

Part number:

**HYDROMA**

HYDRAULICKÉ SYSTÉMY

**HIDROMA  
SYSTEMS**

UKŁADY HYDRAULICZNE

**HYDROMA**

ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

**D9**

SECTIONAL VALVE





### Applications

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

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

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

Different kind of manual and hydraulic remote controls. Countless configurations and custom made solutions. Working sections have auxiliary valves and a broad range of interchangeable spools.



## QUICK REFERENCE GUIDE

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

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

**GENERAL INDEX**

|           |  |
|-----------|--|
| <b>4</b>  | <b>General specifications</b><br>Standard working conditions<br>Fluid options  |
| <b>5</b>  | <b>Order example</b><br>Standard thread<br>Tie-rod kit classification<br>Painting  |
| <b>7</b>  | <b>Dimensions</b>  |
| <b>8</b>  | <b>Typical curves</b><br>Pressure drop (P - T)<br>Pressure drop (P - A/B)<br>Pressure drop (A/B - T)<br>Direct relief valve curve<br>Antishock valve curve<br>Combined valve curve<br>Anticavitation check valve curve   |
| <b>10</b> | <b>Inlet Section</b><br>Order example<br>Inlet side classification<br>Valve identification<br>Valve arrangement<br>Inlet position and available thread type  |
| <b>13</b> | <b>Working section</b><br>Order example<br>Spool identification<br>Spool actuation classification for manual control<br>Spool actuation classification for hydraulic control<br>Spool return action classification - Spring load values<br>Work section identification<br>Compatibility table<br>Auxiliary valves identification |
| <b>20</b> | <b>Intermediate inlet section</b><br>Order example<br>Intermediate inlet section classification<br>Valve identification on intermediate inlet section<br>Valve arrangement on intermediate inlet section<br>Inlet position and available thread type   |
| <b>23</b> | <b>Intermediate outlet section</b><br>Order example<br>Intermediate outlet section classification<br>Inlet position and available thread type<br>(for BF intermediate)<br>Inlet position and available thread type<br>(for BG intermediate)  |
| <b>25</b> | <b>Outlet section (version 1 outlet)</b><br>Order example  |
| <b>25</b> | <b>Outlet section (HPCO version outlet)</b><br>Order example - HPCO version outlet<br>Outlet with single tank classification<br>Outlet with two tanks classification<br>Carry-over connection (HPCO)   |
| <b>29</b> | <b>D9 Spare parts list</b><br>Gasket kits  |
| <b>33</b> | <b>Installation</b>  |
| <b>35</b> | <b>General conditions and patents</b>  |

## GENERAL SPECIFICATIONS

## Standard working conditions

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

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)<br>Oil and Solutions | Temperature (°C) |     | Compatible gasket |
|---|------------------|-----|-------------------|
|   | min              | max |                   |
| Mineral Oil HL, HM (or HLP acc. to DIN 51524)                 | -25              | +80 | NBR               |
| Oil in water emulsions HFA                                    | +5               | +55 | NBR               |
| Water in oil emulsions HFB                                    | +5               | +55 | NBR               |
| Polyglycol-based aqueous solution HFC                         | -10              | +60 | NBR               |

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

ORDER EXAMPLE

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

TYPE:

D9: product type  
/1: working section number

1) INLET ARRANGEMENT: (page 10)

IR 001 inlet side and valve type  
150 setting (bar)  
A G03 inlet position and available thread type

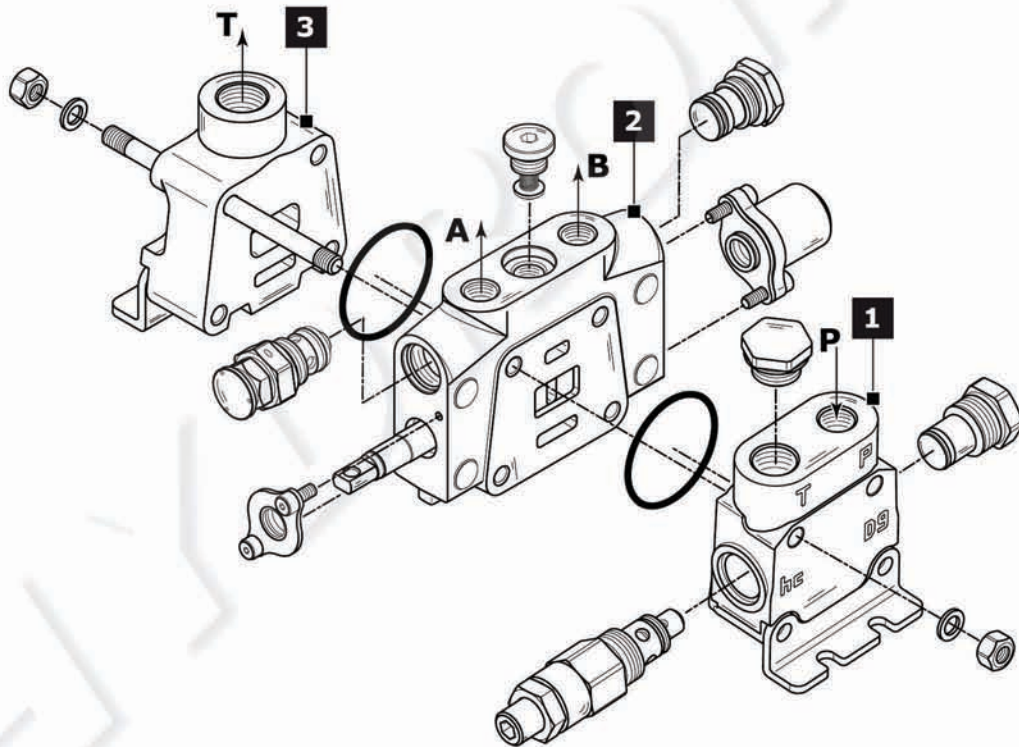
2) WORK SECTION ARRANGEMENT: (page 13)

W001A spool type  
H004 spool actuation type  
F001A spool return action type  
RP G03 type and thread section  
01 PA 100 auxiliary valve (port A)  
01 PB 100 auxiliary valve (port B)

3) OUTLET ARRANGEMENT: (page 25)

TJ outlet type  
A G04 outlet position and available thread type

Ordering row 2 must be repeated for every work section



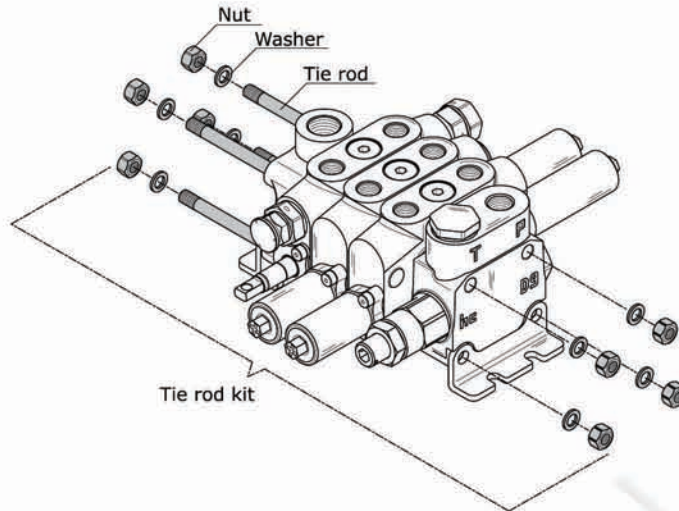
Standard thread

The connection ports size is indicated by an ordering code common for all Hydrocontrol products. Following table shows all available connections; for ordering code refer to table on page 34.

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

**Tie-rod kit classification**

Tie rod kit allows the correct assembly of sectional valves. Tie rod's length depends on the number of sections; each valve is assembled with tie rod kits including a tie rod, two nuts and two washers. D9 requires 4 tie-rod kits.



