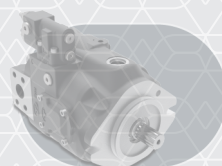
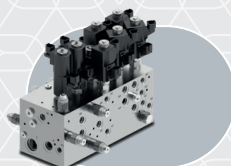
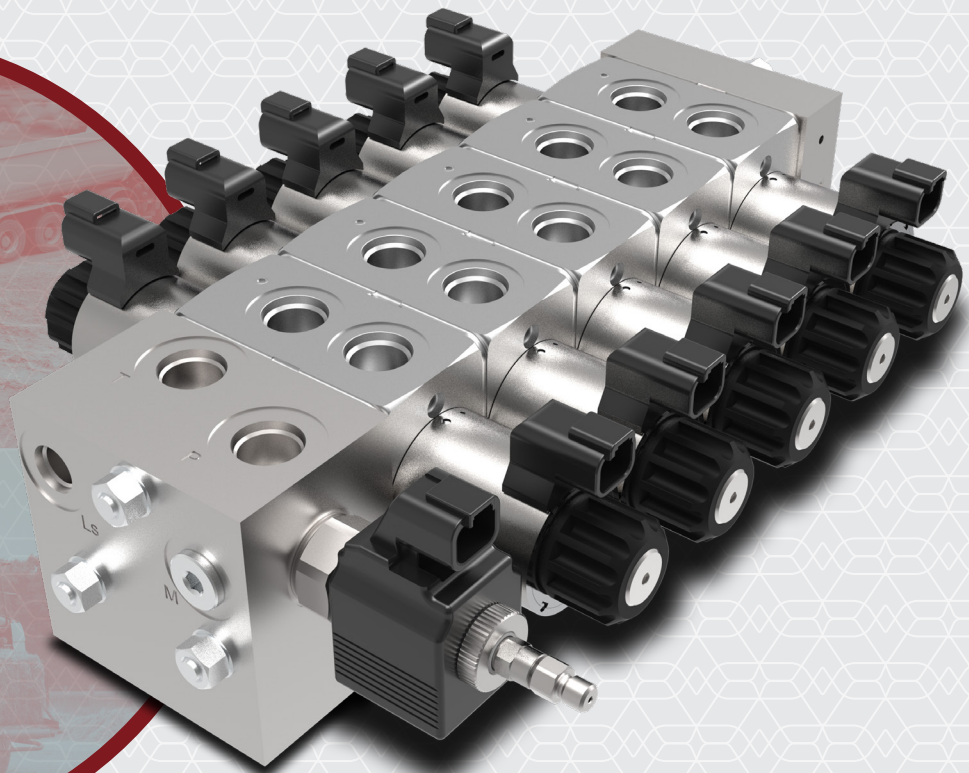


## SDX060

Bankable solenoid valves  
with proportional control



COMPACT HYDRAULICS

## General informations

---

Simple, compact and heavy duty designed sectional valves from 1 to 8 sections.

### SDX060

- Steel inlet sections, available in several configurations.
- Cast iron working sections.
- Different types of spools.
- Different options to be flanged on the workports side.
- Proportional and on/off solenoid controls.
- Emergency handlever available.

### 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 IN NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN INCORRECT USE OF THE PRODUCT.

1<sup>st</sup> edition November 2024

**Content**

|                                        |     |
|----------------------------------------|-----|
| Working conditions . . . . .           | .4  |
| Standard threads . . . . .             | .4  |
| Accessories                            |     |
| Coils and connectors . . . . .         | .26 |
| Fixing brackets . . . . .              | .28 |
| Installation and maintenance . . . . . | .29 |

**SDX060**

|                                            |     |
|--------------------------------------------|-----|
| Dimensions . . . . .                       | .5  |
| Hydraulic circuit . . . . .                | .6  |
| Complete sections ordering codes . . . . . | .7  |
| - Inlet section                            |     |
| Part ordering codes . . . . .              | .9  |
| Dimensions and hydraulic circuit. . . . .  | .10 |
| Options . . . . .                          | .12 |
| - Working section                          |     |
| Part ordering codes . . . . .              | .14 |
| Dimensions and hydraulic circuit. . . . .  | .16 |
| Spools . . . . .                           | .17 |
| Control kits . . . . .                     | .18 |
| - Flangeable valve blocks                  |     |
| Antishock valves . . . . .                 | .20 |
| Check valves . . . . .                     | .21 |
| Solenoid operated check valves . . . . .   | .22 |
| Counterbalance valves. . . . .             | .24 |
| - Outlet section                           |     |
| Dimensions and hydraulic circuit. . . . .  | .25 |

## Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46mm<sup>2</sup>/s - 46 cSt viscosity at 40°C - 104°F temperature.

