

DVS20

SECTIONAL VALVE



TECHNICAL CATALOGUE

A member of



1800-OILSOL
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1st edition DVS20.00

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

WARNING!

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

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



Applications

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





QUICK REFERENCE GUIDE

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
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GENERAL SPECIFICATIONS

Standard working conditions

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

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

Fluid options

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

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



ORDER EXAMPLE

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

TYPE: _____
DVS20: product type
/1: working section number

1) INLET ARRANGEMENT: pag. 9

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

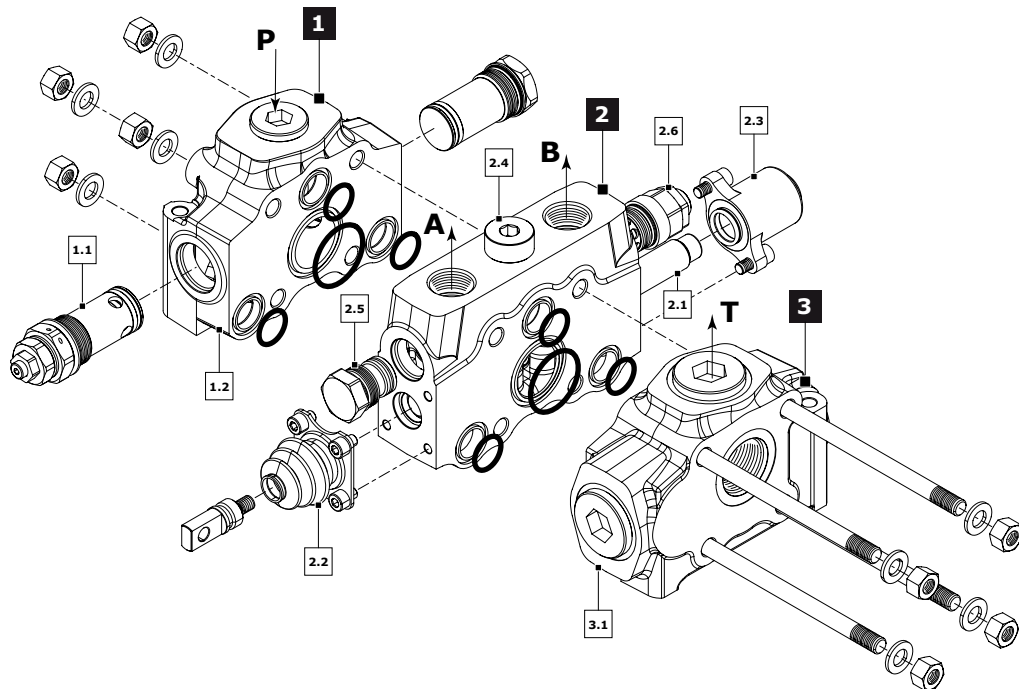
2) WORK SECTION ARRANGEMENT: pag. 12

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

3) OUTLET ARRANGEMENT: pag. 23

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

Ordering row 2 must be repeated for every work section



Standard thread

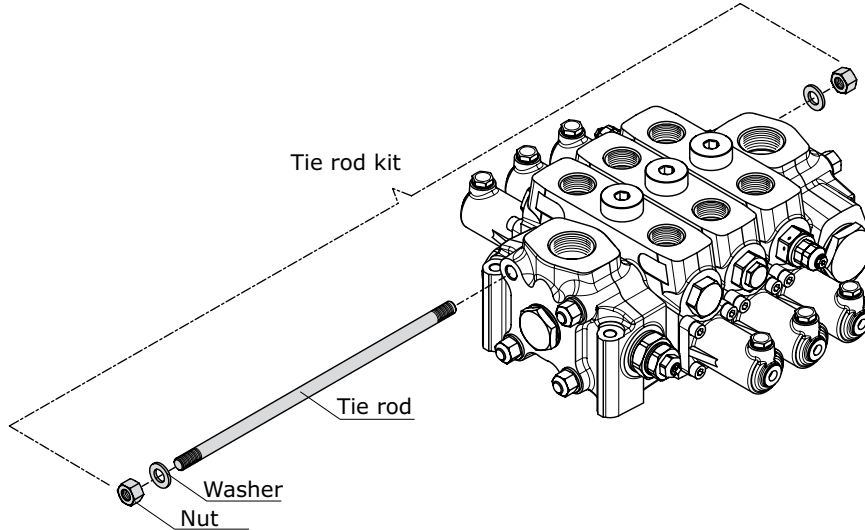
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections; for ordering code refer to table on page 32.

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



Tie-rod kit classification (appendix "A")

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



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

Painting

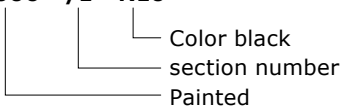
On request, all Hydrocontrol valves can be delivered painted (RAL 9005 black primer).

Order example of DVS20/1 painted:

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

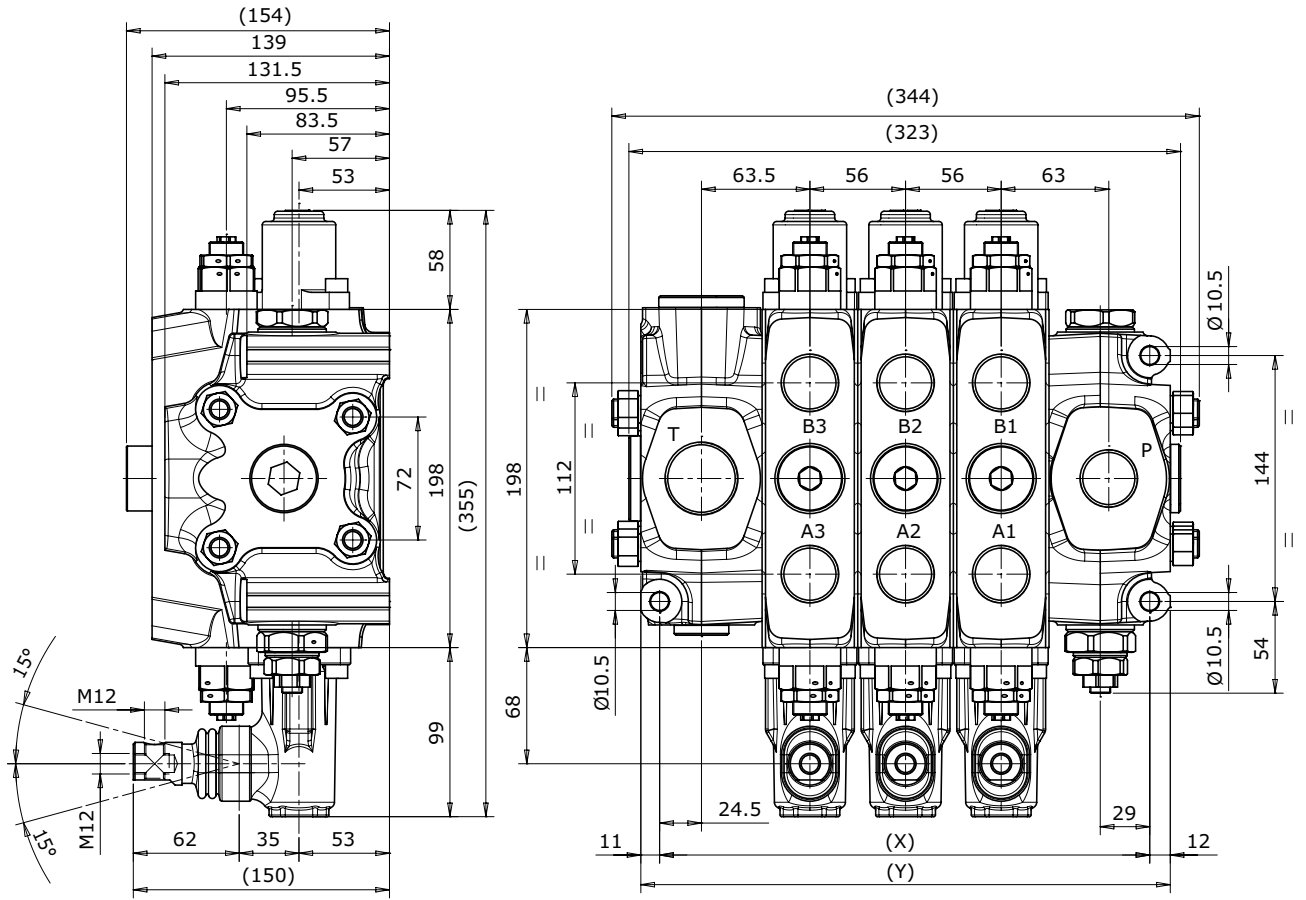
The painting is indicated with the following value:

P006 - /1 - N10





DIMENSIONS



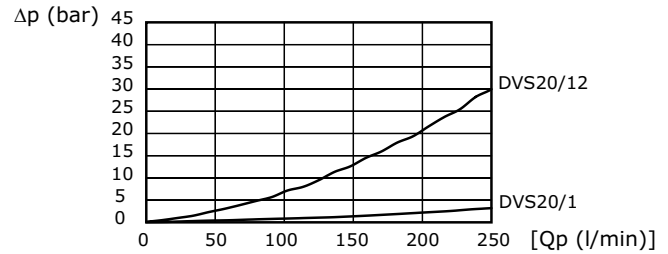
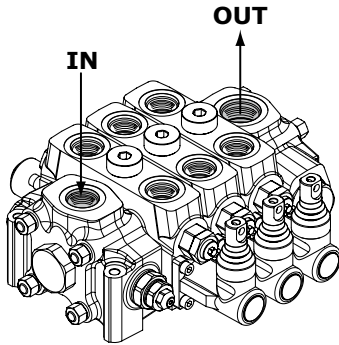
TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	173	229	285	341	397	453	509	565	621	677	733	789
Y (mm)	196	252	308	364	420	476	532	588	644	700	756	812
Weights (kg)	25	34	43	52	61	70	79	88	97	106	115	124



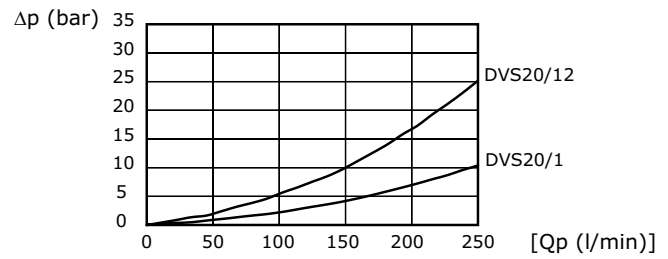
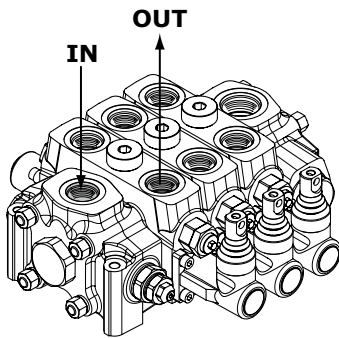
TYPICAL CURVES