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

**Painting**

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

**Order example of D9/1 painted:**

D9/1  
 IR 001 150 A G03  
 W001A H004 F001A RP G03 01 PA 100 01 PB 120  
 TJ A G04

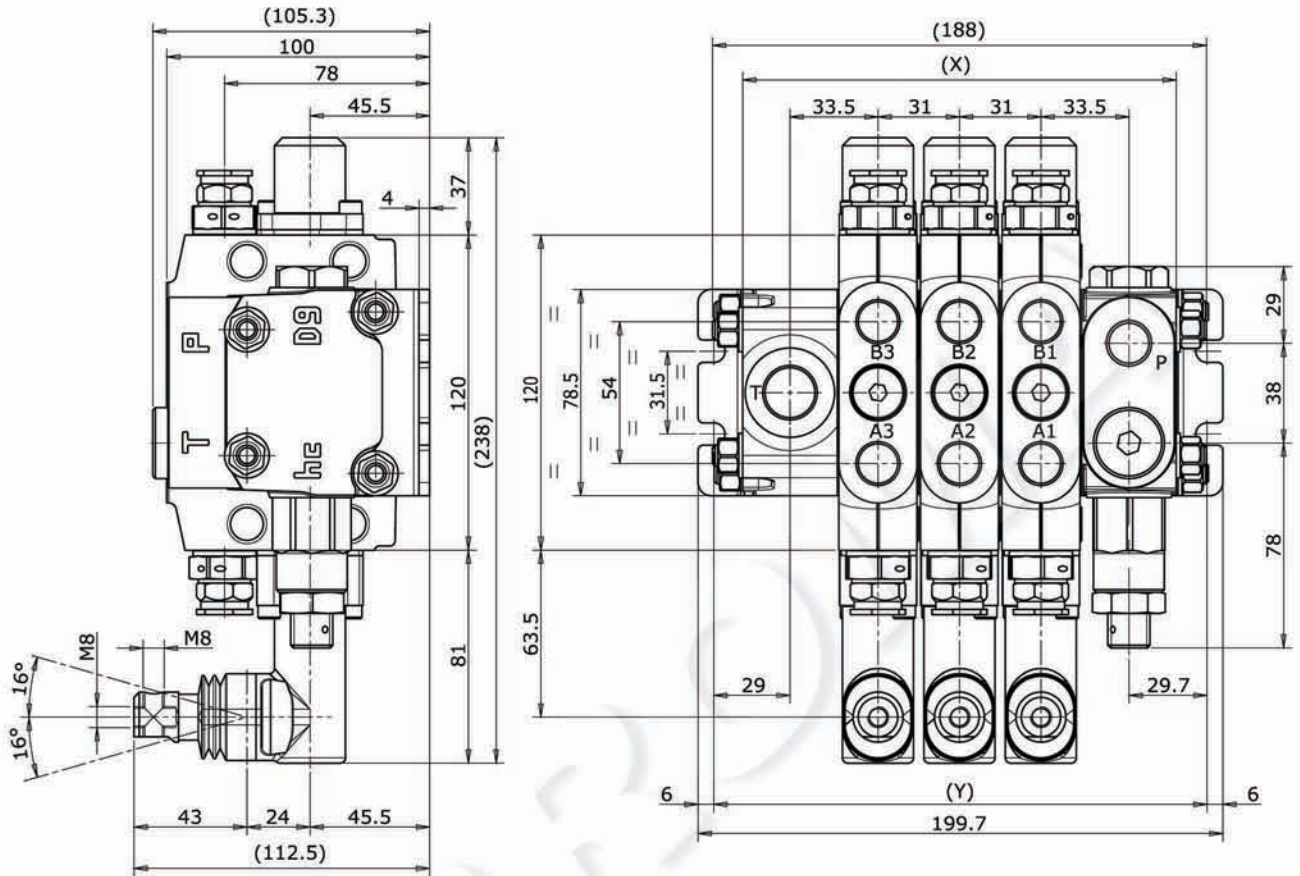
**P006/1 N10**

The painting is indicated with the following value:

**P006 - /1 - N10**

Color black  
 section number  
 Painted

**DIMENSIONS**



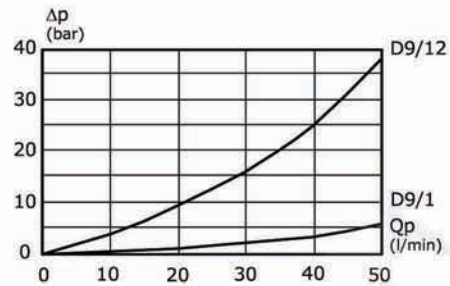
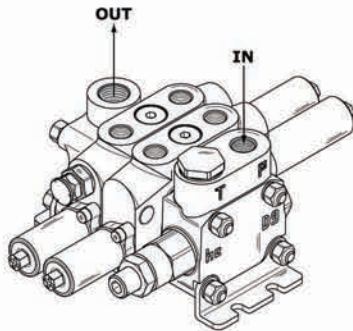
| TYPE         | /1  | /2  | /3  | /4  | /5   | /6  | /7   | /8   | /9   | /10  | /11  | /12  |
|--------------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|
| X (mm)       | 125 | 156 | 187 | 218 | 249  | 280 | 311  | 342  | 373  | 404  | 435  | 466  |
| Y (mm)    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



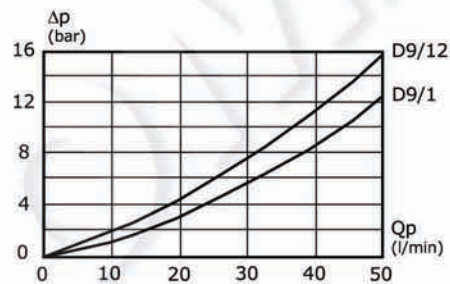
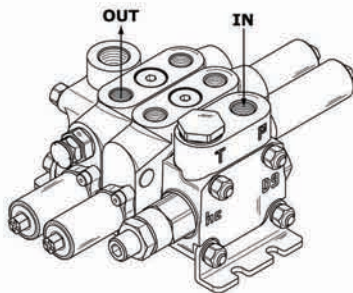
TYPICAL CURVES

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

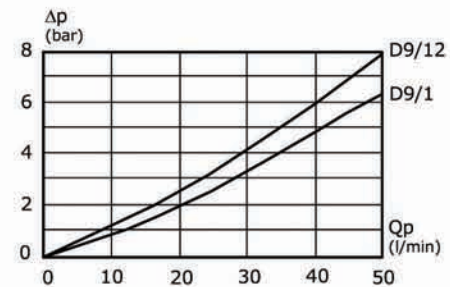
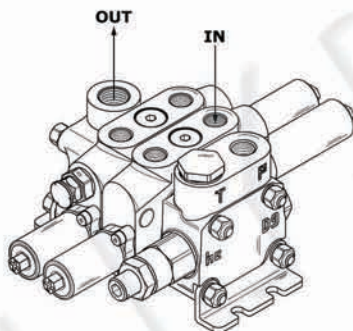
Pressure drop (P - T)



Pressure drop (P - A/B)

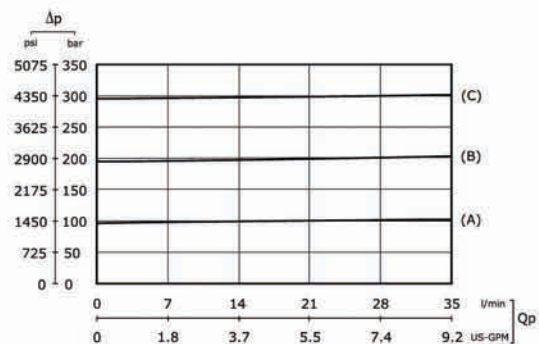


Pressure drop (A/B - T)