### SDX060

|                                            |                                   |                                                      |
|--------------------------------------------|-----------------------------------|------------------------------------------------------|
| Nominal flow rating                        |                                   | 80 l/min @ 14 bar - 21.1 US gpm @ 203 psi            |
| Flow rate uses                             | pre compensated section           | 35 l/min @ 9 bar - 9.2 US gpm @ 131 psi              |
|                                            | non-compensated section           | 35 l/min @ 14 bar - 9.2 US gpm @ 203 psi             |
| Operating pressure (max.)                  |                                   | 300 bar - 4350 psi                                   |
| Back pressure (max.)                       | outlet port T                     | 30 bar - 435 psi                                     |
|                                            | outlet port T, with lever control | 30 bar - 435 psi                                     |
| Internal leakage max. A(B)⇒T               | Δp = 100 bar - 1450 psi           | 14 cm <sup>3</sup> /min - 0.85 in <sup>3</sup> /min  |
| Fluid                                      |                                   | Mineral based oil                                    |
| Fluid temperature                          | with NBR (BUNA-N) seals           | from -20°C to 80°C - from -4°F to 176°F              |
|                                            | with FPM (VITON) seals            | from -20°C to 100°C - from -4°F to 212°F             |
| Viscosity                                  | operating range                   | from 15 to 75 mm <sup>2</sup> /s - from 15 to 75 cSt |
|                                            | min.                              | 12 mm <sup>2</sup> s - 12 cSt                        |
|                                            | max.                              | 400 mm <sup>2</sup> s - 400 cSt                      |
| Max. contamination level                   |                                   | -/18/15 - ISO 4406 - NAS 1638 - class 10             |
| Ambient temperature for working conditions |                                   | from -20°C to 50°C - from -4°F to 122°F              |

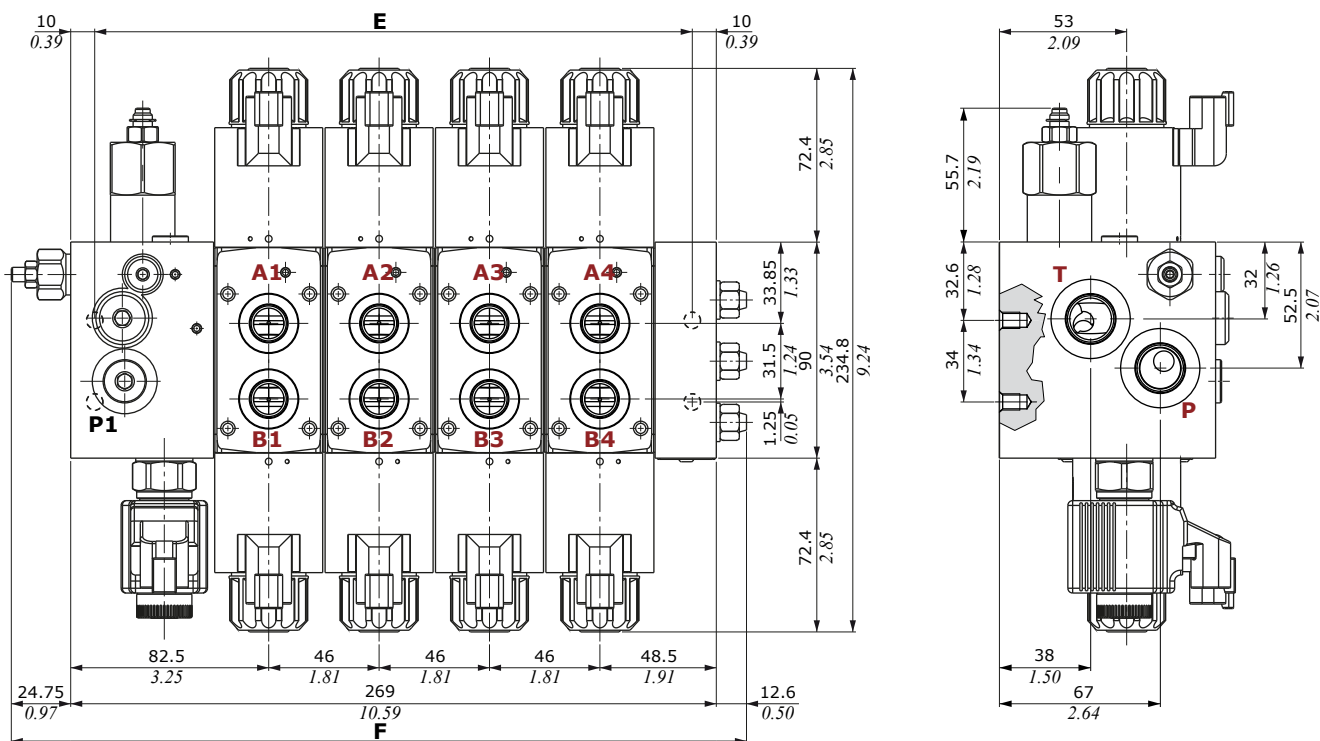
NOTE - for different conditions please contact Sales Dpt.

## Standard threads

| REFERENCE STANDARD            |           |                     |
|-------------------------------|-----------|---------------------|
|                               | BSP       | UN-UNF              |
| THREAD ACCORDING TO           | ISO 228/1 | ISO 263             |
|                               | BS 2779   | ANSI B1.1 unified   |
| CAVITY DIMENSION ACCORDING TO | ISO       | 11926               |
|                               | SAE       | J11926              |
|                               | DIN       | 3852-2 shape X or Y |

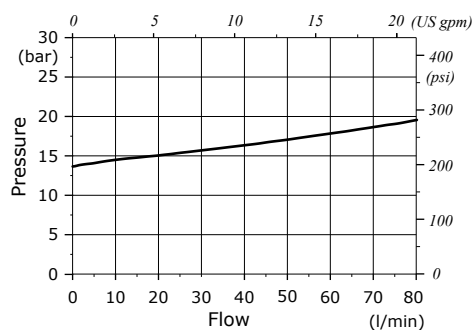
| PORT THREADING                      | BSP   | UN-UNF          |
|-------------------------------------|-------|-----------------|
| Inlet <b>P</b> and outlet <b>T</b>  | G 1/2 | 3/4-16 (SAE 8)  |
| Working ports <b>A</b> and <b>B</b> | G 3/8 | 9/16-18 (SAE 6) |
| Port <b>P1</b>                      | G 3/8 | 9/16-18 (SAE 6) |
| Port <b>LS</b>                      | G 1/4 | 7/16-20 (SAE 4) |

This drawing is referred to directional valve with 4 working sections and AN1 type inlet section.