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

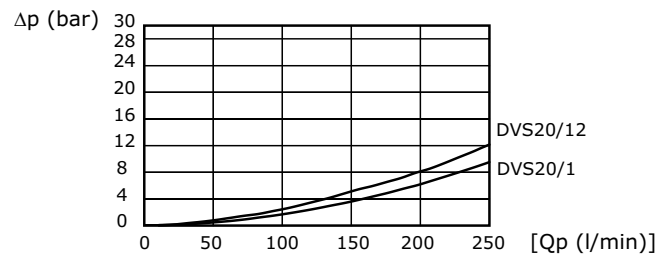
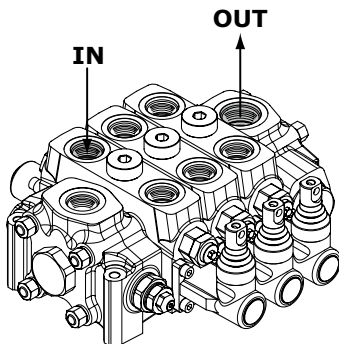
Pressure drop (P - T)



Pressure drop (P - A/B)



Pressure drop (A/B - T)



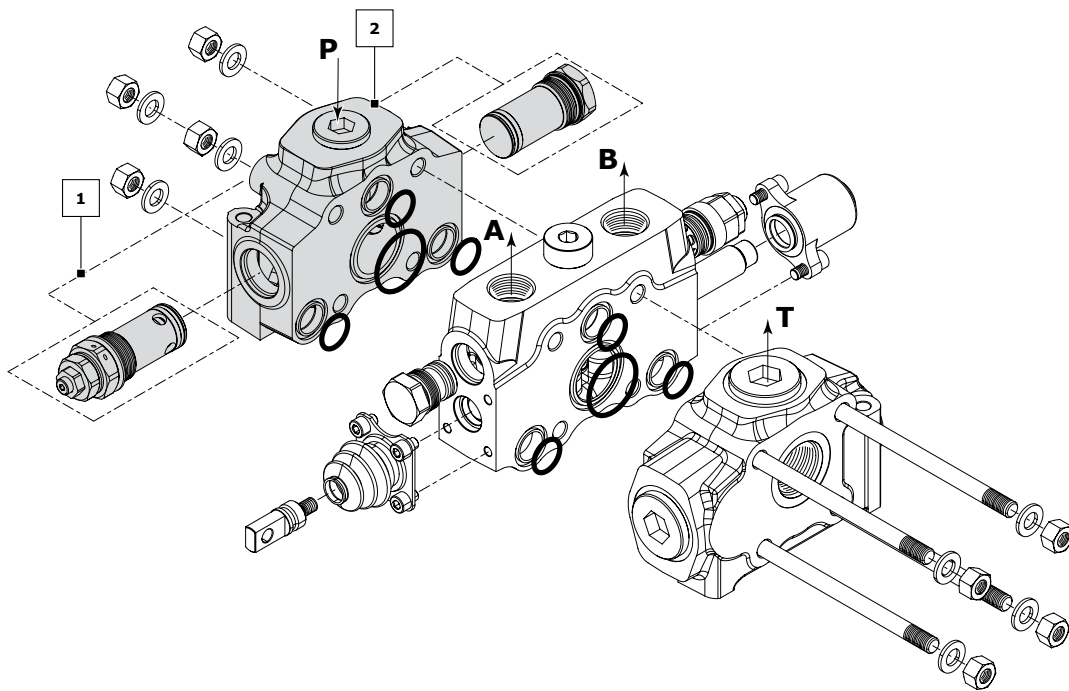


INLET SECTION

Order example

IR	009	150	A G06
-----------	------------	------------	--------------

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



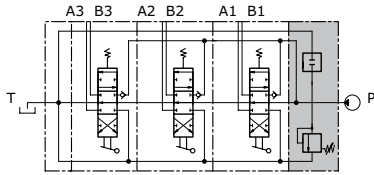
Rif.	Code	Description	Page
-	IR	Sectional valve with right inlet section	10
-	IL	Sectional valve with left inlet section	
1	009	Pilot operated pressure relief valve	11
	010	Pilot operated pressure relief valve and Main anticavitation check valve	
	019	Without valves	
2	A G06	Upper inlet (thread G 1)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

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



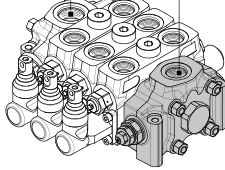
Inlet side classifications

Sectional valve with **right inlet** section

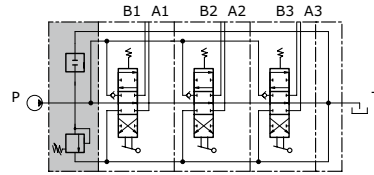


IR

Outlet (T) Inlet (P)

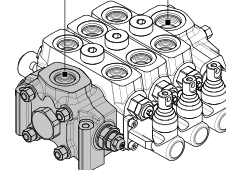


Sectional valve with **right inlet** section



IL

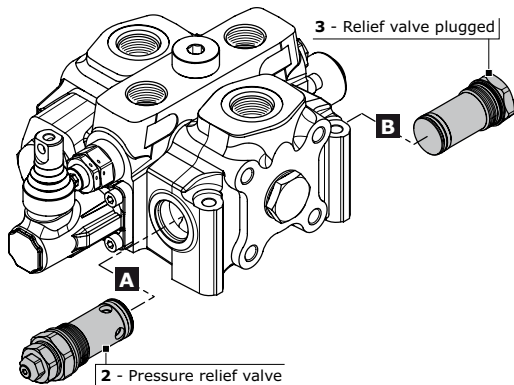
Inlet (P) Outlet (T)



Valve identification

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

Valve arrangement



Combination valve example: 009 = 2A - 3B

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

The code identifies:

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

(A) = spool action side

(B) = spool return action side

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



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

Inlet position

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

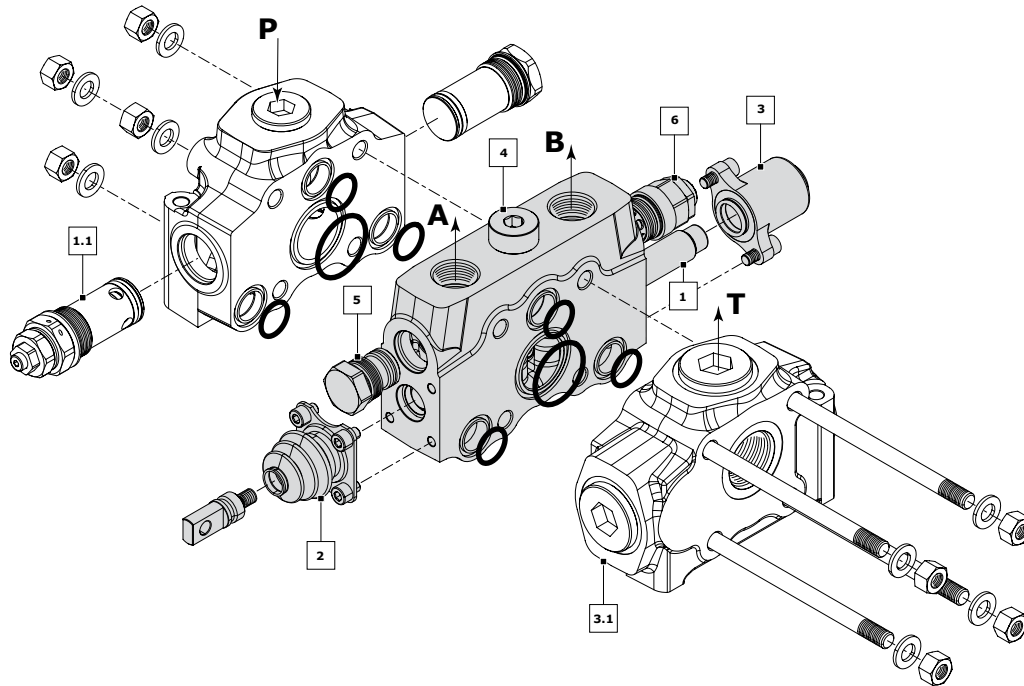


WORK SECTION

Order example:

W001A	H004	F001A	RP G06	05 PA	01 PB 100
--------------	-------------	--------------	---------------	--------------	------------------

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



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

NOTE:

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



Spool identification

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

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

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	

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



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

NOTE:

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

Plaese contact our Sales department for more information.



Spool actuation classification

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

Spool actuation classification for Hydraulic control

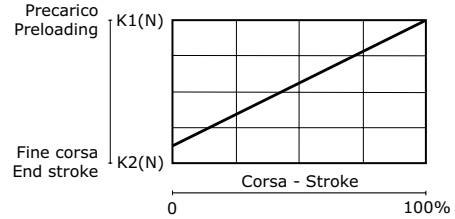
code	description	dimensions	configuration
H005 <small>leave out the spool return action code</small>	Hydraulic actuation with side ports BSP ports = G 1/4 UNF ports = 9/16-18 UNF		



Spool return action classification - Springs load values

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

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



Spool return action classification

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



Pneumatic control classification

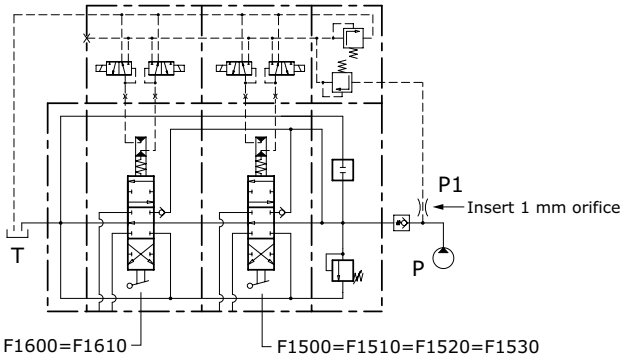
code	description	schema	dimensions	configuration
F020A	Pneumatic control ON - OFF			
F021A	Pneumatic control ON - OFF rotated 180°			
F022A	Proportional Pneumatic control		<p>Pneumatic control: PORT BSP = G 1/8</p>	
F023A	Proportional Pneumatic control rotated 180°			
F135A	Pneumatic control ON - OFF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



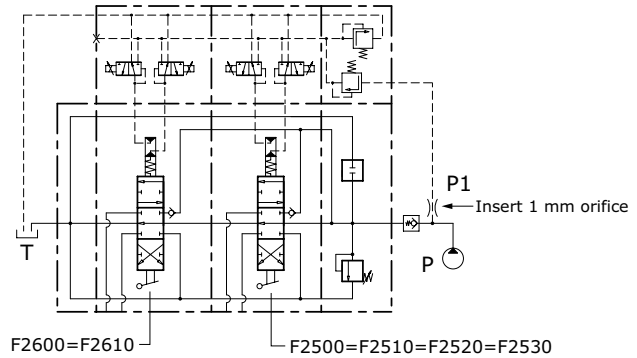
Electrohydraulic control specifications

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

Electrohydraulic ON-OFF control with fixed pressure reducing valve



Electrohydraulic PROPORTIONAL control with fixed pressure reducing valve



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

regulation currents			
Nominal voltage (V)	Resistance R 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)	
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)	
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.