Direct relief valve curve

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

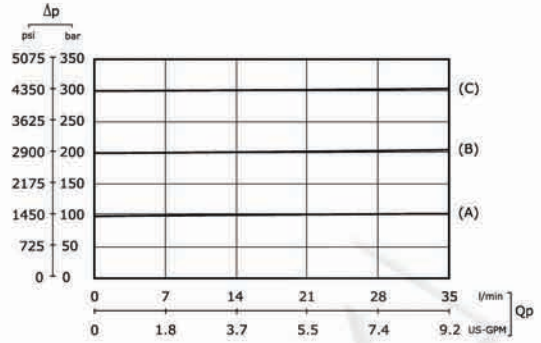


TYPICAL CURVES

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

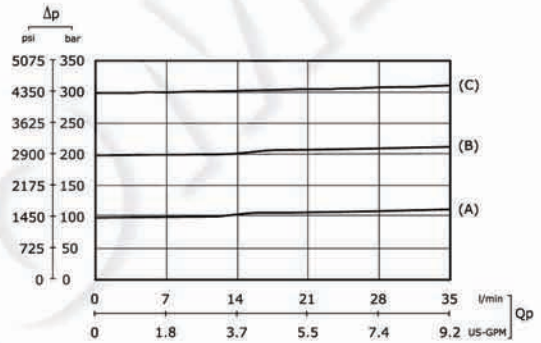
Antishock valve curve

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

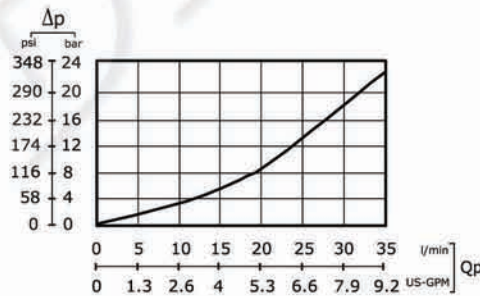


Combined valve curve

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



Anticavitation check valve curve

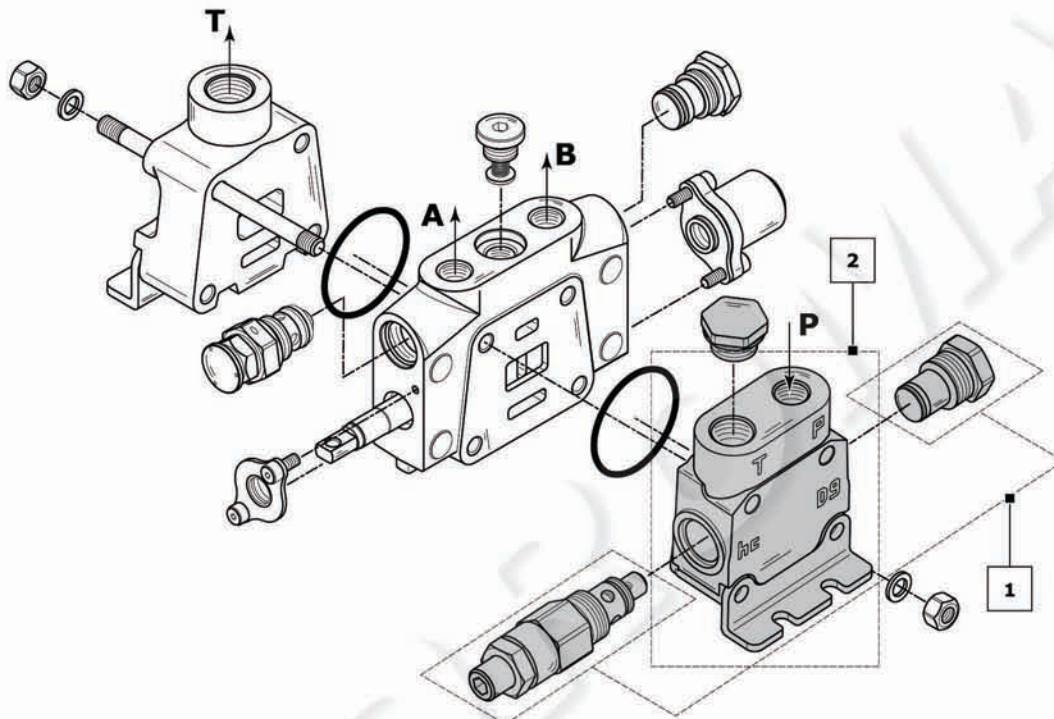


## INLET SECTION

Order example

|    |     |     |       |
|----|-----|-----|-------|
| IR | 001 | 150 | A G03 |
|----|-----|-----|-------|

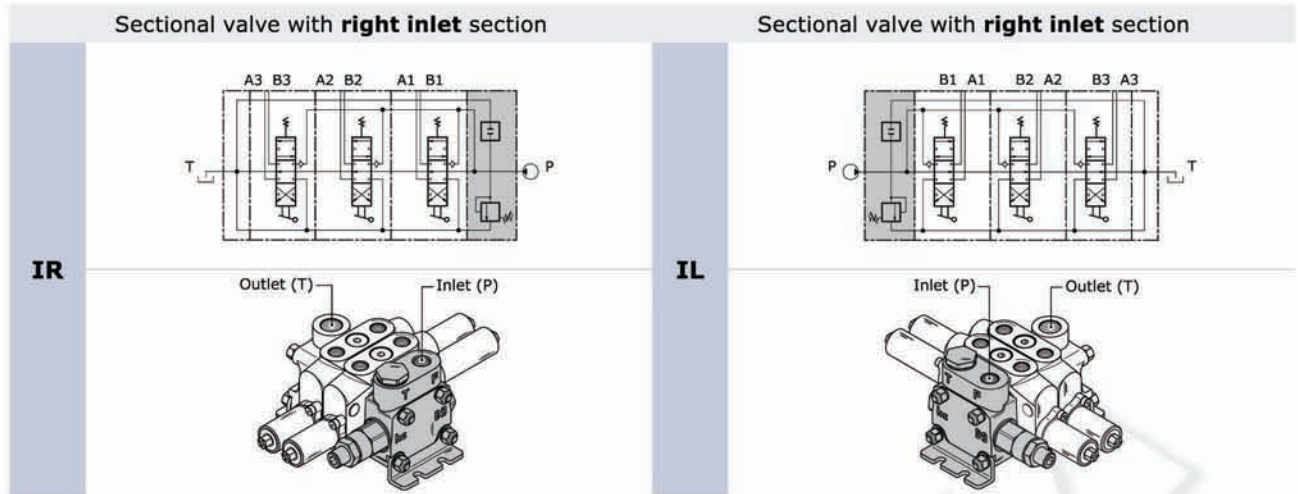
- IR** inlet side
1. **001** valve arrangement
- 150** setting (bar)
2. **A G03** inlet position and available thread type



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

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

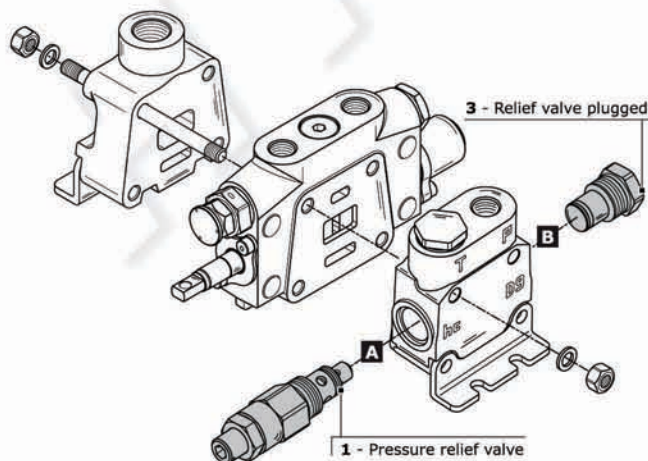
**Inlet side classifications**



**Valve identification**

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

**Valve arrangement**



**Combination valve example: 001 = 1A - 3B**













- 001** Combination valve
- 1A** Pressure relief valve in port A
- 3B** Relief valve plugged in port B

**The code identifies:**

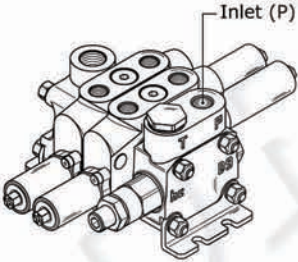
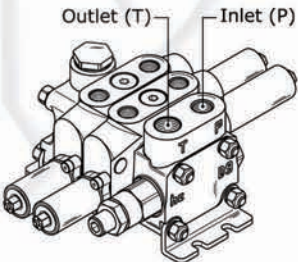
with a number, the type of valve; with a letter its position on the inlet section.

