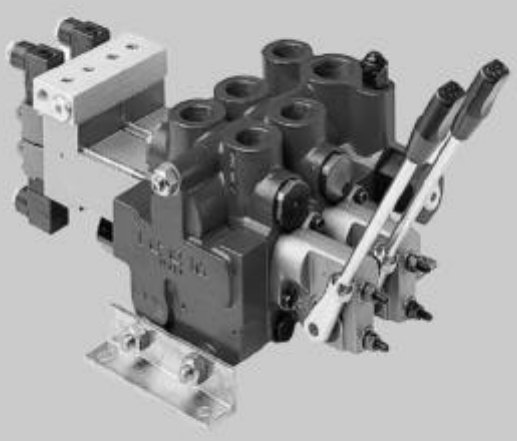
COMPACT CATALOG



# DPC38

PRESSURE COMPENSATED
PROPORTIONAL LOAD SENSING VALVE

walvoil
HYDRAULIC CONTROL SYSTEMS

## Features

These valves, available from 1 to 10 sections, are used for systems with fixed displacement pumps (open center version) or Load-Sensing variable displacement pumps (closed center version).
Main peculiarity are listed below.

**H** Available with compensated or non compensated working sections.
**H** Interchangeable spools.
**H** Available manual, hydraulic and electro-hydraulic proportional spool control kits.
**H** Available anti-shock and anti-cavitation port valves.
**H** Available intermediate sections with pressure reducing valve for pilot feeding and mid return manifold.

## Working conditions

This catalog shows technical specifications and diagrams measured with mineral oil of 46 $mm^2/s$ - *46 cSt* viscosity at 40°C - *104°F* temperature.

| | | | |
|---|---|---|---|
| Nominal flow rating | *on inlet port P* | 200 l/min | *53 US gpm* |
| | *on ports A and B with compensator* | 150 l/min | *40 US gpm* |
| | *on ports A and B without compensator* | 170 l/min | *45 US gpm* |
| Operating pressure (maximum) | *in ingresso P e sulle bocche A, B e LS* | 315 bar | *4600 psi* |
| Max. back pressure | *on outlet port **T*** | 10 bar | *145 psi* |
| | *on drain port **L*** | 2.5 bar | *36 psi* |
| Internal leakage A(B)→T | *Δp=100 bar - 1450 psi fluid and valve at 40°C - 104°F* | 12 $cm^3$/min | *0.73 $in^3$/min* |
| Fluid | | Mineral base oil | |
| Fluid temperature range | *with NBR (BUNA-N) seals* | from -20°C to 80°C | *from -4°F to 176°F* |
| Viscosity | *operating range* | da 15 a 75 $mm^2/s$ | *da 15 a 75 $mm^2/s$* |
| | *min* | 12 $mm^2/s$ | *12 cSt* |
| | *max* | 400 $mm^2/s$ | *400 cSt* |
| Max level of contamination | | 18/15 - ISO 4406 | *NAS 1638 - class 10* |
| Ambient temperature range | | from -40° to 60°C | *from -40°F to 140°F* |
| Tie rod tightening torque (wrench 17) | | 40 Nm | *29.5 lbft* |

NOTE - *For different conditions please contact Customer Service.*

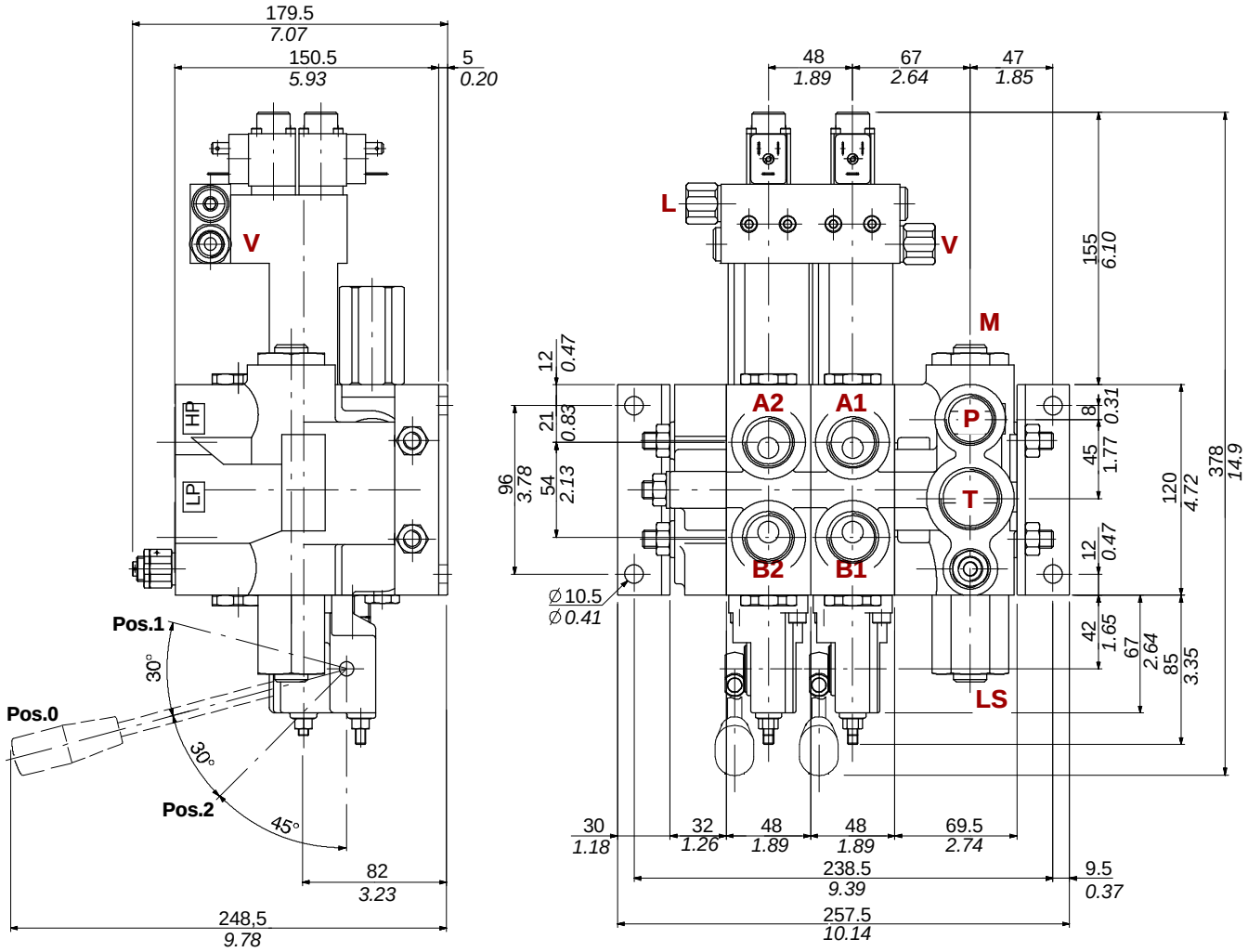
**Additional information**
This catalog shows the product in the most standard configurations.
Please contact Customer Service Dpt. for more detailed information or special request.