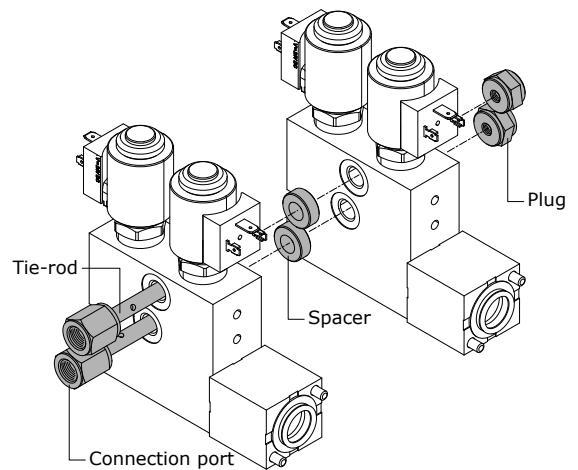
NOTE: the control tie rod kit has always to be ordered separately.

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

Order code for control tie rod (UNF):

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

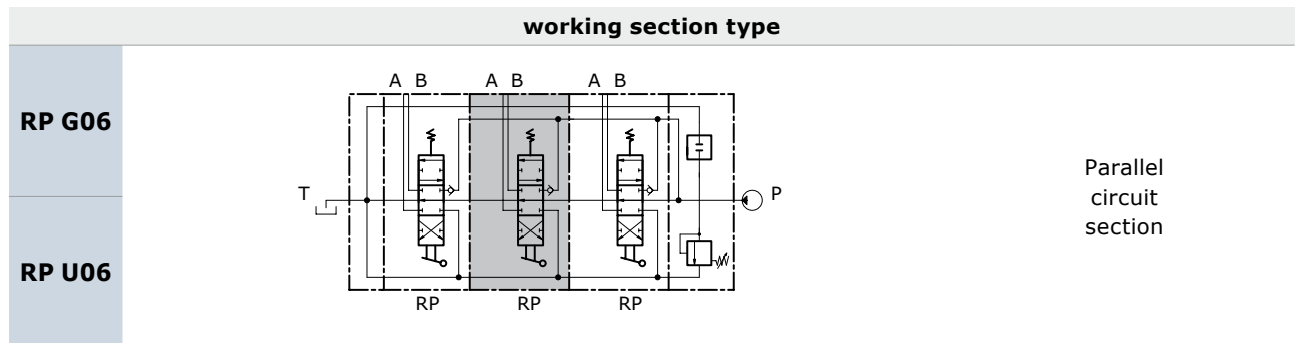


Compatibility table

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

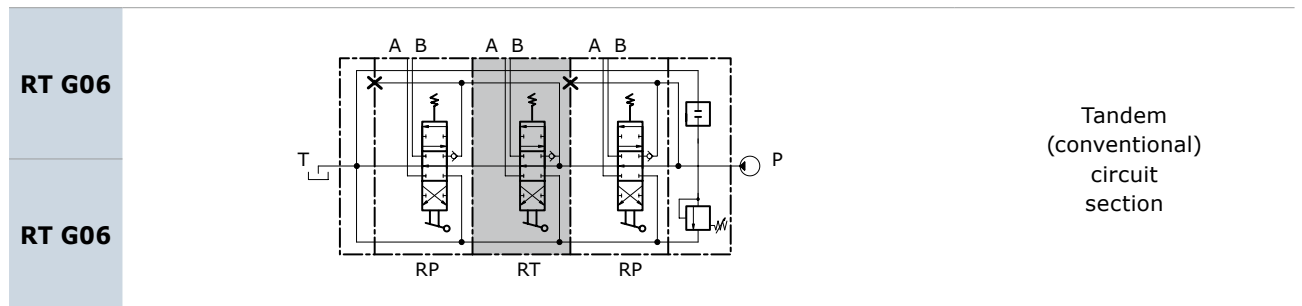


Work section identification



Parallel circuit

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.


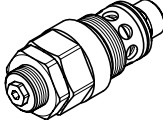

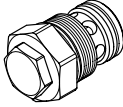

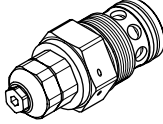

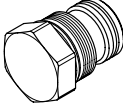



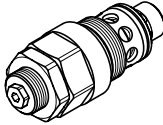

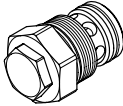

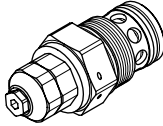

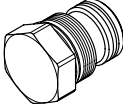
Parallel-Tandem circuit

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



Auxiliary valve identification

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

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

Auxiliary valve - Setting range

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

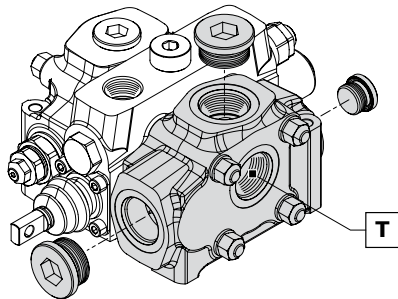
Always indicate setting value when using antishock valve and pilot combined valve:

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



OUTLET SECTION - STANDARD VERSION

Order example



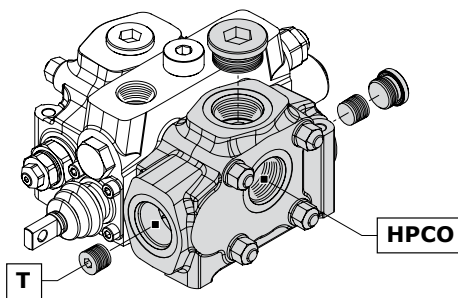
TJ | **A G07**

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

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

OUTLET SECTION - HPCO VERSION

Order example - HPCO version Outlet



TM | **M G07**

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

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

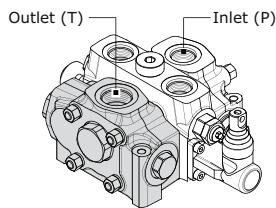
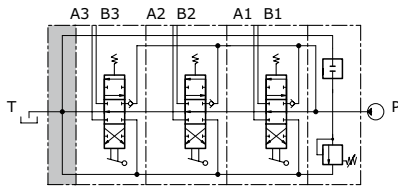