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

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

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

**Inlet position and available thread type**

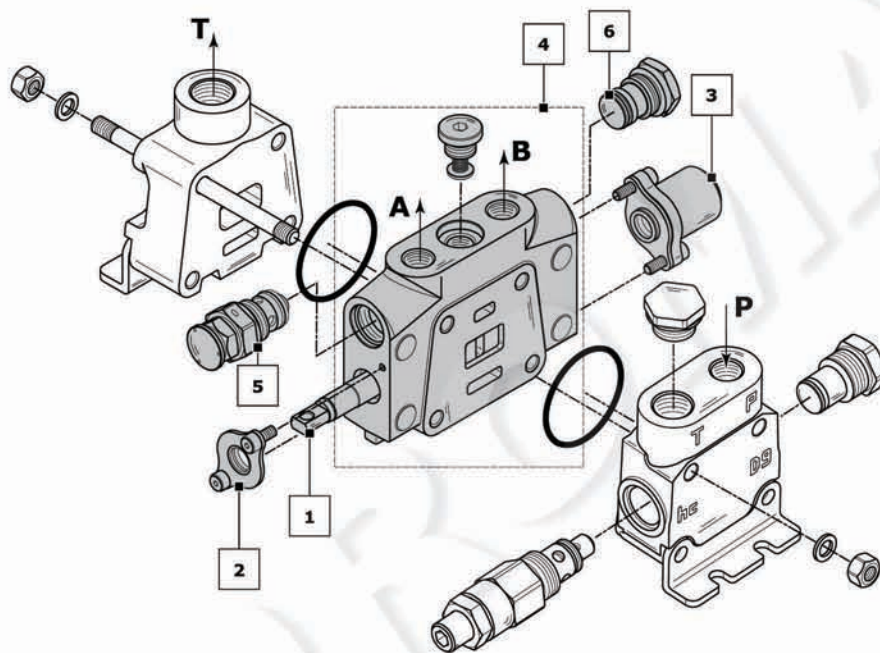
| Inlet position and thread available |   |
|-------------------------------------|---|
| A G03                               |  <p>Inlet (P)</p>            |
| A U03                               |   |
| E G03                               |  <p>Outlet (T) Inlet (P)</p> |
| E U03                               |   |

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

**WORKING SECTION**

Order example:

|    | W001A            | H004 | F001A | RP G03 | 01 PA 100 | 01 PB 100 |
|----|------------------|------|-------|--------|-----------|-----------|
| 1. | <b>W001A</b>     |      |       |        |           |           |
| 2. | <b>H004</b>      |      |       |        |           |           |
| 3. | <b>F001A</b>     |      |       |        |           |           |
| 4. | <b>RP G03</b>    |      |       |        |           |           |
| 5. | <b>01 PA 100</b> |      |       |        |           |           |
| 6. | <b>01 PB 100</b> |      |       |        |           |           |




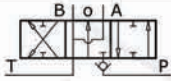

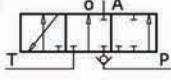

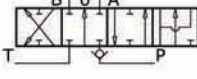


| Rif. | Code             | Description   | Page |
|------|------------------|---|------|
| 1    | <b>W001A</b>     | 3 positions double-acting                                     | 14   |
|      | <b>W002A</b>     | 3 positions double-acting A-B to tank                         |      |
| 2    | <b>H001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

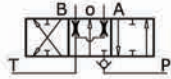
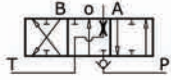
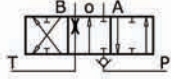
**NOTE:** (\*) Leave out the spool return action code when choosing H006.  
 Sections designed to house auxiliary valve option require double choice on work ports A and B.  
 Always indicate setting value when using antishock and combined valve: **01 PA (100) - 03 PA (100)**

## Spool identification

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

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

|             |  |   |
|-------------|--|---|
| <b>W001</b> | 3 positions double-acting                                |    |
| <b>W002</b> | 3 positions double-acting A and B to tank                |    |
| <b>W003</b> | 3 positions double-acting A to tank B blocked            |    |
| <b>W004</b> | 3 positions double-acting A blocked B to tank            |    |
| <b>W005</b> | 3 positions single - acting on A                         |   |
| <b>W006</b> | 3 positions single - acting on B                         |  |
| <b>W012</b> | 4 positions double-acting with float in the 4th position |  |
| <b>W013</b> | 3 positions double-acting regenerative                   |  |
| <b>W015</b> | 3 positions double-acting series                         |  |
| <b>W016</b> | 3 positions double-acting series A and B to tank         |  |

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

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

**NOTE:**

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

Plaease contact our Sales department for more information.



Spool actuation classification for manual control

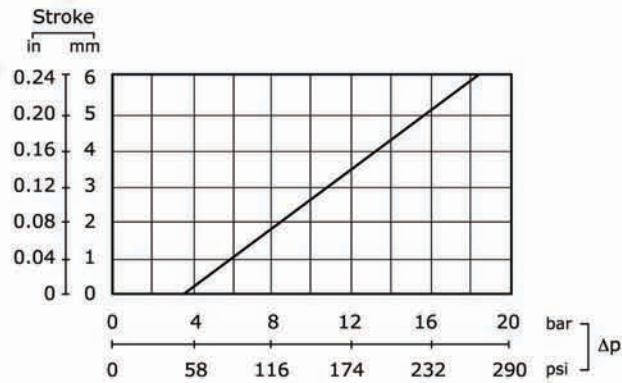
| code | description                  | dimensions | configuration |
|------|------------------------------|------------|---------------|
| H001 | Protected lever              |            |               |
| H002 | Protected lever rotated 180° |            |               |
| H004 | Control without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

Spool actuation classification for Hydraulic control

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

Hydraulic pilot control curve

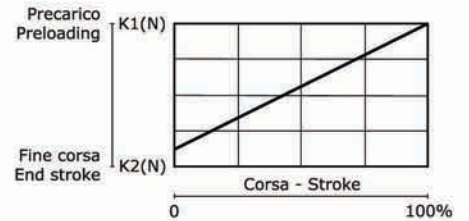
The diagram shows the spool stroke as a function of the pressure operating.



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

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

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



| code                    | description  | schema | dimensions | configuration |
|-------------------------|--|--------|------------|---------------|
| F001A<br>F001B<br>F001C | 3 positions<br>spring-centred spool  |        |            |               |
| F002A                   | 3 positions<br>spring-centred spool<br>detent in A and B   |        |            |               |
| F003A                   | 3 positions<br>spring-centred spool<br>detent in A   |        |            |               |
| F004A                   | 3 positions<br>spring-centred spool<br>detent in B   |        |            |               |
| F005A                   | 4 positions<br>spring-centred spool<br>detent in 4 <sup>th</sup> position<br><br>(only for W012 spool) |        |            |               |
| F013A<br>F013B<br>F013C | 3 positions<br>spring-centred spool<br>prearrangement<br>dual command                                  |        |            |               |

Work section identification

|        |  | working section type     |  |
|--------|--|--------------------------|--|
| RP G03 |  | Parallel circuit section |  |
| RP U03 |  |                          |  |

**Parallel circuit**

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

|        |  |                                       |
|--------|--|---------------------------------------|
| RT G03 |  | Tandem (conventional) circuit section |
| RT U03 |  |                                       |

**Parallel-Tandem circuit**

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

|        |  |                        |
|--------|--|------------------------|
| RS G03 |  | Series circuit section |
| RS U03 |  |                        |









