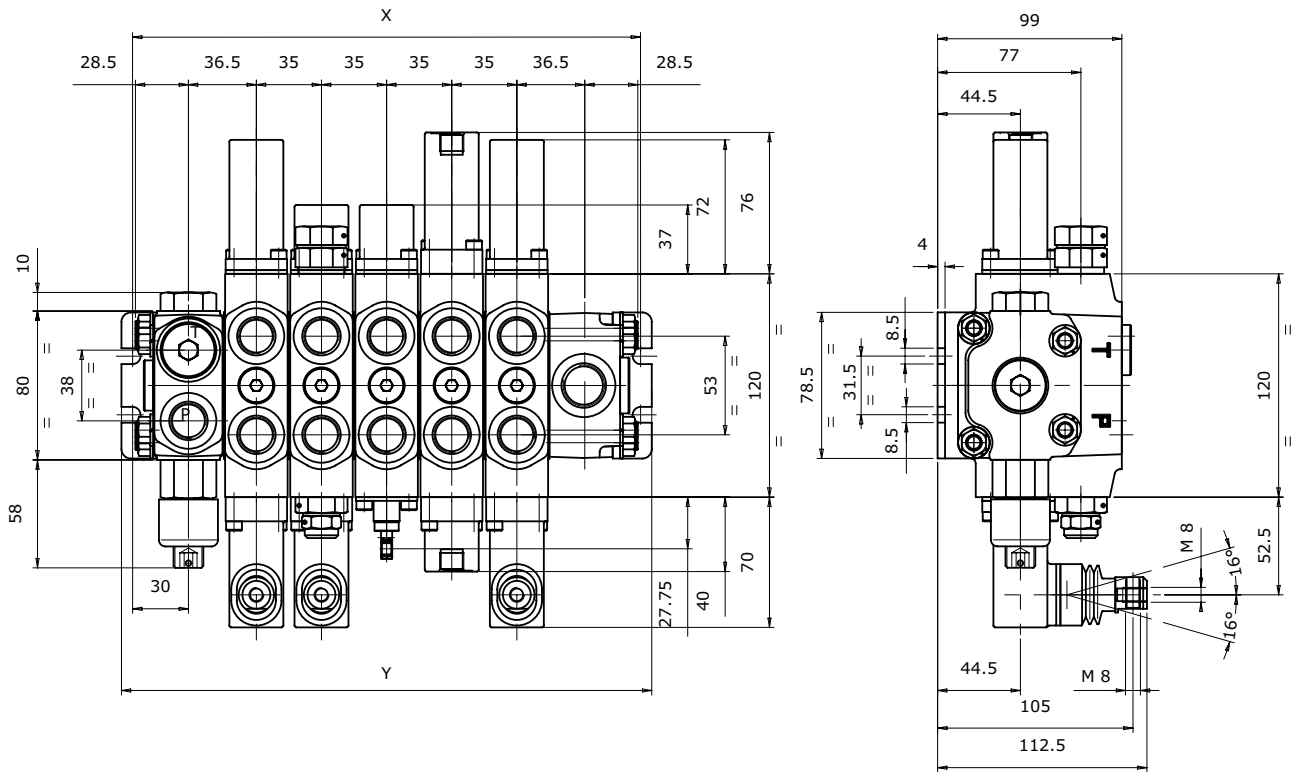
The painting is indicated with the following value:

P006 - /1 - N10





DIMENSIONS



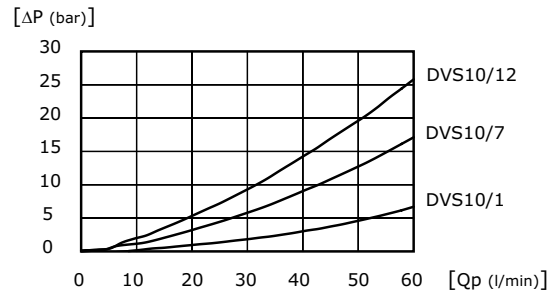
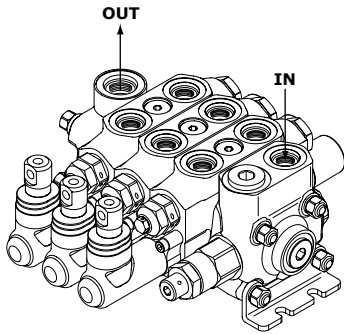
type	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	133	168	203	238	273	308	343	378	413	448	483	518
Y (mm)	145	180	215	250	285	320	355	390	425	460	495	530
Weights (kg)	6	8.5	11	13.5	16	18.5	21	23.5	26	28.5	31	33.5



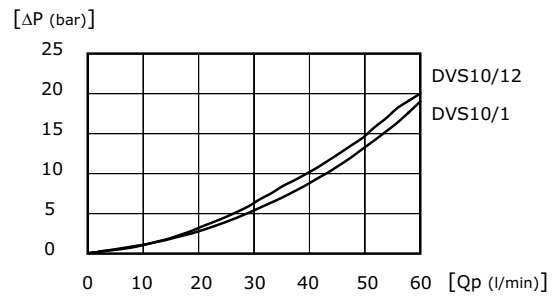
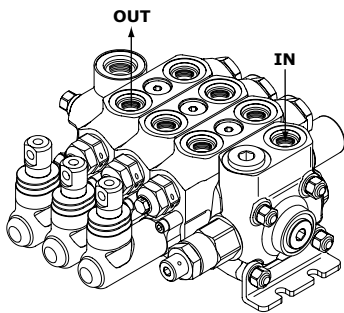
TYPICAL CURVES

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

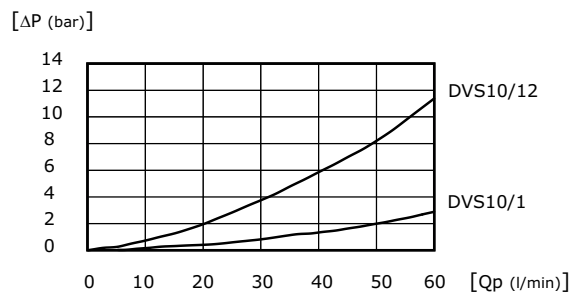
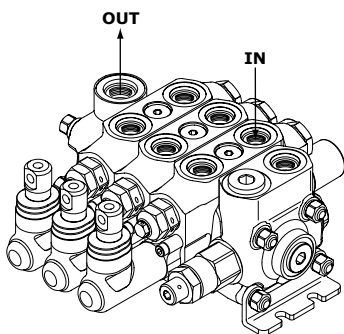
Pressure drop (P - T)



Pressure drop (P - A/B)



Pressure drop (A/B - T)