Outlet with single tank classification

outlet identification

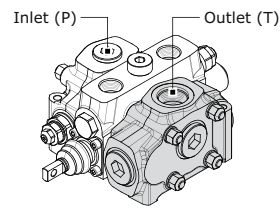
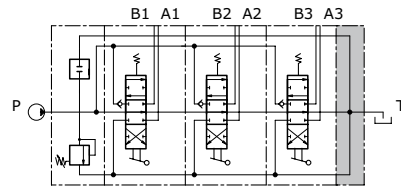
TJ

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



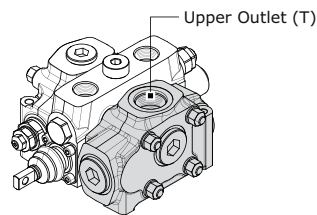
TK

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



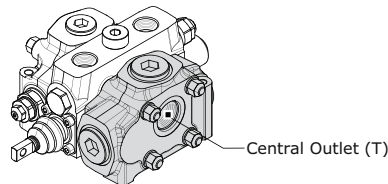
Inlet combination and thread available

A G07



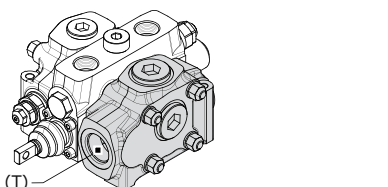
Upper outlet
(thread G 1"1/4)

A U07



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

C G07



Central outlet
(thread G 1"1/4)

C U07

G G07

G U07

Front Outlet side A (T)

**only
for
TK**

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

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

H G07

H U07

Rear Outlet side B (T)

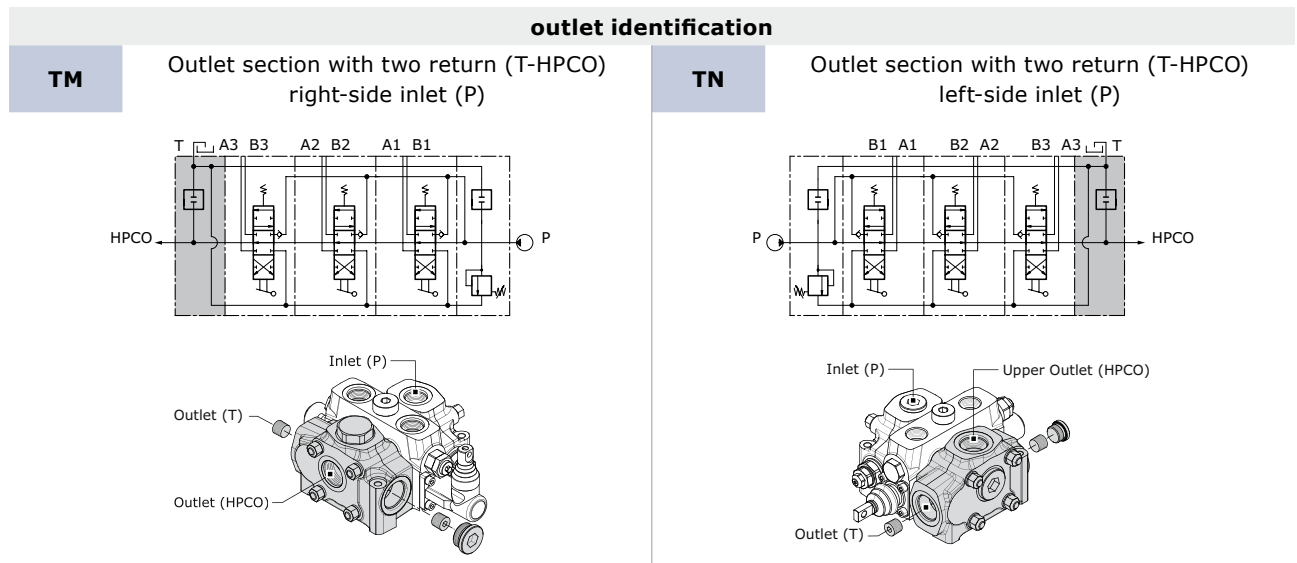
**only
for
TJ**

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

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



Outlet with two tanks classification

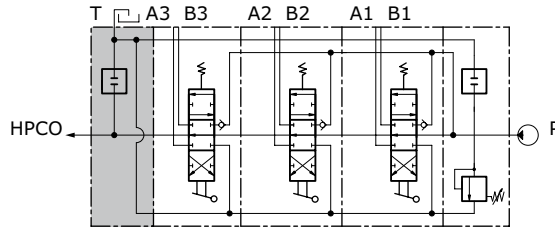


Inlet combination and thread available			
M G07		only for TM	HPCO upper outlet T rear side outlet B (thread G 1 1/4)
M U07			HPCO upper outlet T rear side outlet B (thread 1 5/8 - 12 UNF)
N G07		only for TN	HPCO upper outlet T front outlet side A (thread G 1 1/4)
N U07			HPCO upper outlet T front outlet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

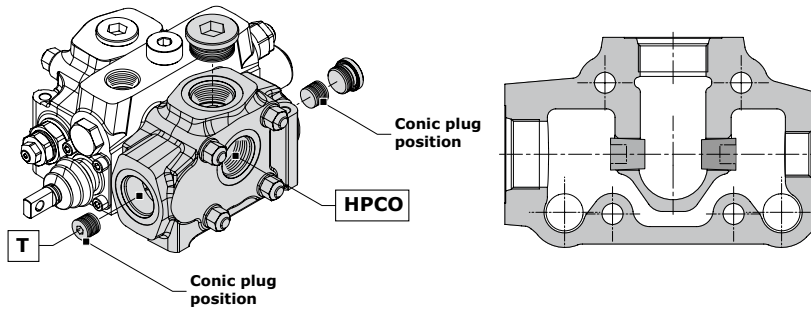


CARRY-OVER CONNECTION (HPCO)

