



DVS 14
Sectional directional
control valve

TECHNICAL CATALOGUE



Features

Simple, compact and heavy duty designed sectional valve from 1 to 10 sections for hydraulic systems with fixed or variable displacement pumps.

- Available in left or right inlet configurations.
- Working sections with and without port valves arrangement.
- Flow Unloader configuration available.
- Proportional electrohydraulic controls.
- Optional spool position sensors.

Additional information

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

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.

4th edition March 2020

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Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm²/s - 46 cSt viscosity at 40°C - 104°F temperature.

| | | | |
|--|---|----------------------------------|-------------------------------|
| Nominal flow rating | standard | 80 l/min | 22 US gpm |
| | Flow Unloader valve configuration | 120 l/min | 32 US gpm |
| Max. pressure ⁽¹⁾ | | 350 bar | 5100 psi |
| Back pressure (max.) on outlet T port | with mechanical controls | 20 bar | 290 psi |
| | with hydraulic controls | 20 bar | 290 psi |
| | with electrohydraulic controls | 20 bar | 290 psi |
| Standard internal leakage A(B)->T | $\Delta p = 100 \text{ bar} - 1450 \text{ psi}$ | 8 cm ³ /min max. | 0.5 in ³ /min max. |
| Fluid | | Mineral oil | |
| Fluid temperature range | with NBR (BUNA-N) seals | from -20°C to 80°C | from -4°F to 176°F |
| Viscosity | operating range | from 15 to 75 mm ² /s | from 15 to 75 cst |
| | min. | 12 mm ² s | 12 cst |
| | max. | 400 mm ² s | 400 cst |
| Contamination level | | -/19/16 - ISO 4406 | -/19/16 - ISO 4406 |
| Environmental temperature for working conditions | with mechanical, hydraulic, electric and electrohydraulic devices | from -40°C to 60°C | from -40°F to 140°F |
| Tie rods tightening torque (ch 13) | | 40 Nm | 29,5 Nm |

NOTE - ⁽¹⁾ Intermittent pressure at max. 250,000 cycles with specific internal testing.

- For different working conditions please, contact our Sales Department.

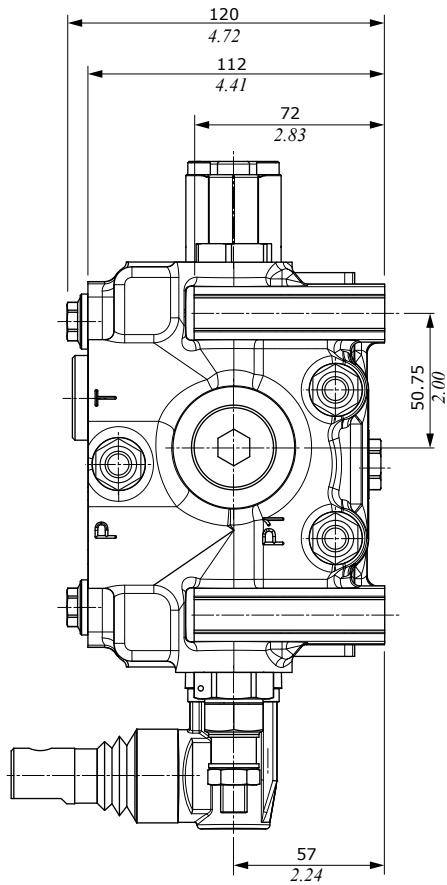
Standard thread

| REFERENCE STANDARD | | | | |
|---------------------|-----|---------------------|-------------------|--------------|
| | | BSP | UN-UNF | NPTF |
| THREAD ACCORDING TO | | ISO 228/1 | ISO 263 | ANSI B1.20.3 |
| | | BS 2779 | ANSI B1.1 unified | |
| CAVITY | ISO | 1179-1 | 11926-1 | |
| DIMENSION | SAE | | J1926-1 | J476a |
| ACCORDING TO | DIN | 3852-2 shape X or Y | | |

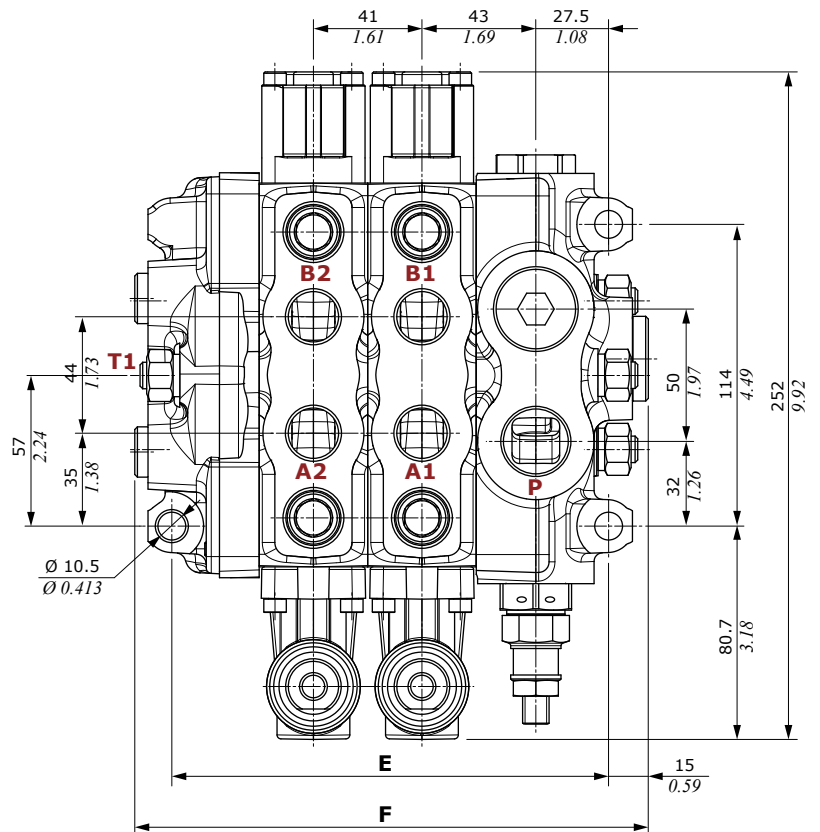
| PORTS THREADING | | |
|---|-------|--------------------------------------|
| | BSP | UN-UNF |
| P inlet | G 3/4 | 1 1/6-12 (SAE 12) |
| A and B ports | G 1/2 | 7/8-14 (SAE 10) |
| T outlet, HPCO carry-over | G 3/4 | 1 1/6-12 (SAE 12) - 7/8-14 (SAE 10)* |
| Y pilot | G 1/4 | 9/16-18 (SAE 6) |
| X drain | G 1/4 | 9/16-18 (SAE 6) |
| Hydraulic controls | G 1/4 | 9/16-18 (SAE 6) |

NOTE (*) - on outlet section (mechanical and hydraulic controls)

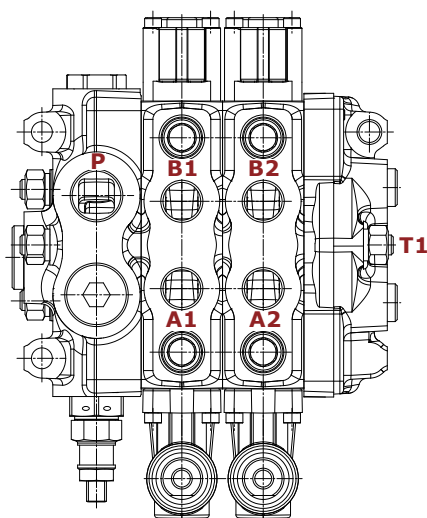
Mechanical control configuration



Right Inlet configuration example



Left Inlet configuration example

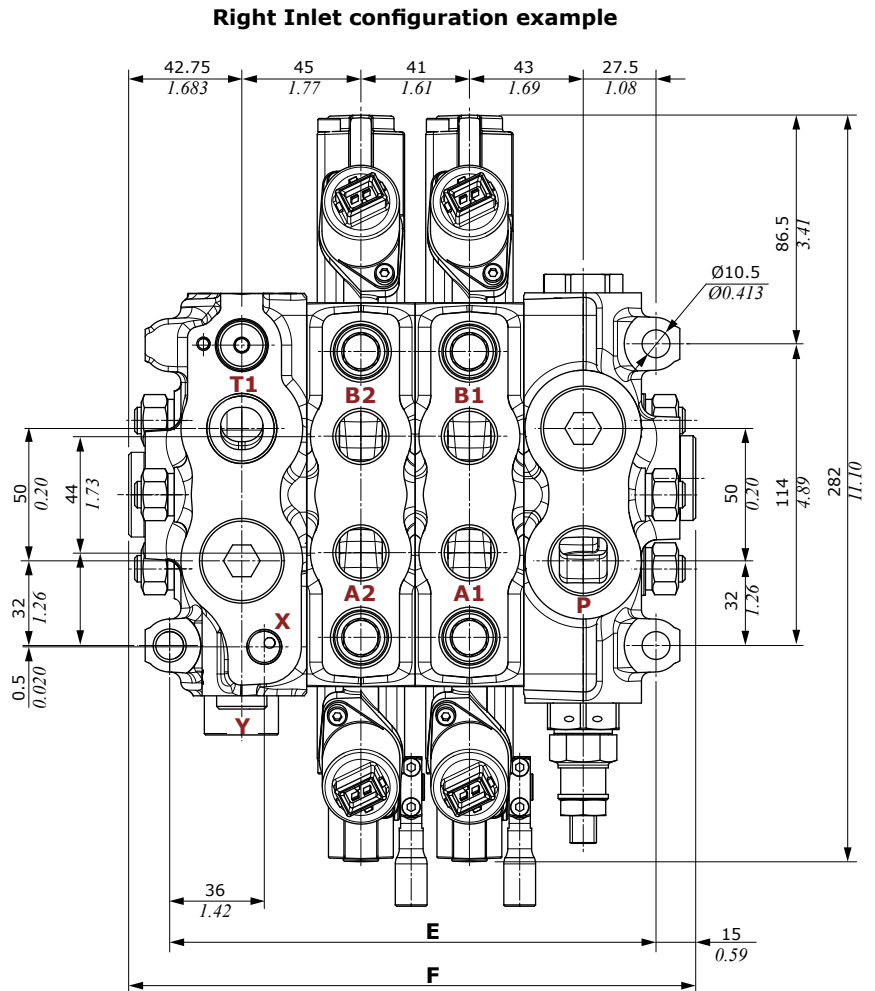
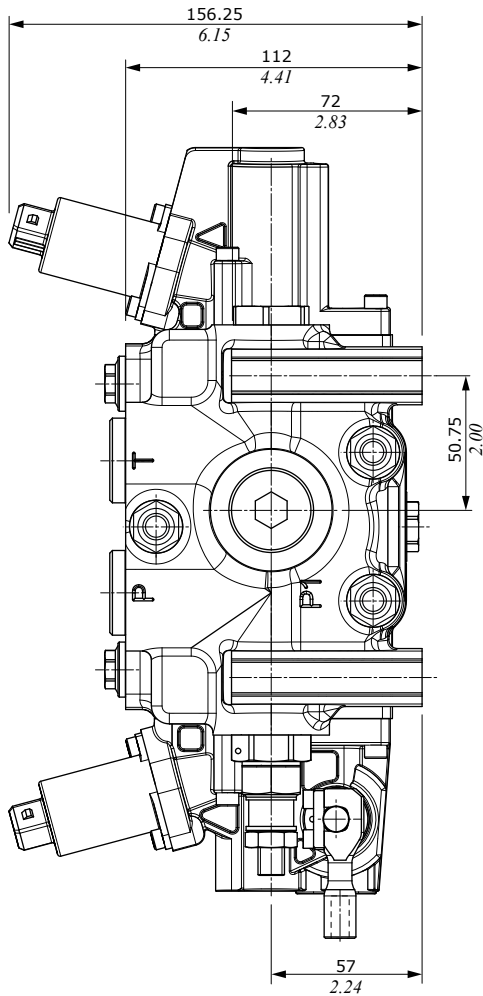


| TYPE | E | | F | |
|----------|-----|-------|-----|-------|
| | mm | in | mm | in |
| DVS14/1 | 124 | 4.88 | 153 | 6.02 |
| DVS14/2 | 165 | 6.50 | 194 | 7.64 |
| DVS14/3 | 206 | 8.11 | 235 | 10.43 |
| DVS14/4 | 247 | 9.72 | 276 | 10.87 |
| DVS14/5 | 288 | 11.34 | 317 | 12.48 |
| DVS14/6 | 329 | 12.95 | 358 | 14.09 |
| DVS14/7 | 370 | 14.57 | 399 | 15.71 |
| DVS14/8 | 411 | 16.18 | 440 | 17.32 |
| DVS14/9 | 452 | 17.80 | 481 | 18.94 |
| DVS14/10 | 493 | 19.41 | 522 | 20.55 |

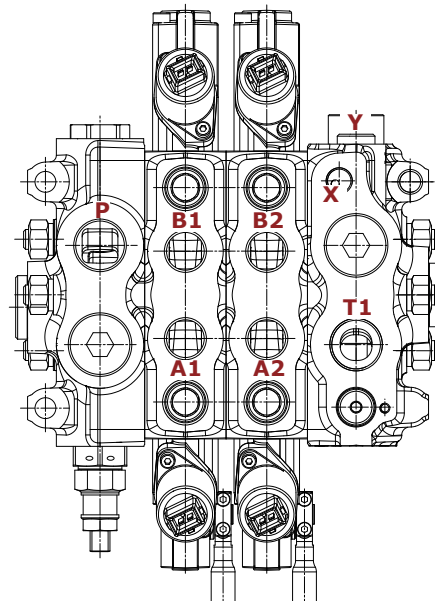
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

Dimensional data

Electrohydraulic control configuration



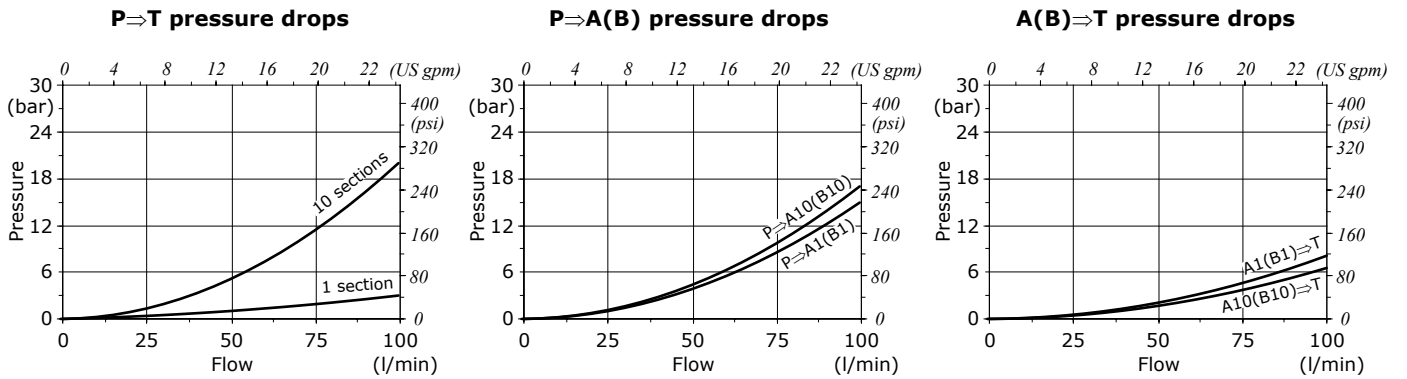
Left Inlet configuration example



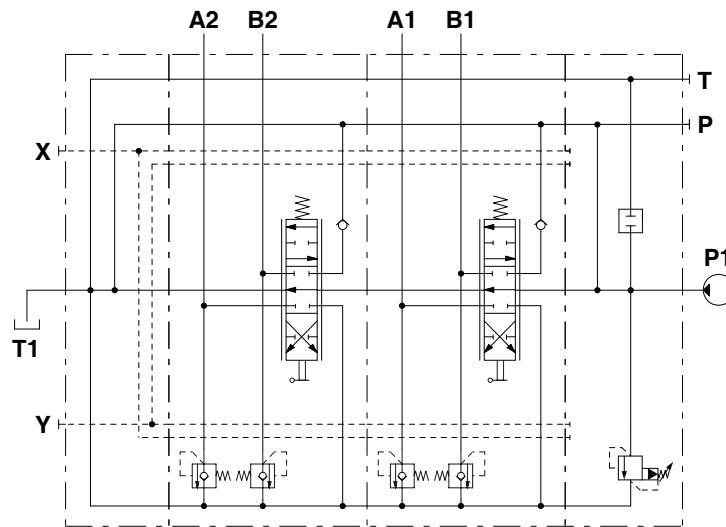
| TYPE | E | | F | |
|----------|-----|-------|--------|-------|
| | mm | in | mm | in |
| DVS14/1 | 144 | 5.67 | 173.25 | 6.82 |
| DVS14/2 | 185 | 7.28 | 214.25 | 8.44 |
| DVS14/3 | 226 | 8.90 | 255.25 | 10.05 |
| DVS14/4 | 267 | 10.51 | 296.25 | 11.66 |
| DVS14/5 | 308 | 12.13 | 337.25 | 13.28 |
| DVS14/6 | 349 | 13.74 | 378.25 | 14.89 |
| DVS14/7 | 390 | 15.35 | 419.25 | 16.51 |
| DVS14/8 | 431 | 16.97 | 460.25 | 18.12 |
| DVS14/9 | 472 | 18.58 | 501.25 | 19.73 |
| DVS14/10 | 513 | 20.20 | 542.25 | 21.35 |

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

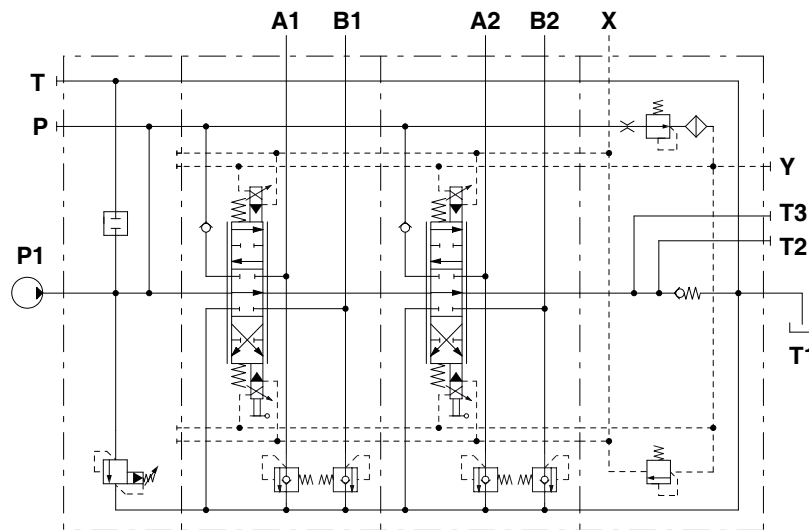
Performances



Hydraulic circuit



Right Inlet valve with mechanical controls configuration:
 DVS14/2/MR-V1A(175)V3B-A-G05/W001A-H001-F001A-RP1-G04.03TF-PA(100)\03TF-PB(100)/
 W001A-H001-F001A-RP1-G04.03TF-PA(100)\03TF-PB(100)/KZM1-G05



Left Inlet valve with electrohydraulic controls configuration:
 DVS14/2/ML-V1A(200)V7B-C12-A-G05/W001A-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/
 W001A-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/KZP1-G05

Complete section ordering codes

Mechanical/hydraulic controls valve configuration example

Right Inlet: R
Left Inlet: L

DVS14/2/MR-V2A(200)V3B-A-G05/W001A-H001-F001A-RP1-G04.05TF-PA\05TF-PB/....