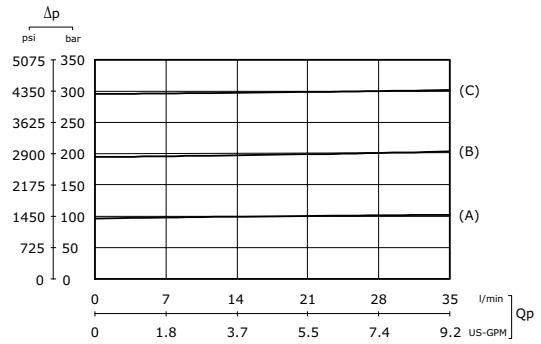


TYPICAL CURVES

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

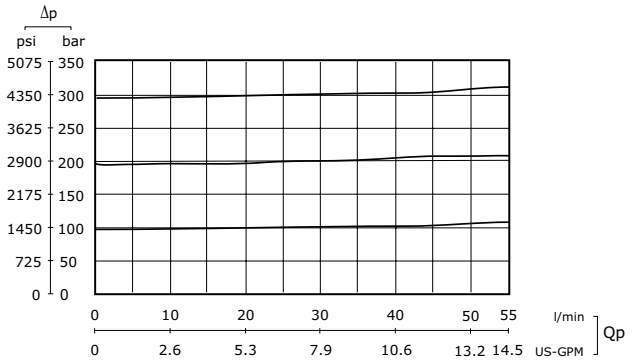
Direct relief valve curve

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



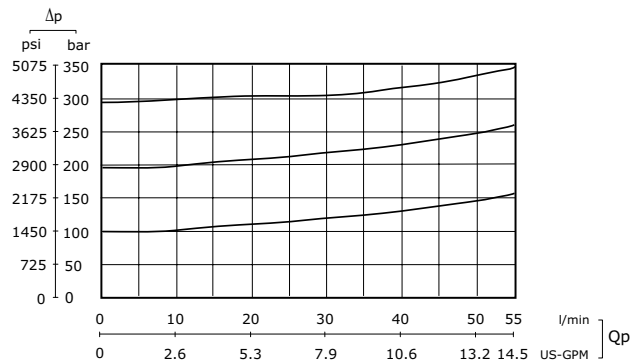
Antishock valve curve

type	Setting ranges	
	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	
	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



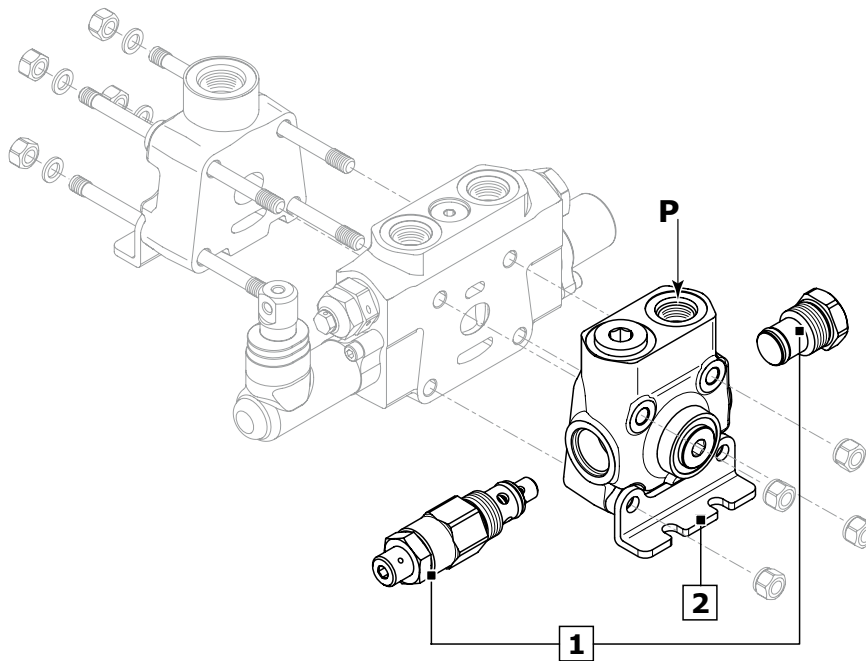


INLET SECTION

Order example

IR	001	150	A U03
-----------	------------	------------	--------------

- 1. IR** inlet side classification _____
- 001** valve arrangement _____
- 150** setting (bar) _____
- 2. A U03** 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	11
1	001 019	Direct acting pressure relief valve without valves	11
2	A G03 C G03 E G03 A U03 C U03 E U03	Upper inlet (thread G 3/8) Central side inlet (thread G 3/8) Upper inlet (inlet-outlet) (thread G 3/8) Upper inlet (thread 3/4" - 16 UNF) Central side inlet (thread 3/4" - 16 UNF) Upper inlet (inlet-outlet) (thread 3/4" - 16 UNF)	12

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



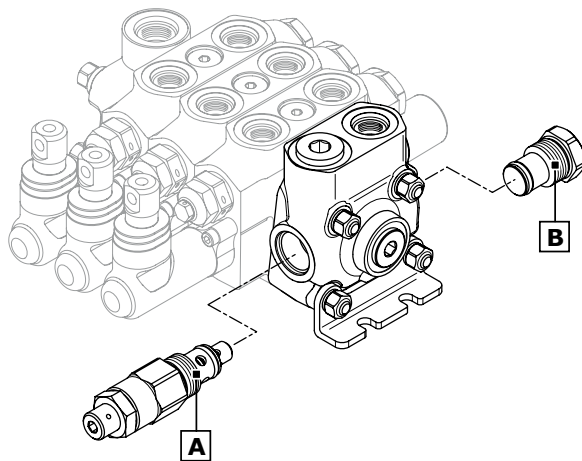
Inlet side classifications

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

Valve identification

type	schema	layout	description	type	schema	layout	description
1			Direct acting pressure relief valve	3			Relief valve plugged

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.