**WARNING!**
All specifications of this catalog 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.**

3rd edition July 2001
**This edition supercedes all prior documents**.

## Dimensional data




| TYPE | E | | F | | Weight | |
|---|---|---|---|---|---|---|
| | mm | *in* | mm | *in* | kg | *lb* |
| **DPC38/1** | 209.5 | *8.25* | 190.5 | *7.50* | 14.4 | *31.7* |
| **DPC38/2** | 257.5 | *10.1* | 238.5 | *9.39* | 21.3 | *47.0* |
| **DPC38/3** | 305.5 | *12.0* | 286.5 | *11.3* | 28.3 | *62.4* |
| **DPC38/4** | 353.5 | *13.9* | 334.5 | *13.2* | 35.3 | *77.8* |
| **DPC38/5** | 401.5 | *15.8* | 382.5 | *15.1* | 42.2 | *93.0* |

| TYPE | E | | F | | Weight | |
|---|---|---|---|---|---|---|
| | mm | *in* | mm | *in* | kg | *lb* |
| **DPC38/6** | 449.5 | *17.7* | 430.5 | *16.9* | 49.1 | *108* |
| **DPC38/7** | 497.5 | *19.6* | 478.5 | *18.8* | 56 | *123* |
| **DPC38/8** | 545.5 | *21.5* | 526.5 | *20.7* | 62.9 | *139* |
| **DPC38/9** | 593.5 | *23.4* | 574.5 | *22.6* | 69.8 | *154* |
| **DPC38/10** | 641.5 | *25.3* | 622.5 | *24.5* | 76.7 | *169* |

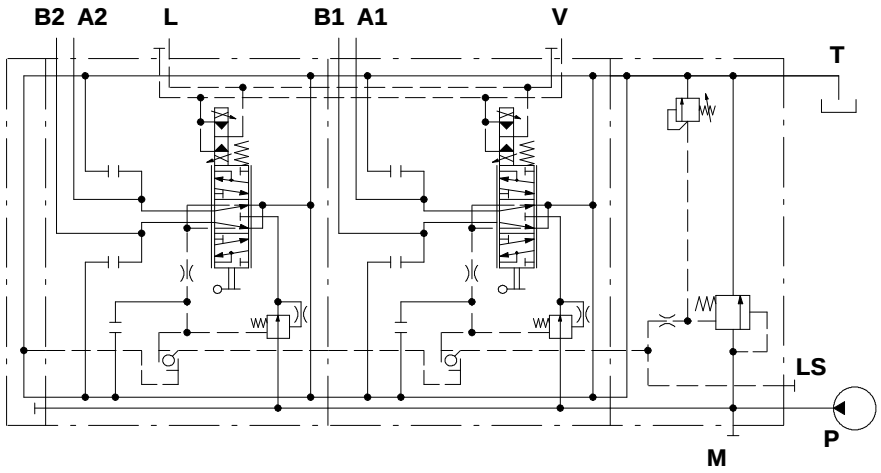
## Standard threads

| PORTS | **BSP** (ISO 228/1) | **UN-UNF** (ISO11926-1) |
|---|---|---|
| Inlet **P** | G 3/4 | 1 1/16-12 UN-2B (SAE 12) |
| Outlet **T** | G 1 | 1 5/16-12 UN-2B (SAE 16) |
| **A** and **B** ports | G 3/4 | 1 1/16-12 UN-2B (SAE 12) |
| PILOT PORTS | | |
| **LS, M, V, L** | G 1/4 | 9/16-18 UNF-2B (SAE 6) |