**Series circuit**









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

Compatibility table

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

Auxiliary valve identification

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

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

Auxiliary valve - Setting range

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

**01PA (120) = setting at full flow**

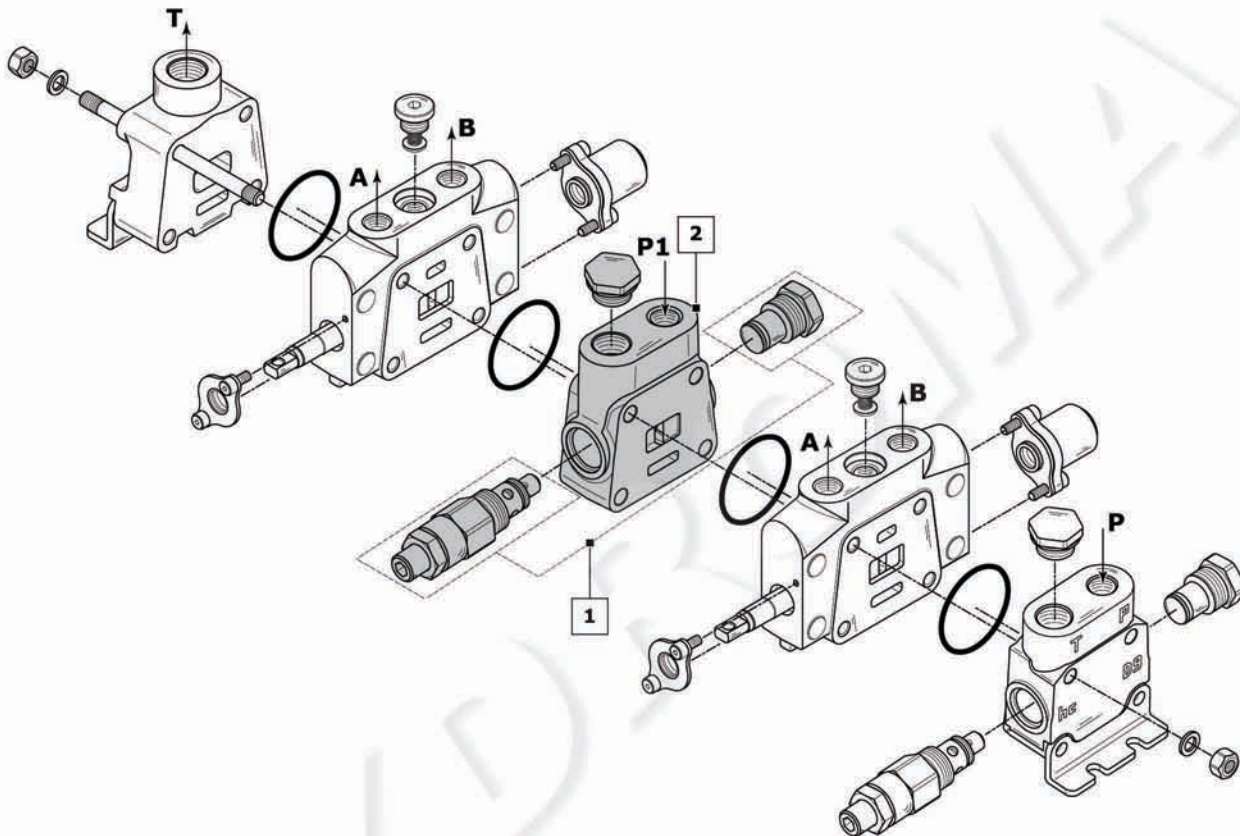
**01PA (120-A) = setting at min. flow**

## INTERMEDIATE INLET SECTION

Order example

|    |     |     |       |
|----|-----|-----|-------|
| BE | 001 | 150 | A G04 |
|----|-----|-----|-------|

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



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

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

Intermediate inlet section classifications

**intermediate inlet type**

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

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

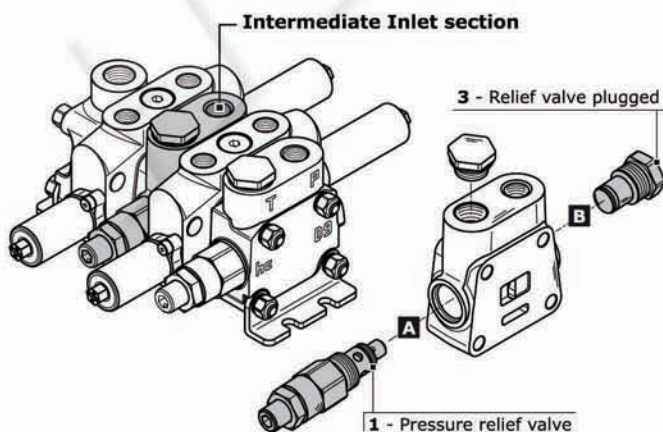
|           |  |  |   |
|-----------|--|--|---|
| <b>BV</b> |  |  | Intermediate inlet section with pressure relief valve |
|-----------|--|--|---|

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

Valve identification on intermediate inlet section

| type     | schema | layout | description                         | type      | schema | configurazione | descrizione                         |
|----------|--------|--------|-------------------------------------|-----------|--------|----------------|-------------------------------------|
| <b>1</b> |        |        | Direct acting pressure relief valve | <b>11</b> |        |                | Plug with pressure-gauge connection |
| <b>3</b> |        |        | Relief valve plugged                |           |        |                |                                     |

Valve arrangement on intermediate inlet section









Combination valve example: 001 = 1A - 3B

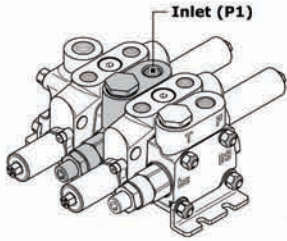
- 001** Combination valve
- 1A** Pressure relief valve in port A
- 3B** Relief valve plugged in port B

**The code identifies:**  
 with a number, the type of valve; with a letter its position on the inlet section.  
 (A) = spool action side  
 (B) = spool return action side

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

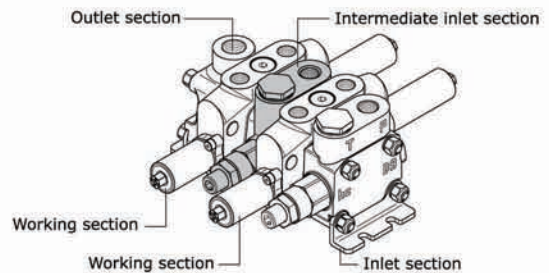
| AVAILABLE COMBINATIONS ON INLET SECTION |  | Valve type on port B  |   |  |
|---|--|---|---|--|
|   |  |  1 |  3 |  11 |
| Valve type on port A                    |  1  |   | 001   | 008  |
|   |  3  | 017   | 019   | 027  |
|   |  11 | 084   | 086   |  |

**Inlet position and available thread type**

| Inlet position and thread available |  |
|-------------------------------------|--|
| A G03                               |  <p>Inlet (P1)</p> <p>Upper inlet (P1)</p> |
| A U03                               |  |

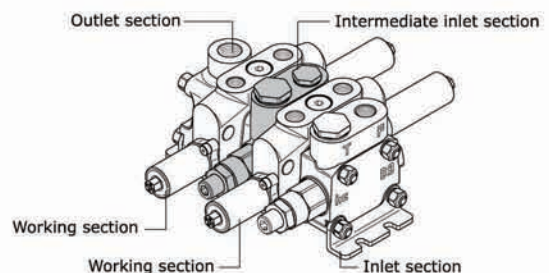
**Complete configuration samples for D9/2 with intermediate inlet section (BE)**

- IR 001 150 A G03..... Right inlet section
- W001A H006 RP G03 ..... Working section
- BE 001 120 A G03.....Intermediate inlet section**
- W001A H006 RP G03 ..... Working section
- TJ A G04 ..... Outlet section



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

- IR 001 150 A G03..... Right inlet section
- W001A H006 RP G03 ..... Working section
- BV 009 120 .....Intermediate inlet section**
- W001A H006 RP G03 ..... Working section
- TJ A G04 ..... Outlet section