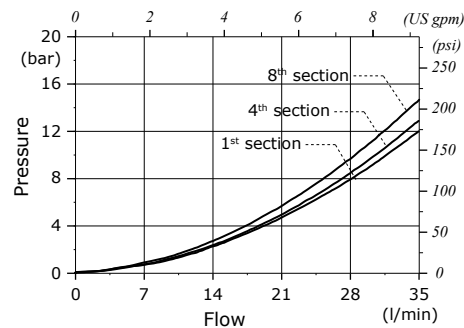


| TYPE     | AN1 type inlet section (see drawing) |       |        |       | AN2 type inlet section |       |        |       |
|----------|--------------------------------------|-------|--------|-------|------------------------|-------|--------|-------|
|          | E                                    |       | F      |       | E                      |       | F      |       |
|          | mm                                   | in    | mm     | in    | mm                     | in    | mm     | in    |
| SDX060/1 | 111                                  | 4.37  | 168.35 | 6.63  | 111                    | 4.37  | 168.35 | 6.63  |
| SDX060/2 | 157                                  | 6.18  | 214.35 | 8.44  | 157                    | 6.18  | 214.35 | 8.44  |
| SDX060/3 | 203                                  | 7.99  | 260.35 | 10.25 | 203                    | 7.99  | 260.35 | 10.25 |
| SDX060/4 | 249                                  | 9.80  | 306.35 | 12.06 | 249                    | 9.80  | 306.35 | 12.06 |
| SDX060/5 | 295                                  | 11.61 | 352.35 | 13.87 | 295                    | 11.61 | 352.35 | 13.87 |
| SDX060/6 | 341                                  | 13.42 | 398.35 | 15.68 | 341                    | 13.42 | 398.35 | 15.68 |
| SDX060/7 | 387                                  | 15.23 | 444.35 | 17.49 | 387                    | 15.23 | 444.35 | 17.49 |
| SDX060/8 | 433                                  | 17.04 | 490.35 | 19.30 | 433                    | 17.04 | 490.35 | 19.30 |

**P⇒T Pressure drop inlet compensator  
(margin pressure)**

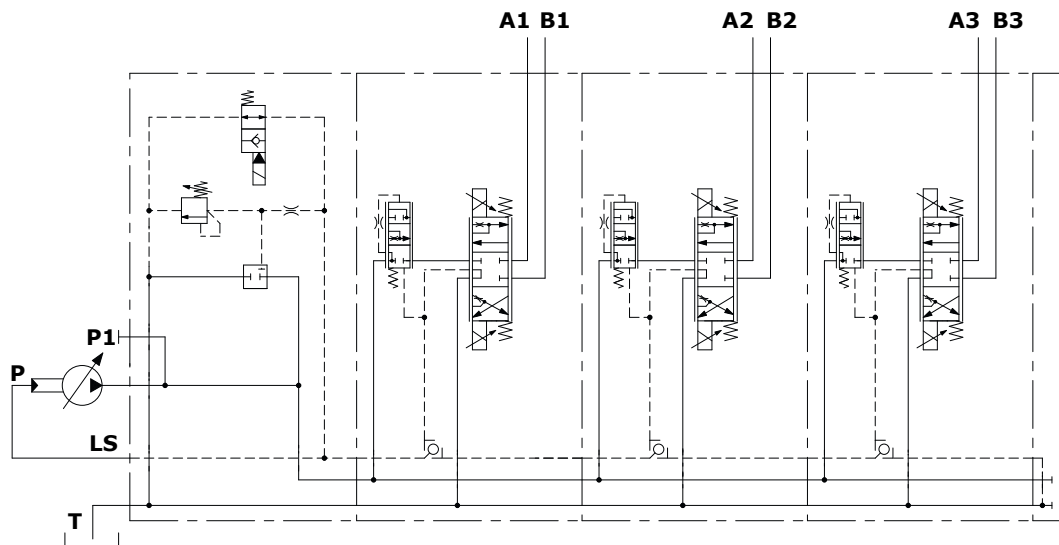


**A(B)⇒T pressure drop  
(type 1 standard spool @ max.stroke)**



## Hydraulic circuit

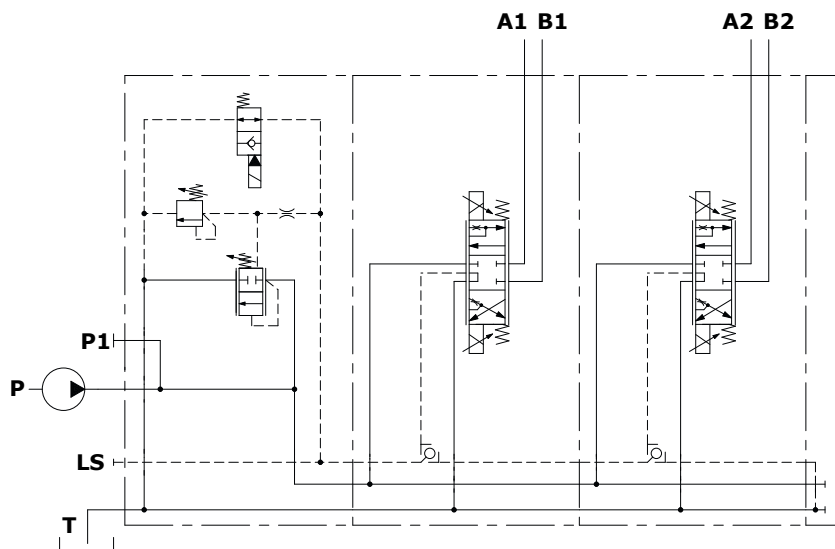
### Compensated circuit



Description example:

SDX060/3/AN2(VMP02TR-250/ELN)C-S107(35/35)-8ESZ34/C-S107(35/35)-8ESZ34/  
C-S107(35/35)-8ESZ34/RF-12VDC

### Non-compensated circuit



Description example:

SDX060/2/AN1(VMP02TR-250/ELN)/D-S105(35/35)-8ESZ34/  
D-S105(35/35)-8ESZ34/RF-12VDC

## Complete section ordering codes

SDX060/4/AN1(VMP02TS-210/ELN)/D-S105(35/35)8ESZ34/D-S105(35/35)8ESZ34.BPEN3/

Nr. of working sections

1

2

2

4

D-S105(35/35)8ESZ34/D-S105(35/35)8ESZ34.PS3(DC3-160\DC4-200)/RF-.....-12VDC-TAGRS

2

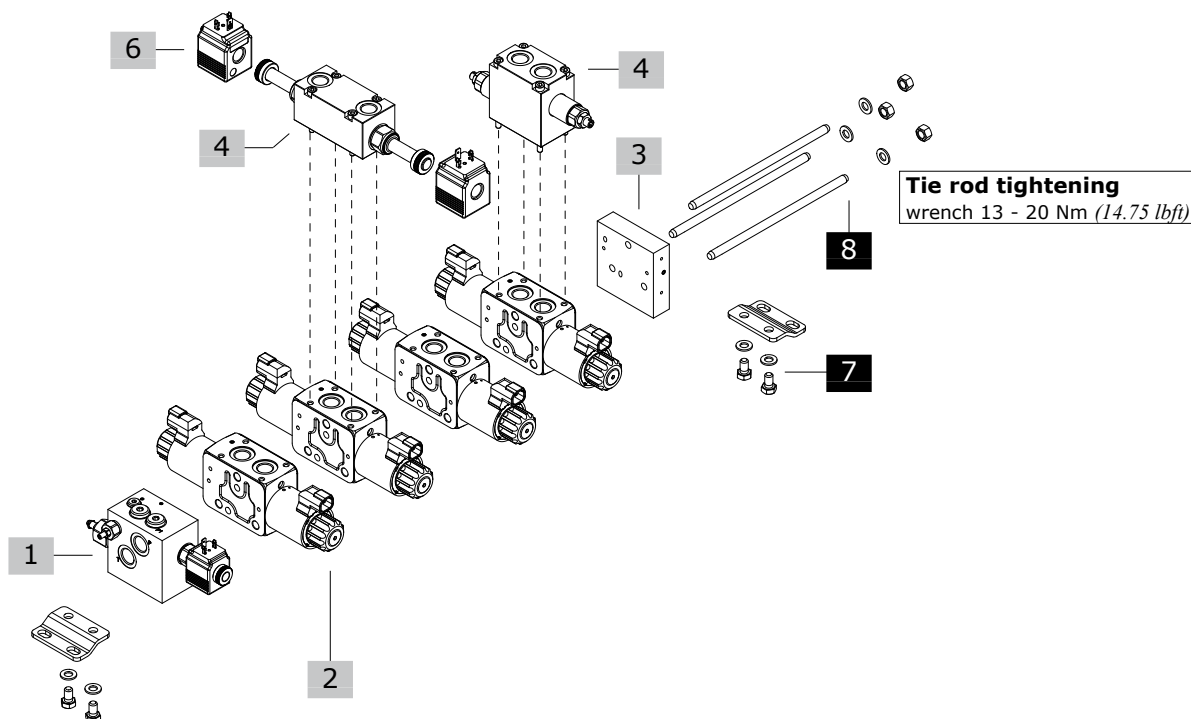
2

4

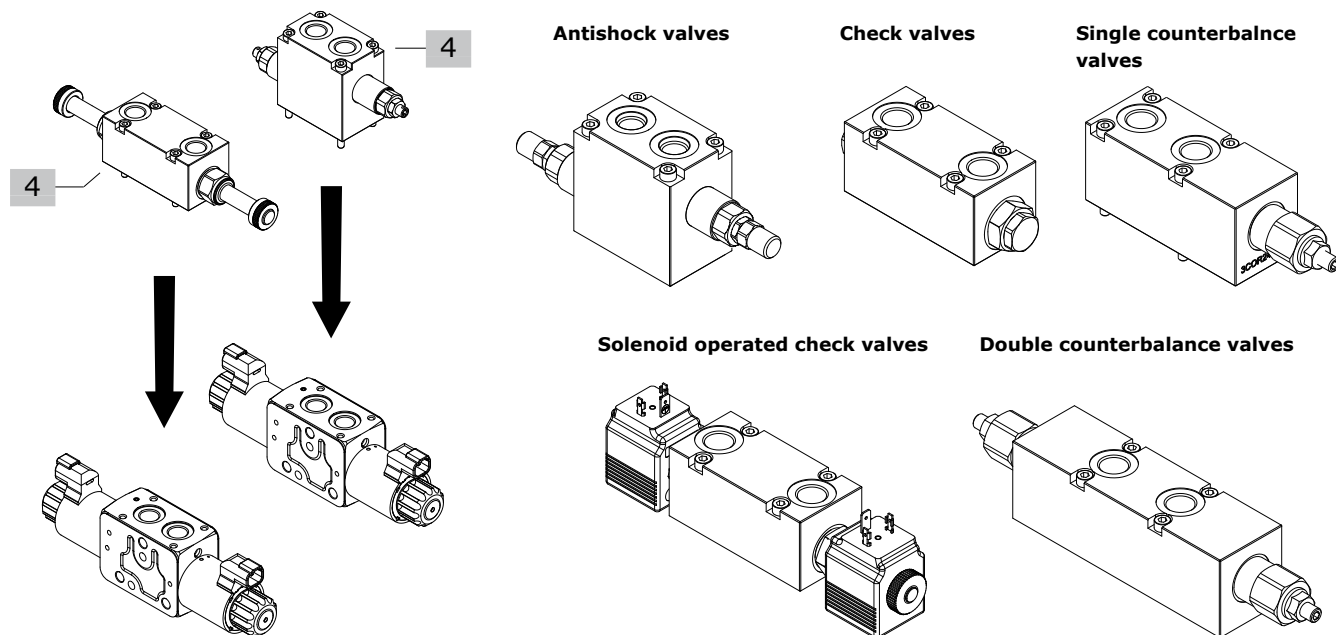
3

5

6



### Valve block examples



## Complete section ordering codes

### 1 Complete inlet section \* page 9

Section bodies are zinc-plated steel made

#### Open Center circuit

TYPE: **SDX060/AN1(VMP02TS-150\LT)**

CODE: 61X200009

DESCRIPTION: With pressure relief valve and compensator

TYPE: **SDX060/AN1(VMP02TS-150\ELN)-12VDC**

CODE: 61X200010

DESCRIPTION: With pressure relief valve, compensator and 12VDC unloading valve

#### Closed Center circuit

TYPE: **SDX060/AN2(VMP02TS-150\LT)**

CODE: 61X200011

DESCRIPTION: With pressure relief valve

TYPE: **SDX060/AN2(VMP02TS-150\ELN)-12VDC**

CODE: 61X200012

DESCRIPTION: With pressure relief valve and 12VDC unloading valve