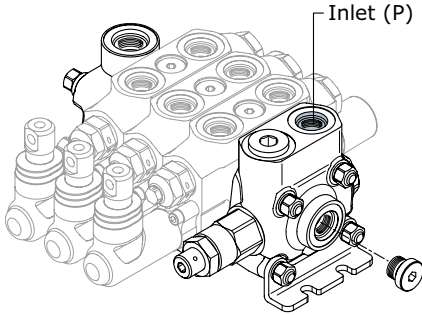
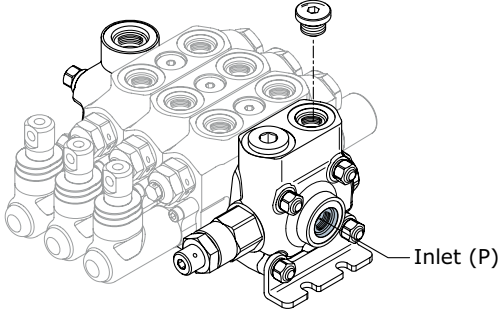
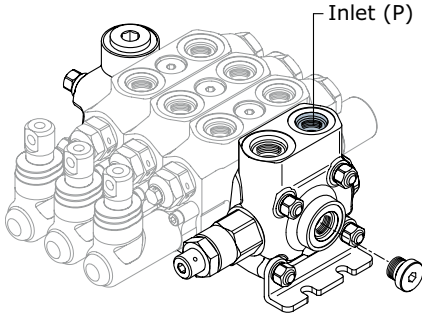
- (A) = spool action side
- (B) = spool return action side

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

		port B	
		1	3
port A		1	001
		3	017



Inlet position and available thread type

Inlet combination and thread available		
A G04		Upper inlet (P)
A U03		
A U04		
C G04		Central side inlet (P)
C U03		
C U04		
E G04		Upper inlet (inlet - outlet)
E U03		
E U04		

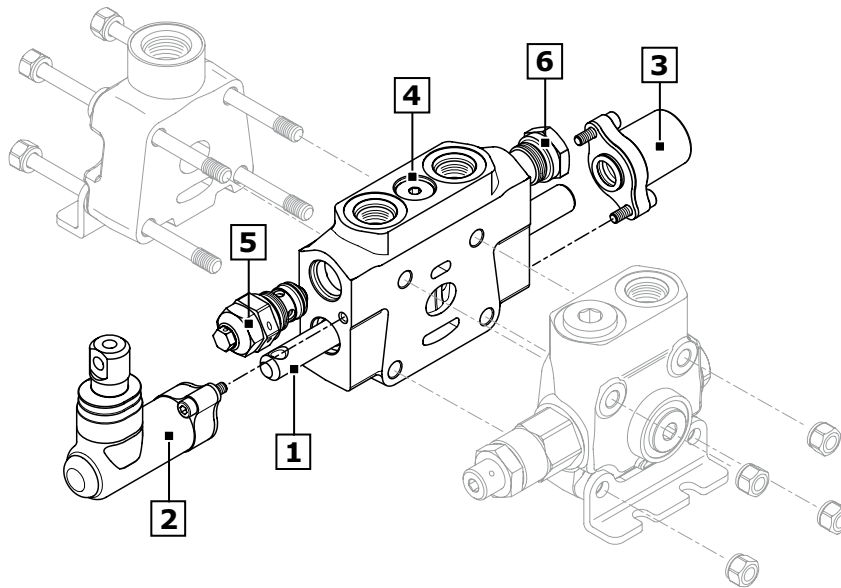
NOTE: code "E" on inlet section obliges to choice "E", "W" or "Y" on outlet section.



WORKING SECTION

Order example:

	W001A	H001	F001A	RP U03	01 PA 100	05 PB
1. W001A	spool type					
2. H001	spool actuation type					
3. F001A	spool return action type					
4. RP U03	section and thread type					
5. 01 PA 100	auxiliary valve (port A - handle side)					
6. 05 PB	auxiliary valve (port B - cap side)					



Rif.	Code	Description	Page
1	W001	3 positions double-acting	14
	W002	3 positions double-acting A-B to tank	
2	H001	Protected lever	16
	H005	hydraulic actuation	
3	F001A	3 positions spring-centred spool (spring A)	17
	F002A	3 positions spring-centred spool detent in A and B (spring A)	
4	RP G03	Parallel circuit (G 3/8)	22
	RP U03	Parallel circuit (3/4"-16 UNF)	
	RT G03	Parallel-Tandem circuit (G 3/8)	
	RT U03	Parallel-Tandem circuit (3/4"-16 UNF)	
5	01 PA 100	Antishock valve (port A)	23
	05 PA	Prearrangement for auxiliary valve (port A)	
6	01 PB 100	Antishock valve (port B)	23
	05 PB	Prearrangement for auxiliary valve (port B)	

NOTE: (*) Leave out the spool return action code when choosing H005.
 Sections designed to house auxiliary valve option require double choice on work ports A and B.
 Always indicate setting value when using antishock and combined valve: **01 PA (100) - 03 PA (120)**



Spool identification

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

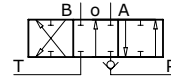
W001 spool schema 3 positions double-acting

A spool type standard spool

J10 restricted service ports restriction on diameter (0,10 mm in A and B)

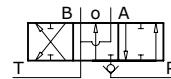
W001

3 positions double-acting



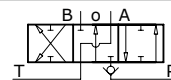
W002

3 positions double-acting A and B to tank



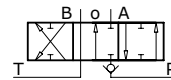
W003

3 positions double-acting A to tank B blocked



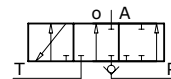
W004

3 positions double-acting A blocked B to tank



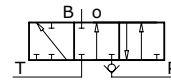
W005

3 positions single - acting on A



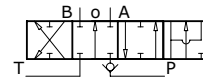
W006

3 positions single - acting on B



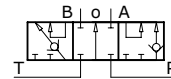
W012

4 positions double-acting with float in the 4th position



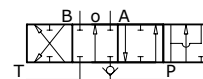
W015

3 positions double-acting series



W020

4 positions double-acting with float in the 4th position



NOTE:

There are two types of spools available with floating position:

- **FLOAT IN SPOOL (code W012)**
- **FLOAT OUT SPOOL (code W020)**

Is always necessary to specify the type of spools installed in the float function.

Further information are available in the "spool return action" section.

For spool W012 is necessary to apply detent kit number F005, or F017; for spool W020 is necessary to apply detent kit number F015, or F016. W012, W020 spools need a special machining on the valve body.

W015 spool need RS type body.



spools with restricted service ports				
code	circuit	restriction on diameter (mm)	section (mm ²)	hydraulic schema
J10	A-B IN T	0,10	2,66	
K10	A IN T	0,10	2,66	
Y10	B IN T	0,10	2,66	

spool type available (inlet flow)			
CODE	Q = 45 l/min	Q = 30 l/min	Q = 15 l/min
	A	B	E
W001	W001A	W001B	W001C
W002	W002A	W002B	W002C
W003	W003A	W003B	W003C
W004	W004A	W004B	W004C
W005	W005A	W005B	
W006	W006A	W006B	
W012	W012A	W012B	
W015	W015A		
W020	W020A	W020B	

Different spools are available on request.
 Please contact our Sales department for more information.