Nr. of working sections

1

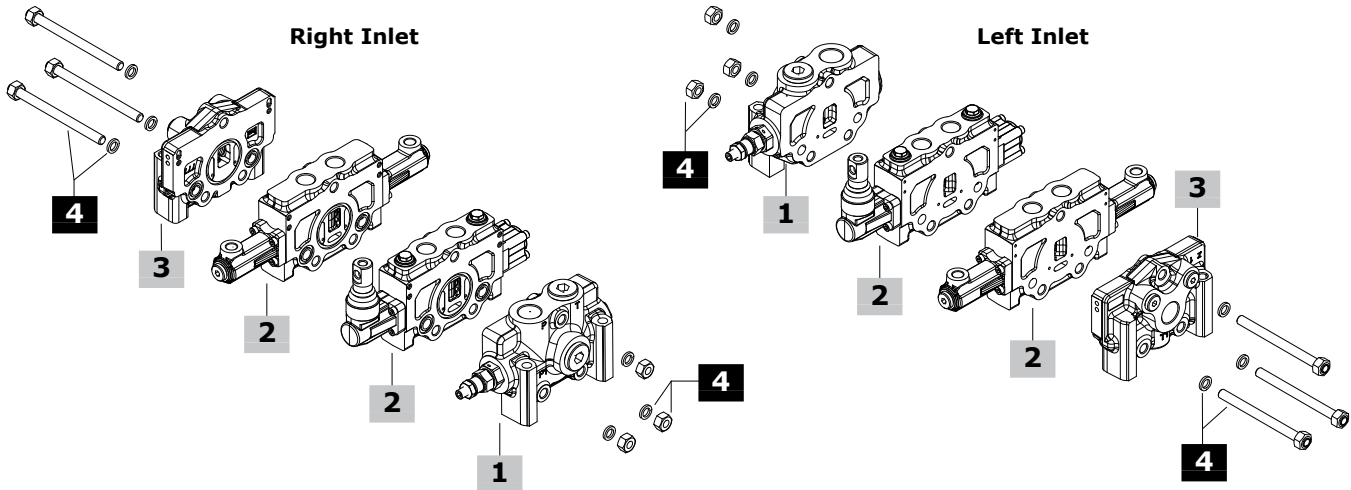
2

W001A-HP05A-RP2-G04/KZM1-G05-<P006/2>

2

3

Valve is painted as standard, with one coat of Primer RAL9005 black antitrust paint



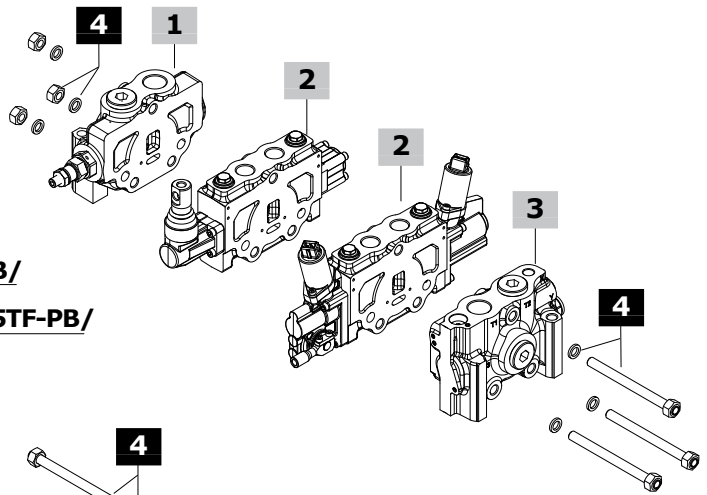
Mechanical/electrohydraulic controls valve configuration example with Left Inlet

DVS14/2/ML-V2A(200)V3B-A-G05/ **1**

2 **W001A-H001-F001A-RP1-G04.05TF-PA\05TF-PB/**

2 **W001A-HP04-FP04-B12AJ-RP1-G04.05TF-PA\05TF-PB/**

3 **KZP1-G05-<P006/2>**



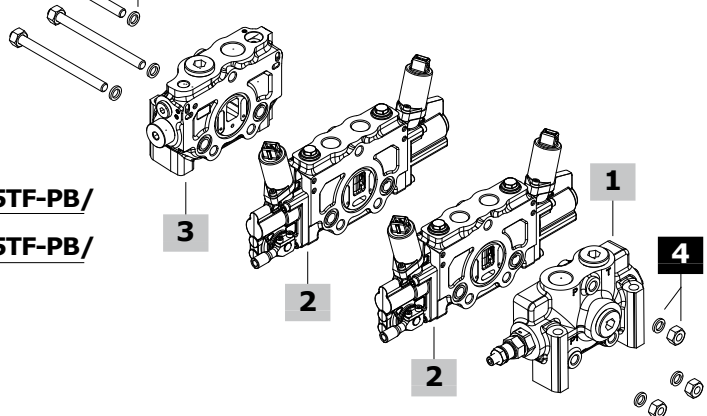
Electrohydraulic controls valve configuration example with Right Inlet

DVS14/2/MR-V2A(200)V3B-A-G05/ **1**

2 **W001A-HP04-FP04-B12AJ-RP1-G04.05TF-PA\05TF-PB/**

2 **W001A-HP04-FP04-B12AJ-RP1-G04.05TF-PA\05TF-PB/**

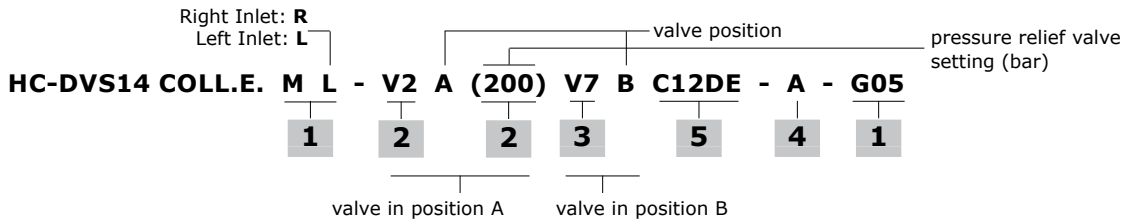
3 **KZP1-G05-<P006/2>**



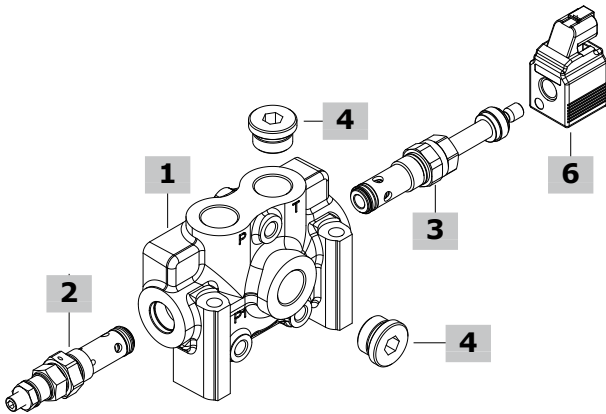
| | |
|--|---|
| <p>1 Inlet section * page 10</p> <p>Right Inlet configuration TYPE: MR-V2A(200)-V3B-A-G05 CODE: SHE140006 DESCRIPTION: Upper inlet open, side inlet and upper outlet plugged, with pilot operated main relief valve TYPE: MR-V3A-V3B-A-G05 CODE: SHE140007 DESCRIPTION: Upper inlet open, side inlet and upper outlet plugged, without main relief valve Left Inlet configuration TYPE: ML-V2A(200)-V3B-A-G05 CODE: SHE140001 DESCRIPTION: Upper inlet open, side inlet and upper outlet plugged, with pilot operated main relief valve TYPE: ML-V3A-V3B-A-G05 CODE: SHE140002 DESCRIPTION: Upper inlet open, side inlet and upper outlet plugged, without main relief valve</p> | <p>3 Outlet section * page 31</p> <p>TYPE CODE DESCRIPTION For all control types, without pressure reducing valve KZM1-G05 SHU140009 T1 port open, Y pilot and drain X plugged KZM2-G05 SHU140010 All ports plugged KZM3-G05 SHU140017 All ports open KZM4-G05 SHU140018 T1 port plugged, Y pilot and drain X open KZMH1-G05 SHU140019 With carry-over (HPCO) on T1 port, Y pilot and drain X plugged KZMH2-G05 SHU140020 With carry-over (HPCO) on T1 port, Y pilot and drain X open For electrohydraulic control, with pressure reducing valve KZP1-G05 SHU140001 With backpressure valve, upper T1 port and X drain open, T2-T3 outlets and Y pilot plugged KZP3-G05 SHU140002 With backpressure valve, X drain open, ports and Y pilot plugged KZP6-G05 SHU140021 Without backpressure valve, upper T1-T2 ports and Y pilot plugged, side T3 port and X drain open KZPH1-G05 SHU140022 Without backpressure valve, carry-over (HPCO) on upper T2 port, upper T1 port and drain X open, side T3 port and Y pilot plugged KZPH2-G05 SHU140023 Without backpressure valve, carry-over (HPCO) on side T3 port, upper T1 port and drain X open, upper T2 port and Y pilot plugged</p> |
| <p>2 Working section * page 14</p> <p>Right Inlet configuration TYPE: SD\W001A-H001-F001A-RP1-G04.05TF-PA/05TF-PB CODE: SHL140015 DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position TYPE: SD\W001A-HP05A-RP2-G04 CODE: SHL140019 DESCRIPTION: Parallel circuit without port valves arrangement, 3 positions double acting spool, proportional hydraulic control with spring return in neutral position TYPE: SD\W001A-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB CODE: SHL140017 DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool, 12VDC proportional electrohydraulic control (AMP JPT connector) with lever and spring return to neutral position TYPE: SD\W001A-HP04-FP04-B12AJ-RP2-G04 CODE: SHL140018 DESCRIPTION: As previous one without port valves arrangement Left Inlet configuration TYPE: SS\W001A-H001-F001A-RP1-G04.05TF-PA/05TF-PB CODE: SHL140009 DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position TYPE: SS\W001A-HP05A-RP2-G04 CODE: SHL140005 DESCRIPTION: Parallel circuit without port valves arrangement, 3 positions double acting spool, proportional hydraulic control with spring return in neutral position TYPE: SS\W001A-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB CODE: SHL140001 DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool, 12VDC proportional electrohydraulic control (AMP JPT connector) with lever and spring return to neutral position TYPE: SS\W001A-HP04-FP04-B12AJ-RP2-G04 CODE: SHL140003 DESCRIPTION: As previous one without port valves arrangement</p> | <p>4 Tie rods kit</p> <p>CODE DESCRIPTION For valve with KZM type outlet section 5TIRDVS1401 For 1 section valve 5TIRDVS1402 For 2 sections valve 5TIRDVS1403 For 3 sections valve 5TIRDVS1404 For 4 sections valve 5TIRDVS1405 For 5 sections valve 5TIRDVS1406 For 6 sections valve 5TIRDVS1407 For 7 sections valve 5TIRDVS1408 For 8 sections valve 5TIRDVS1409 For 9 sections valve 5TIRDVS1410 For 10 sections valve For valve with KZP type outlet section 5TIRDVS1401EI For 1 section valve 5TIRDVS1402EI For 2 sections valve 5TIRDVS1403EI For 3 sections valve 5TIRDVS1404EI For 4 sections valve 5TIRDVS1405EI For 5 sections valve 5TIRDVS1406EI For 6 sections valve 5TIRDVS1407EI For 7 sections valve 5TIRDVS1408EI For 8 sections valve 5TIRDVS1409EI For 9 sections valve 5TIRDVS1410EI For 10 sections valve</p> |

NOTE (*): Codes are referred to a BSP thread

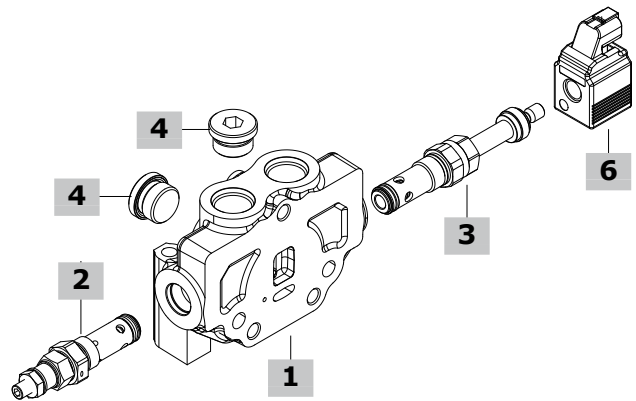
Part ordering codes



Right Inlet configuration example



Left Inlet configuration example



1 Section body * page 11

| TYPE | CODE | DESCRIPTION |
|---------------|-----------|---------------------------------|
| ML-G05 | 4205C3002 | Inlet section body, G3/4 thread |

2 Main relief valve page 12

| TYPE | CODE | DESCRIPTION |
|----------------|-----------|--|
| V2(200) | 91501C302 | Pilot operated, setting range from 50 to 350 bar (725 to 5100 psi) |
| V3 | 4301C3001 | Valve blanking plug |

3 Secondary inlet valves page 13

| TYPE | CODE | DESCRIPTION |
|------------|-----------|--|
| V4 | 91505C301 | Anticavitation valve |
| V6 | 91504C301 | Hydraulic operated unloading valve |
| V7 | 91504C302 | Solenoid operated unloading valve (without coil), "push&twist" emergency actuation |
| V8 | 91504C303 | As previous one without emergency actuation |
| V3 | 4301C3001 | Valve blanking plug |
| V13 | 4301C3002 | Valve blanking plug with G1/4 port for pressure gauge arrangement |

4 Port configuration * page 12

| TYPE | CODE | DESCRIPTION |
|----------|-----------|--|
| A | 430000020 | G3/4 plug: nr.1 - Upper P inlet port open, side P1 inlet port and upper T outlet port plugged |
| B | 430000020 | G3/4 plug: nr.1 |
| | 300007006 | G3/4 plug with G1/4 press. gauge arrangement: n.1 Upper P inlet port open, side P1 inlet port with press. gauge arrangement, upper T outlet port plugged |
| C | 430000020 | G3/4 plug: nr.1 - Side P1 inlet port open, upper P inlet port and T outlet port plugged |
| D | 430000020 | G3/4 plug: nr.1 |
| | 300007006 | G3/4 plug with G1/4 press. gauge arrangement: n.1 Side P1 inlet port open, upper P inlet port with press. gauge arrangement, upper T outlet port plugged |
| E | 430000020 | G3/4 plug: nr.1 - Side P1 inlet port plugged, upper P inlet port and T outlet port open |
| F | 300007006 | G3/4 plug with G1/4 press. gauge arrangement: n.1 Side P1 inlet port with press. gauge arrangement, upper P inlet port and T outlet port open |
| G | 430000020 | G3/4 plug: nr.1 - Side P1 inlet port and upper T outlet port open, upper P inlet port plugged |
| H | 300007006 | G3/4 plug with G1/4 press. gauge arrangement: n.1 Side P1 inlet port and upper T outlet port open, upper P inlet port with press. gauge arrangement |

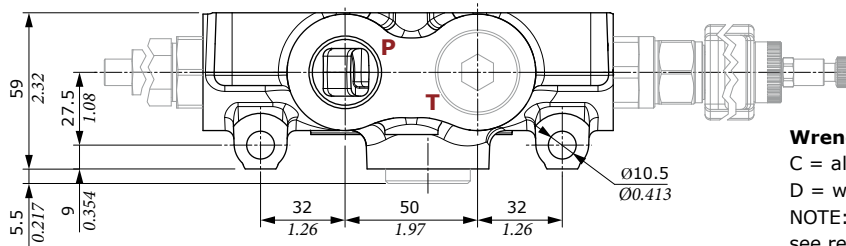
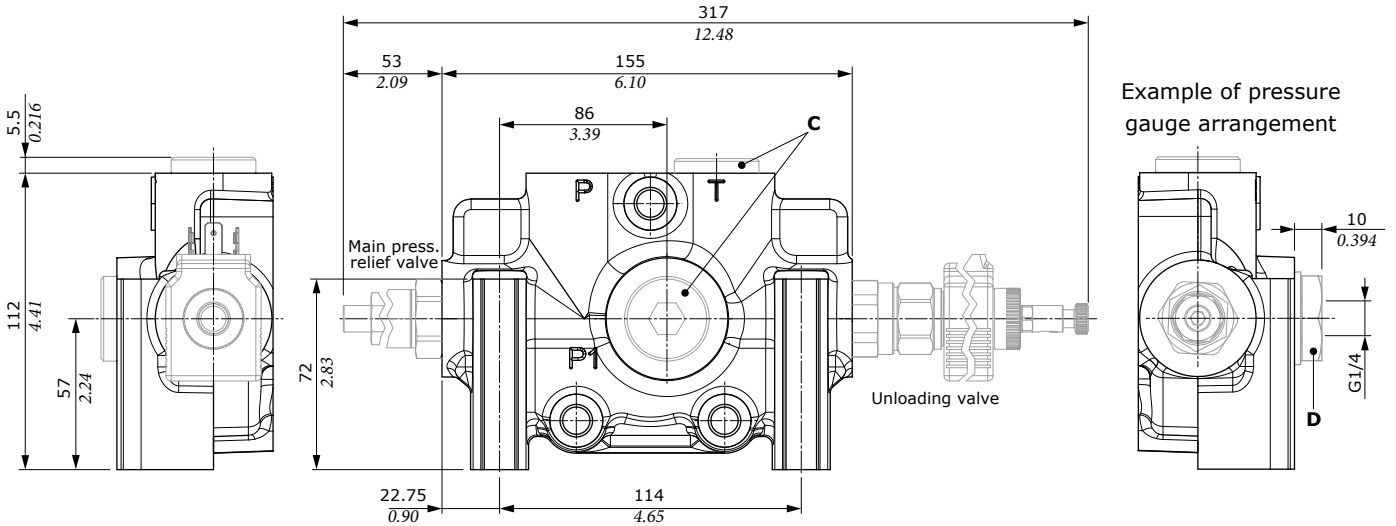
5 Coils page 44

| TYPE | CODE | DESCRIPTION |
|--------------|-------------|--|
| C12DI | 4SLE001200A | BER type, 12 VDC, ISO4400 connector |
| C12AJ | 4SLE001203A | BER type, 12 VDC, AMP JPT connector |
| C12DE | 4SLE001202A | BER type, 12 VDC, Deutsch connector |

NOTE (*): Codes are referred to a **BSP** thread

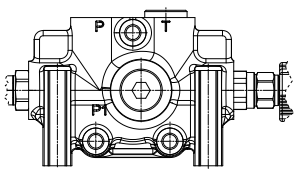
Dimensional data and hydraulic circuit

MR type inlet section example
 dimensions are the same for MR and ML type

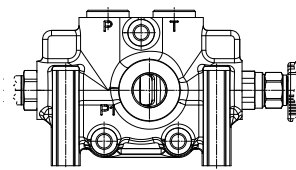


Wrenches and tightening torques
 C = allen wrench 12 - 90 Nm (66 lbf_t)
 D = wrench 32 - 90 Nm (66 lbf_t)
 NOTE: for valves wrench and torque, see related pages

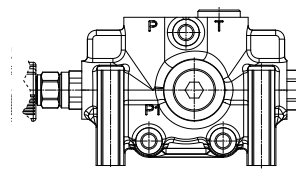
MRA section type, upper inlet



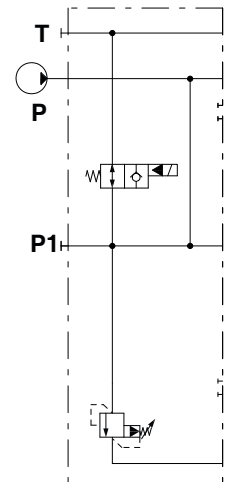
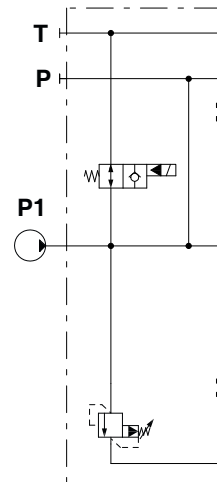
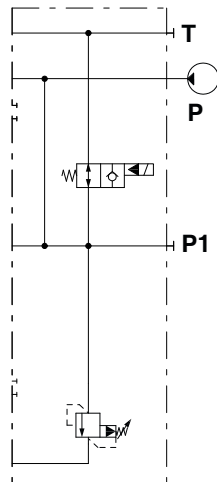
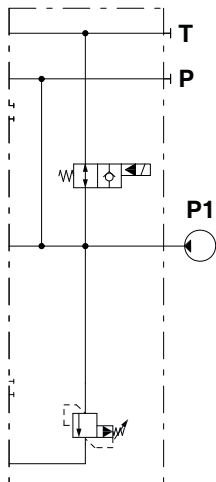
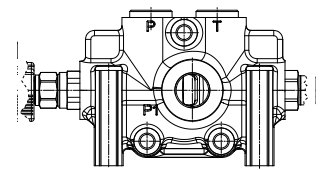
MRC section type, side inlet



MLA section type, upper inlet



MLC section type, side inlet



Port configuration

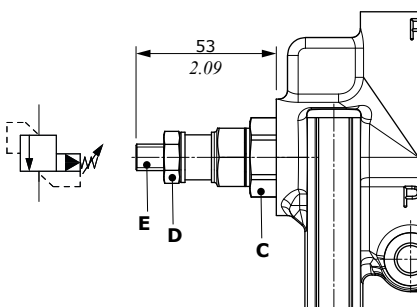
| Type | P inlet port | P1 inlet port | T outlet port | |
|------|----------------------------|----------------------------|---------------|--|
| A | open | closed | closed | |
| B | open | pressure gauge arrangement | closed | |
| C | closed | open | closed | |
| D | pressure gauge arrangement | open | closed | |
| E | open | closed | open | |
| F | open | pressure gauge arrangement | open | |
| G | closed | open | open | |
| H | pressure gauge arrangement | open | open | |

Inlet valves

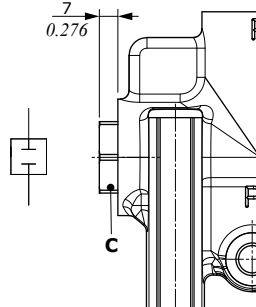
Main relief valve

Drawings show valve on **MR** type inlet section.

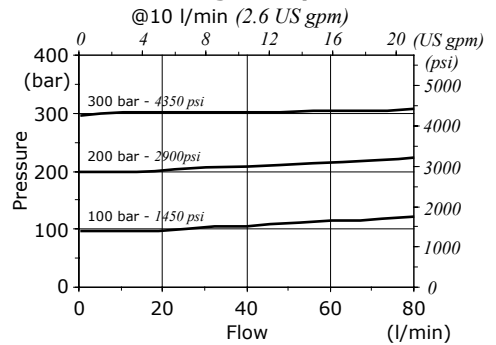
V2 type
Pilot operated



V3 type
Valve blanking plug



Setting example



Wrenches and tightening torques

- C = wrench 27 - 80 Nm (59 lbft)
- D = wrench 16 - 25 Nm (18.4 lbft)
- E = allen wrench 5

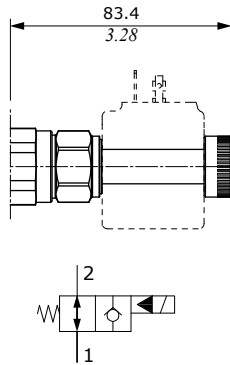
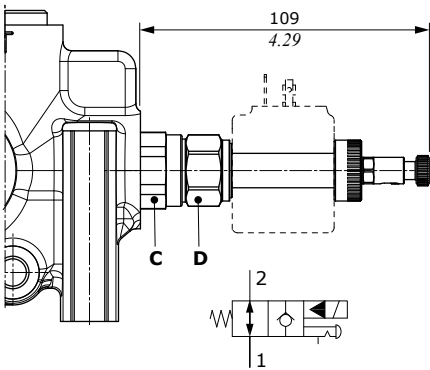
Secondary inlet valves

Drawings show valves on **MR** type inlet section.