## Hydraulic circuit

### Fixed displacement pump (open center)

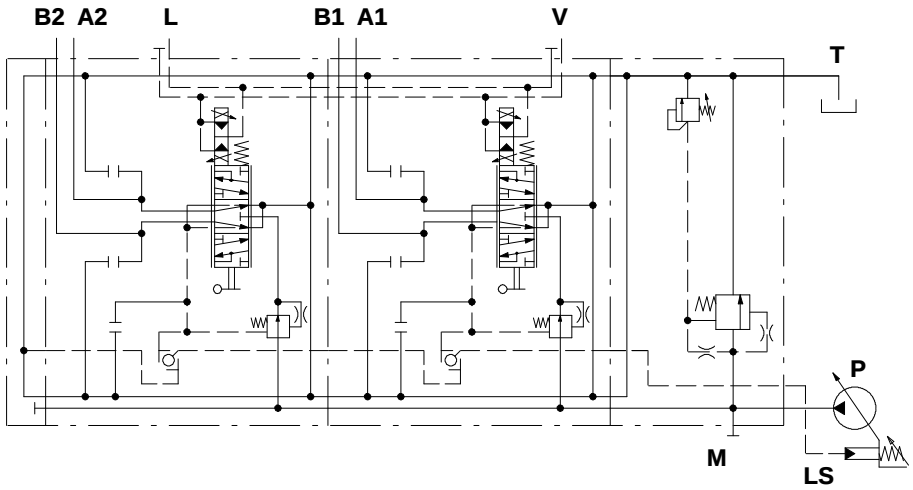
When the spools are in neutral position the main pump flow is discharged to tank by a 3-way compensator valve in the inlet section at stand by pressure (15 bar - *218 psi*).
When the spools are activated the highest load pressure is selected by the shuttle valve logic.
Any excess pump flow is discharged by the 3-way compensator valve in the inlet section at load pressure + stand by pressure (15 bar - *218 psi*) to tank.




Ex.: DPC38**A**/2/**BNS11**-S20/CTS501N-AE0018EZ32LH.UTUTST/CTS501N-AE0018EZ32LH.UTUTST/RF-<SB15>-<CVN>

### Variable displacement pump with Load Sensing compensator

The compensator located in the inlet section acts as the main stage of a pilot operated relief valve.
When main pressure exceeds the setting of the L.S. relief valve, any excees flow is discharged at L.S. valve setting to tank.

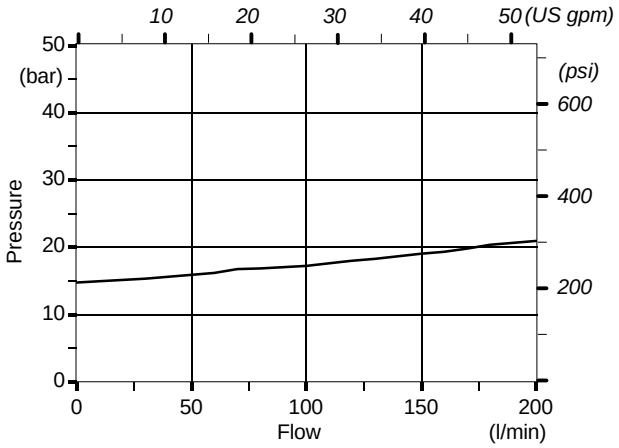



Ex.: DPC38**C**/2/**BNS21**-S20/CTS501N-AE0018EZ32LH.UTUTST/CTS501N-AE0018EZ32LH.UTUTST/RF-<SB15>-<CVN>

## Performance data (pressure drop vs. flow)

### Open center

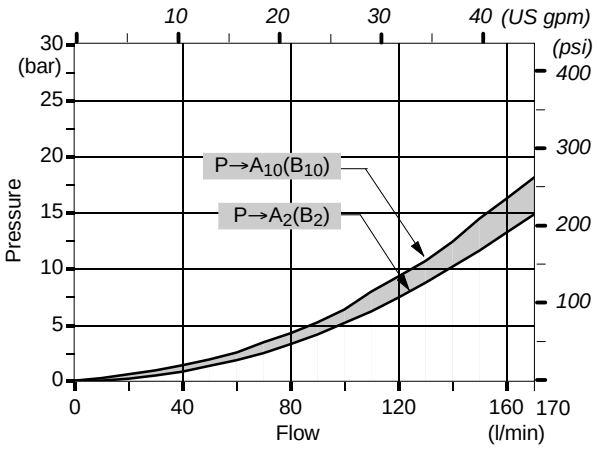
Pressure drop curve (stand-by pressure) on inlet section from port P to port T, for open center circuit (with fixed displacement pump).



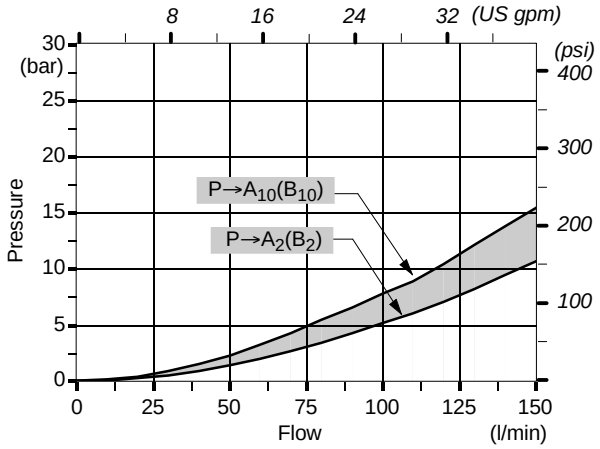

### Inlet to work port

From inlet **P** to port **A** (spool in position **1**) or port **B** (spool in position **2**).

**Working section without compensator**



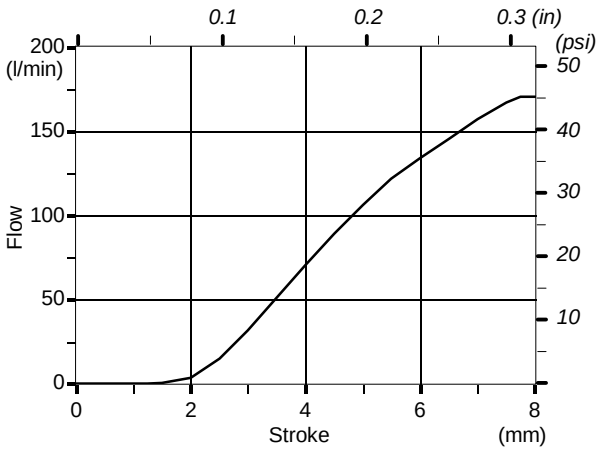

**Working section with compensator**




### Spool metering

From inlet **P** to port **A** (spool in position **1**) or port **B** (spool in position **2**).