Spool actuation classification for manual control

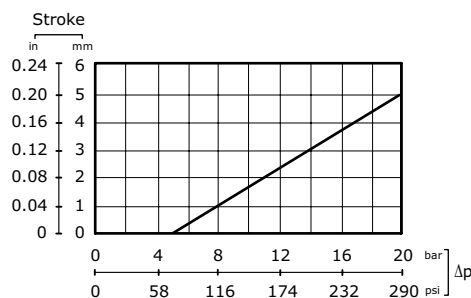
code	description	dimensions	configuration
H001	Protected lever		
H002	Protected lever rotated 180°		
H004	Control without lever (tang)		
H030	Control without lever (clevis)		

Spool actuation classification for Hydraulic control

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

Hydraulic pilot control curve

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

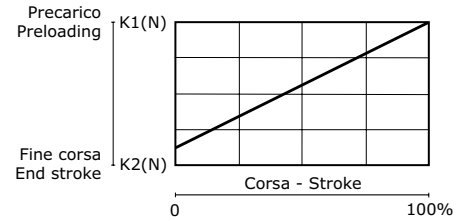




Spool return action classification - Springs load values

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

Spring type			
Code	A (standard spring)	B (soft spring)	C (heavy spring)
Preloading	98 N	71 N	120 N
End of stroke	125 N	102 N	150 N
Spool return action identification example			
Code	F001A	F001B	F001C



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			



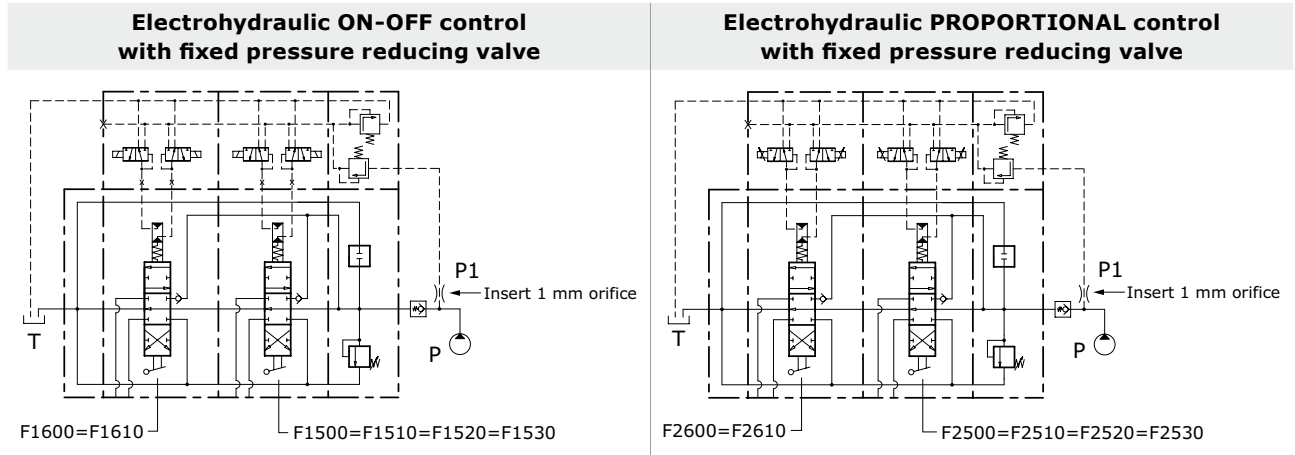
Detent kit classification

code	description	schema	dimensions	configuration
F005A F005B F005C	4 positions spring-centred spool detent in 4 th pos. (FLOAT IN) (only for W012 spool)			
F017A F017B F017C	4 positions spring-centred spool with feel in 4 th pos. (FLOAT IN) (only for W012 spool)			
F015A F015B F015C	4 positions spring-centred spool detent in 4 th pos. (FLOAT OUT) (only for W020 spool)			
F016A F016B F016C	4 positions spring-centred spool with feel in 4 th pos. (FLOAT OUT) (only for W020 spool)			



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



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

Nominal voltage (V)	regulation currents		
	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

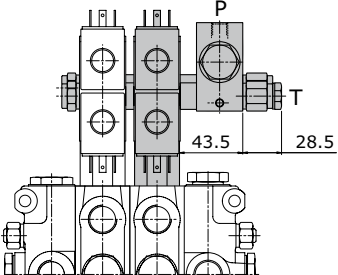
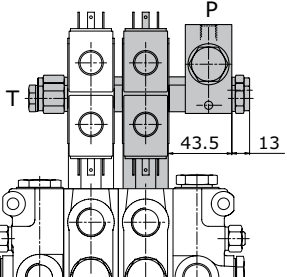
Electrohydraulic control classification

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 orifice 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)	 <p>Port BSP (P - T) = G 1/4 Port UNF (P - T) = 9/16"18 UNF</p>
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)	 <p>Port BSP (P - T) = G 1/4 Port UNF (P - T) = 9/16"18 UNF</p>
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)	

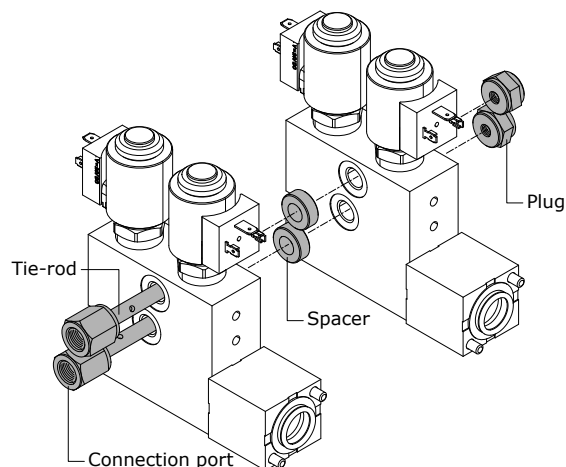
Control tie rod assembly

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

NOTE: the control tie rod kit has always to be ordered separately.
Reducing valve, combined with electrohydraulic control kit has to be calculated as a normal working section.

ORDER EXAMPLE:

Complete valves with 3 sections F1600 requires a complete tie-rod kit /3.
Complete valves with 2 sections F1600 and 1 section with F1500 (reducing valve) requires a complete tie-rod kit /4.