Solenoid operated unloading valve

V8 type: push&twist emergency actuation

V7 type: without emergency actuation



Valve features

- Nominal flow : 2 l/min (0.53 US gpm)
- Max. pressure. : 350 bar (5100 psi)
- Max. internal leakage.. : 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)

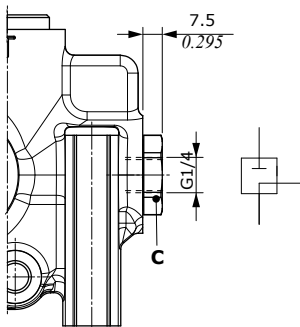
For **BER** type coils, see page 44

Wrenches and tightening torques

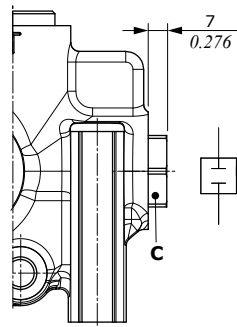
C = wrench 27 - 80 Nm (59 lbft)

D = wrench 24 - 30 Nm (22 lbft)

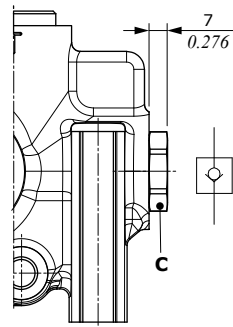
**V13 type
Plug with pressure
gauge arrangement**



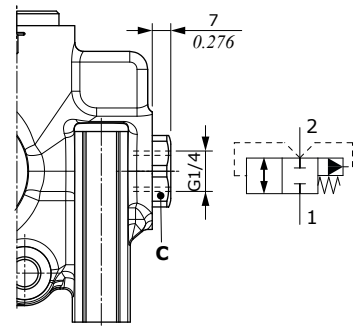
**V3 type
Valve blanking plug**



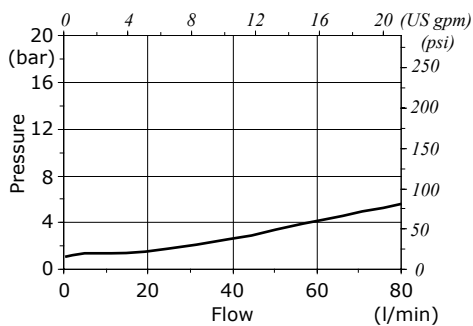
**V4 type
Anticavitation valve**



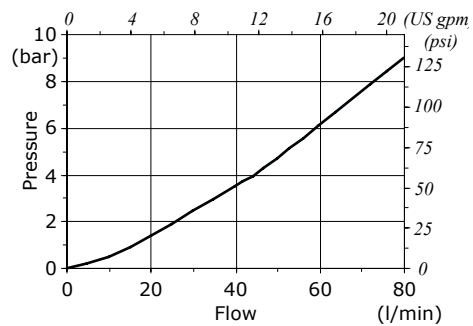
**V6 type
Hydraulic operated
unloading valve**



**V6-V7-V8 valves pressure drops
2 → 1**



V4 valve pressure drops



Part ordering codes

Mechanical control valve configuration example for Left Inlet

Right Inlet: **D**
Left Inlet: **S**

HC-DVS14 - SS/W001A-H001-F001

2A 3A 4A

valve setting (bar)

port valve position

-RP1-G04.03TF-PA(100)\03TF-PB(80)

1A

6

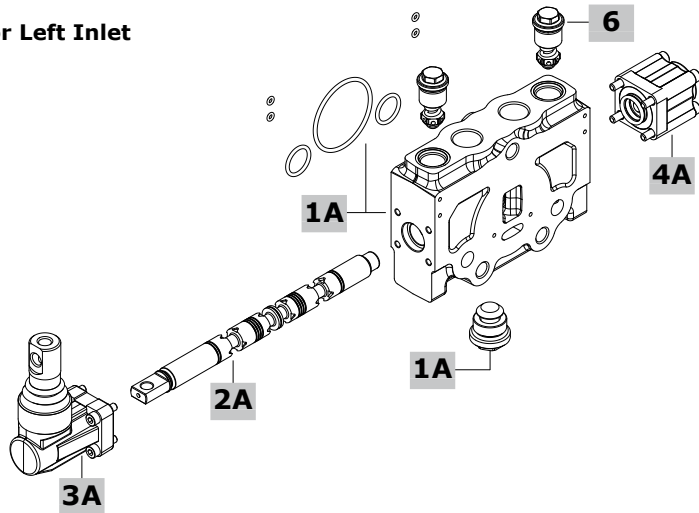
6

6

6

valve on A port

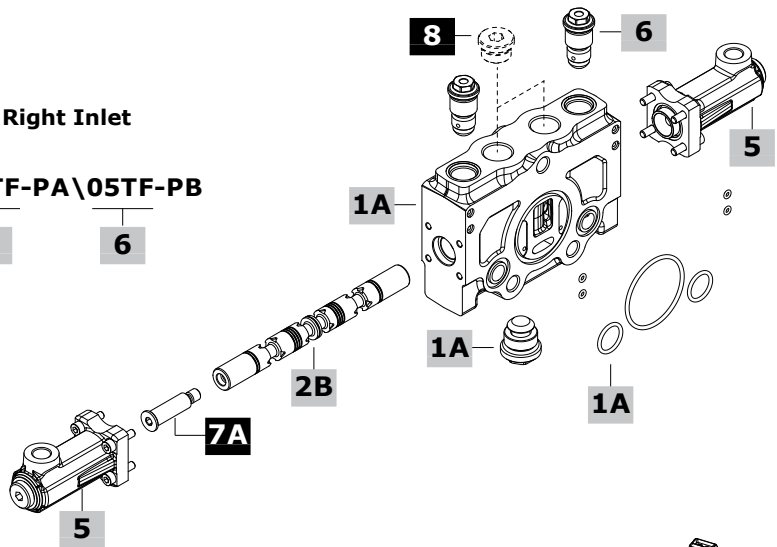
valve on B port



Hydraulic control valve configuration example for Right Inlet

HC-DVS14-SD/W001A-HP05A-RP1-G04.05TF-PA\05TF-PB

2B 5 1A 6 6



Electrohydraulic control valve configuration example for Right Inlet

HC-DVS14-SD/W001A-HP04-FP04-B12AJ

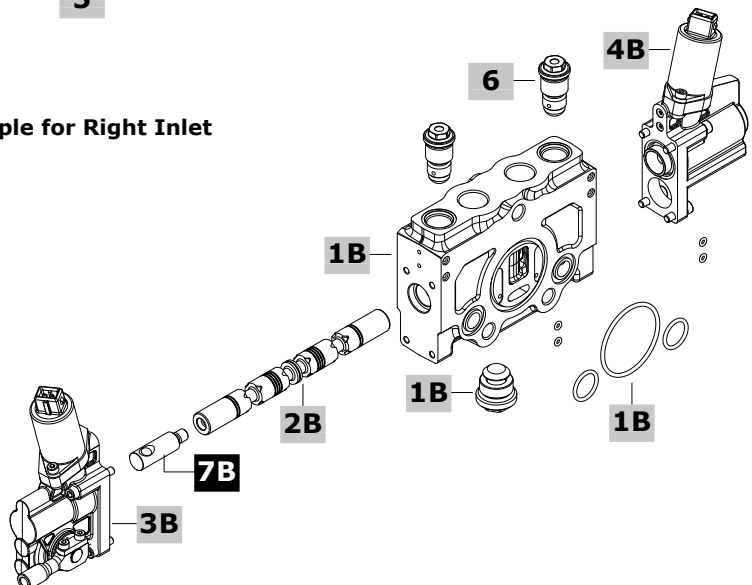
2B 3B 4B 3B-4B

-RP1-G04.02TF-PA\02TF-PB

1B

6

6



MECHANICAL CONTROL SECTION

1A Section body kit * page 17

TYPE: **RP1-G04** CODE: 5EL4208C3003
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **RP2-G04** CODE: 5EL4208C3014
 DESCRIPTION: Parallel circuit, without port valves arrangement

3A A side controls page 21

| TYPE | CODE | DESCRIPTION |
|-------------|-----------|--|
| H001 | 3203C3001 | Lever box control |
| | 3203C3011 | Lever box control for floating circuit. Spool type W012A and F005A control are required |
| H002 | 3203C3001 | Lever box control, assembled rotated 180° |
| | 3203C3011 | Lever box control for floating circuit, assembled rotated 180°. Spool type W012A and F005A control are required |
| H004 | 3203C3005 | Without lever box, with dust proof rubber bellow |
| | 3203C3006 | As previous one, for floating circuit. Spool type W012A and F005A control are required |

Joystick control

| | | |
|------------------|-----------|---|
| H009-H120 | 3206C3001 | For Right Inlet, pivot on 1 st section. Obligatory description for 2 nd section: H120. |
| H120-H012 | 3206C3001 | For left Inlet, pivot on 2 nd section. Obligatory description for 1 st section: H120. |
| H120-H010 | 3206C3002 | For Right Inlet, pivot on 2 nd section. Obligatory description for 1 st section: H120. |
| H011-H120 | 3206C3002 | For left Inlet, pivot on 1 st section. Obligatory description for 2 nd section: H120. |

2A Spools page 18

| TYPE | CODE | DESCRIPTION |
|-----------------------------|-----------|--|
| Double acting spools | | |
| W001A | 4212C3022 | 3 positions, A and B closed in neutral position, for 70 l/min (18.5 US gpm) |
| W001B | 4212C3023 | As previous one, for 40 l/min (10.6 US gpm) |
| W012A | 4212C3062 | 4 positions, for floating circuit. Special RPF1 body kit is required; contact Sales Department. Dedicated A and B side controls are required |

4A B side controls page 23

| TYPE | CODE | DESCRIPTION |
|---|-----------|--|
| With spring return to neutral position | | |
| F001A | 3207C3001 | 3 positions |
| F001B | 3207C3003 | As F001A type, with light spring |
| F001C | 3207C3004 | As F001A type, with heavy spring |
| F001ASL | 3200C3003 | 3 pos., with analog spool position sensor(#) |
| F001ASD | 3200C3004 | 3 pos., with digital spool position sensor(#) |
| F002A | 3208C3001 | 3 positions, detent in A and B |
| F003A | 3208C3004 | 3 positions, detent in A |
| F004A | 3208C3005 | 3 positions, detent in B |
| F013A | 3207C3002 | 3 positions, double control arrangement |
| F005A | 3208C3002 | 4 positions, detent in 4 th position Spool type W012A and dedicated A side controls are required. |

Note (#): For sensors features please see page 20.

HYDRAULIC CONTROL SECTION

1A Section body kit * page 17

See body kit for mechanical controls

2B Spools page 18

See spool for electrohydraulic controls

7A Spool pin page 19

| CODE | DESCRIPTION |
|-----------|----------------------------------|
| 420311025 | Spool pin for hydraulic controls |

5 A+B controls* page 28

| TYPE | CODE | DESCRIPTION |
|---|-----------|---|
| With spring return to neutral position | | |
| HP05A | 3205C3015 | With upper ports |
| HP05C | 3205C3017 | With side ports |
| HP05L | 3205C3019 | With upper ports and spool stroke limiter |

PORT VALVES AND ACCESSORIES

6 Port valves page 30

| TYPE | CODE | DESCRIZIONE |
|-------------|-----------|----------------------|
| 05TF | 4300C3002 | Valve blanking plug |
| 02TF | 915089001 | Anticavitation valve |

Fixed setting antishock and anticavitation valves:
 setting is referred to 10 l/min (2.6 US gpm) flow
 TYPE: **03TF(100)** CODE: 915870 100
 └── setting (bar) ───┬── setting (bar)

SETTING RANGE:

From 40 to 350 bar (580 to 5100 psi), 10 bar (145 psi) step

8 Plug for single acting

| CODE | DESCRIPTION |
|-----------|-------------|
| 430000019 | G1/2 plug |

NOTE (*): Codes are referred to **BSP** thread

Part ordering codes

ELECTROHYDRAULIC CONTROL SECTION

1B Section body kit * page 20

TYPE: **RP1-G04** CODE: 5EL4208C3002
 DESCRIPTION: Parallel circuit with port valves arrangement
 TYPE: **RP2-G04** CODE: 5EL4208C3011
 DESCRIPTION: Parallel circuit without port valves arrangement

2B Spools page 21

| TYPE | CODE | DESCRIPTION |
|-----------------------------|-----------|---|
| Double acting spools | | |
| W001A | 4212C3001 | 3 positions, A and B closed in neutral position, for 70 l/min (18.5 US gpm) |
| W001B | 4212C3002 | As previous one, for 40 l/min (10.6 US gpm) |
| W002A | 4212C3003 | 3 positions, A and B to tank in neutral position, for 70 l/min (18.5 US gpm) |
| W002B | 4212C3004 | As previous one, for 40 l/min (10.6 US gpm) |
| W003A | 4212C3005 | 3 positions, A to tank and B closed in neutral position, for 70 l/min (18.5 US gpm) |
| W003B | 4212C3006 | As previous one, for 40 l/min (10.6 US gpm) |
| W004A | 4212C3005 | 3 positions, A closed and B to tank in neutral position, for 70 l/min (18.5 US gpm) |
| W004B | 4212C3006 | As previous one, for 40 l/min (10.6 US gpm) |
| W012A | 4212C3013 | 4 positions, for floating circuit. |

Special RPF1 body kit is required; contact Sales Department

Single acting spools: G1/2 plug is required

| | | |
|--------------|-----------|---|
| W005A | 4212C3007 | 3 positions, single acting in A, for 70 l/min (18.5 US gpm) |
| W005B | 4212C3008 | As previous one, for 40 l/min (10.6 US gpm) |
| W006A | 4212C3007 | 3 positions, single acting in B, for 70 l/min (18.5 US gpm) |
| W006B | 4212C3008 | As previous one, for 40 l/min (10.6 US gpm) |

Double acting spools partially to tank

| | | |
|-----------------|-----------|---|
| W001AK10 | 4212C3059 | Double acting, 3 positions, A to tank in neutral position, for 70 l/min (18.5 US gpm) |
| W001AY10 | 4212C3059 | Double acting, 3 positions, B to tank in neutral position, for 70 l/min (18.5 US gpm) |
| W001AJ10 | 4212C3058 | Double acting, 3 pos., A and B to tank in neutral position, for 70 l/min (18.5 US gpm) |
| W001BJ10 | 4212C3009 | Double acting, 3 positions, A and B to tank in neutral position, for 40 l/min (10.6 US gpm) |
| W001BK10 | 4212C3021 | Double acting, 3 positions, A to tank in neutral position, for 40 l/min (10.6 US gpm) |
| W001BY10 | 4212C3021 | Double acting, 3 positions, B to tank in neutral position, for 40 l/min (10.6 US gpm) |

7B Spool pin page 19

| CODE | DESCRIPTION |
|-----------|--|
| 422501293 | Spool pin for electrohydraulic controls, standard type |
| 422501294 | As previous one, milled type |

3B A side controls page 26

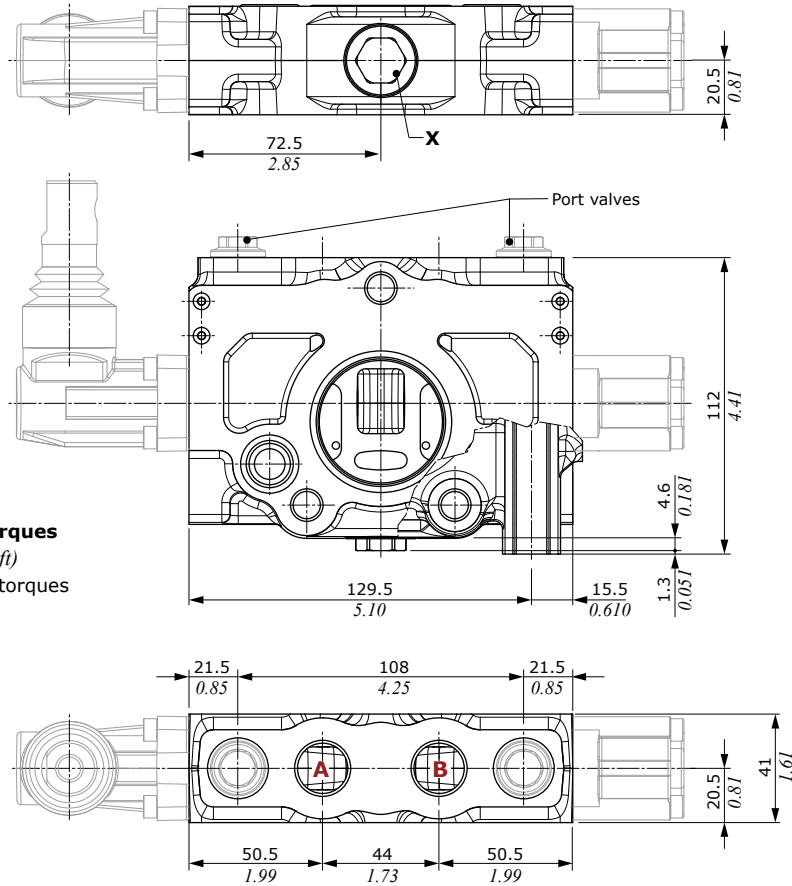
| TYPE | CODE | DESCRIPTION |
|--------------------|-----------|--|
| HP07-B12AJ | 322593026 | Without lever, 12VDC, AMP connector |
| HP07-B24AJ | 322593027 | As previous one, 24VDC |
| HP07-B12DE | 322593028 | Without lever, 12VDC, Deutsch connector |
| HP07-B24DE | 322593029 | As previous one, 24VDC |
| HP07L-B12AJ | 322593046 | Without lever, 12VDC, with spool stroke limiter, AMP connector |
| HP07L-B24AJ | 322593047 | As previous one, 24VDC |
| HP07L-B12DE | 322593048 | Without lever, 12VDC, with spool stroke limiter, Deutsch connector |
| HP07L-B24DE | 322593049 | As previous one, 24VDC |
| HP04-B12AJ | 322593018 | With lever, 12VDC, AMP connector |
| HP04-B24AJ | 322593019 | As previous one, 24VDC |
| HP04-B12DE | 322593020 | With lever, 12VDC, Deutsch connector |
| HP04-B24DE | 322593021 | As previous one, 24VDC |
| HP04L-B12AJ | 322593022 | With lever, 12VDC, with spool stroke limiter, AMP connector |
| HP04L-B24AJ | 322593023 | As previous one, 24VDC |
| HP04L-B12DE | 322593024 | With lever, 12VDC, with spool stroke limiter, Deutsch connector |
| HP04L-B24DE | 322593025 | As previous one, 24VDC |

4B B side controls page 27

| TYPE | CODE | DESCRIPTION |
|---|-----------|---|
| With spring return to neutral position | | |
| FP04-B12AJ | 3225C3106 | 12VDC, AMP connector |
| FP04-B24AJ | 3225C3107 | As previous one, 24VDC |
| FP04-B12DE | 3225C3108 | 12VDC, Deutsch connector |
| FP04-B24DE | 3225C3109 | As previous one, 24VDC |
| FP04SL-B12AJ | 3225C3119 | 12VDC, analog spool position sensor, AMP connector |
| FP04SL-B24AJ | 3225C3120 | As previous one, 24VDC |
| FP04SL-B12DE | 3225C3121 | 12VDC, analog spool position sensor, Deutsch connector |
| FP04SL-B24DE | 3225C3122 | As previous one, 24VDC |
| FP04SD-B12AJ | 3225C3123 | 12VDC, digital spool position sensor, AMP connector |
| FP04SD-B24AJ | 3225C3124 | As previous one, 24VDC |
| FP04SD-B12DE | 3225C3125 | 12VDC, digital spool position sensor, Deutsch connector |
| FP04SD-B24DE | 3225C3126 | As previous one, 24VDC |
| FP07L-B12AJ | 3225C3110 | Spool stroke limiter, 12VDC, AMP connector |
| FP07L-B24AJ | 3225C3111 | As previous one, 24VDC |
| FP07L-B12DE | 3225C3112 | Spool stroke limiter, 12VDC, Deutsch conn. |
| FP07L-B24DE | 3225C3113 | As previous one, 24VDC |

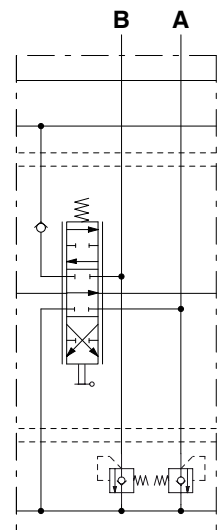
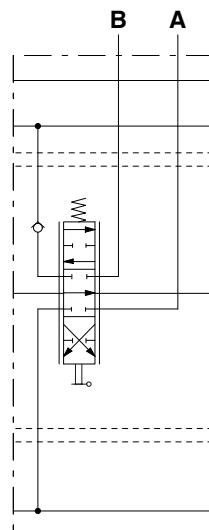
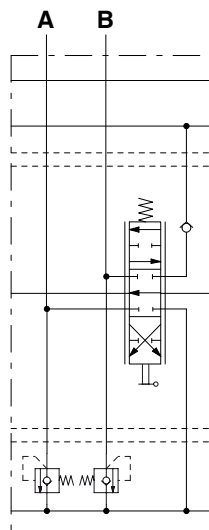
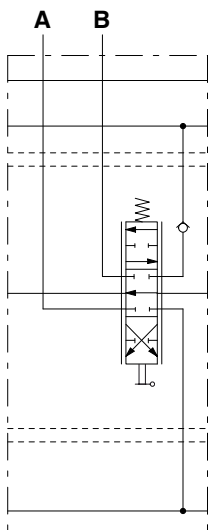
NOTE (*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuit



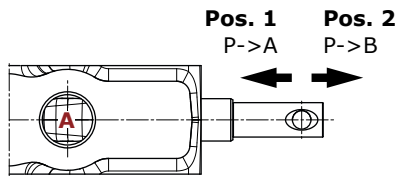
Wrenches and tightening torques
 X = wrench 17 - 130 Nm (96 lbft)
 NOTE: for valve wrenches and torques see related pages