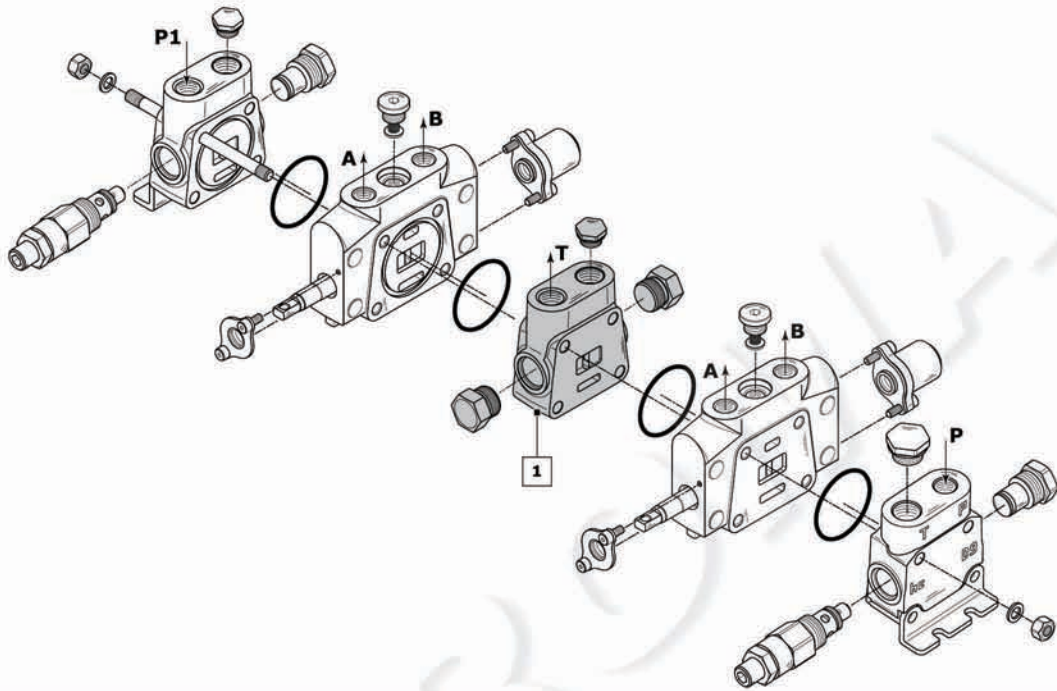


INTERMEDIATE OUTLET SECTION

Order example

|    |       |
|----|-------|
| BF | A G04 |
|----|-------|

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



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

Intermediate outlet section classifications

**intermediate outlet type**

|           |  |  |  |
|-----------|--|--|--|
| <b>BF</b> |  |  | <p>Intermediate outlet section<br/>with single tank return</p> |
|-----------|--|--|--|

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

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

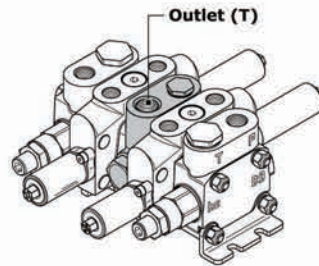
The section in question allows the flow of oil of the two pumps to be piped in two outlets: HPCO for powering another directional control valve, T for discharge of the work ports. In order to obtain this, the two T need to be linked.



**Outlet position and available thread type (for BF intermediate)**

**Outlet combination and thread available**

**A G04**

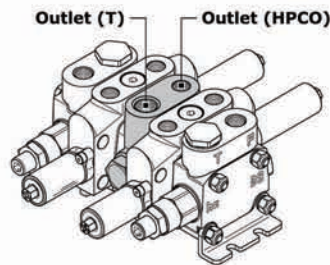


Upper outlet (T)

**Outlet position and available thread type (for BG intermediate)**

**Inlet combination and thread available**

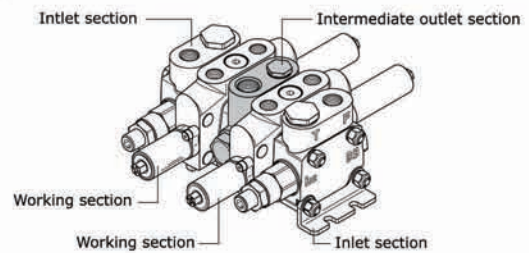
**W G04**



HPCO upper intermediate outlet section  
T (TANK) upper intermediate outlet section

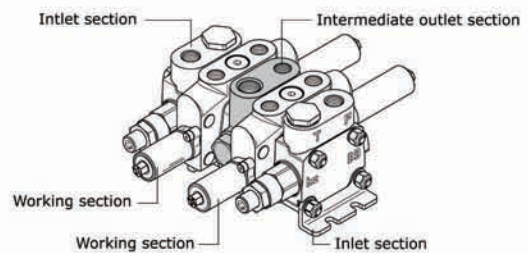
**Complete configuration samples for D9/2 with intermediate outlet section (BF)**

- IR 001 150 A G03..... Right inlet section
- W001A H006 RP G03 ..... Working section
- BF A G04 .....Intermediate outlet section**
- W001A H006 RP G03 ..... Working section
- IL 001 150 A G03 ..... Left inlet section



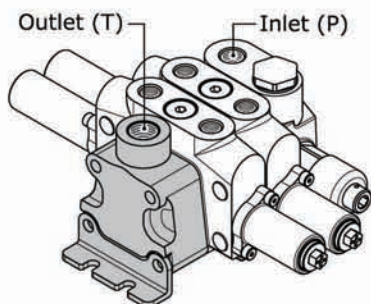
**Complete configuration samples for D9/2 with intermediate outlet section (BG)**

- IR 001 150 A G03..... Right inlet section
- W001A H006 RP G03 ..... Working section
- BG W G04 .....Intermediate outlet section**
- W001A H006 RP G03 ..... Working section
- IL 001 150 A G03 ..... Left inlet section



**OUTLET SECTION (VERSION 1 OUTLET)**

**Order example**



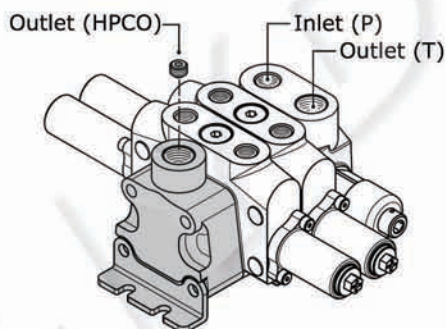
**TJ** | **A G04**

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

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

**OUTLET SECTION (HPCO VERSION OUTLET)**

**Order example - HPCO version Outlet**



**TM** | **W G04**

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

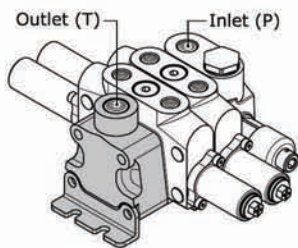
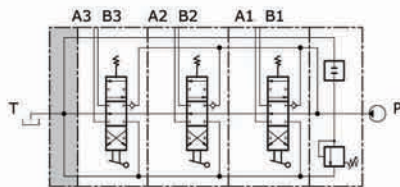
| Rif. | Code         | Description  | Page |
|------|--------------|--|------|
| 1    | <b>TM</b>    | Outlet section with two return (T-HPCO) right-side inlet (P)           | 27   |
|      | <b>TN</b>    | Outlet section with two return (T-HPCO) left-side inlet (P)            |      |
| 2    | <b>W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

Outlet with single tank classification

outlet identification

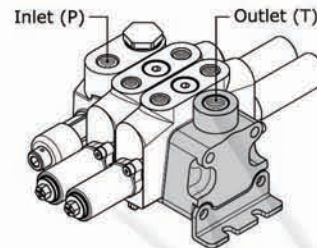
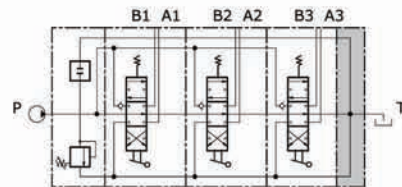
TJ

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



TK

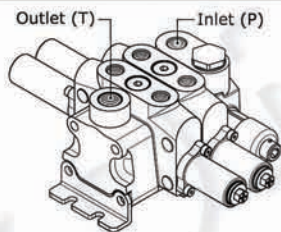
Outlet section with single return (T)  
left-side inlet (P)



Outlet position

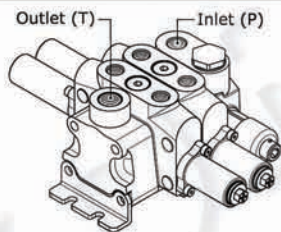
outlet combination and thread available

A G04



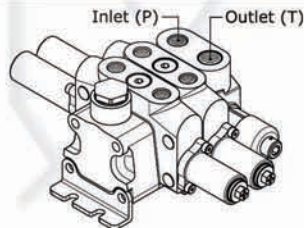
Upper outlet  
(thread G 1/2)

A U04



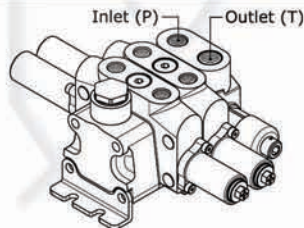
Upper outlet  
(thread 7/8" - 14 UNF)