Order code fixed pressure reducing valve:

- 915000303** = reducing valve for BSP ports
- 915000312** = reducing valve for UNF ports

Order code for control tie rod (BSP):

- 320103001** = control tie rod /1
- 320103002** = control tie rod /2
- 320103003** = control tie rod /3
- 320103004** = control tie rod /4
- 320103005** = control tie rod /5
- 320103006** = control tie rod /6
- 320103007** = control tie rod /7
- 320103008** = control tie rod /8
- 320103009** = control tie rod /9

Order code for control tie rod (UNF):

- 320103026** = control tie rod /1
- 320103027** = control tie rod /2
- 320103028** = control tie rod /3
- 320103029** = control tie rod /4
- 320103030** = control tie rod /5
- 320103031** = control tie rod /6
- 320103032** = control tie rod /7
- 320103033** = control tie rod /8
- 320103034** = control tie rod /9



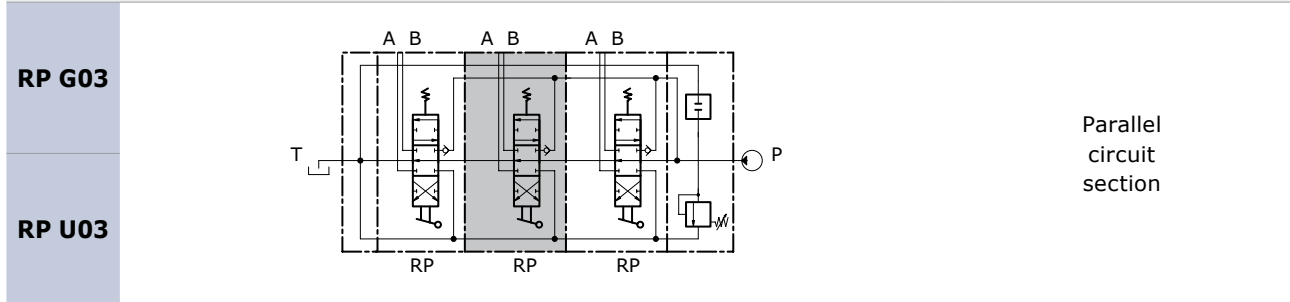
Compatibility table

SPOOL ACTION TYPE	SPOOL TYPE																					
	W001A	W001B	W001C	W002A	W002B	W002C	W003A	W003B	W003C	W004A	W004B	W004C	W005A	W005B	W006A	W006B	W012A	W012B	W015A	W020A	W020B	
H001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H002	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H004	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H005	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H030	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SPOOL RETURN ACTION TYPE	SPOOL TYPE																					
	W001A	W001B	W001C	W002A	W002B	W002C	W003A	W003B	W003C	W004A	W004B	W004C	W005A	W005B	W006A	W006B	W012A	W012B	W015A	W020A	W020B	
F001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•			
F002	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•			
F003	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•			
F004	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•			
F005																	•	•				
F015																				•	•	
F016																				•	•	
F017																	•	•				

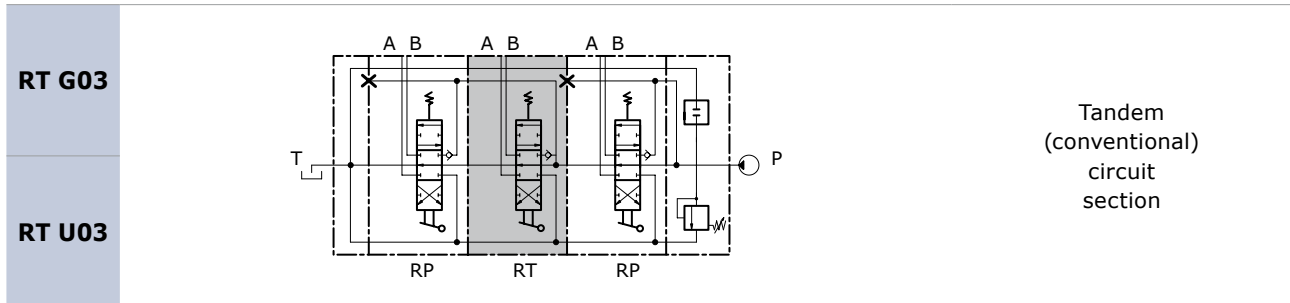


Work section identification

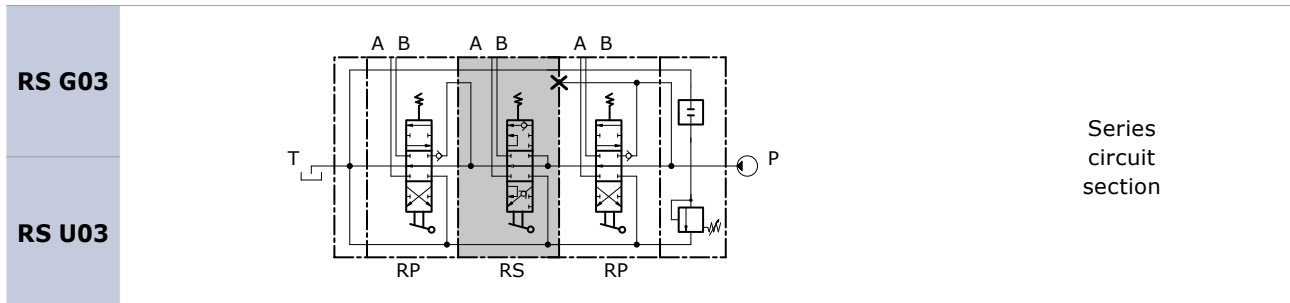
working section type



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.



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.



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.



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:

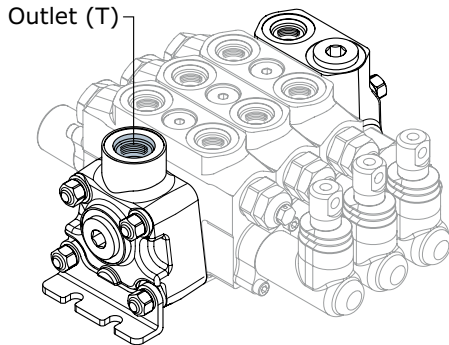
01PA (120) = setting at full flow

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



OUTLET SECTION (VERSION 1 OUTLET)

Order example



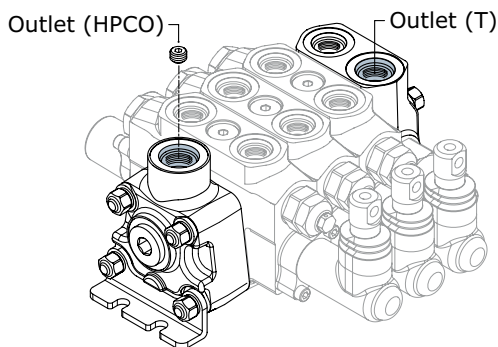
TJ | **A U04**

1. **TJ** outlet section type
2. **A U04** 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)	25
	C G04	Central outlet (thread G 1/2)	
	A U04	Upper outlet (thread 7/8" - 14 UNF)	
	C U04	Central outlet (thread 7/8" - 14 UNF)	

OUTLET SECTION (HPCO VERSION OUTLET)