SD\RP2 type without port valves arrangement **SD\RP1 type** with port valves arrangement **SS\RP2 type** without port valves arrangement **SS\RP1 type** with port valves arrangement

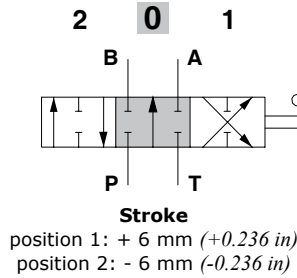


Spools

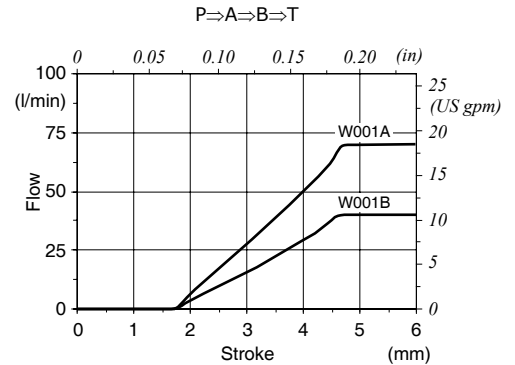
Standard spools



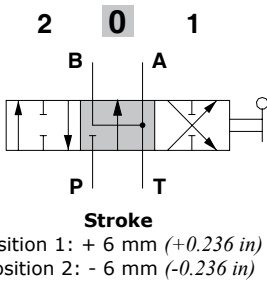
W001A/W001B types
Double acting, 3 positions,
A and B closed in neutral position



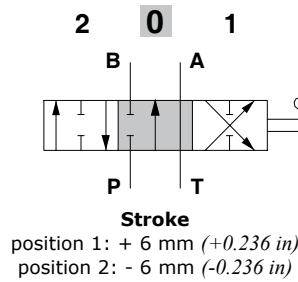
W001A/W001B types
metering curves



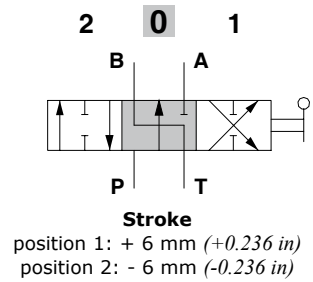
W002A/W002B types
Double acting, 3 positions,
A and B to tank in neutral position



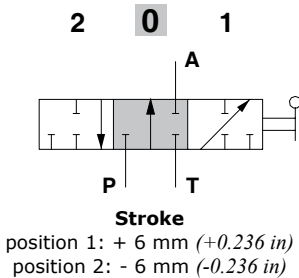
W003A/W003B types
Double acting, 3 positions, B closed
and A to tank in neutral position



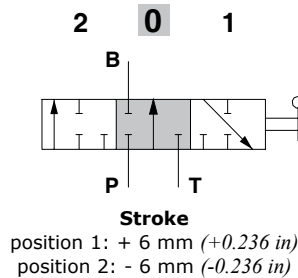
W004A/W004B types
Double acting, 3 positions, A closed
and B to tank in neutral position



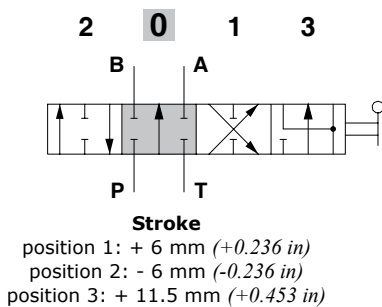
W005A/W005B types
Single acting in A, 3 positions



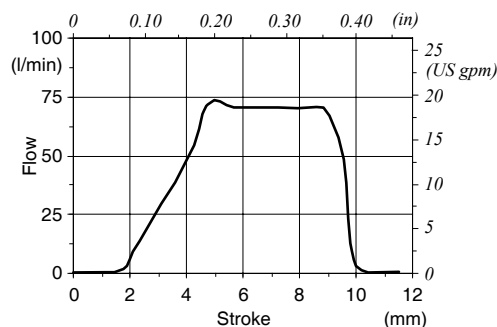
W006A/W006B types
Single acting in B, 3 positions



W012A type
Double acting, 4 positions,
float in 4th position



W012A type metering curve
P->A->B->T



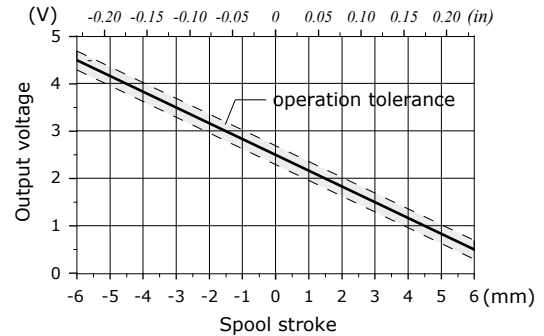
Spool position sensors

SPSL sensor

The SPSL position sensor converts the spool movements into a voltage linear signal.

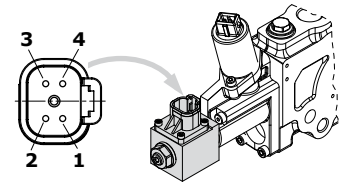
| Working conditions | | |
|-------------------------------------|------------------|--|
| Voltage supply | | 5 VDC |
| Current absorption | | < 10 mA (no load) |
| Mechanical life | | 3x10 ⁶ |
| Connector type | | DT04-4P Deutsch |
| Weather protection | | IP67 / IP69K |
| Working temperature | | from -40°C to 105°C (from -40°F to 221°F) |
| Working pressure | | 350 bar (5100 psi) |
| Max. electrical stroke | | ±10 mm (±0.39 in) |
| Max. mechanical stroke | | ±10 mm (±0.39 in) |
| Output signal | range | from 0.5 to 4.5 V |
| | linearity | ± 5% |
| | spool in neutral | 2.5 ± 0.2 V |
| | max. current | 1 mA |
| EMC compatibility | | ISO 13766 / ISO 14982 |
| Mechanical vibrations, shock, bumps | | IEC 68-2-6,-27,-29 |

SPSL sensor output signal



Deutsch DT04-4P connector

| Pin | Function |
|-----|---------------|
| 1 | + 5V |
| 2 | not connected |
| 3 | GND |
| 4 | signal OUT |



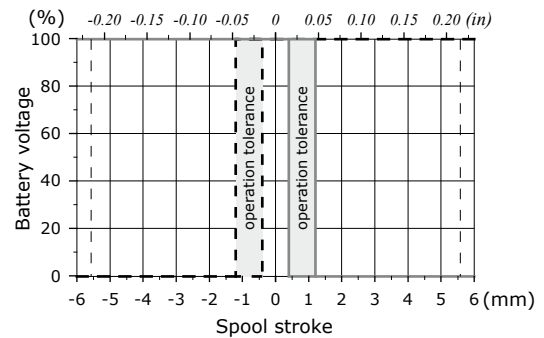
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

The SPSP position sensor converts the spool movements into an electric digital signal.

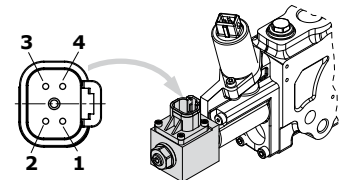
| Working conditions | | |
|-------------------------------------|--------------|--|
| Voltage supply | | from 9 to 32 VDC |
| Current absorption | | < 10 mA (no load) |
| Mechanical life | | 3x10 ⁶ |
| Connector type | | DT04-4P Deutsch |
| Weather protection | | IP67 / IP69K |
| Working temperature | | from -40°C to 105°C (from -40°F to 221°F) |
| Working pressure | | 350 bar (5100 psi) |
| Max. electrical stroke | | ±10 mm (±0.39 in) |
| Max. mechanical stroke | | ±10 mm (±0.39 in) |
| Output signal | type | PNP |
| | max. current | 6 mA |
| EMC compatibility | | ISO 13766 / ISO 14982 |
| Mechanical vibrations, shock, bumps | | IEC 68-2-6,-27,-29 |

SPSD sensor output signal



Deutsch DT04-4P connector

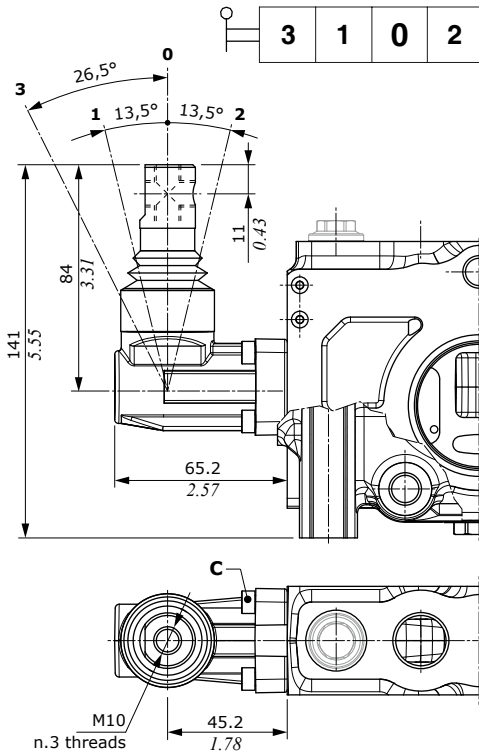
| Pin | Function |
|-----|----------|
| 1 | Out A |
| 2 | GND |
| 3 | VB + |
| 4 | Out B |



Deutsch DT06-4S mating connector, code 5CON140072

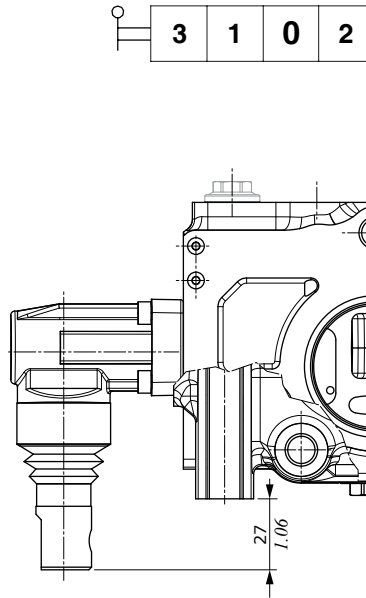
A side controls

H001 type
Lever box



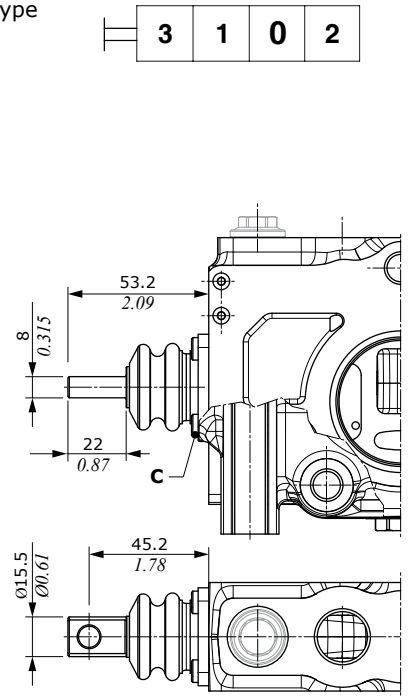
H002 type

Lever box assembled rotated 180°. Dimensions are the same of H001 type

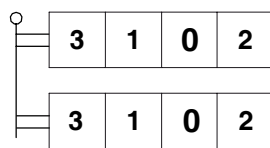


H004 type

With dust proof rubber bellow



Joystick controls

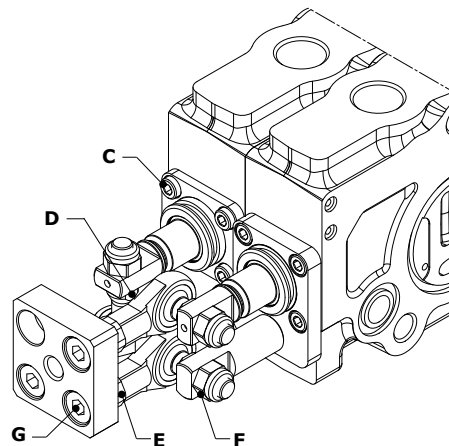
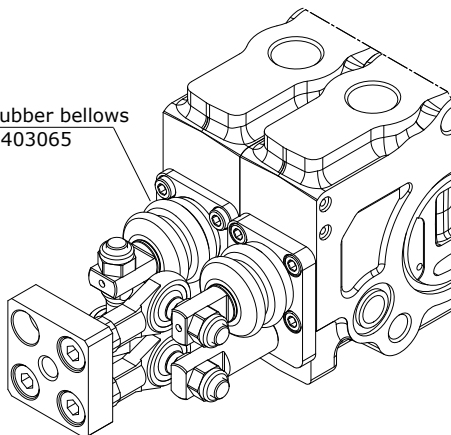


Wrenches and tightening torques

- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)
- D = wrench 10
- E = wrench 6
- F = wrench 13 - 7 Nm (5.2 lbf_t)
- G = allen wrench 6 - 7 Nm (5.2 lbf_t)

Configuration examples

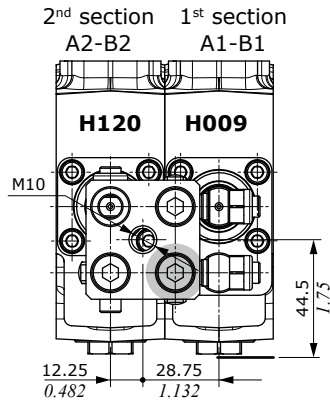
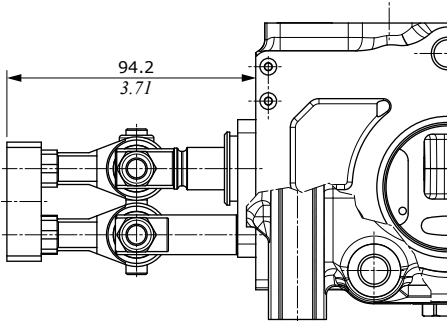
Optional rubber bellows
code: 423403065



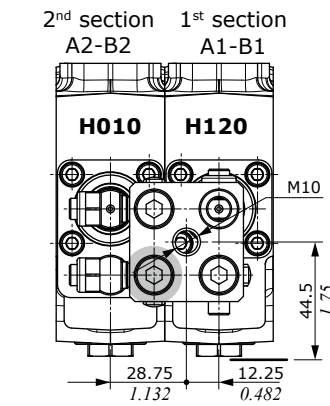
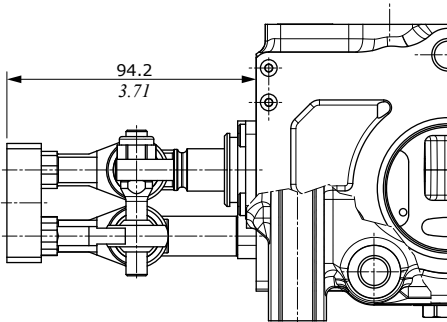
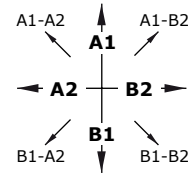
Mechanical controls

A side controls

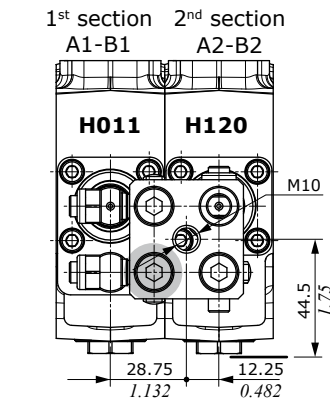
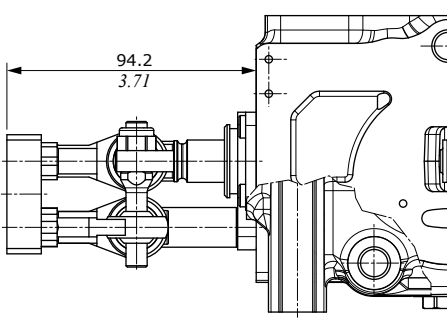
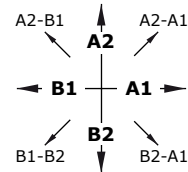
Joystick controls



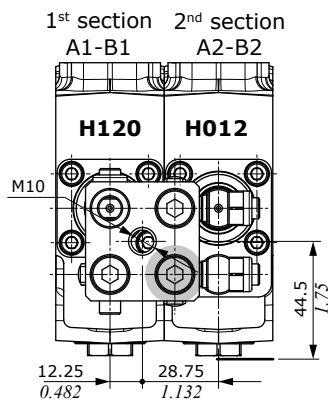
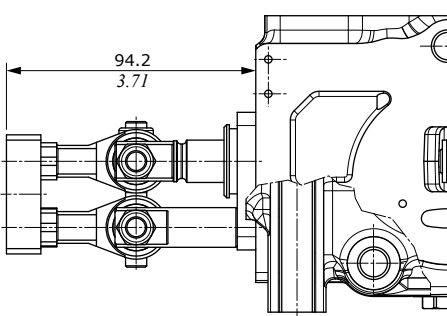
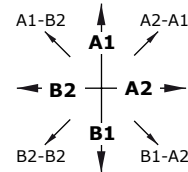
**Right Inlet configuration
H009-H120 type**
pivot "●" on 1st section



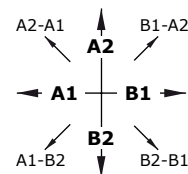
**Right Inlet configuration
H120-H010 type**
pivot "●" on 2nd section



**Left Inlet configuration
H011-H120 type**
pivot "●" on 1st section



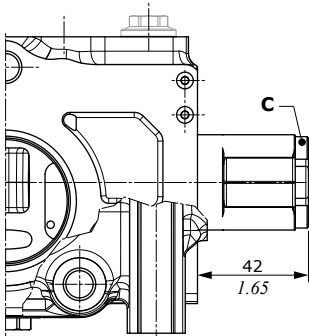
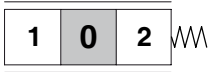
**Left Inlet configuration
H120-H012 type**
pivot "●" on 2nd section



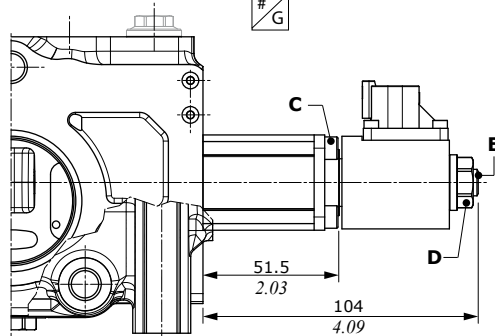
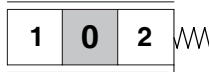
B side controls

With spring return in neutral position

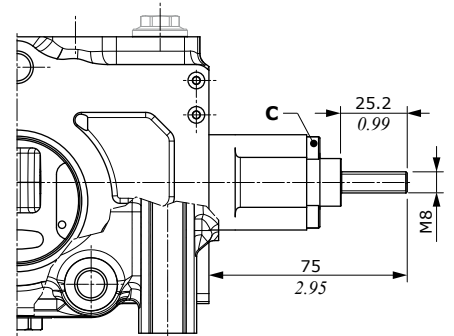
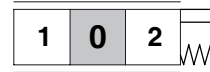
F001A-F001B-F001C types



F001ASL - F001ASD types

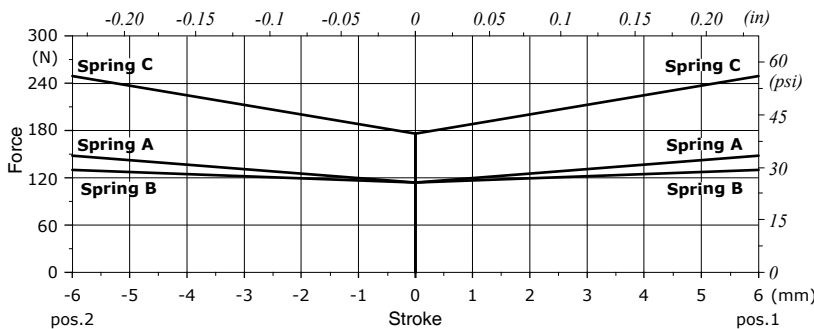


F013A type
M8 male external pin



Wrenches and tightening torques
 C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
 D = wrench 17 - 9,8 Nm (7.2 lbft)
 E = allen wrench 4 - 9,8 Nm (7.2 lbft)

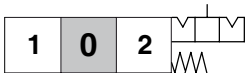
Force vs. Stroke diagram



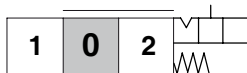
Legenda
 Spring A = from 114 N to 148 N (25.6 lb to 33.3 lb)
 Spring B = from 114 N to 130 N (25.6 lb to 29.2 lb)
 Spring C = from 176 N to 249 N (39.6 lb to 56 lb)

With detent and spring return in neutral position

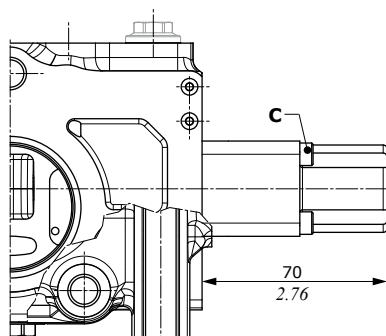
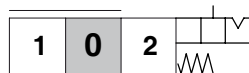
F002A type
detent in A and B



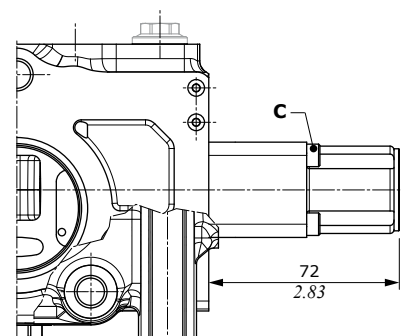
F003A type
detent in A



F004A type
detent in B



F005A type
4 position, detent in position 3,
W012A spool is required



Proportional electrohydraulic controls

Performance data

Following specifications are measured with:

- mineral oil of 46 mm²/s (46 cSt) viscosity at 40°C (104°F) temperature.
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

The following electrohydraulic controls need a CED400W electronic unit; for information, please contact our Sales Department.