### 2 Complete working section \* page 14

Section bodies are zinc-plated cast iron made and are arranged for flangeable valve blocks

TYPE: **SDX060/C-S1078ESZ34-12VDC-SAE**

CODE: 61X100002

DESCRIPTION: Compensated section with 12VDC direct proportional electric control, type 1 spool

TYPE: **SDX060/D-S1058ESZ34-12VDC-SAE**

CODE: 61X100004

DESCRIPTION: Non-compensated section with 12VDC direct proportional electric control, type 1 spool

### 3 Complete outlet section \* page 25

Outlet section bodies are steel made

TYPE: **SDX060/RF**

CODE: 3FIA760300

DESCRIPTION: Without ports

### 4 Complete flangeable valve block

Antishock valves .....page 20

Check valves .....page 21

Solenoid operated check valves (without coils) .....page 22

Single counterbalance valves .....page 24

Double counterbalance valves. ....page 24

### 5 Valve threading

Specify threading always when it is different from BSP standard (see page 4).

### 6 Coil page 26

Coils voltage specification; for list of available coils see pages of related section

### 7 Fixing bracket page 28

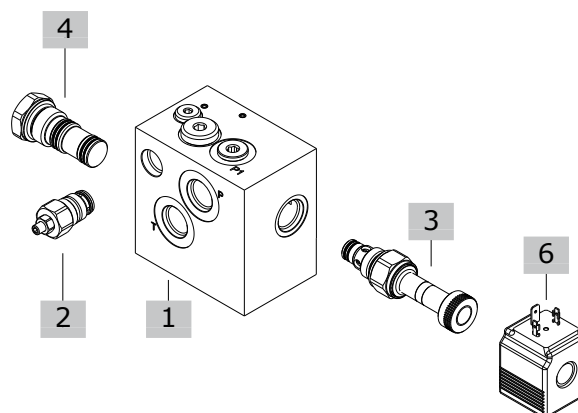
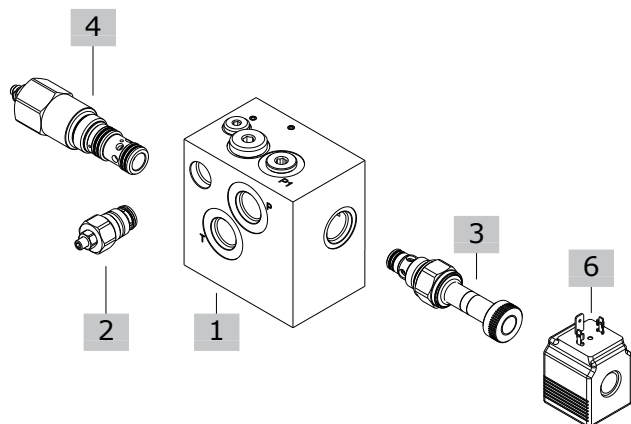
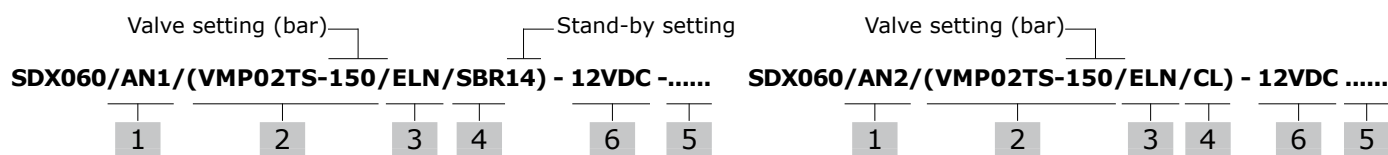
| TYPE | CODE       | DESCRIPTION                 |
|------|------------|-----------------------------|
| STAF | 5STA148065 | Brackets with fixing screws |