Order example - HPCO version Outlet



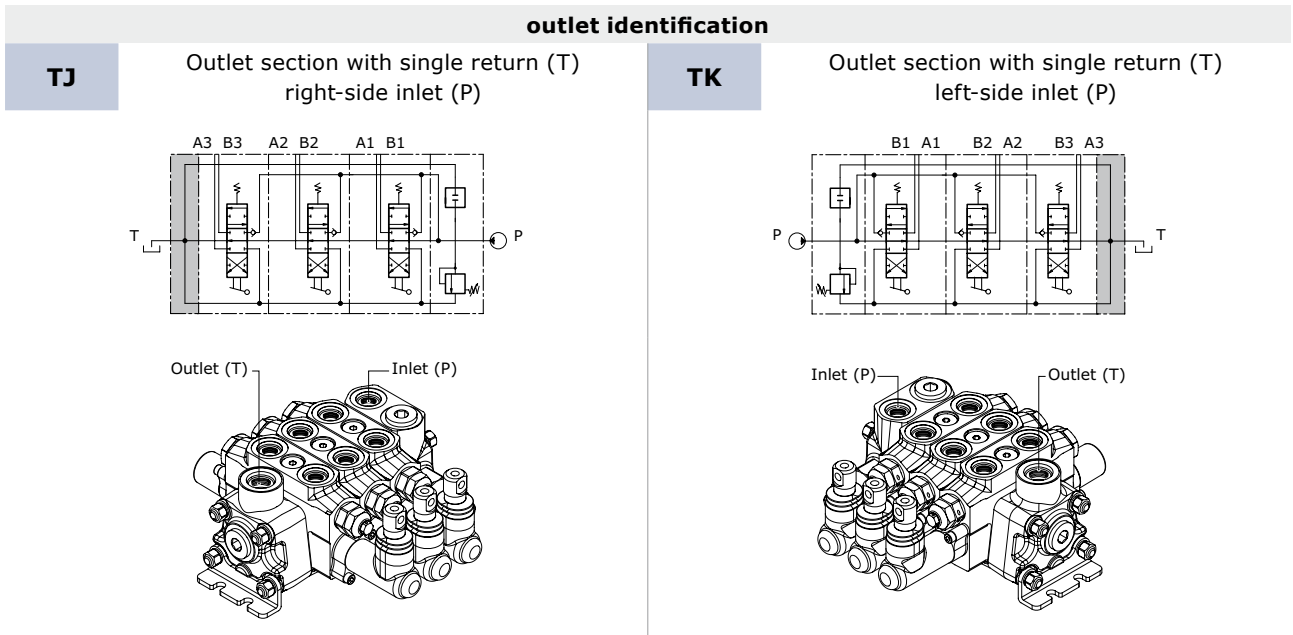
TM | **W U04**

1. **TM** outlet section type
2. **W U04** outlet position and available thread type

Rif.	Code	Description	Page
1	TM	Outlet section with two return (T-HPCO) right-side inlet (P)	
	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)	26
	W U04	HPCO Upper inlet - outlet T (tank) upper outlet section (thread 7/8" - 14 UNF)	



Outlet with single tank classification



outlet combination and thread available		
A G04		Upper outlet (thread G 1/2)
A U04		Upper outlet (thread 3/4" - 16 UNF)
C G04		Central side outlet (thread G 1/2)
C U04		Central side 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.

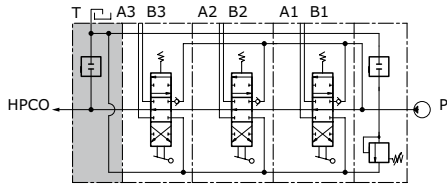


Outlet with two tanks classification

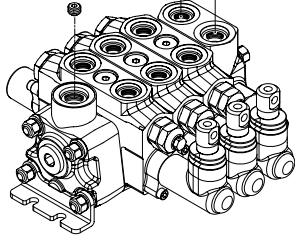
outlet identification

TM

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

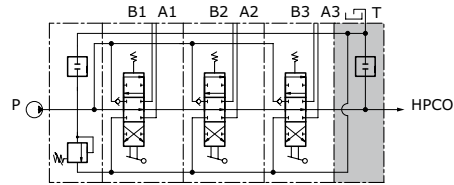


Outlet (HPCO) Inlet (P) Outlet (T)

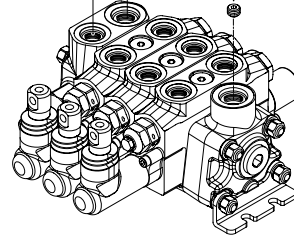


TN

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



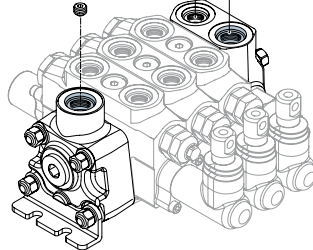
Inlet (P) Outlet (T) Outlet (HPCO)



outlet combination and thread available

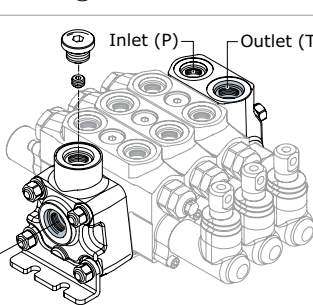
W G04

Outlet (HPCO) Inlet (P) Outlet (T)



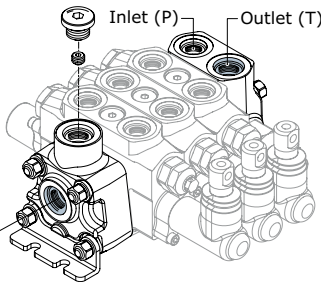
HPCO Upper inlet - outlet T (tank) upper outlet section (thread G 1/2)

W U04



HPCO Upper inlet - outlet T (tank) upper outlet section (thread 7/8" - 14 UNF)

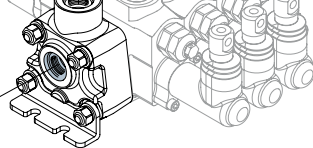
Y G04



HPCO Upper inlet - outlet T (tank) central outlet section (thread G 1/2)

Y U04

Outlet (HPCO)



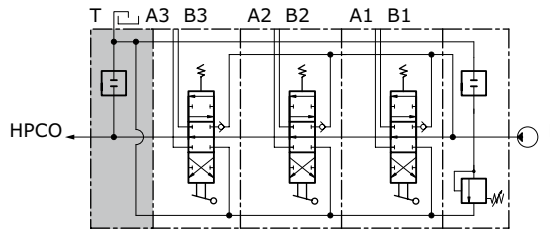
HPCO Upper inlet - outlet T (tank) central outlet section (thread 7/8" - 14 UNF)