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



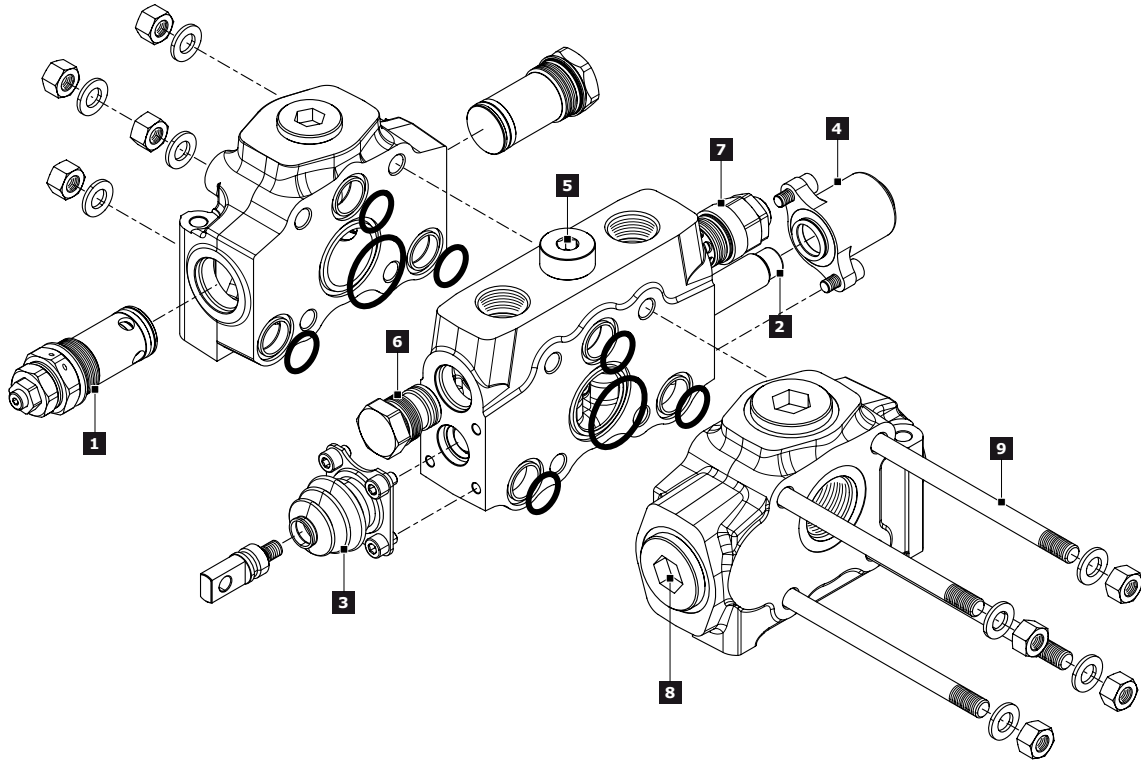
It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



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



DVS20 SPARE PARTS LIST



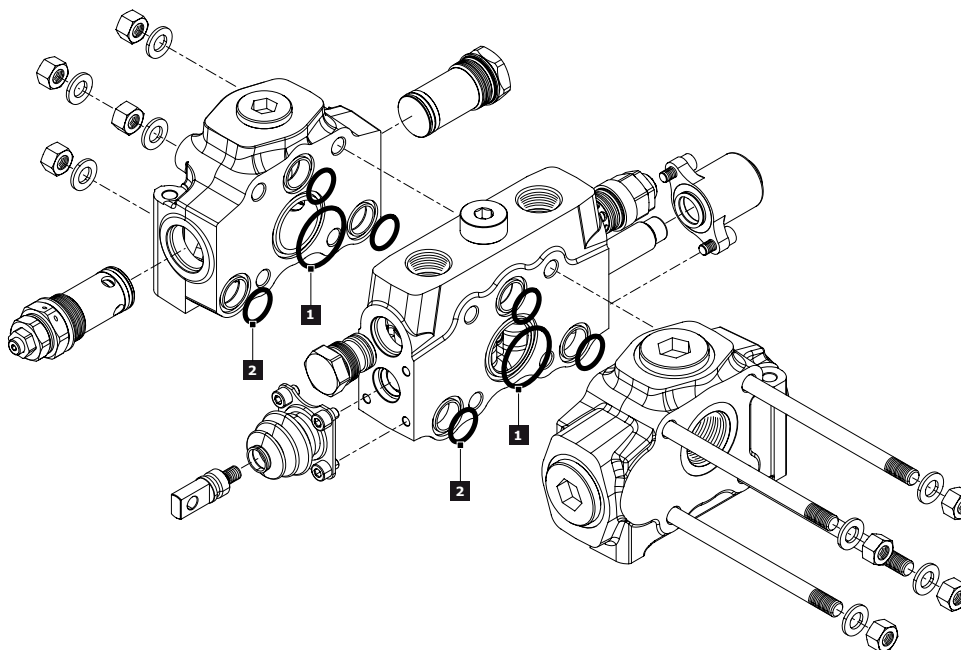
Ref.	Description	Order code	Q.ty	Code	Note
1	Pilot operated pressure relief valve	89380	1		Setting: 80 bar
		89312			Setting: 150 bar
		89381			Setting: 250 bar
	Relief valve plugged	430188001	1	-	
	Main Anticavitation check valve	915058801	1		
2	Plug with pressure-gauge connection	430188002	1		
	3 positions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