E G04



Upper outlet  
(inlet - outlet)  
(thread G 1/2)

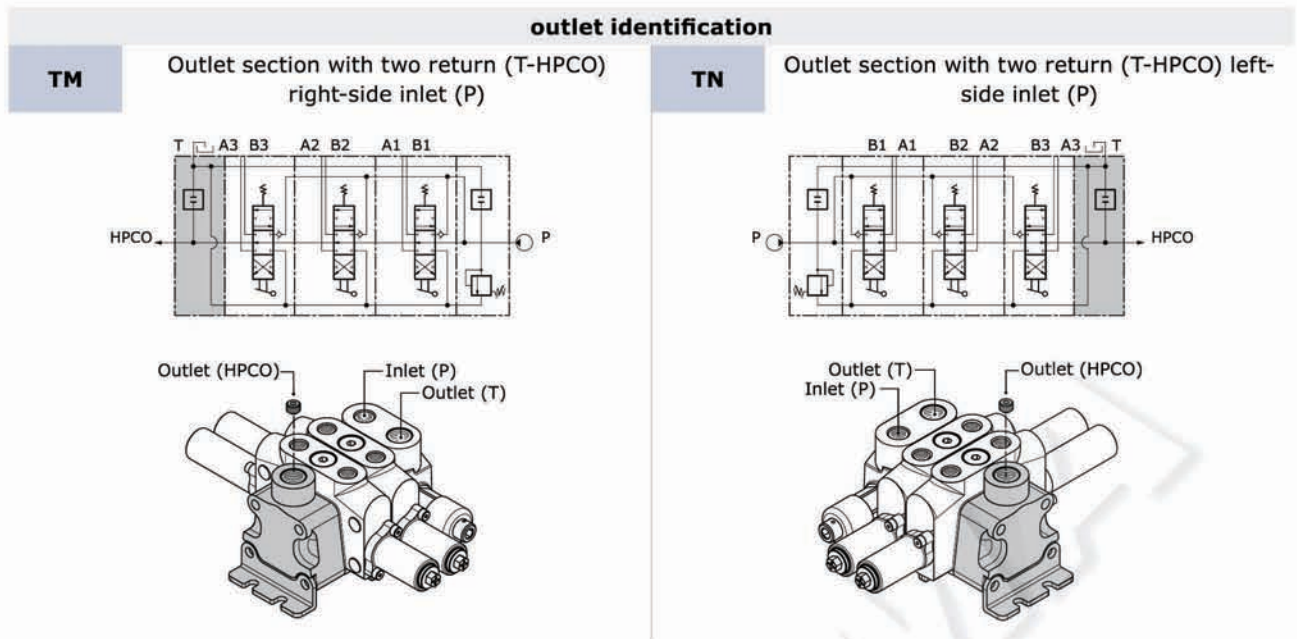
E U04



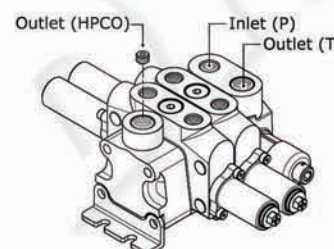
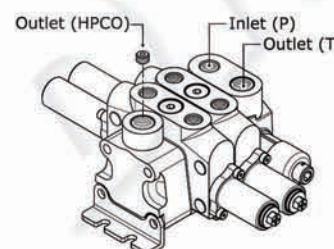
Upper outlet  
(inlet - outlet)  
(thread 7/8" - 14 UNF)

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

**Outlet with two tanks classification**



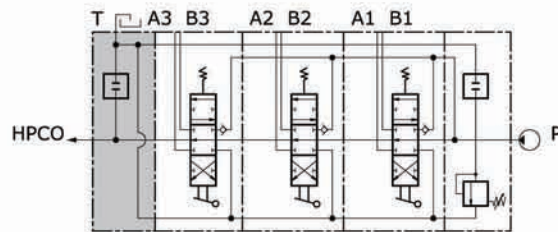
**Outlet position**

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

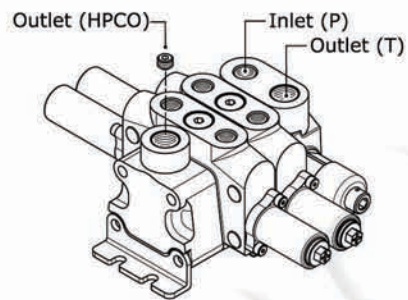
**NOTE:** code "W" on outlet section obliges to choice "E" on inlet section.

**Carry-over connection (HPCO)**

This option, available on all D9, allows the sectional valve to feed a second valve, by extending the free flow channel. In this configuration, the valve need a separated port for connection to tank.

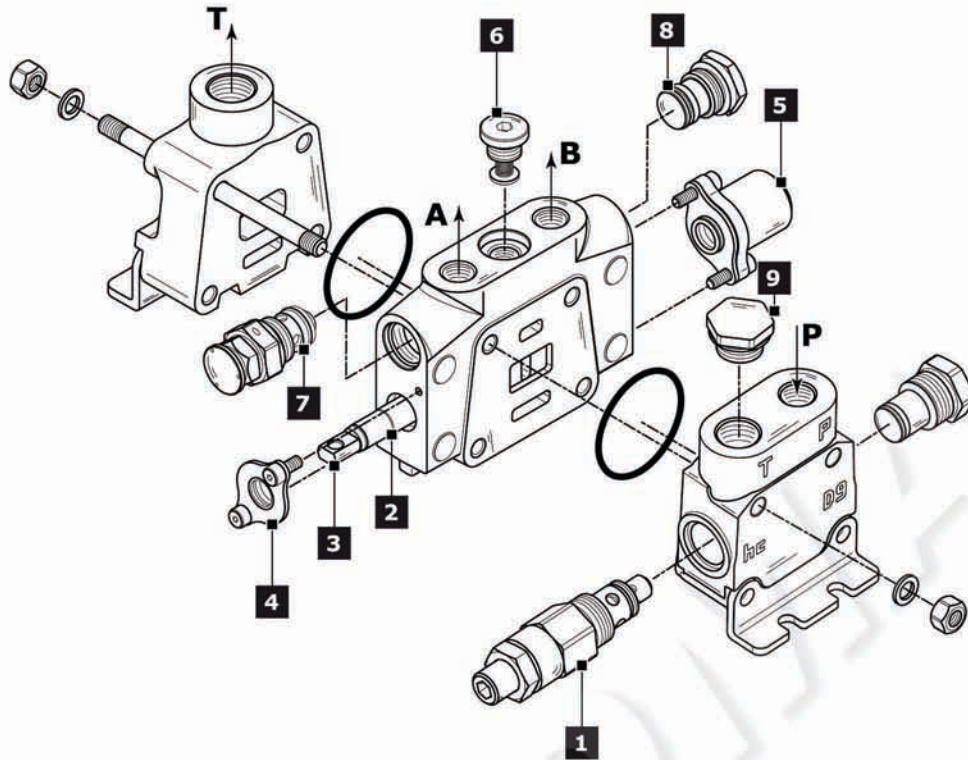


It is possible to transform sectional valve from standard to HPCO version just by ordering the appropriate conic plug:



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

D9 SPARE PARTS LIST



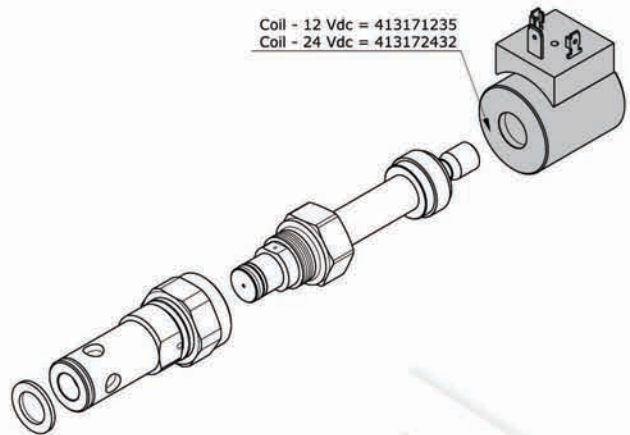
| Ref. | Description  | Order code | Q.ty | Code        | Note                           |
|------|--|------------|------|-------------|--------------------------------|
| 1    | Direct acting pressure relief valve (*)                          | 84642      |      |             | Setting: 100 bar    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