### 8 Assembling kit

| CODE       | DESCRIPTION          |
|------------|----------------------|
| 5TIR108099 | For 1 section valve  |
| 5TIR108144 | For 2 sections valve |
| 5TIR108191 | For 3 sections valve |
| 5TIR108236 | For 4 sections valve |
| 5TIR108282 | For 5 sections valve |
| 5TIR108329 | For 6 sections valve |
| 5TIR108375 | For 7 sections valve |
| 5TIR108420 | For 8 sections valve |

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

## Inlet section; part ordering codes

**1 Inlet section body kit \*** page 10

Section bodies are zinc-plated steel made

| TYPE       | CODE       | DESCRIPTION                                            |
|------------|------------|--------------------------------------------------------|
| <b>AN1</b> | 5FIA160700 | Section body kit for open circuit with compensator     |
| <b>AN2</b> | 5FIA160701 | Section body kit for close circuit without compensator |

**2 L.S. pressure relief valve** page 12

| TYPE | CODE | DESCRIPTION |
|------|------|-------------|
|------|------|-------------|

**For sections AN1-AN2 type**

Valve standard setting is referred to 10 l/min (2.6 US gpm) flow, considering the valve mounted on inlet section.

|                      |            |                                                                     |
|----------------------|------------|---------------------------------------------------------------------|
| <b>(VMP02TV-50)</b>  | 1100000100 | Range 5-80 bar (75-1160 psi)<br>std setting 50 bar (725 psi)        |
| <b>(VMP02TS-150)</b> | 1100000101 | Range 50-220 bar (725-3200 psi)<br>std setting 150 bar (2200 psi)   |
| <b>(VMP02TR-250)</b> | 1100000102 | Range 180-350 bar (2600-5100 psi)<br>std setting 250 bar (3600 psi) |

**3 Solenoid operated unloading valve** page 13

| TYPE                             | CODE        | DESCRIPTION                           |
|----------------------------------|-------------|---------------------------------------|
| <b>For sections AN1-AN2 type</b> |             |                                       |
| <b>ELN</b>                       | 0EF08002000 | Without emergency actuation           |
| <b>ELP</b>                       | 0EF08002002 | With push-button emergency actuation  |
| <b>ELV</b>                       | 0EF08002003 | With screw type emergency actuation   |
| <b>ELT</b>                       | 0EF08002004 | With "twist&push" emergency actuation |
| <b>LT</b>                        | XTAP510320  | Unloading valve blanking plug         |

**4 Compensator kit**

| TYPE                        | CODE         | DESCRIPTION                                                                                                                        |
|-----------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>For section AN1 type</b> |              |                                                                                                                                    |
| <b>SBR14</b>                | 0LA10Q002002 | Compensator with adjustable stand-by; from 8-15 bar (120-220 psi) (standard setting 14 bar with 5 l/min - 205 psi with 1.3 US gpm) |
| <b>For section AN2 type</b> |              |                                                                                                                                    |
| <b>CL</b>                   | XTAP327573   | Compensator blanking plug, for Closed Center circuit                                                                               |

**5 Section threading**

Specify threading always when it is different from BSP standard (see page 4).

**6 Coil** page 26

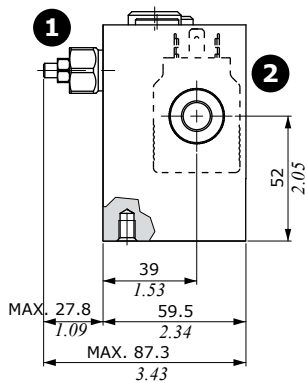
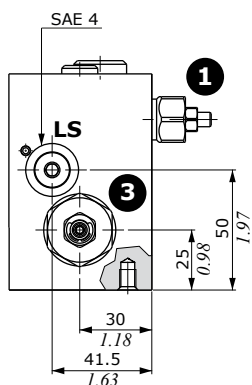
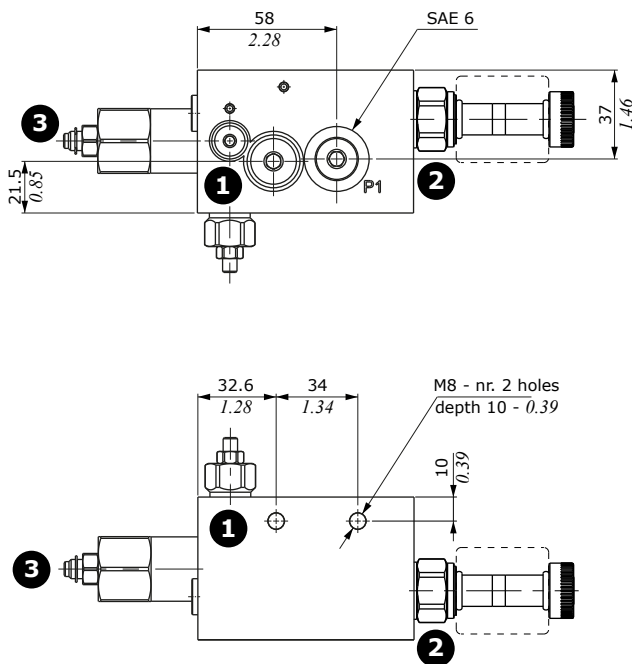
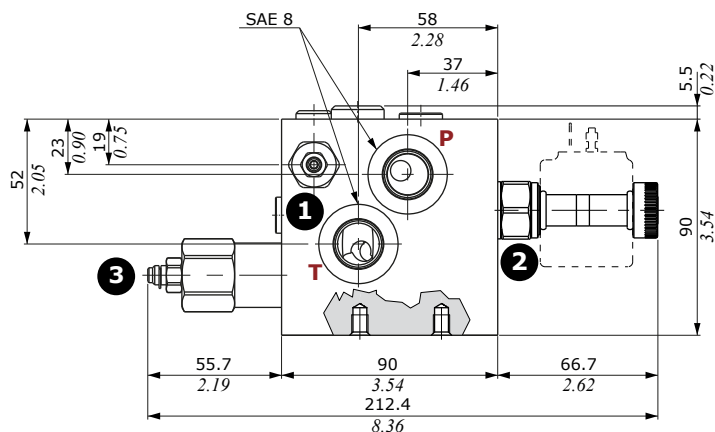
For list of available coils see pages of related section