A and B sides spool controls

Electric specifications

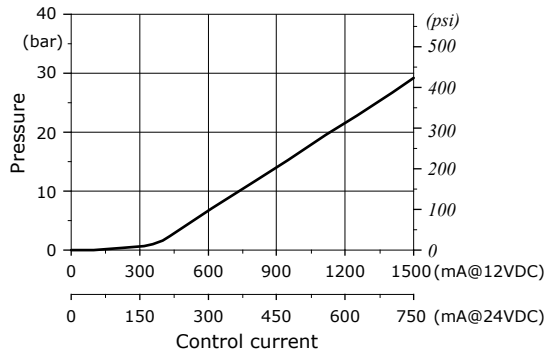
| | | |
|--------------------------------|--------|------------------------------------|
| Coil impedance | 12 VDC | 4.7 Ω |
| | 24 VDC | 20.8 Ω |
| Max. operating current | 12 VDC | 1.5 A |
| | 24 VDC | 0.75 A |
| No load current consumption | | 0 |
| Min. flow control signal | 12 VDC | 400 mA |
| | 24 VDC | 200 mA |
| Flow control signal | 12 VDC | 1200 mA |
| | 24 VDC | 600 mA |
| Dither frequency | | 70 - 90 Hz |
| Insertion | | 100% |
| Coil insulation | | Class H (180°C - 356°F) |
| Connector type | | AMP JPT Deutsch DT |
| Weather protection (connector) | | IP65 (JPT type) IP69K (DT type) |

Hydraulic specifications

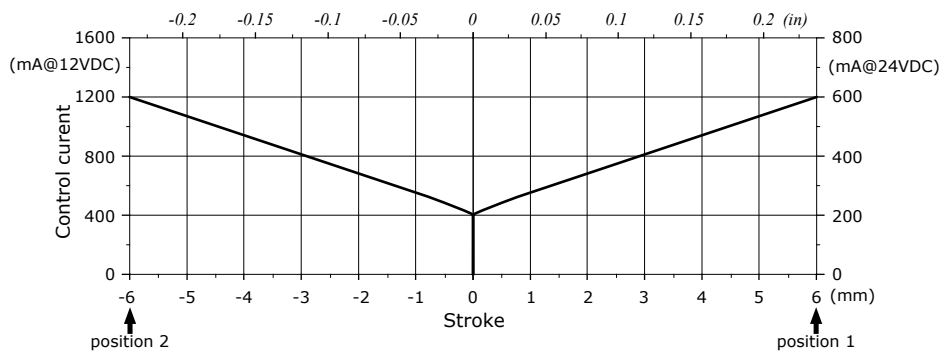
| | |
|--|------------------|
| Max. pressure | 40 bar (580 psi) |
| Max. back pressure on solenoid valve drain | 5 bar (72.5 psi) |

Performance data

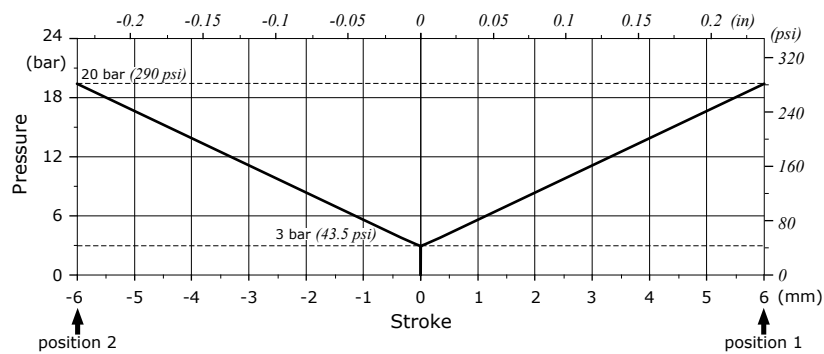
Solenoid pressure reducing valve performance



Stroke vs. Current diagram



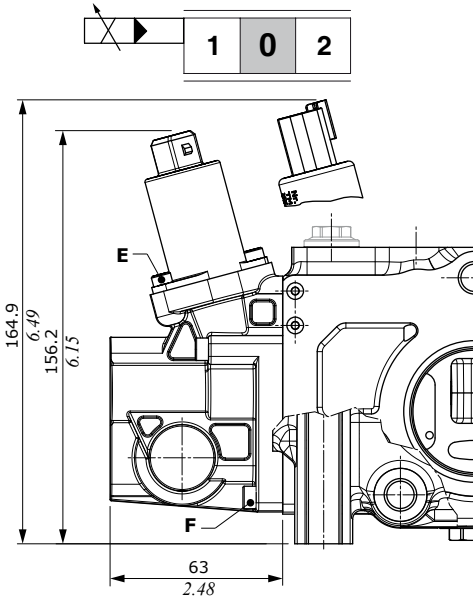
Stroke vs. Pressure diagram



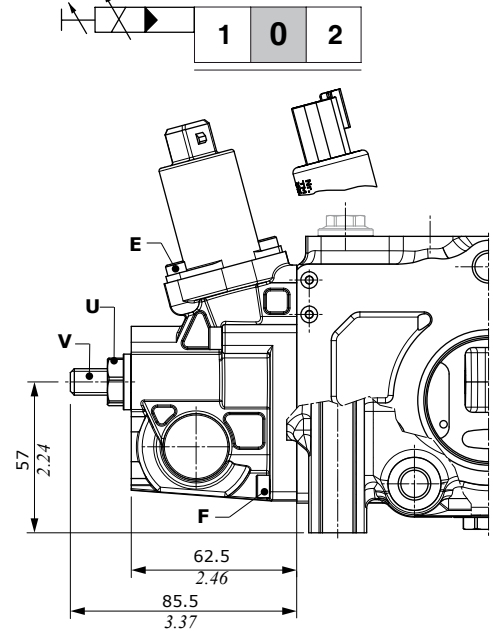
Proportional electrohydraulic controls

A side controls

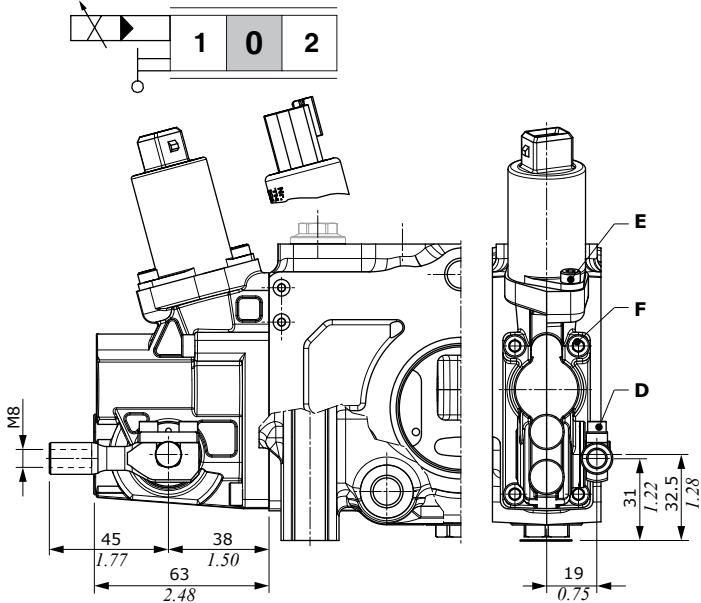
HP07 type



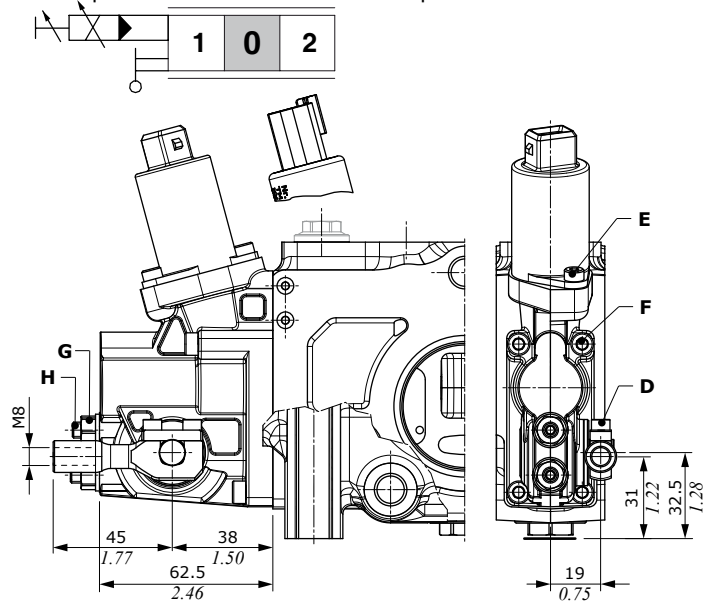
HP07L type
with spool stroke limiter on B port



HP04 type
with lever



HP04L type
with spool stroke limiter on A and B ports



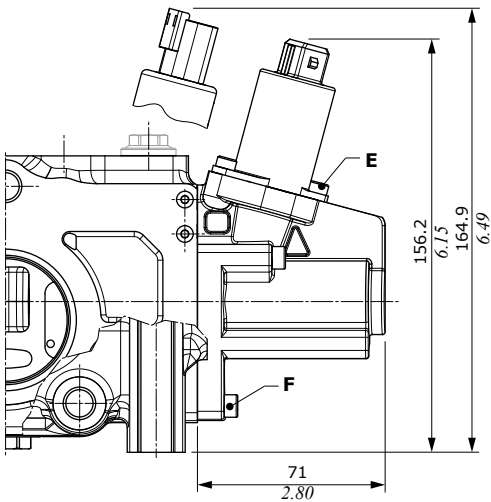
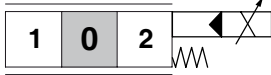
Wrenches and tightening torques

- D = allen wrench 3 - 2 Nm (1.5 lbf^t)
- E = allen wrench 3 - 2 Nm (1.5 lbf^t)
- F = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf^t)
- G = wrench 17 - 15 Nm (11 lbf^t)
- H = allen wrench 3
- U = wrench 17 - 15 Nm (11 lbf^t)
- V = allen wrench 3

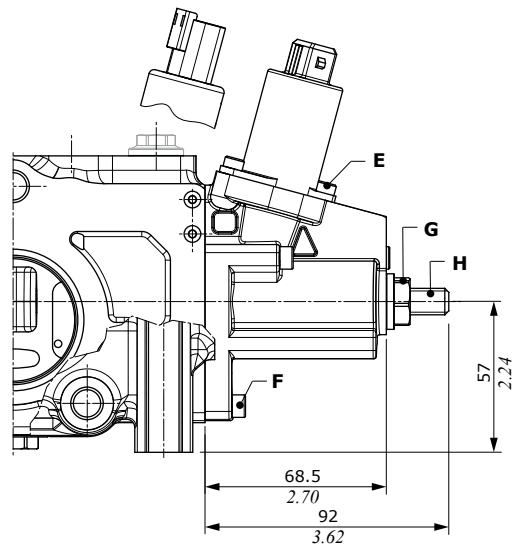
Proportional electrohydraulic controls

B side controls

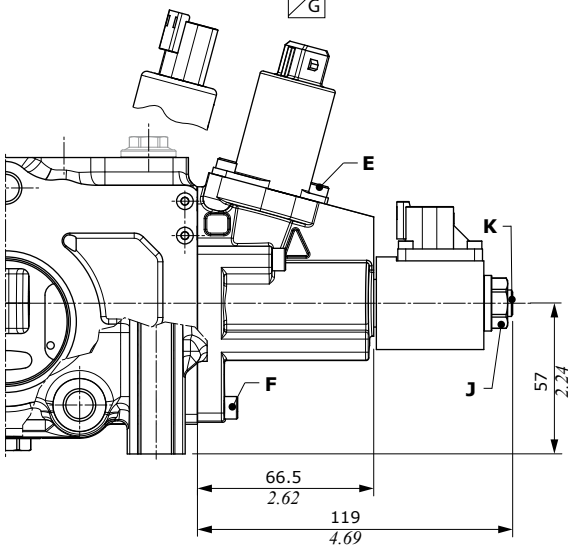
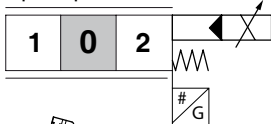
FP04 type



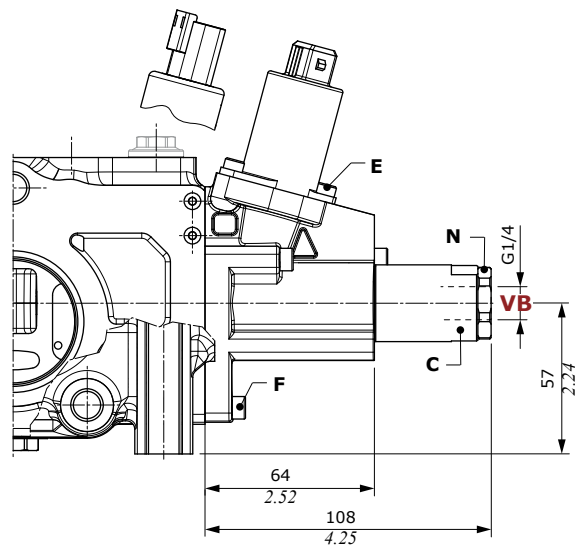
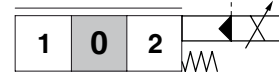
FP07L type
with spool stroke limiter on A port



FP04SL - FP04SD type
with spool position sensor



FP08 type
with double control VB



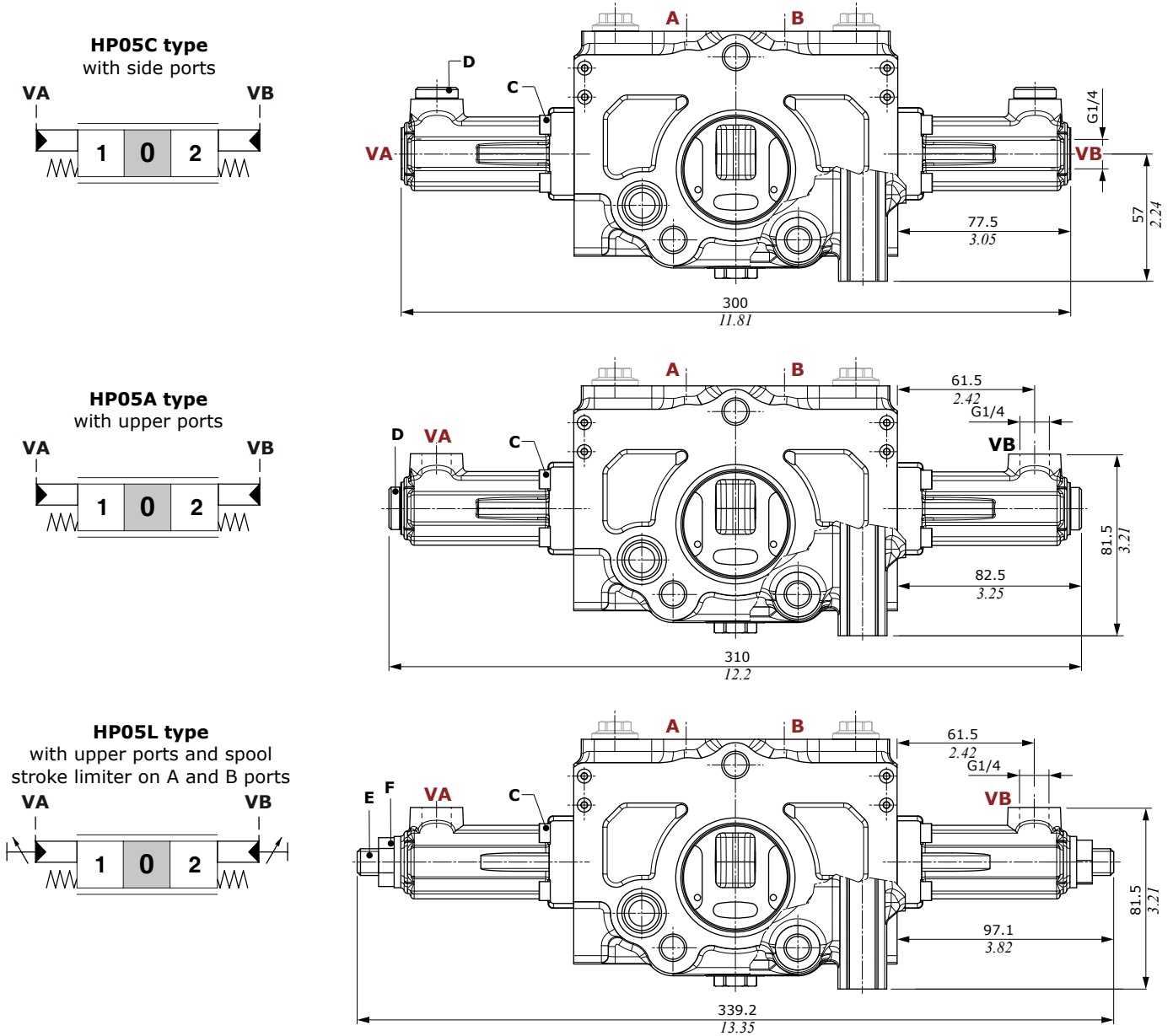
Wrenches and tightening torques

- C = wrench 26 - 25 Nm (18.4 lbf_t)
- E = allen wrench 3 - 2 Nm (1.5 lbf_t)
- F = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)
- G = wrench 17 - 15 Nm (11 lbf_t)
- H = allen wrench 3
- N = wrench 25 - 25 Nm (18.4 lbf_t)
- J = wrench 17 - 9.8 Nm (7.2 lbf_t)
- K = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

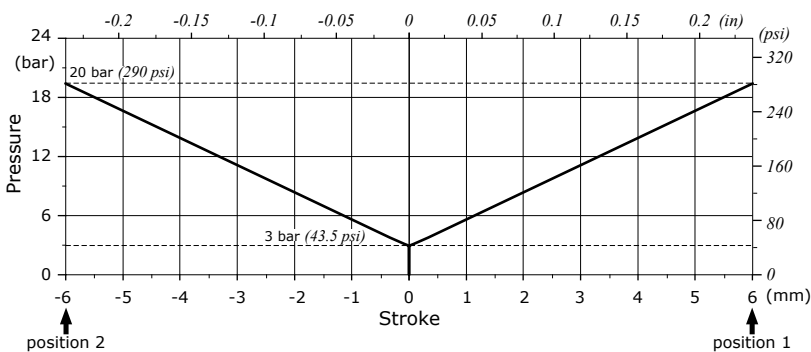
Proportional hydraulic controls

A and B side s controls

Controls are available with upper or side ports and with spool stroke limiter.



Stroke vs. Pressure diagram

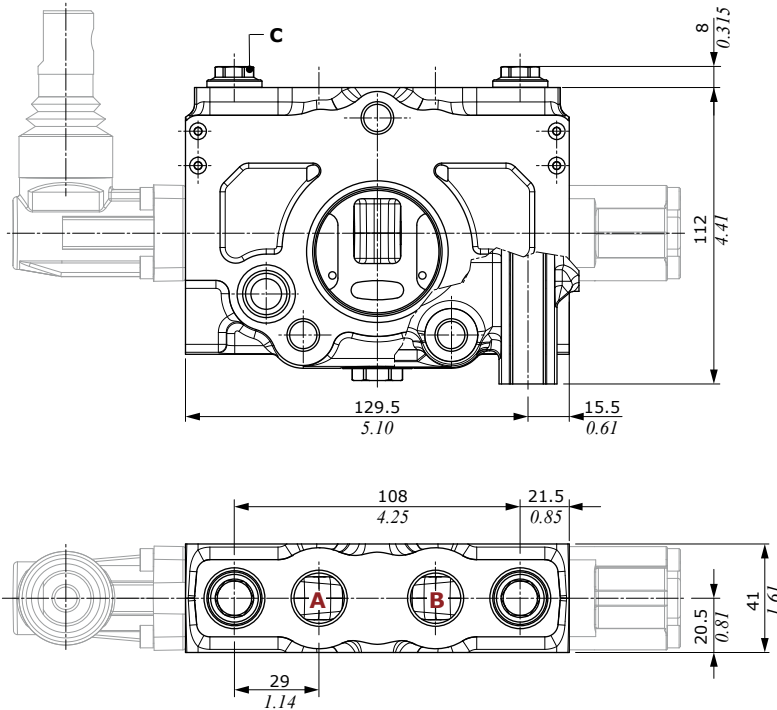


Wrenches and tightening torques

- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
- D = allen wrench 6 - 30 Nm (22 lbft)
- E = allen wrench 6
- F = wrench 19 - 15 Nm (11 lbft)

Wrenches and tightening torques

C = wrench 13 - 40 Nm (29.5 lbf_t)



03TF type

combined antishock and anticavitation valve, with fixed setting



02TF type

anticavitation valve



05TF type

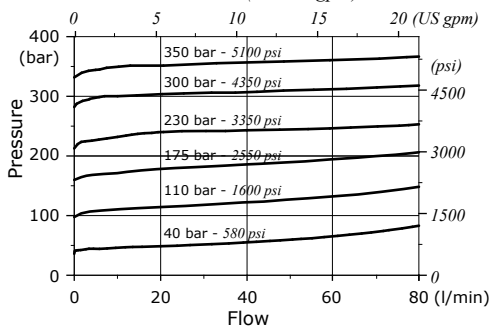
valve blanking plug



03TF type: combined valves

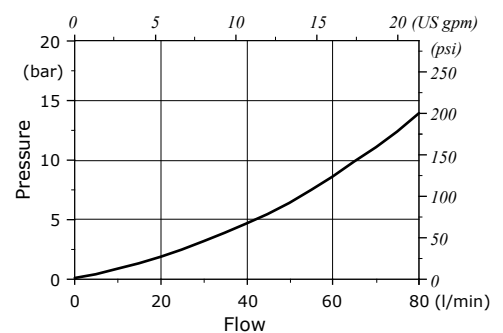
Setting example

@10 l/min (2.6 US gpm)



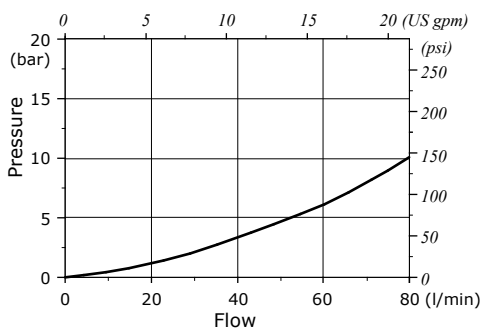
02TF type: anticavitation valve

Pressure drops



Pressure drops

(in anticavitation)



Dimensional data and hydraulic circuit

KZM configuration

For mechanical, hydraulic and electrohydraulic controls, without pressure reducing valve.