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

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

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

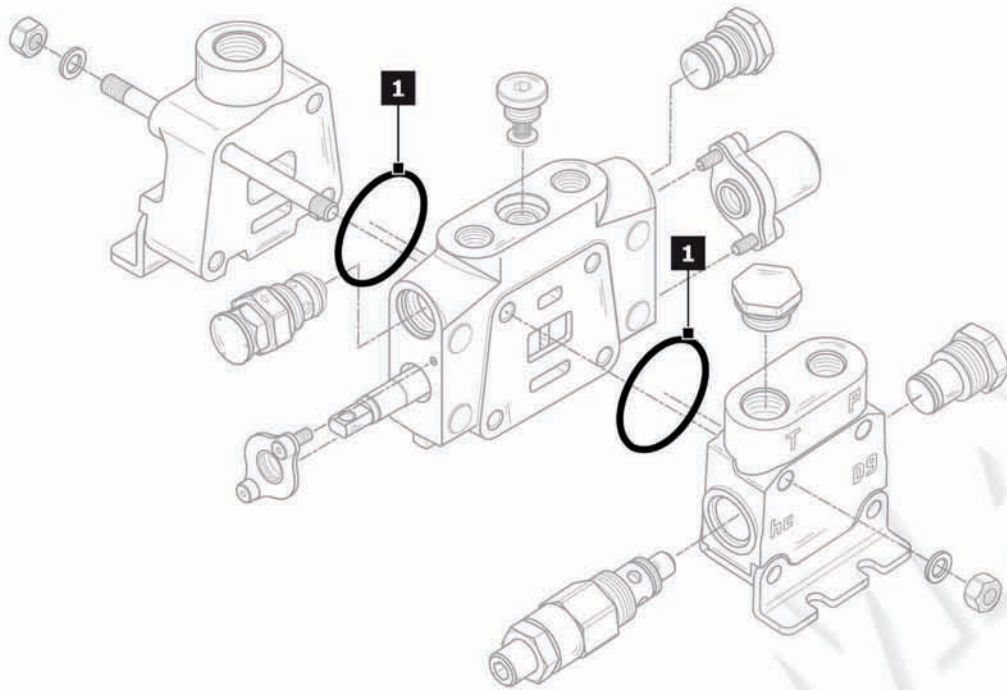
Coil - 12 Vdc = 413171235  
Coil - 24 Vdc = 413172432



HYDRO



## Gasket kit



## INLET AND WORK SECTION

| Rif. | ORDER CODE | DESCRIPTION                    | Q.ty |
|------|------------|--------------------------------|------|
| 1    | 412010634  | O.R. 70SH 50,47 x 2,62 (2-136) | 1    |

**Complete Gasket kit: order code - 350946001**

**INSTALLATION**

**Guidelines**

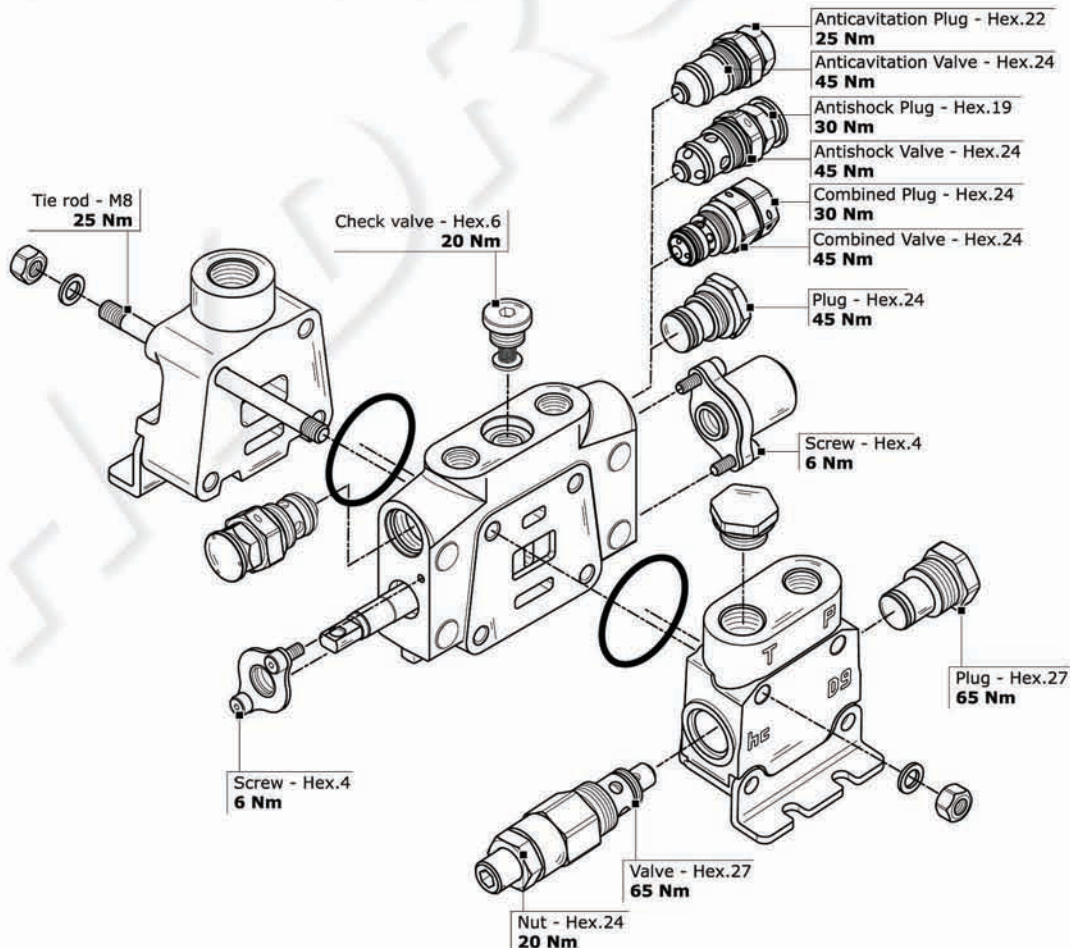
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting.
- When handling the control valve, be careful not hold the pilot cover or return spring cap of the spool or accessory valves such as main relief valves and anti-shock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

**Fittings tightening torque (Nm)**

| thread type                            | port P               | Port A - B           | Port T               |
|--|----------------------|----------------------|----------------------|
| <b>BSP (ISO - 228)</b>                 | <b>G 3/8</b>         | <b>G 3/8</b>         | <b>G 3/8</b>         |
| with rubber sealing (DIN 3869)         | 40                   | 40                   | 40                   |
| with copper or steel and rubber washer | 40                   | 40                   | 40                   |
| <b>BSP (ISO - 228)</b>                 | <b>G 1/2</b>         | <b>G 1/2</b>         | <b>G 1/2</b>         |
| with rubber sealing (DIN 3869)         | 70                   | 70                   | 70                   |
| with copper or steel and rubber washer | 70                   | 70                   | 70                   |
| <b>UN-UNF (ISO - 725)</b>              | <b>3/4" - 16 UNF</b> | <b>3/4" - 16 UNF</b> | <b>3/4" - 16 UNF</b> |
| with O.R.                              | 40                   | 40                   | 40                   |
| <b>UN-UNF (ISO - 725)</b>              | <b>7/8" - 14 UNF</b> | <b>7/8" - 14 UNF</b> | <b>7/8" - 14 UNF</b> |
| with O.R.                              | 90                   | 90                   | 90                   |

**General clamping torque**

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



## Dimensions - Thread codes

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

## METRIC THREAD (ISO 9974-1)

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

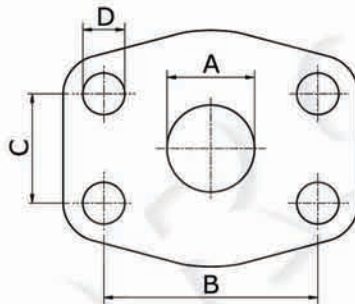
## BSP THREAD (ISO 1179-1)

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

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

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

## Dimensions - SAE Flange codes



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

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

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

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