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

## Inlet section; part ordering codes

### AN1 inlet section

#### AN1 type Open Center

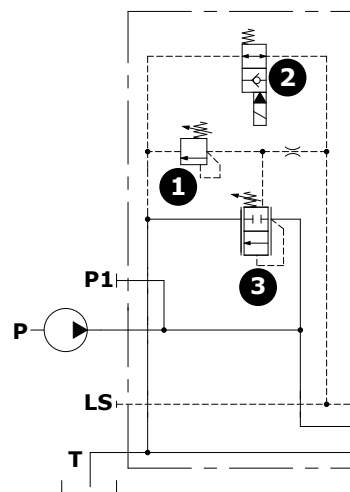


#### Legenda

- 1: Pressure relief valve
- 2: Solenoid operated unloading valve
- 3: Compensator

#### Wrenches and tightening torque

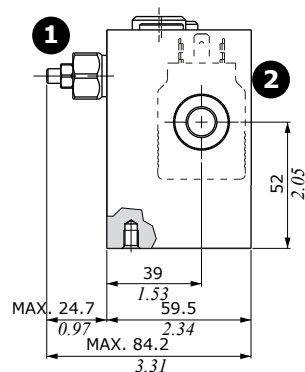
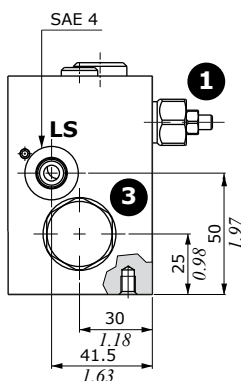
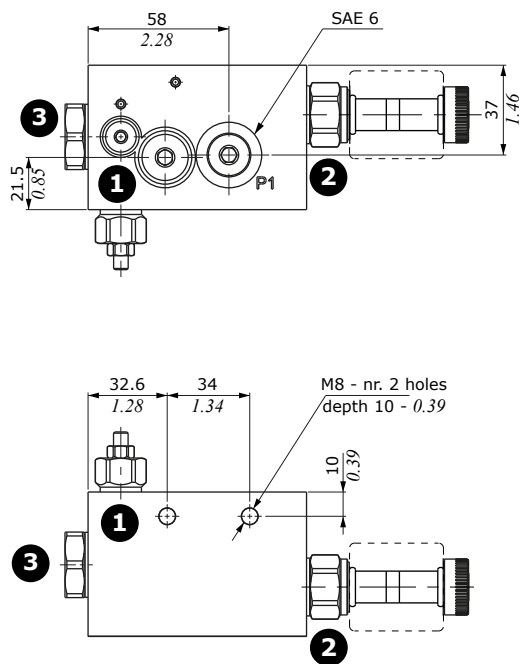
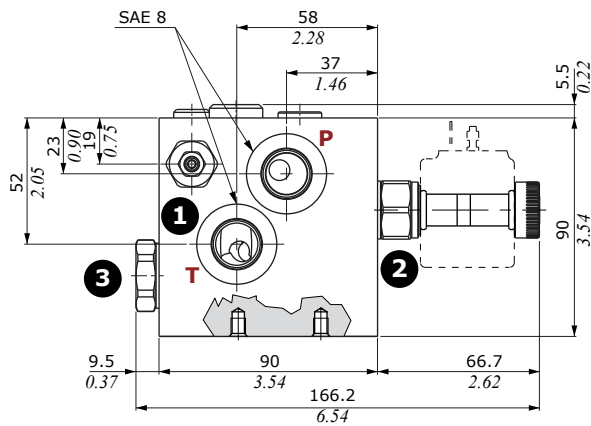
NOTE: for valve wrench and torque see pages 12 and 13