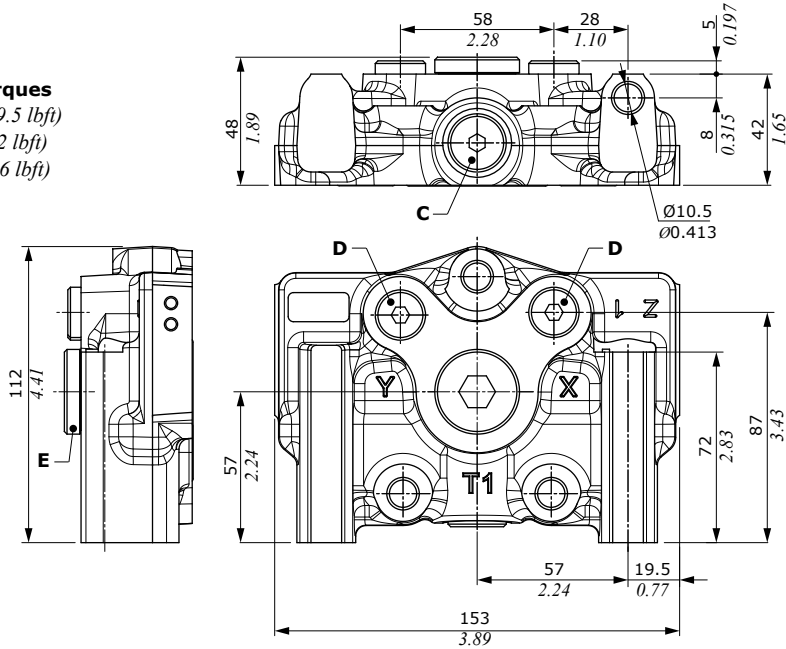
KZM2 type: outlet port plugged, Y pilot and X drain plugged

Wrenches and tightening torques

C = allen wrench 6 - 40 Nm (29.5 lbf^t)

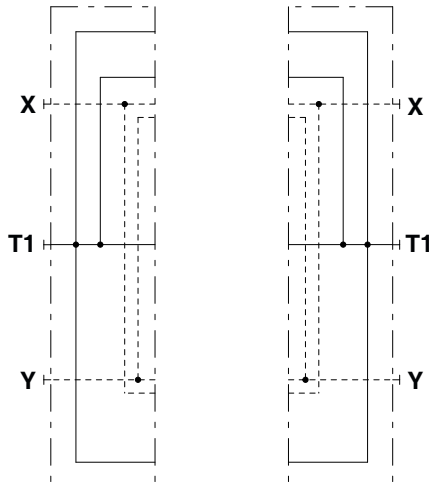
D = allen wrench 6 - 30 Nm (22 lbf^t)

E = allen wrench 12 - 90 Nm (66 lbf^t)



Right Inlet circuit

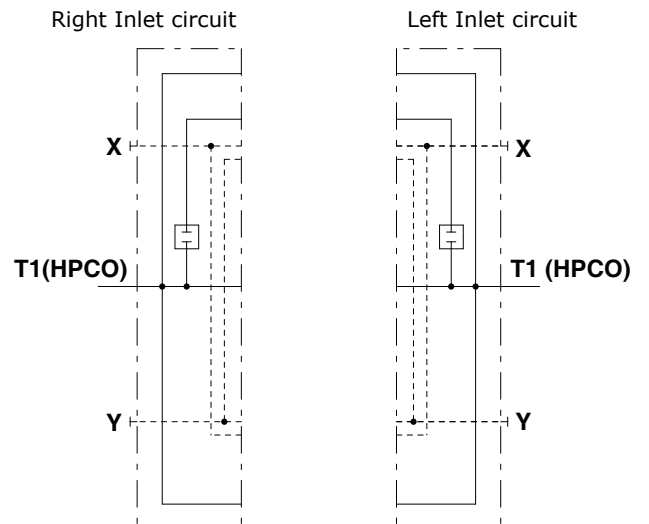
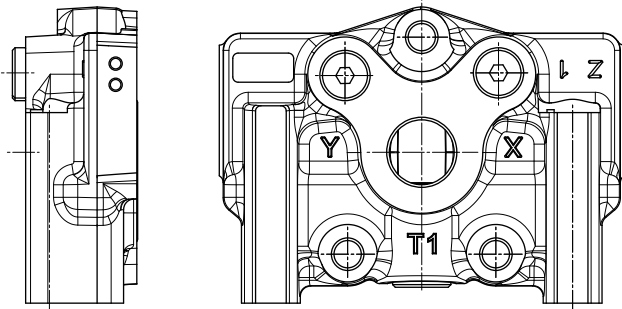
Left Inlet circuit



Dimensional data and hydraulic circuit

KZM configuration

KZMH1 type: with HPCO carry over on T1 port, Y pilot and X drain plugged



Port configuration

| Type | T1 port | X drain | Y pilot | |
|--------------|-----------|---------|---------|--|
| KZM1 | open | plugged | plugged | |
| KZM2 | plugged | plugged | plugged | |
| KZM3 | open | open | open | |
| KZM4 | plugged | open | open | |
| KZMH1 | HPCO open | plugged | plugged | |
| KZMH2 | HPCO open | open | open | |

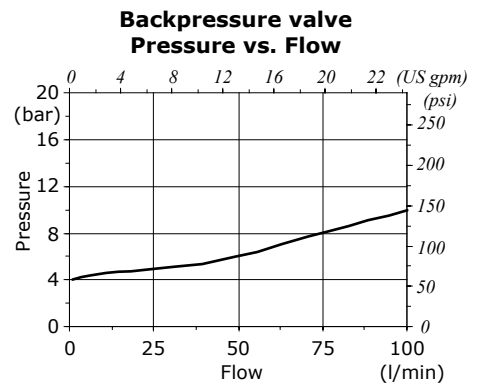
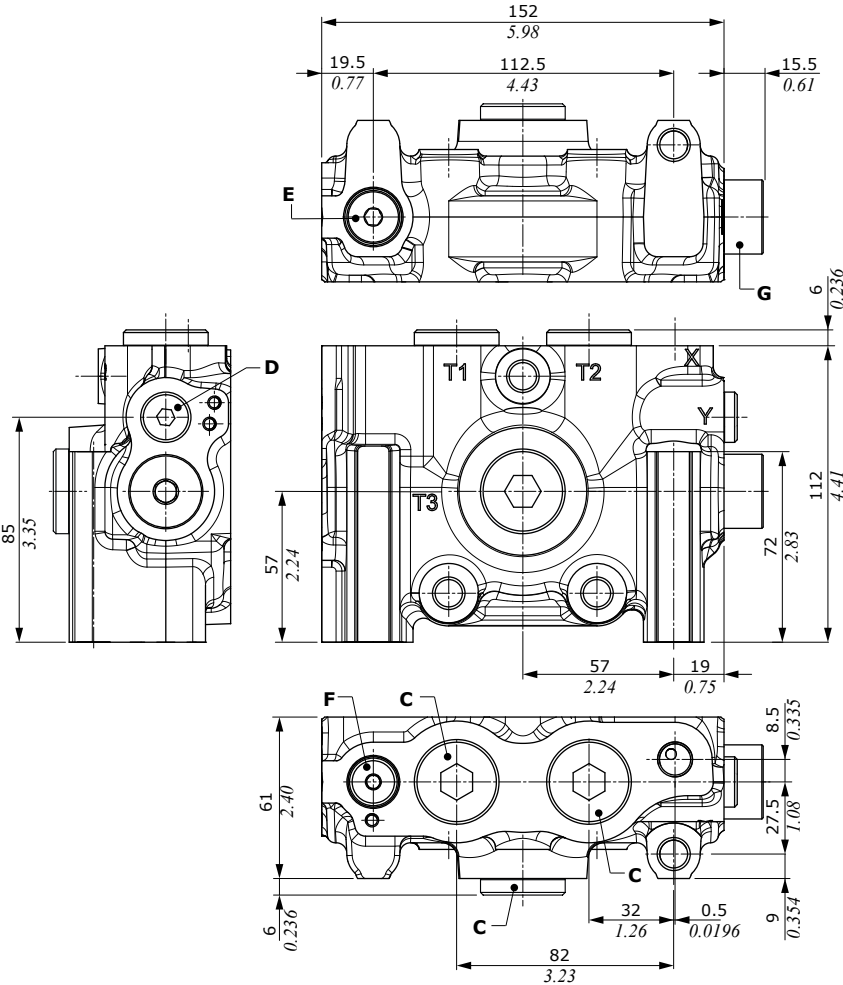
Dimensional data and hydraulic circuit

KZP configuration

For mechanical, hydraulic and electrohydraulic controls, with pressure reducing valve and backpressure valve.

Type KZP3

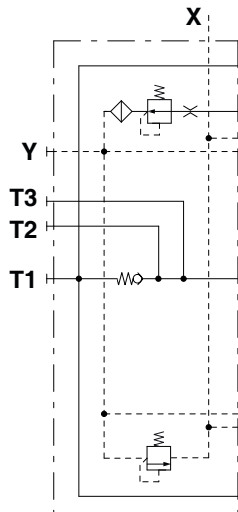
ports plugged, pilot Y plugged, X drain open



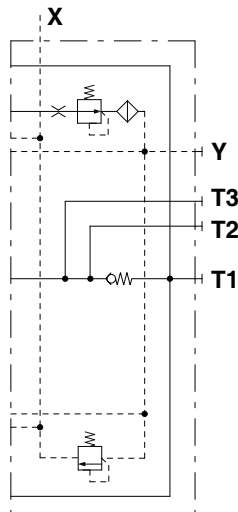
Wrenches and tightening torques

- C = allen wrench 12 - 90 Nm (66 lbft)
- D = allen wrench 6 - 30 Nm (22 lbft)
- E = allen wrench 6 - 30/35 Nm (22/25.8 lbft)
- F = allen wrench 5 - 20/25 Nm (14.8/34 lbft)
- G = allen wrench 8 - 50 Nm (37 lbft)

Right Inlet circuit



Left Inlet circuit

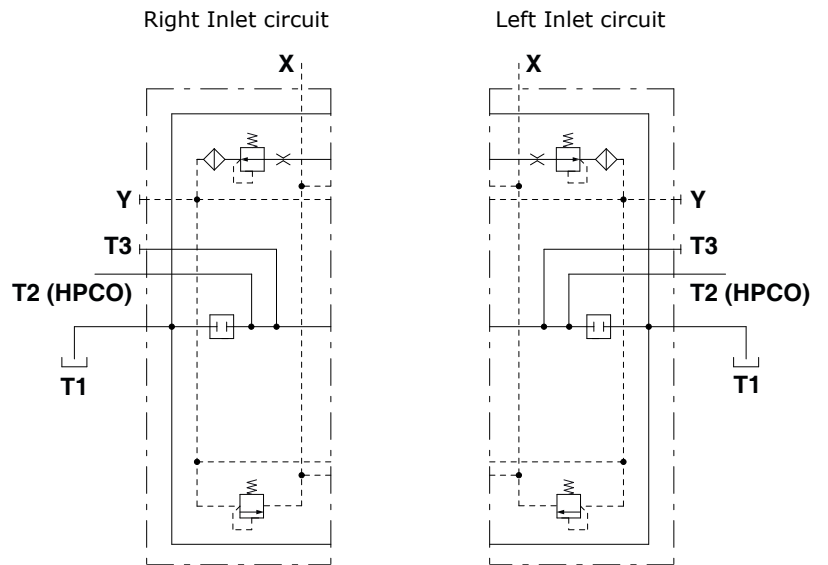
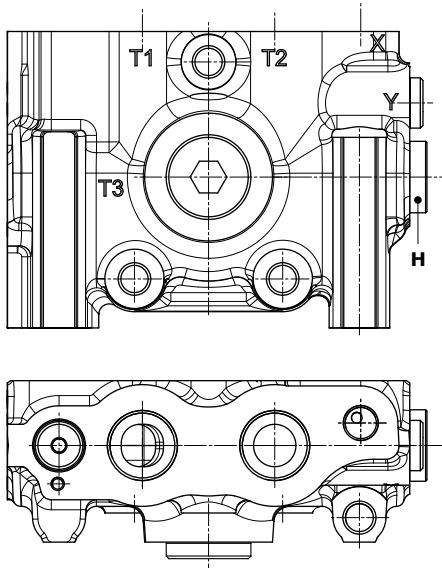


Dimensional data and hydraulic circuit

KZP configuration

KZPH1 type

HPCO on T2 port, T1 port and X drain open, T3 port and Y pilot closed, without backpressure valve



Wrenches and tightening torques

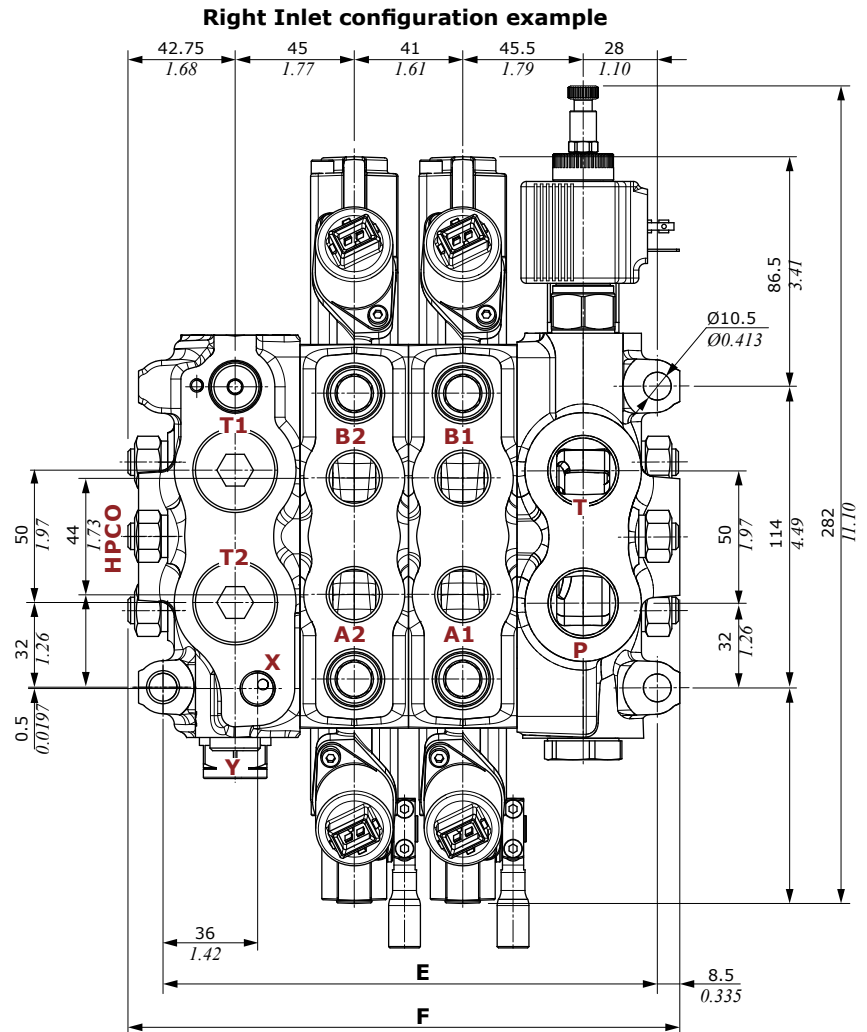
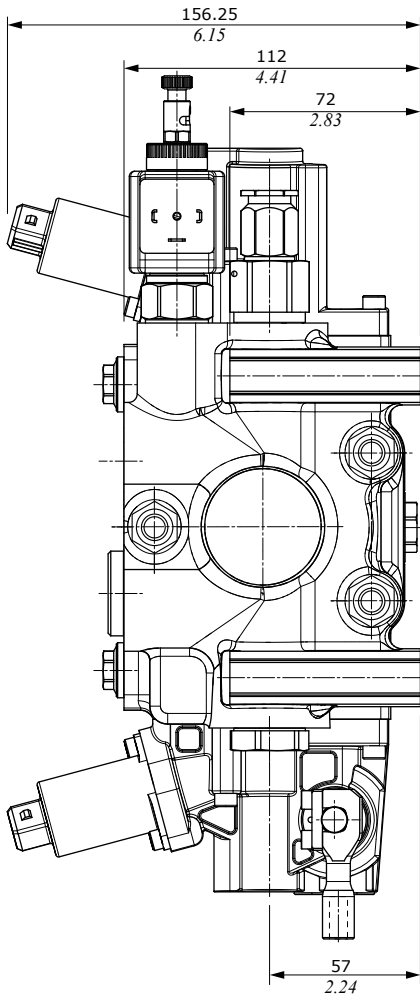
H = allen wrench 8 - 50 Nm (37 lbf)

Port configuration

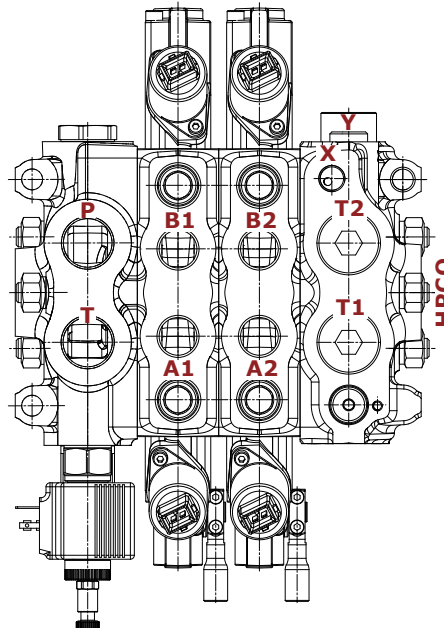
| Type | T1 port | T2 port | T3 port | X drain | Y pilot | Backpressure valve | |
|-------|---------|-----------|-----------|---------|---------|--------------------|--|
| KZP1 | open | plugged | plugged | open | plugged | yes | |
| KZP3 | plugged | plugged | plugged | open | plugged | yes | |
| KZP6 | plugged | plugged | open | open | plugged | no | |
| KZPH1 | open | HPCO open | plugged | open | plugged | no | |
| KZPH2 | open | plugged | HPCO open | open | plugged | no | |

Dimensional data and hydraulic circuit

Configuration with electrohydraulic controls.



Left Inlet configuration example



| TYPE | E | | F | |
|----------|-----|-------|--------|-------|
| | mm | in | mm | in |
| DVS14/1 | 144 | 5.67 | 173.25 | 6.82 |
| DVS14/2 | 185 | 7.28 | 214.25 | 8.44 |
| DVS14/3 | 226 | 8.90 | 255.25 | 10.05 |
| DVS14/4 | 267 | 10.51 | 296.25 | 11.66 |
| DVS14/5 | 308 | 12.13 | 337.25 | 13.28 |
| DVS14/6 | 349 | 13.74 | 378.25 | 14.89 |
| DVS14/7 | 390 | 15.35 | 419.25 | 16.51 |
| DVS14/8 | 431 | 16.97 | 460.25 | 18.12 |
| DVS14/9 | 472 | 18.58 | 501.25 | 19.73 |
| DVS14/10 | 513 | 20.20 | 542.25 | 21.35 |

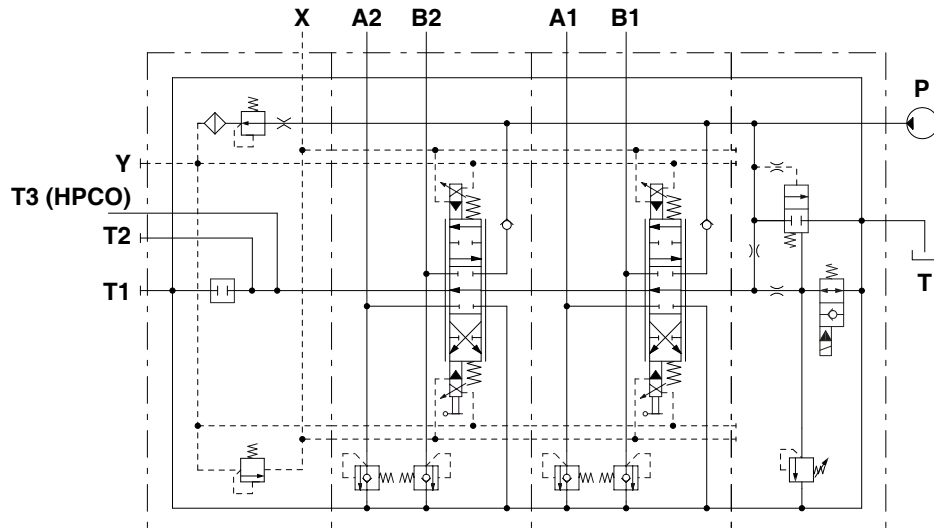
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

Dimensional data and hydraulic circuit

The DVS14 sectional valve is available in Flow Unloader configuration as well.