**Working section without compensator**



## Ordering codes

### Description example:

Complete sectional valve is supplied painted as standard, with one coat of Primer black antirust paint

n. of working section

1st section — following section

**DPC38 A / 1 / BNS11 – S 20 – L / CTS501N..... / CTS501N – AD003 8EZ3 LH .UTUT ST / RF – <SB15> – <CVN>**

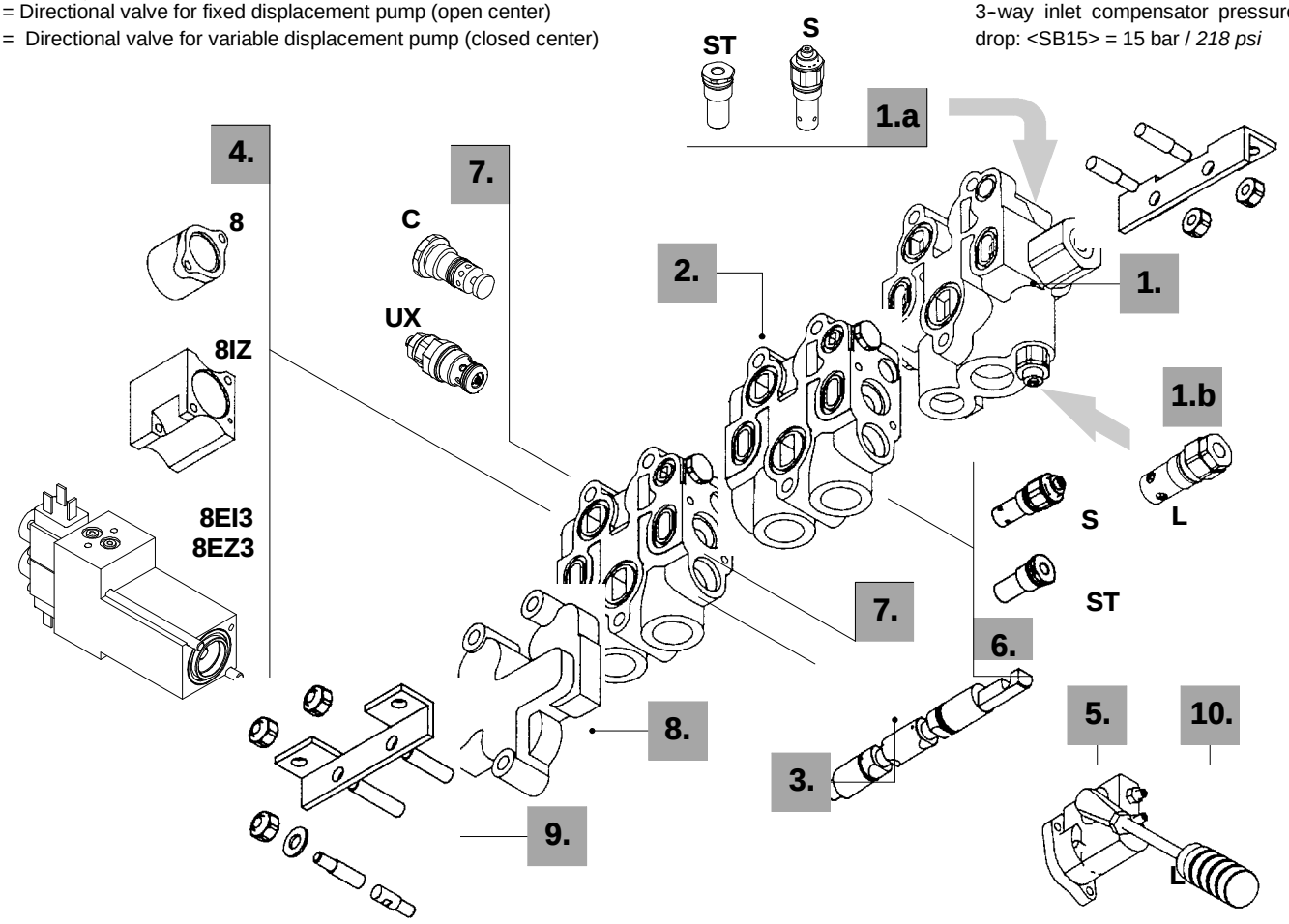
1.a 1.b 5. 7.

1. 2. 3. 4. 6. 8.

L.S. relief valve setting (MPa)

**A** = Directional valve for fixed displacement pump (open center)
**C** = Directional valve for variable displacement pump (closed center)

3-way inlet compensator pressure drop: <SB15> = 15 bar / *218 psi*




### 1. Complete inlet cover *

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| <u>For open center circuit</u> | | |
| **BNS11-S35** | 636211013 | With L.S. relief valve, for setting from 180 to 350 bar / *from 2600 to 5070 psi* |
| **BNS11-S35-LT** | 636211015 | With L.S. relief valve for setting from 180 to 350 bar / *from 2600 to 5070 psi* and arrangement for unloader valve |
| **BNS11-S35-L** | 636211016 | With L.S. relief valve for setting from 180 to 350 bar / *from 2600 to 5070 psi* and unloader valve |
| <u>For closed center circuit</u> | | |
| **BNS21-ST** | 636221012 | With L.S. relief valve arrangement |
| **BNS21-S35** | 636221013 | With L.S. relief valve, for setting from 180 to 350 bar / *from 2600 to 5070 psi* |