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



Gasket kits



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

Complete Gasket kit: order code - 350988001

**Guidelines**

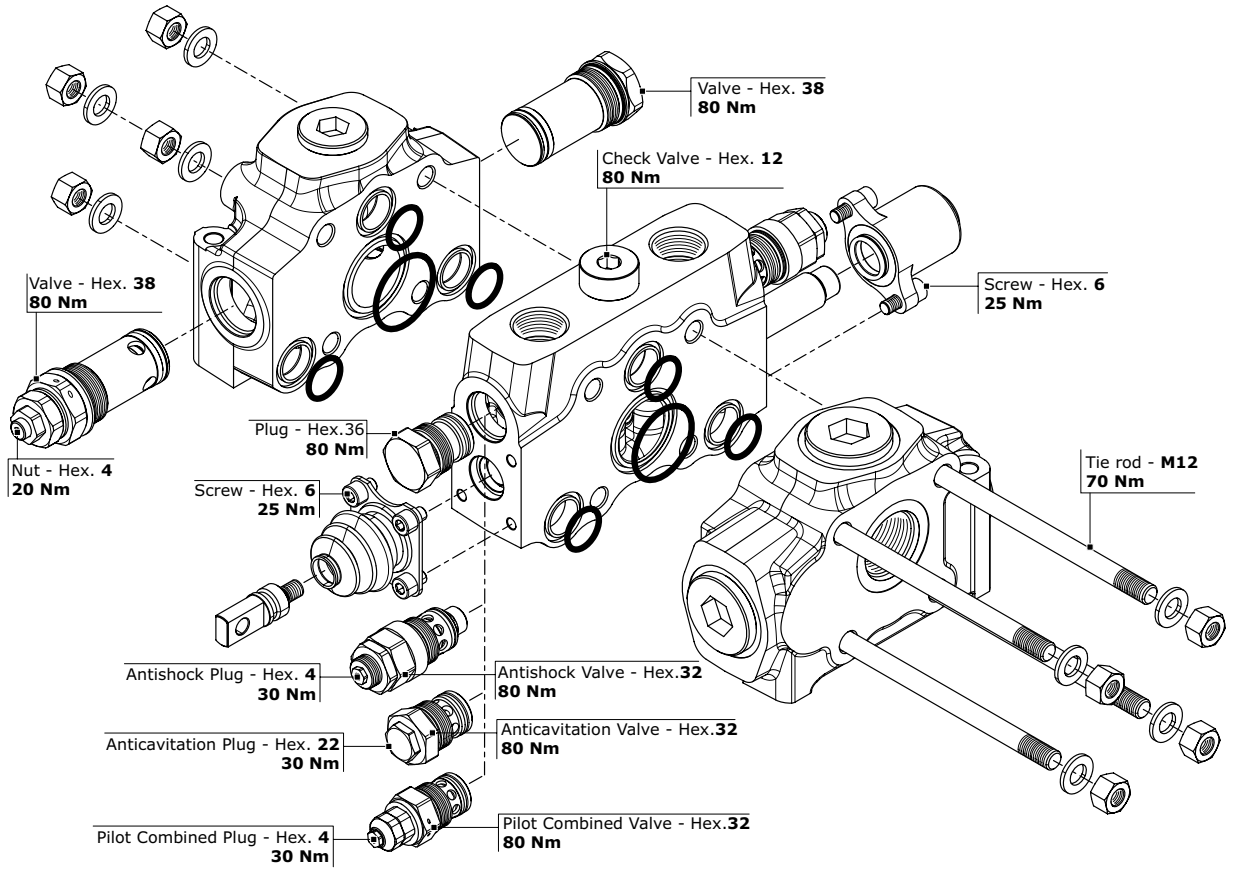
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock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

Fittings tightening torque (Nm)

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



General clamping torque





Dimensions - Thread codes

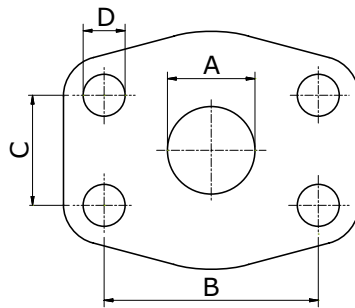
The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections.

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

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

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

Dimensions - SAE Flange codes



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

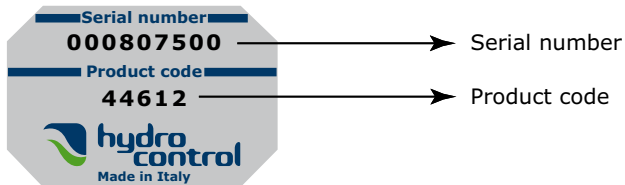
SAE / 6000 FLANGE (ISO 6162-2)								
Type	3/4" (MA)	3/4" (UNC)	1" (MA)	1" (UNC)	1"1/4 (MA)	1"1/4 (UNC)	1"1/2 (MA)	1"1/2 (UNC)
Code	S33	S34	S35	S36	S37	S38	S39	S40
A	19	19	25	25	32	32	38	38
B	50,8	50,8	57,2	57,2	66,6	66,6	79,3	79,3
C	23,8	23,8	27,8	27,8	31,8	31,8	36,5	36,5
D	M10	3/8-16	M12	7/16-14	M14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



GENERAL CONDITIONS AND PATENTS

Product identification

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



Serial number:

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

Product code:

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

Introduction

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

Management of orders

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

Payment conditions

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

Delivery and shipment

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

Product characteristics

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

Claims

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



GENERAL CONDITIONS AND PATENTS

Warranty

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

Ownership retention

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

Obligation confidentiality

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

Patents

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

Applicable law and court of jurisdiction

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

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