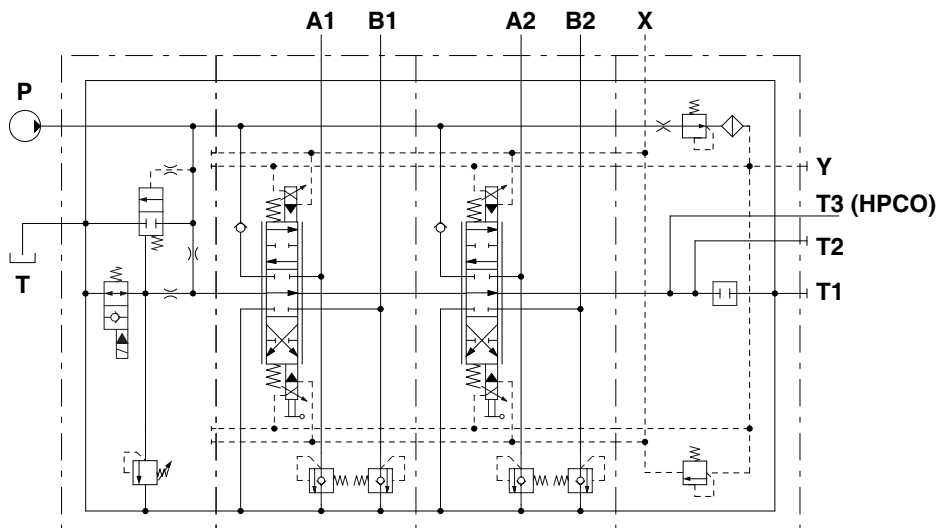
Feature of this configuration is to limit flow on "free flow line" (typically 20 l/min - 5.3 US gpm) making it possible to manage all flow (80 l/min - 21 US gpm) by working ports, when the spools are operated till to stroke end.

The Flow Unloader system is configured with special inlet section, fitted with compensator and dedicated spools.



Right Inlet valvet with electrohydraulic controls configuration:

DVS14/2/MRQ-V1A(200)V7B-C12DI-E-MA-X-G05/W001Q-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/W001Q-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/KZP4-G05



Left Inlet valvet with electrohydraulic controls configuration:

DVS14/2/MLQ-V1A(200)V7B-C12DI-E-MA-X-G05/W001Q-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/W001Q-HP04-FP04-B12AJ-RP1-G04.03TF-PA(100)\03TF-PB(100)/KZP4-G05

Part ordering codes

Right Inlet: **R**
Left inlet: **L**

valve position valve position T port open

DVS14/2/MLQ - V1 A (200) V7 B - C12DI - E - MA - X - G05 / W001Q-HP04-FP04-B12AJ-RP1-G04.02TF-

1 2 2 3 4 5 6 1 7

valve in position A valve in position B

A **B**

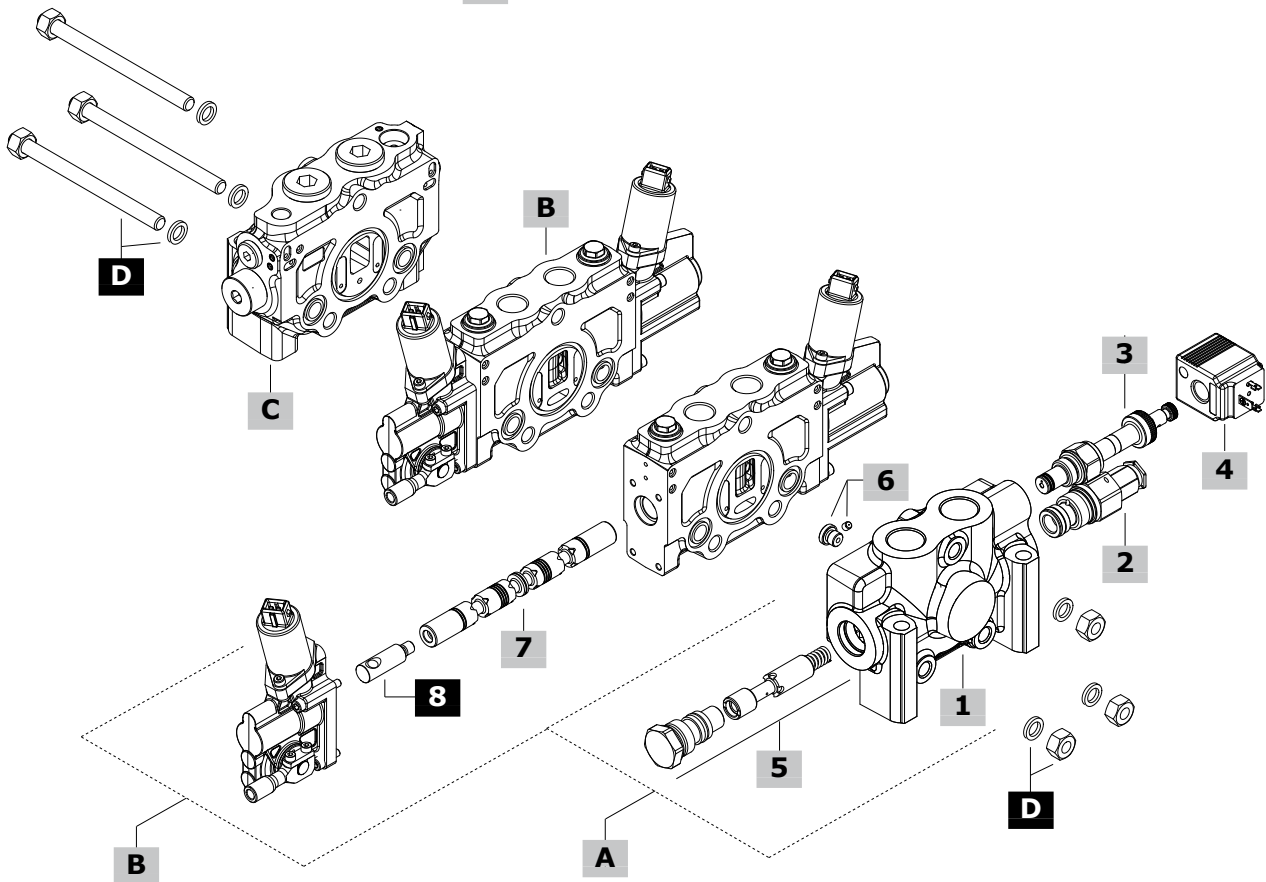
PA\02TF-PB/W001Q-HP04-FP04-B12AJ-RP1-G04.02TF-PA\02TF-PB/KZP4-G05-<P006/2>

7

C

Valve is painted as std, with one coat of Primer RAL9005 black antitrust paint

B



A Complete inlet section * page 38

TYPE: **MLQ-V1A(200)-V7B-C12DI-E-MA-X-G05**
 CODE: SHE140004
 DESCRIPTION: With compensator, upper outlet and inlet ports, direct operated main pressure relief valve, 12VDC solenoid operated unloading valve (DIN connector)

B Complete working section * page 14

Right Inlet configuration

TYPE: **SD\W001Q-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB**
 CODE: SHL140013

DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool with A and B closed in neutral position, 12VDC proportional electrohydraulic control (AMP JPT connector) with lever and spring return to neutral position

TYPE: **SD\W002Q-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB**
 CODE: SHL140014

DESCRIPTION: As previous one, 3 positions double acting spool with A and B to tank in neutral position

Left Inlet configuration

TYPE: **SS\W001Q-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB**
 CODE: SHL140011

DESCRIPTION: Parallel circuit with port valves arrangement (seat plugged), 3 positions double acting spool with A and B closed in neutral position, 12VDC proportional electrohydraulic control (AMP JPT connector) with lever and spring return to neutral position

TYPE: **SS\W002Q-HP04-FP04-B12AJ-RP1-G04.05TF-PA/05TF-PB**
 CODE: SHL140012

DESCRIPTION: As previous one, 3 positions double acting spool with A and B to tank in neutral position

1 Inlet section body * page 38

| TYPE | CODE | DESCRIPTION |
|--------------|-----------|--|
| Q-G05 | 4205C3003 | Section body for Flow Unloader configuration, with compensator arrangement, G3/4 ports |

2 Main relief valve page 39

| TYPE | CODE | DESCRIPTION |
|----------------|-----------|---|
| V1(100) | 915025501 | Direct operated, setting range from 50 to 200 bar (725 to 2900 psi) |
| V1(250) | 915025502 | Direct operated, setting range from 200 to 420 bar (2900 to 6100 psi) |
| V3 | 430155001 | Valve blanking plug |

3 Unloading valve page 39

| TYPE | CODE | DESCRIPTION |
|-----------|-------------|---|
| V8 | 0EB08002001 | Solenoid operated unloading valve (without coil), without emergency actuation |
| V7 | 0EB08002000 | As previous one with "push&twist" emergency actuation |
| V3 | 430059003 | Valve blanking plug |

4 Coils page 44

| TYPE | CODE | DESCRIPTION |
|--------------|-------------|--|
| C12DI | 4SLE001200A | BER type, 12 VDC, ISO4400 connector |
| C12AJ | 4SLE001203A | BER type, 12 VDC, AMP JPT connector |
| C12DE | 4SLE001202A | BER type, 12 VDC, Deutsch connector |

NOTE (*): Codes are referred to **BSP** thread

C Complete outlet section * page 41

| TYPE | CODE | DESCRIPTION |
|--|-----------|---|
| For electrohydraulic controls, with pressure reducing valve | | |
| KZP2-G05 | SHU140013 | Without backpressure valve, upper T1 port and X drain open, T2-T3 outlets and Y pilot plugged |
| KZP4-G05 | SHU140014 | Without backpressure valve, X drain open, other ports plugged |
| KZP6-G05 | SHU140021 | Without backpressure valve, upper T1-T2 ports and Y pilot plugged, side T3 port and X drain open |
| KZPH3-G05 | SHU140003 | Without backpressure valve, carry-over (HPCO) on upper T2 port, upper T1 and side T3 ports plugged, X drain open, Y pilot plugged |
| KZPH4-G05 | SHU140004 | Without backpressure valve, carry-over (HPCO) on side T3 port, upper T1 and T2 ports plugged, drain X open, Y pilot plugged |

D Tie rods kit

| CODE | DESCRIPTION |
|---------------|-----------------------|
| 5TIRDVS1401EI | For 1 section valve |
| 5TIRDVS1402EI | For 2 sections valve |
| 5TIRDVS1403EI | For 3 sections valve |
| 5TIRDVS1404EI | For 4 sections valve |
| 5TIRDVS1405EI | For 5 sections valve |
| 5TIRDVS1406EI | For 6 sections valve |
| 5TIRDVS1407EI | For 7 sections valve |
| 5TIRDVS1408EI | For 8 sections valve |
| 5TIRDVS1409EI | For 9 sections valve |
| 5TIRDVS1410EI | For 10 sections valve |

5 Compensator page 40

| TYPE | CODE | DESCRIPTION |
|-----------|-----------|--|
| MA | 4300C3017 | Compensator kit for Flow Unloader section, spring A type |

6 Tappi con fori calibrati

| TYPE | CODE | DESCRIPTION |
|--|-----------|---|
| | 423411009 | M5 plug with $\varnothing 0.6$ mm ($\varnothing 0.0236$ in) tapered hole: nr.1 always present |
| G1/8 plug with tapered hole for compensator flow control. | | |
| X | 423400145 | $\varnothing 3.5$ mm ($\varnothing 0.138$ in) for 20 l/min (5.3 US gpm) flow |
| Y | 423400142 | $\varnothing 4.0$ mm ($\varnothing 0.157$ in) for 28 l/min (7.4 US gpm) flow |
| Z | 423400116 | $\varnothing 4.5$ mm ($\varnothing 0.177$ in) for 36 l/min (9.5 US gpm) flow |
| K | 423400191 | $\varnothing 5.0$ mm ($\varnothing 0.197$ in) for 44 l/min (11.6 US gpm) flow |

7 Spools page 40

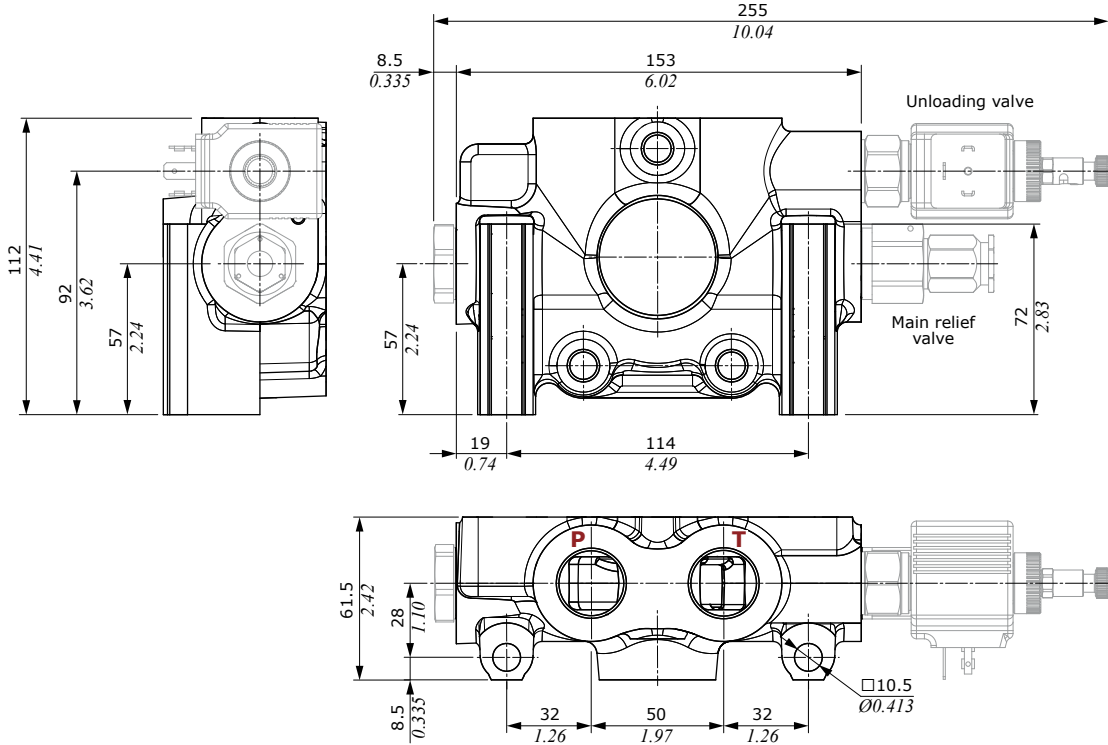
| TYPE | CODE | DESCRIPTION |
|-----------------------------|-----------|--|
| Double acting spools | | |
| W001Q | 4212C3056 | 3 positions, A and B closed in neutral position, for 70 l/min (18.5 US gpm) |
| W002Q | 4212C3057 | 3 positions, A and B to tank in neutral position, for 70 l/min (18.5 US gpm) |

8 Spool pin

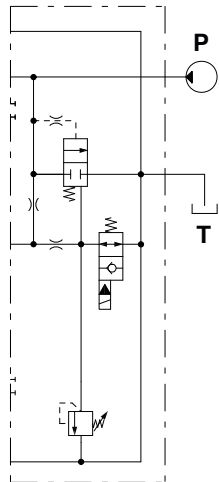
| CODE | DESCRIPTION |
|-----------|---|
| 422501293 | Spool pin for electrohydraulic controls |

Inlet section

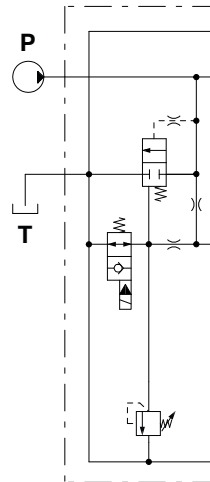
Dimensional data and hydraulic circuit



MRQ type
for Right Inlet



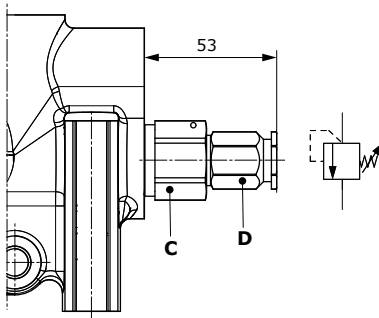
MLQ type
for Left Inlet



Inlet valves

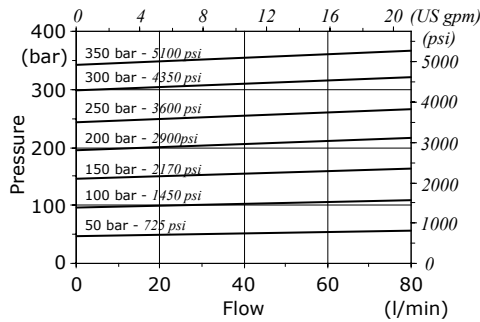
Main relief valve

**V1 type
Direct operated**

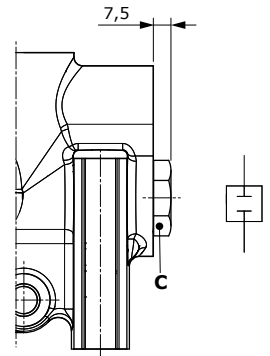


Setting example

@10 l/min (2.6 US gpm)



**V3 type
Valve blanking plug**



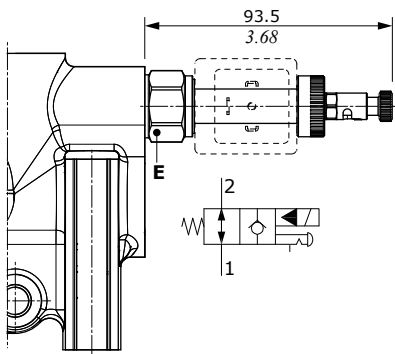
Wrenches and tightening torques

- C = wrench 27 - 80 Nm (59 lbft)
- D = wrench 19 - 15 Nm (11 lbft)

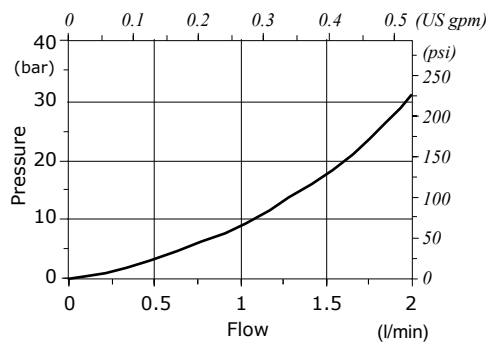
Unloading valve

**Tipo V7
Solenoid operated**

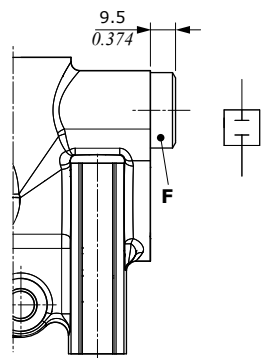
With push&twist emergency actuation



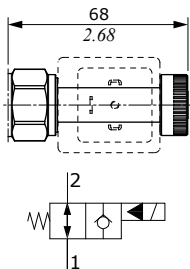
Pressure drops



**V3 type
Valve blanking plug**



Without emergency actuation



Wrenches and tightening torques

- E = wrench 24 - 30 Nm (22 lbft)
- F = allen wrench 8 - 30 Nm (22 lbft)

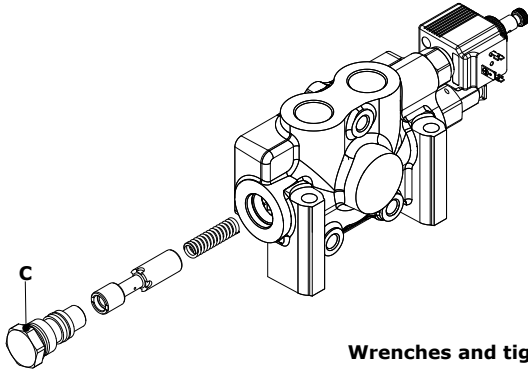
Valve features

- Nominal flow : 2 l/min (0.53 US gpm)
- Max. pressure. : 350 bar (5100 psi)
- Max. internal leakage.. : 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)

For **BER** type coils see page 44

Inlet section

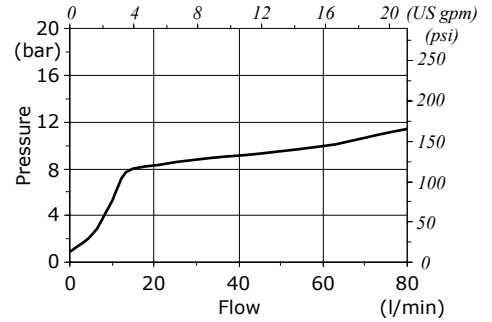
Compensator kit



Wrenches and tightening torques
C = wrench 27 - 80 Nm (59 lbf)

P⇒T Pressure drop inlet compensator (margin pressure)

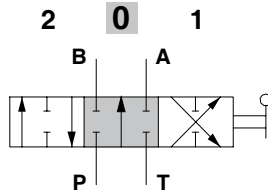
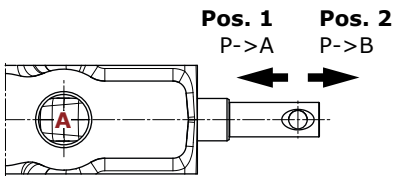
Flow = 80 l/min (21 US gpm)



Spools

W001Q type

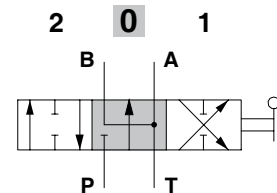
Double acting, 3 position,
A and B closed in neutral position



Stroke
position 1: + 6 mm (+0.236 in)
position 2: - 6 mm (-0.236 in)

W002Q type

Double acting, 3 position,
A and B to tank in neutral position



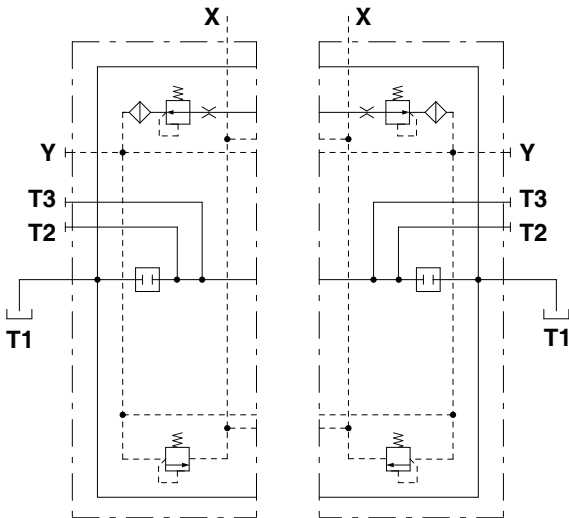
Stroke
position 1: + 6 mm (+0.236 in)
position 2: - 6 mm (-0.236 in)

For section dimensions see pages 32/33.