### 1.a Inlet relief options

| TIPO | CODICE | DESCRIZIONE |
|---|---|---|
| **S** | XCAR602100 | Setting from 63 to 210 bar / from 900 to 3050 psi |
| | XCAR602200 | Setting from 180 to 350 bar / *from 2600 to 5070 psi* |
| **ST** | XTAP220440 | L.S. relief valve blanking plug |

### 1.b Unloader valve options

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **L** | XCAR701000 | Unloader valve |
| **LT** | XTAP227570 | Unloader valve blanking plug |

## Ordering codes

### 2. Working section *

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| With compensator | | |
| **CMS200N** | 536111016 | For manual control, with service valves arrangement |
| **CMS501N** | 536111017 | For manual control, with service and L.S. valves arrangement |
| **CTS200N** | 536111018 | For electro-hydraulic control, with service valves arrangement |
| **CTS501N** | 536111021 | For electro-hydraulic control, with service and L.S. valves arrangement |

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| Without compensator | | |
| **DMS200V** | 536121020 | For manual control, with service valves arrangement |
| **DTS501V** | 536121021 | For electro-hydraulic control, with service and L.S. valves arrangement |

### 3. Spool options

| TYPE | CODE | | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| | 50 l/min *13.2 US gpm* | 70 l/min *18.5 US gpm* | 90 l/min *23.8 US gpm* | 110 l/min *29.1 US gpm* | 130 l/min *34.3 US gpm* | 150 l/min *39.6 US gpm* | Nominal flow with open center circuit (SB 15 bar / *218 psi*) and compensated workin section |
| **AD** | 3CU41**AD003** | 3CU41**AD012** | 3CU41**AD002** | 3CU41**AD010** | 3CU41**AD011** | 3CU41**AD006** | Double acting, 3 positions with A and B closed in neutral position |
| **AE** | 3CU41**AE001** | 3CU41**AE007** | 3CU41**AE028** | 3CU41**AE030** | 3CU41**AE017** | 3CU41**AE003** | Double acting, 3 positions with A and B partially open to tank in neutral position |

### 4. "A" side positioner kits

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **8** | 5V08138005 | Manual control , 3 positions with spring return in neuteral position |
| **8IZ** | 5V08138870* | Proportional hydraulic operated with spring return in neutral position |
| **8EI3** | 5V08138750 | 12VDC ON/OFF electro-hydraulic |
| | 5V08138751 | 24VDC ON/OFF electro-hydraulic |
| **8EZ3** | 5V08138780 | 12VDC proportional electro-hydraulic |
| | 5V08138790 | 24VDC proportional electro-hydraulic |

### 5. "B" side options

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **LH** | 5LEV138700 | Lever box for hydraulic and electro-hydraulic controls |
| **LM** | 5LEV138715 | Lever box for manual control |

NOTE - *Handlever not included*

### 6. L.S. relief options

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **S** | XCAR602101 | L.S valve with setting from 63 to 210 bar / *from 900 to 3050 psi* |
| | XCAR602201 | L.S valve with setting from 180 to 350 bar / *from 2600 to 5070 psi* |
| **ST** | XTAP220440 | L.S. valve blanking plug |
| **SR** | XGIU120410 | Joint for external connection of L.S. signal |
| **SR1** | 5GIU120410 | 90° JIC joint for external connection of L.S. signal |

### 7. Service valves

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **UX** | X143411145 | Pilot operated anti-shock and anti-cavitation valve |
| **C** | XCAR502000 | Anti-cavitation valve |
| **UT** | XTAP230330 | Service valve blanking plug |

### 8. End cover *

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **RF** | 636310001 | Standard, without any connection |

### 9. Assembling kit

| CODE | DIRECTIONAL VALVE |
|---|---|
| **5TIR110186** | Tie rods with nuts for 1 section |
| **5TIR110234** | Tie rods with nuts for 2 sections |
| **5TIR110282** | Tie rods with nuts for 3 sections |
| **5TIR110330** | Tie rods with nuts for 4 sections |
| **5TIR110378** | Tie rods with nuts for 5 sections |
| **5TIR110426** | Tie rods with nuts for 6 sections |
| **5TIR110474** | Tie rods with nuts for 7 sections |
| **5TIR110522** | Tie rods with nuts for 8 sections |
| **5TIR110570** | Tie rods with nuts for 9 sections |
| **5TIR110618** | Tie rods with nuts for 10 sections |

### 10. Optional handlever

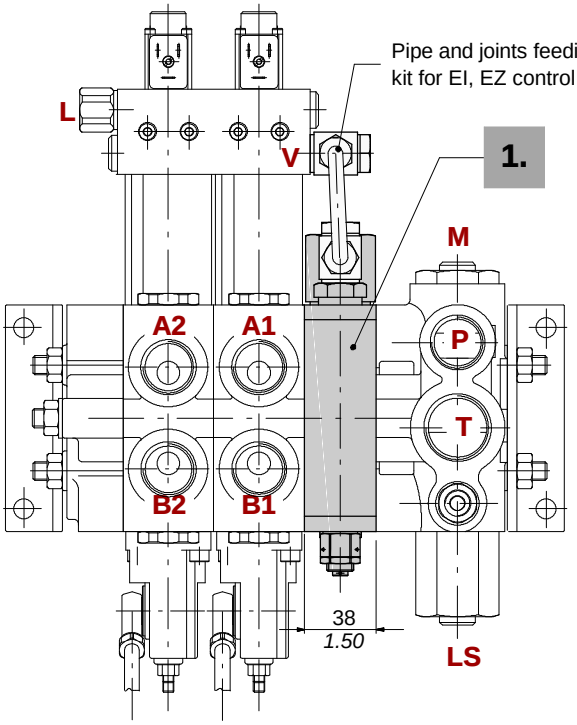
| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **AL01/M8x170** | 170011117 | For L lever box: h = 170 mm / *6.69 in* |

NOTE (*) - *Codes are referred to **UN-UNF** thread.*

## Intermediate sections

### With pressure reducing valve

This section is introduced after inlet cover in order to create necessary low pressure pilot signal for 8EI3 and 8EZ3 controls; it's complete with pipe connection and it's available also within solenoid operated unloader valve for L.S. signal.
Special tie rods are necessary; contact Customer Service.