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

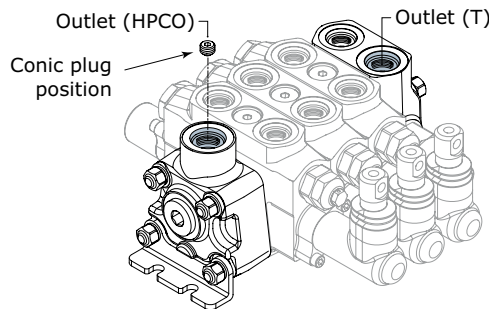


Carry-over connection (HPCO)

This option, available on all DVS10, 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:

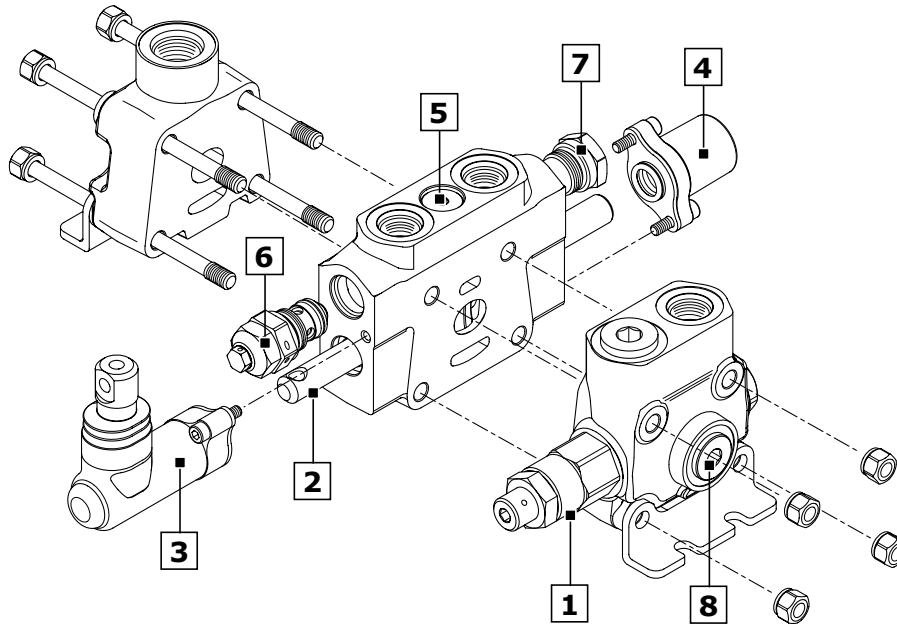


code (HPCO Plug identification)	description	q.ty
413010203	conic plug G 1/4 x 13	1

NOTE: HPCO option needs "E-G04", "E-U03" or "E-U04" inlet arrangement only.



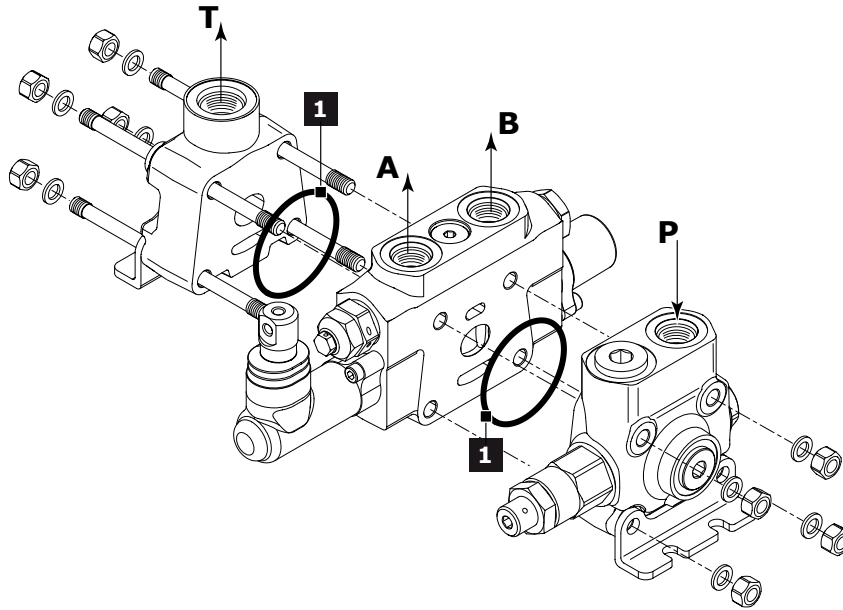
DVS10 SPARE PARTS LIST



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		
2	3 positions double-acting spool	421266029	1	W001A	
		421266028		W001B	
		421266027		W001C	
	3 positions double-acting A and B to tank spool	421266032	1	W002A	
		421266031		W002B	
		421266030		W002C	
	3 positions single-acting on A	421266041	1	W005A	
	3 positions single-acting on B	421266044	1	W006A	
4 positions double-acting with float in the 4 th pos.	421266053	1	W012A		
		421266056		W020A	
3	Protected lever	320366001	1	H001 = H002	
	Control without lever	320366003	1	H004 = H030	
	Hydraulic actuation with side ports	320566001	1	H005	
	3 position spring centred spool	320766002	1	F001A	
		320700003	1	F001B	
		320766001	1	F001C	
	Detent in A and B	320866012	1	F002A	
	Detent in A	320866018	1	F003A	
	Detent in B	320866020	1	F004A	
	Pneumatic control ON-OFF	321166001	1	F020A=F021A	BSP ports
		321166002		F135A=F136A	NPT ports
4	Electrohydraulic ON-OFF (12 vdc)	321466005	1	F1600	
	Electrohydraulic ON-OFF (24 vdc)	321466006	1	F1610	
	Electrohydraulic Proportional (12 vdc)	322066001	1	F2600	
	Electrohydraulic Proportional (24 vdc)	322066002	1	F2610	



Ref.	Description	Order code	Q.ty	Code	Note
4	Electrohydraulic ON-OFF (12 vdc) with reducing valve	321466007	1	F1500=F1520	
	Electrohydraulic ON-OFF (24 vdc) with reducing valve	321466008	1	F1510=F1530	
	Electrohydraulic Proportional (12 vdc) with reducing valve	322066003	1	F2500=F2520	BSP ports
	Electrohydraulic Proportional (24 vdc) with reducing valve	322066004	1	F2510=F2530	
	Electrohydraulic ON-OFF (12 vdc) with reducing valve	321466011	1	F1500=F1520	
	Electrohydraulic ON-OFF (24 vdc) with reducing valve	321466012	1	F1510=F1530	
	Electrohydraulic Proportional (12 vdc) with reducing valve	322066006	1	F2500=F2520	UNF ports
	Electrohydraulic Proportional (24 vdc) with reducing valve	322066007	1	F2510=F2530	
5	Check valve on the work section	320266001	1	-	
6		4044			Setting: 100 bar
	Antishock valve on port A	6891		01 PA	Setting: 200 bar
		9778			Setting: 300 bar
	Anticavitation valve on port A	915083001	1	02 PA	
		23504			Setting: 100 bar
	Combined valve on port A	14779		03 PA	Setting: 200 bar
	38346			Setting: 300 bar	
	Prearrangement for auxiliary valve on port A	430430001		05 PB	
7		4044			Setting: 100 bar
	Antishock valve on port B	6891		01 PB	Setting: 200 bar
		9778			Setting: 300 bar
	Anticavitation valve on port B	915083001	1	02 PB	
		23504			Setting: 100 bar
	Combined valve on port A	14779		03 PB	Setting: 200 bar
	38346			Setting: 300 bar	
	Prearrangement for auxiliary valve on port B	430430001		05 PB	
8	Plug kit (G 3/8)	430000018		G03	
	Plug kit (3/4" - 16 UNF)	300066001	1	U03	
	Plug kit (G 1/2)	430000019		G04	
	Plug kit (7/8" - 14 UNF)	300066002		U04	