KZP2 type circuit example

Right Inlet circuit

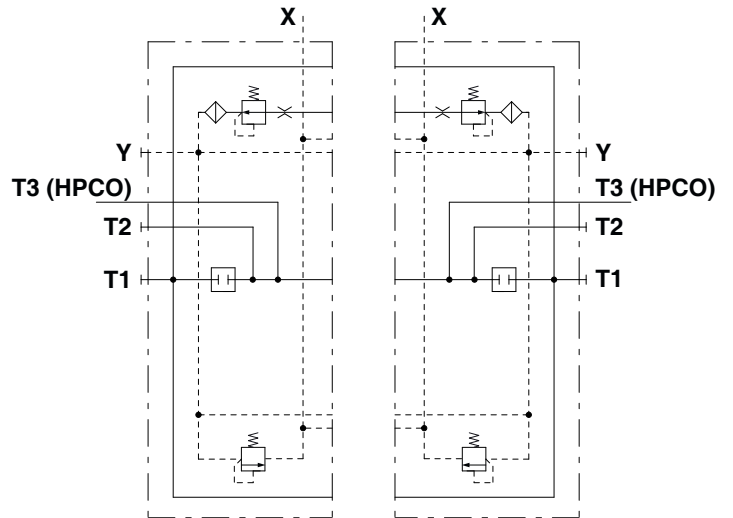
Left Inlet circuit



KZPH4 type circuit example

Right Inlet circuit

Left Inlet circuit



Port configuration

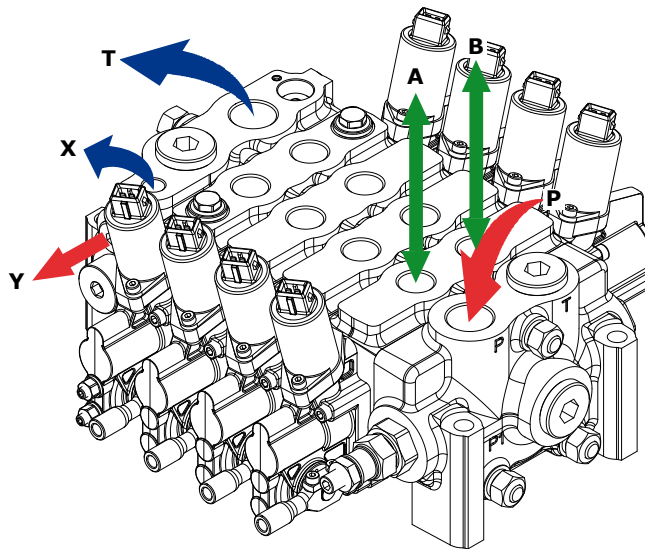
| Type | T1 port | T2 port | T3 port | X drain | Y pilot | Backpressure valve | |
|--------------|---------|-----------|-----------|---------|---------|--------------------|--|
| KZP2 | open | plugged | plugged | open | plugged | no | |
| KZP4 | plugged | plugged | plugged | open | plugged | no | |
| KZP6 | plugged | plugged | open | open | plugged | no | |
| KZPH3 | plugged | HPCO open | tappata | open | plugged | no | |
| KZPH4 | plugged | plugged | HPCO open | open | plugged | no | |

Main rules

The DVS14 valve is assembled and tested as per the technical specifications of this catalogue.

Before the final installation on your equipment, please follow the below recommendations:

- the valve can be assembled in any position; in order to prevent body deformation and spool sticking, mount the product on a flat surface;
- In order to prevent the possibility of water entering the spool control kit, do not use high pressure washdown directly on the valve;
- prior to painting, ensure that plugs on normally open ports are tightly in place.



FITTING TIGHTENING TORQUE - Nm (lbft)

| THREAD TYPE | P port | A and B ports | T and HPCO ports | | Y pilot | X drain |
|------------------------------|----------------------|--------------------|----------------------|--------------------|--------------------|--------------------|
| BSP | G 3/4 | G 1/2 | G 3/4 | | G 1/4 | G 1/4 |
| With O-Ring seal | 90 (66.4) | 50 (36.9) | 90 (66.4) | | 20 (14.8) | 20 (14.8) |
| With copper washer | 90 (66.4) | 60 (44.3) | 90 (66.4) | | 25 (18.4) | 25 (18.4) |
| With steel and rubber washer | 70 (51.6) | 60 (44.3) | 70 (51.6) | | 16 (11.8) | 16 (11.8) |
| UN-UNF | 1 1/6-12 (SAE 12) | 7/8-14 (SAE 10) | 1 1/6-12 (SAE 12) | 7/8-14 (SAE 10) | 9/16-18 (SAE 6) | 9/16-18 (SAE 6) |
| With O-Ring seal | 95 (70) | 90 (66.4) | 95 (70) | 90 (66.4) | 30 (22) | 30 (22) |

NOTE – These torques are recommended.

Assembly tightening torque depends on many factors, including lubrication, coating and surface finishing.

Carry-over transformation rules

KZM type outlet section

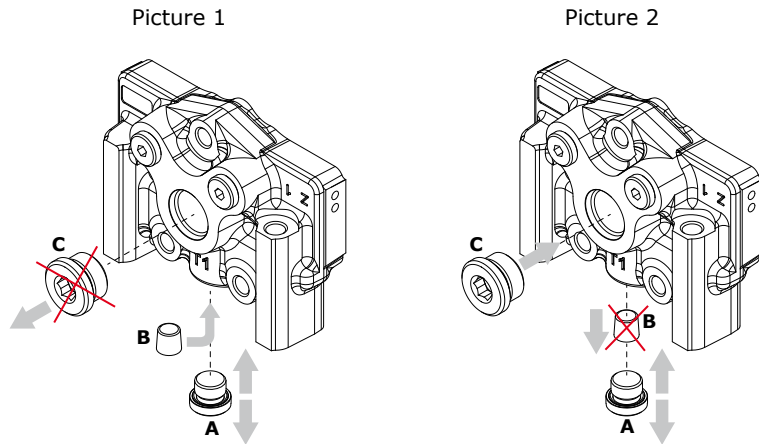
In order to transform the KZM outlet section in a HPCO carry-over configuration (picture 1), it is necessary to unscrew the **A** bottom plug, to insert the tapered **B** plug, **413010203** code, and to screw the **A** plug.

If the **C** plug is present, it is necessary to remove it from T1 port: this one will be used for HPCO.

If the HPCO port is no longer used, please remove the **B** tapered plug (picture 2) and, if necessary, close the T1 port with the **C** plug, **430000020** code.

Wrenches and tightening torques

- A = allen wrench 6 - 40 Nm (29.5 lbf^t)
- B = allen wrench 6 - 40 Nm (29.5 lbf^t)
- C = allen wrench 12 - 90 Nm (66.4 lbf^t)



KZP type outlet section

If needed, a HPCO carry-over configuration is available on T2 or T3 ports.

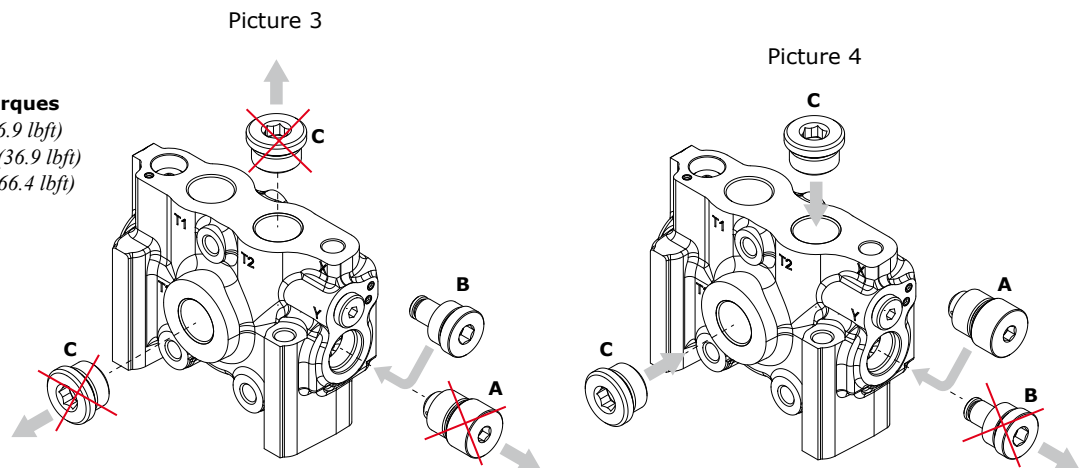
It is necessary (picture 3) to remove the **A** backpressure valve and replaced it with the **B** plug, **4300C3004** code.

Select the port for HPCO configuration and remove one of the **C** plugs.

If the HPCO port is no longer used, please remove the **B** plug (picture 4), insert the **A** backpressure valve, **3202C3004** code, and close both the T2 and T3 ports with the **C** plug, **430000020** code.

Wrenches and tightening torques

- A = allen wrench 8 - 50 Nm (36.9 lbf^t)
- B = allen wrench 10 - 50 Nm (36.9 lbf^t)
- C = allen wrench 12 - 90 Nm (66.4 lbf^t)

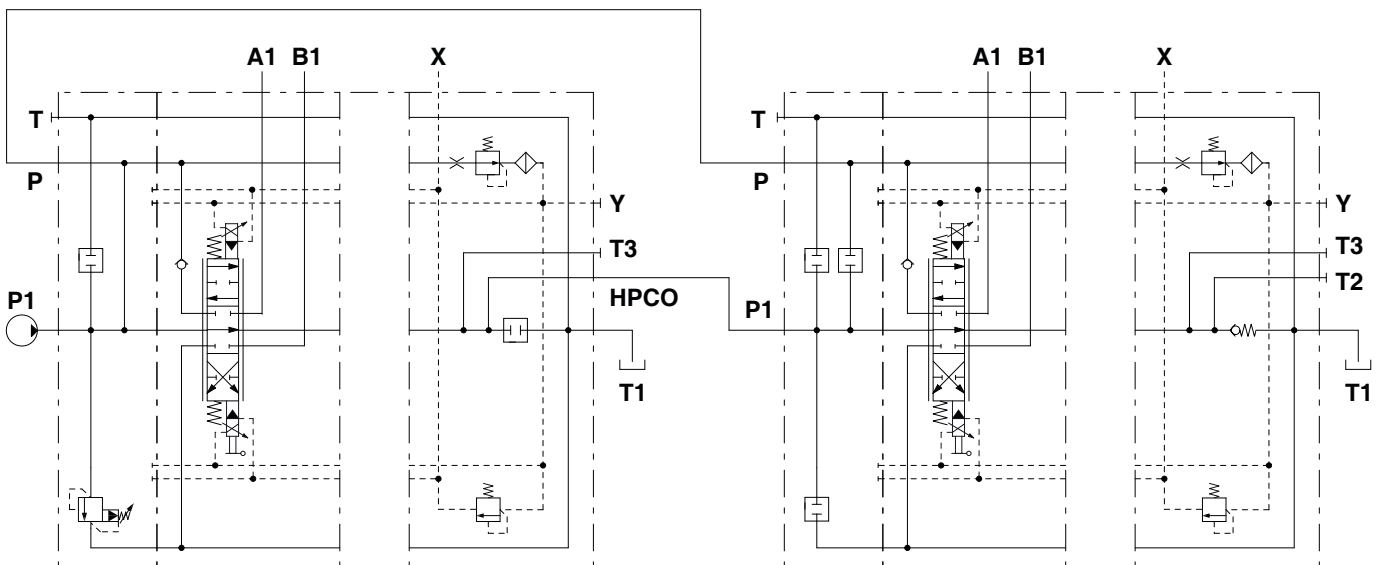
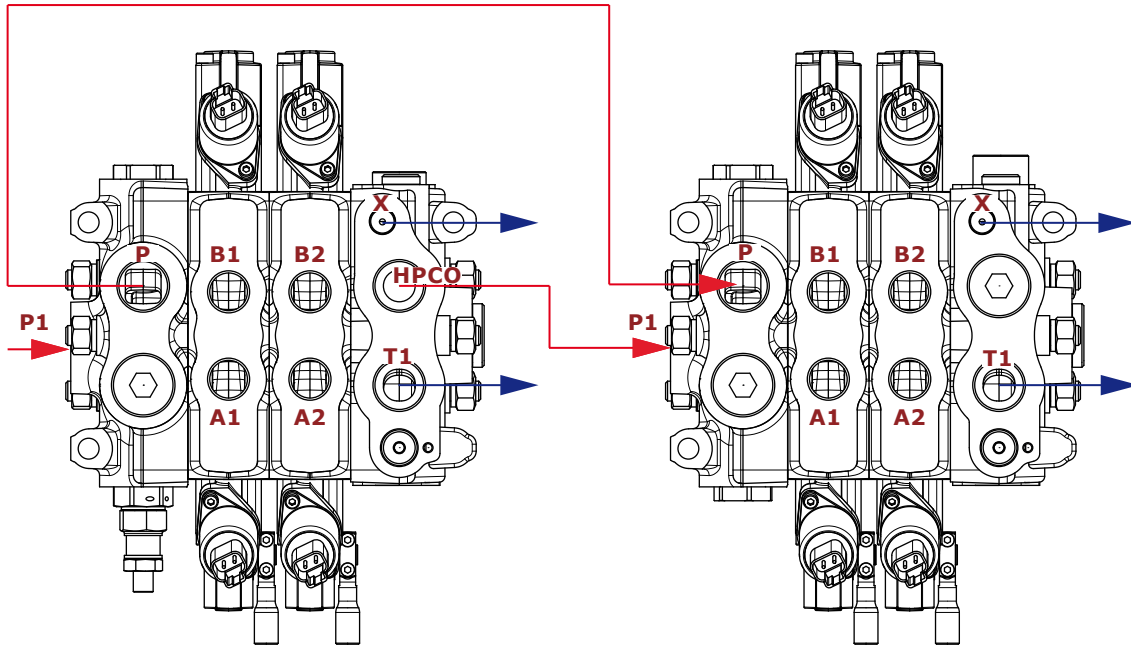


Two valves connection

This system, named IZ, allows the contemporary use of nr. 2 DVS14 valves when they are connected in parallel circuit and to the same pump.

The pump connected to the first DVS14 valve feeds also the pressure line of the second valve, while the "free flow line" from the HPCO of the first valve is connected to the "free flow line" of the following valve.

The pump can be connected indifferently to P or P1 ports of the first valve, while the HPCO must be connected to P1 port of the second DVS14 valve.



Coils and connectors

Dimensional data and features

| Coil type | Voltage | Connectors | | | | | |
|--|---|---|--|------------------------------|----------------------------|----------------------------|------------------------------|
| | | ISO4400 | Deutsch DT | AMP JPT | Packard Weatherpack | Packard Metri-pack | Flying leads (without conn.) |
| BER | 10 VDC | 4SLE001000A | - | - | - | - | - |
| | 12 VDC | 4SLE001200A 4SLE001217A ⁽³⁾ | 4SLE001201A ⁽⁵⁾ | 4SLE001203A ⁽⁵⁾ | 4SLE001210A ⁽²⁾ | 4SLE001214A ⁽²⁾ | 4SLE001207A |
| | | | 4SLE001209A ⁽³⁻⁵⁾ | 4SLE001211A ⁽³⁻⁵⁾ | | | |
| | | | 4SLE001202A ⁽⁶⁾ | | | | |
| | | | 4SLE001216A ⁽³⁻⁶⁾ 4SLE001206A ⁽²⁾ | | | | |
| | 14 VDC | - | 4SLE001400A ⁽⁶⁾ | 4SLE001403A ⁽³⁻⁵⁾ | - | - | - |
| | | | 4SLE001401A ⁽³⁻⁶⁾ 4SLE001402A ⁽³⁻⁵⁾ | | | | |
| | 24 VDC | 4SLE002400A 4SLE002408A ⁽³⁾ 4SLE302400A ⁽¹⁾ | 4SLE002401A ⁽⁵⁾ | 4SLE002403A ⁽⁵⁾ | - | - | 4SLE002404A |
| | | | 4SLE002407A ⁽³⁻⁵⁾ 4SLE002402A ⁽⁶⁾ | | | | |
| | 28 VDC | - | 4SLE002802A ⁽⁶⁾ | 4SLE002800A ⁽⁵⁾ | - | - | - |
| 48 VDC | 4SLE004800A 4SLE304800A ⁽¹⁾ | - | - | - | - | - | |
| | | | | | | | |
| 110VDC | 4SLE011000A 4SLE311000A ⁽¹⁾ | - | - | - | - | - | |
| | | | | | | | |
| 220 VDC | 4SLE022000A 4SLE322000A ⁽¹⁾ | - | - | - | - | - | |
| | | | | | | | |
| Mating connectors (For connector with rectifier see following table) | | 4CN1009995 | 5CON140031 | 5CON003 | 5CON001 | 5CON017 | - |

Note: ⁽¹⁾ supply with AC and use only with rectifier connector - ⁽²⁾ with flying leads - ⁽³⁾ with bidirectional diode - ⁽⁴⁾ with unidirectional diode - ⁽⁵⁾ integrated perpendicular type - ⁽⁶⁾ integrated parallel type

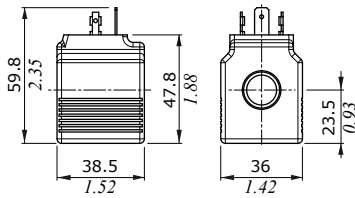
| Voltage | ISO 4400 mating connector with rectifier | |
|---------|--|--|
| | BER type coil | |
| 24 VDC | 4CN1010240 | |
| 48 VDC | 4CN1010480 | |
| 110 VDC | 4CN1011100 | |
| 220 VDC | 4CN1012200 | |

Coils and connectors

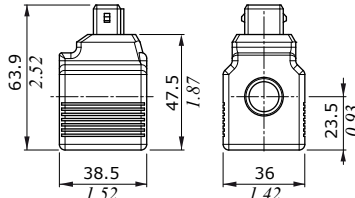
Dimensional data and features

BER type

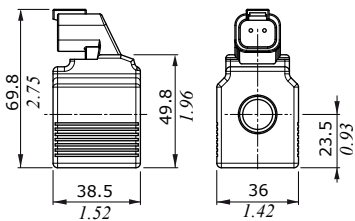
ISO4400 connector



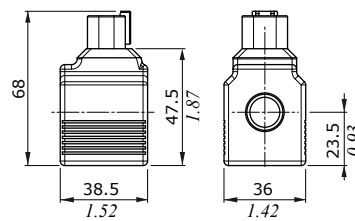
AMP JPT connector



DEUTSCH DT04 connector
(parallel type)



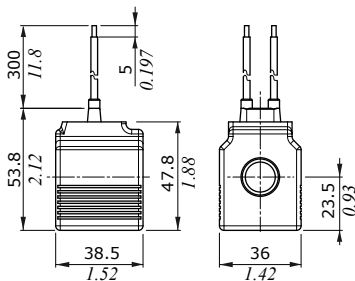
DEUTSCH DT04 connector
(perpendicular type)



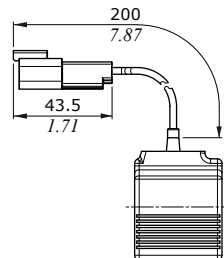
Features

- Nominal voltage tolerance : $\pm 10\%$
- Power rating : 19.2 W - 12/24 VDC - 48 RAC
: 19.1 W - 28 VDC
: 19 W - 10/14/48/110/220 VDC
: 24/110/220 RAC
- Max. operating current . . . : 1.90 A - 10 VDC
: 1.60 A - 12 VDC
: 1.36 A - 14 VDC
: 0.80 A - 24 VDC
: 0.68 A - 28 VDC
: 0.40 A - 48 VDC
: 0.17 A - 110 VDC
: 0.09 A - 220 VDC
: 0.89 A - 24 RAC
: 0.45 A - 48 RAC
: 0.19 A - 110 RAC
: 0.09 A - 220 RAC
- Coil insulation : Class H (180°C - 356°F)
- Weather protection : IP65 - ISO4400
: IP69K - Deutsch DT
: IP65 - AMP JPT
: IP67 - Weatherpack
: IP67 - Metri-pack
- Insertion : 100%

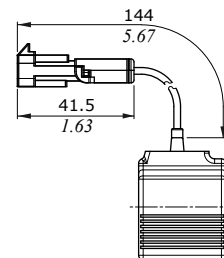
Flying leads



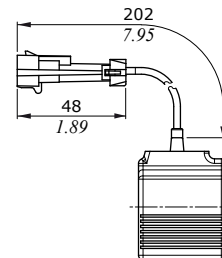
Flying leads with DEUTSCH DT04 connector



Flying leads with PACKARD WEATHER-PACK connector



Flying leads with PACKARD METRI-PACK connector





Innovation · Continuity · Integration
————— It is Power —————

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FLUID POWER E|*MOTION*

 **walvoil**

 **hydro control**

 **Caltex**

D1WHEB12E
4th edition March 2020

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