Description example:
DPC38C/2/BNS21-S20/**ERB-LT**/
CTS501N-AE0018EZ32LH.UTUTST/
CTS501N-AE0018EZ32LH.UTUTST/RF-<SB15>

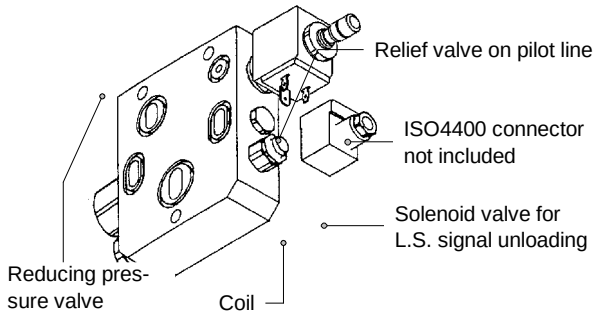
**Operating features**
Reduced pressure . . . . . : 30 bar / *435 psi*

**Coil operating features**
Nominal supply voltage . . . . . : 12 VDC / 24 VDC
Power rating . . . . . : 21 W
Duty cycle . . . . . : 100%

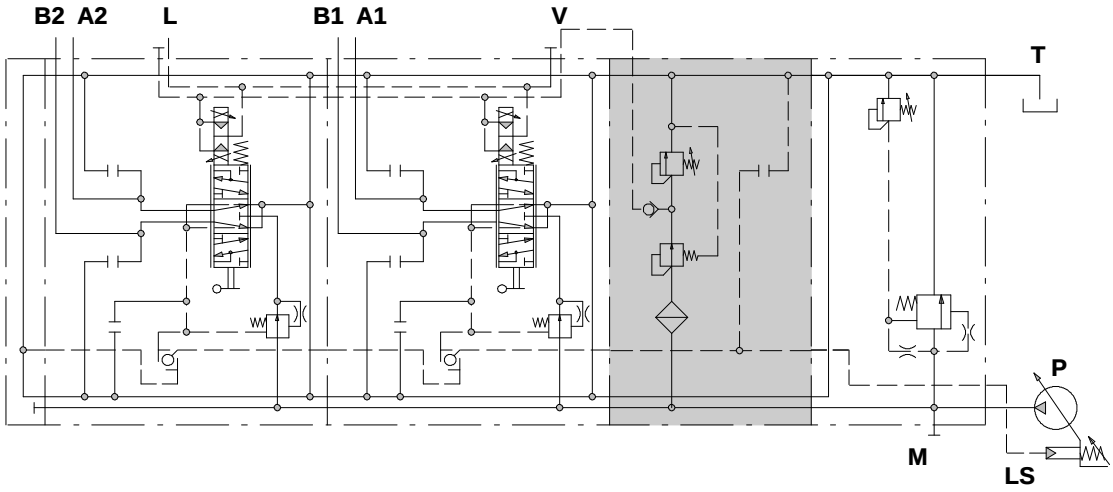
**1. Intermediate section**

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **ERS-LT** | 536431003 | Standard with solenoid valve arrangement on L.S. signal |
| **ERS-EL2** | 536431001 | With 12VDC solenoid valve on L.S. signal |
| **ERS-EL4** | 536431002 | With 24VDC solenoid valve on L.S. signal |