Inlet and work section			
Rif.	Order code	Description	Q.ty
1	412010634	O.R. 70SH 50,47 x 2,62 (2-136)	1



INSTALLATION

Guidelines

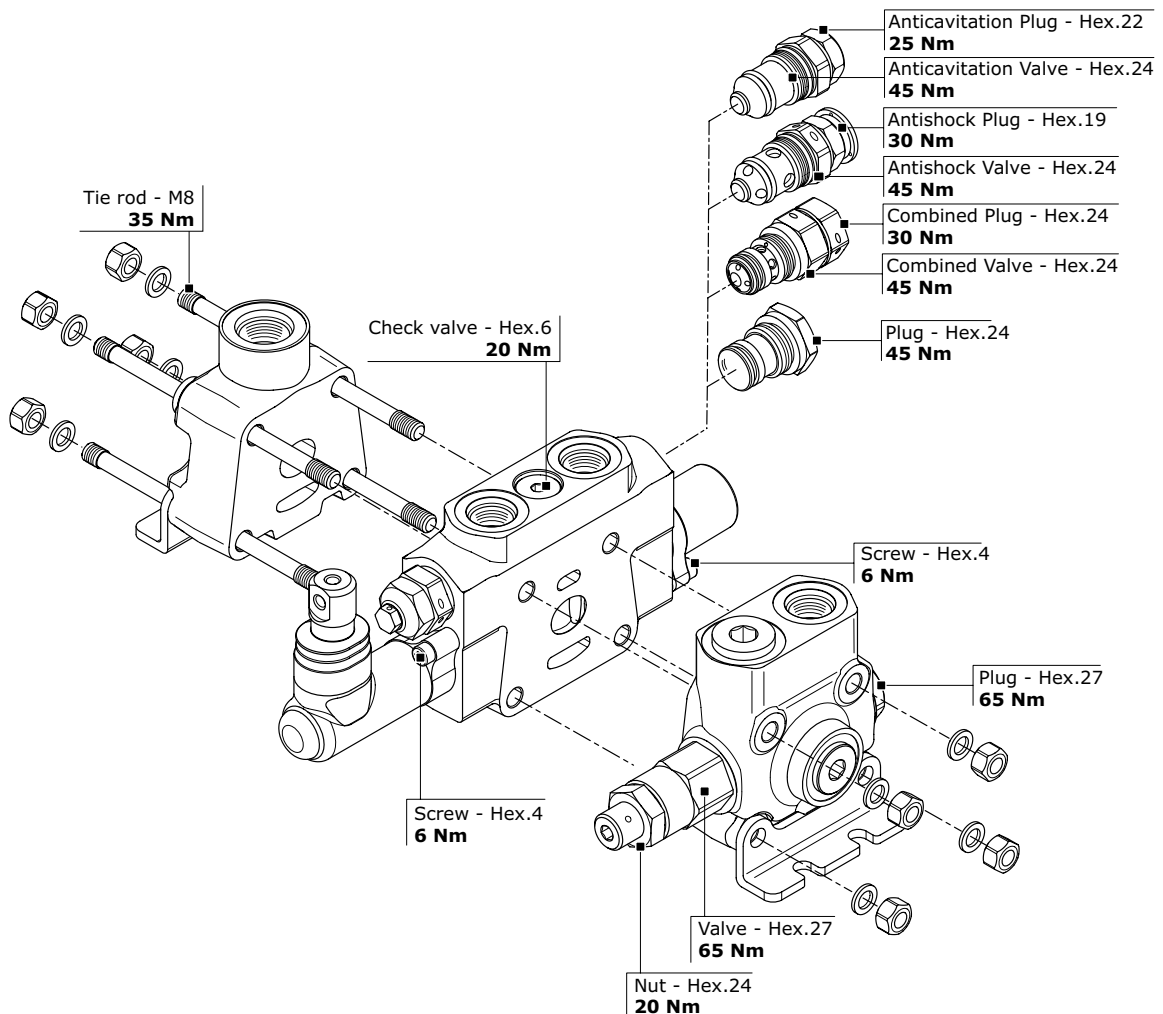
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock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

Fittings tightening torque (Nm)

thread type	port P	Port A - B	Port T
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
UN-UNF (ISO - 725)	3/4" - 16 UNF	3/4" - 16 UNF	3/4" - 16 UNF
with O.R.	40	40	40

General clamping torque

The following table provides the main tightening torques of the sectional valve DVS10:





Dimensions - Thread codes

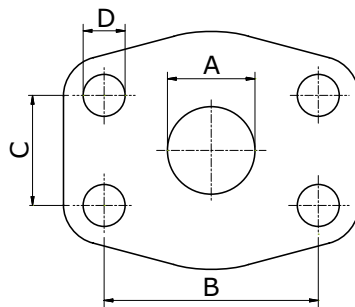
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections.

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

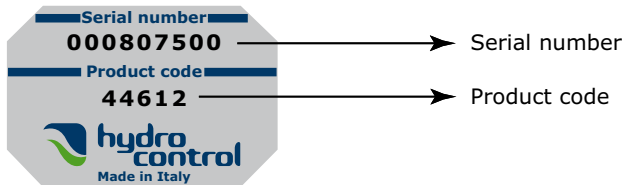
SAE / 6000 FLANGE (ISO 6162-2)								
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1 1/4" (MA)	1 1/4" (UNC)	1 1/2" (MA)	1 1/2" (UNC)
Code	S33	S34	S35	S36	S37	S38	S39	S40
A	19	19	25	25	32	32	38	38
B	50,8	50,8	57,2	57,2	66,6	66,6	79,3	79,3
C	23,8	23,8	27,8	27,8	31,8	31,8	36,5	36,5
D	M10	3/8-16	M12	7/16-14	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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1st edition DVS10.00

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