**Example of section with solenoid valve**

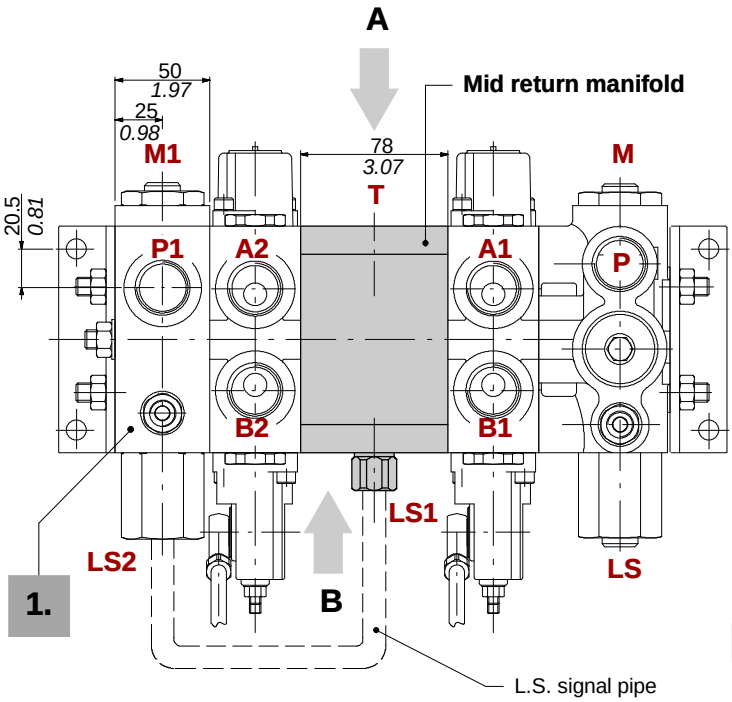


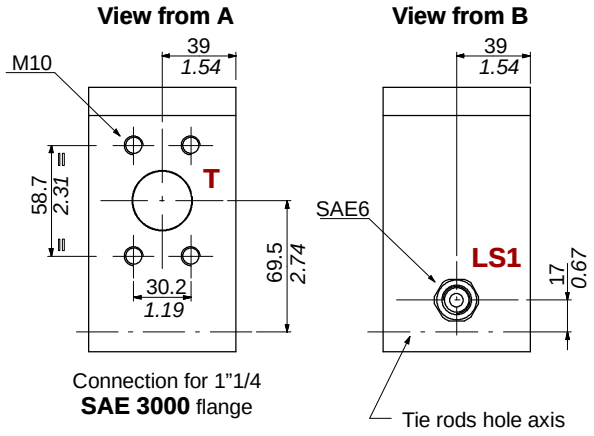

| PART CODE | DESCRIPTION |
|---|---|
| 5CAR438302 | 12VDC solenoid valve |
| 5CAR438304 | 24VDC solenoid valve |
| XTAP222340 | Solenoid valve blanking plug |



## CS1 mid return manifold code: 636419002*

Mid return manifold to be added with right inlet valves (standard) and left inlet valves.
The drawing and scheme shows open center circuit valve.
In case of close center circuit the L.S. signal coming out from manifold must be connected with L.S. port on the pump.
Special tie rods are necessary: contact Customer Service.

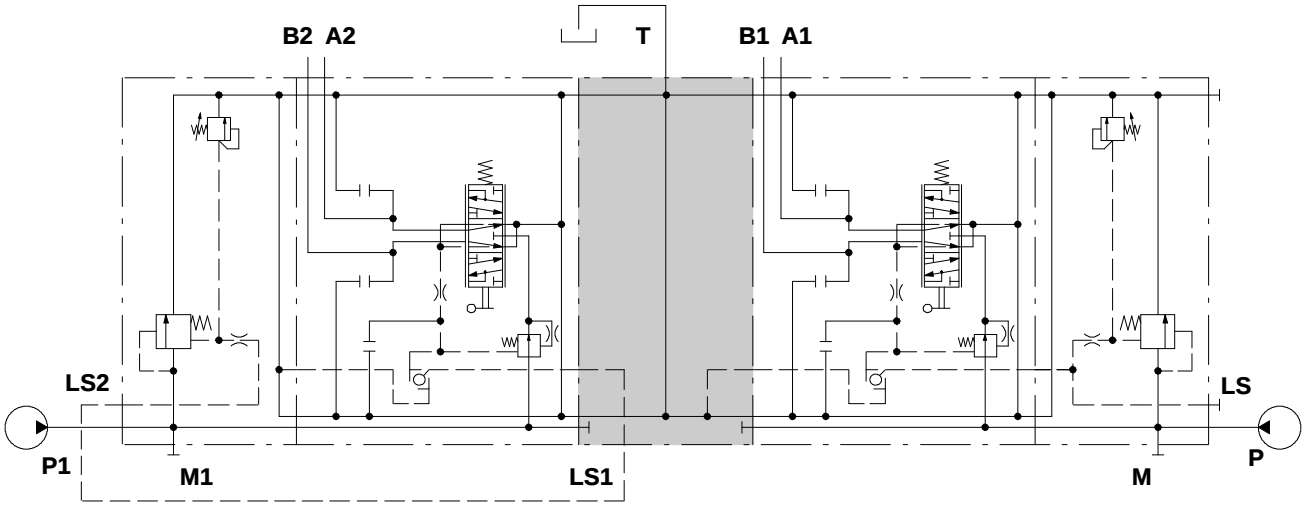



Description example:
DPC38A/2/BNS12-S20/CTS501N-AE0018L.UTUTST/
**CS1-FS3**/CTS501N-AE0018L.UTUTST/ANS11-S35-<SB15>

### 1. Complete left inlet cover *

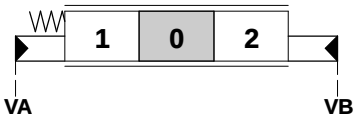
| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **ANS11-S35** | 636221010 | For open center circuit with L.S. main relief valve |
| **ANS21-S35** | 636221011 | For closed center circuit with L.S. main relief valve |

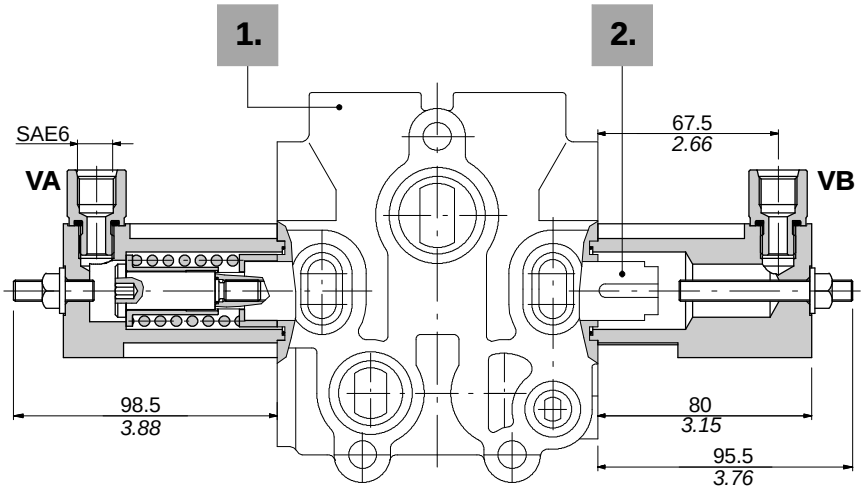



NOTE (*)- *Codes are referred to* ***UN-UNF*** *thread.*

## Special spool controls

### 8IM double side proportional operated hydraulic control code: 5IDR238700*

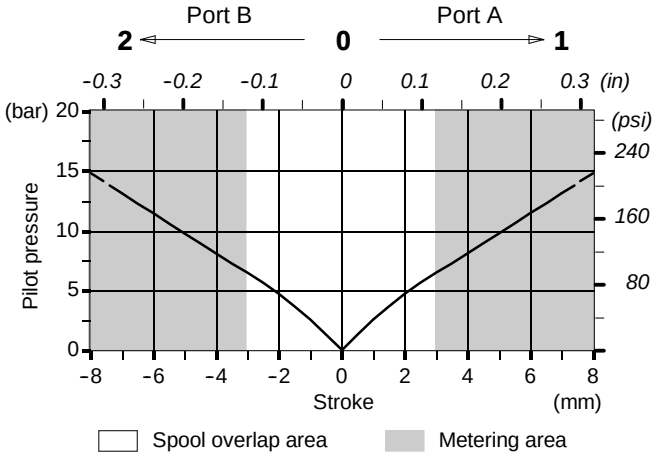



**Operating features**

Adjustment range (curva 020): from 4 to 14 bar
*from58 to 203 psi*

**Pilot pressure - stroke diagram**




#### 1. Special working section kit *

| TYPE | CODE | DESCRIPTION |
|---|---|---|
| **CUS501N** | 536111011 | With compensator and arrangement for service and L.S. valves. |
| **DUS501V** | 536121010 | Without compensator and arrangement for service and L.S. valves. |

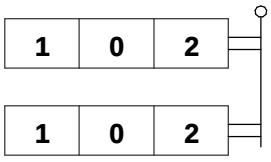
#### 2. Special spool

3 positions spools with A and B closed in neutral position (tipo **BD**) and with A and B to tank in neutral position (tipo **BE**) are available.
For informations about code and flow contact Customer Service.

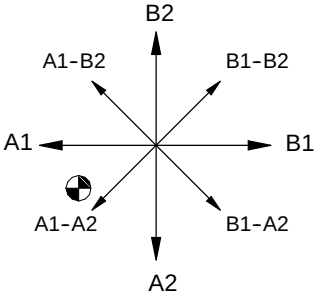
NOTE (*) - *Codes are referred to **UN-UNF** thread.*

## Joystick control

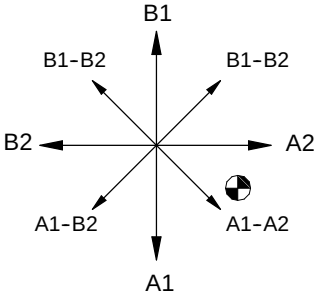
For two sections control.




Execution **LCB1**
*pivot placed down on the left*

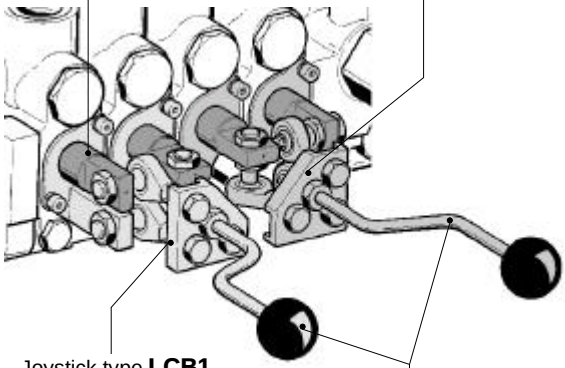



Execution **LCB2**
*pivot placed down on the right*




Special spools; for information contact Customer Service

Joystick type **LCB2**
code: **5CLO338010**



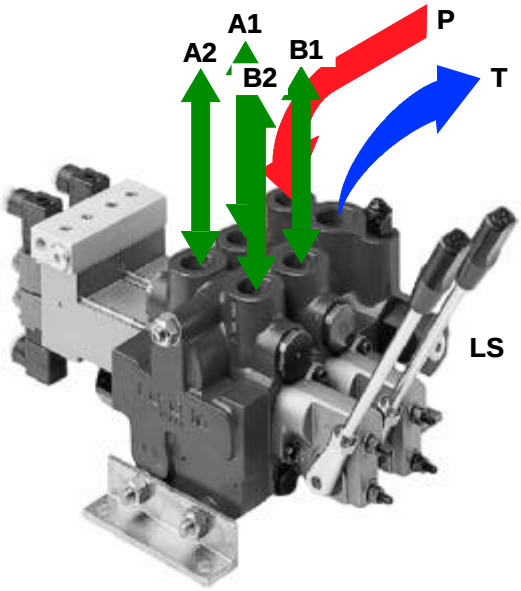
Joystick type **LCB1**
code: **5CLO338000**

Handlever on request **AL04/M10x200**
code: **170012024**

## Installation and maintenance

The DPC38 valve is assembled and tested as per the technical specification of this catalog.
Before the final installation on your equipment, follow the below recommendations:

- the valve can be assembled in any position; in order to prevent working sections deformation and spool sticking mount the product on a flat surface;
- prior to painting, ensure plastic port plugs are tightly in place.




**Open center configuration**

## Fitting tightening torque - Nm

| THREAD TYPE | ports P, A and B | port T | port LS |
|---|---|---|---|
| BSP (ISO 228/1) | G 3/4 | G 1 | G 1/4 |
| With O-Ring seal | 70 | 100 | 25 |
| With copper washer | 70 | 90 | 30 |
| With steel and rubber washer | 70 | 100 | 16 |
| UN-UNF (ISO 11926-1) | 1 1/16-12 UN-2B (SAE 12) | 1 5/16-12 UN-2B (SAE 16) | 9/16-18 UNF-2B (SAE 6) |
| With O-Ring seal | 95 | 150 | 30 |

NOTE - *These torque are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.*