## Inlet section; part ordering codes

## AN2 inlet section

## AN2 type Closed Center

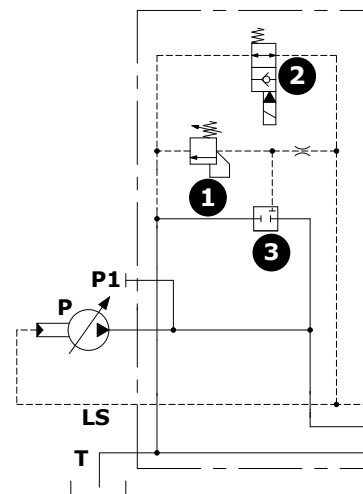


## Legenda

- 1: Pressure relief valve
- 2: Solenoid operated unloading valve
- 3: Compensator blanking plug

## Wrenches and tightening torque

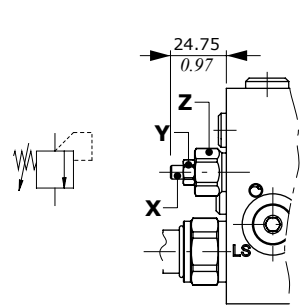
NOTE: for valve wrench and torque see pages 12 and 13



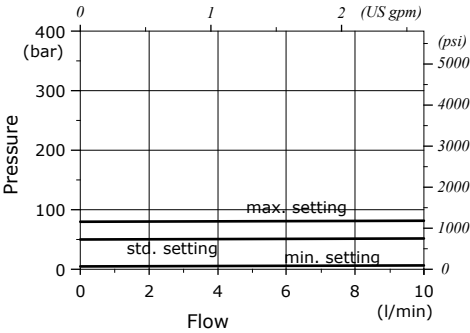
Inlet section: options

L.S. pressure relief valve

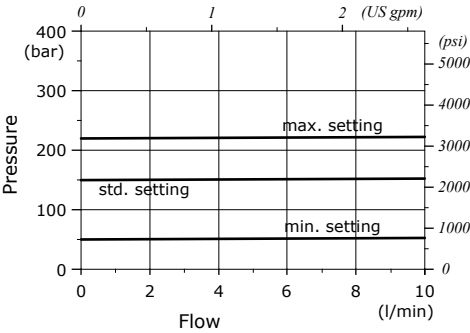
For sections AN1 - AN2 type



Setting range: VMP02TV type



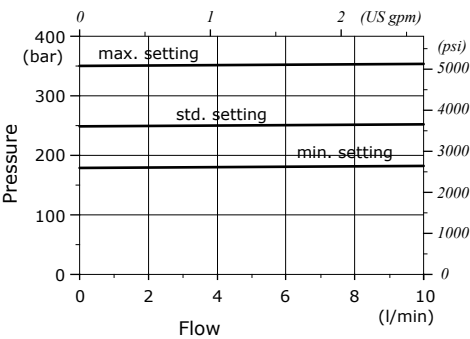
Setting range: VMP02TS type



Wrenches and tightening torque

- Y = wrench 10 - 6.6 Nm (4.9 lbf ft)
- Z = wrench 19 - 24 Nm (17.7 lbf ft)
- X = wrench 3

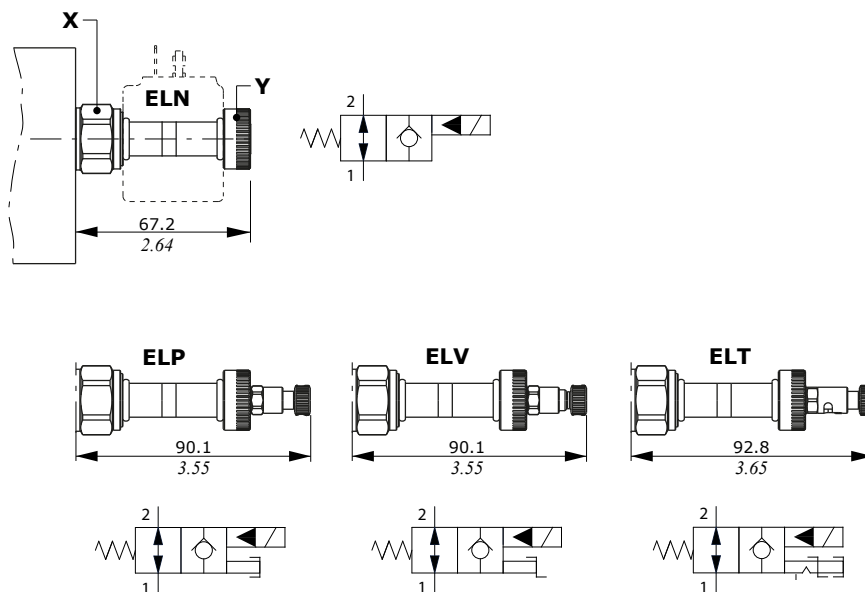
Setting range: VMP02TR type



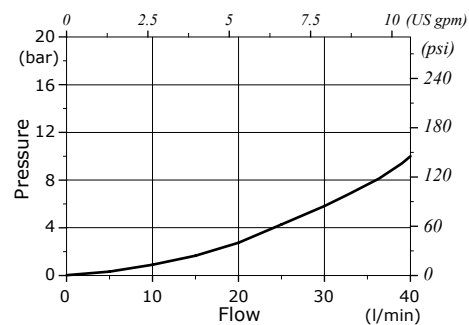
## Unloading valve

For sections AN1 - AN2 type

### Emergency actuation types



Pressure drop diagram



### Legenda

- ELN:** without emergency actuation
- ELP:** push-button type emergency actuation
- ELV:** screw type emergency actuation
- ELT:** "push&twist" type emergency actuation

### Wrenches and tightening torque

X = wrench 24 - 30 Nm (22 lbf ft)

Y = 5 Nm (3.7 lbf ft)

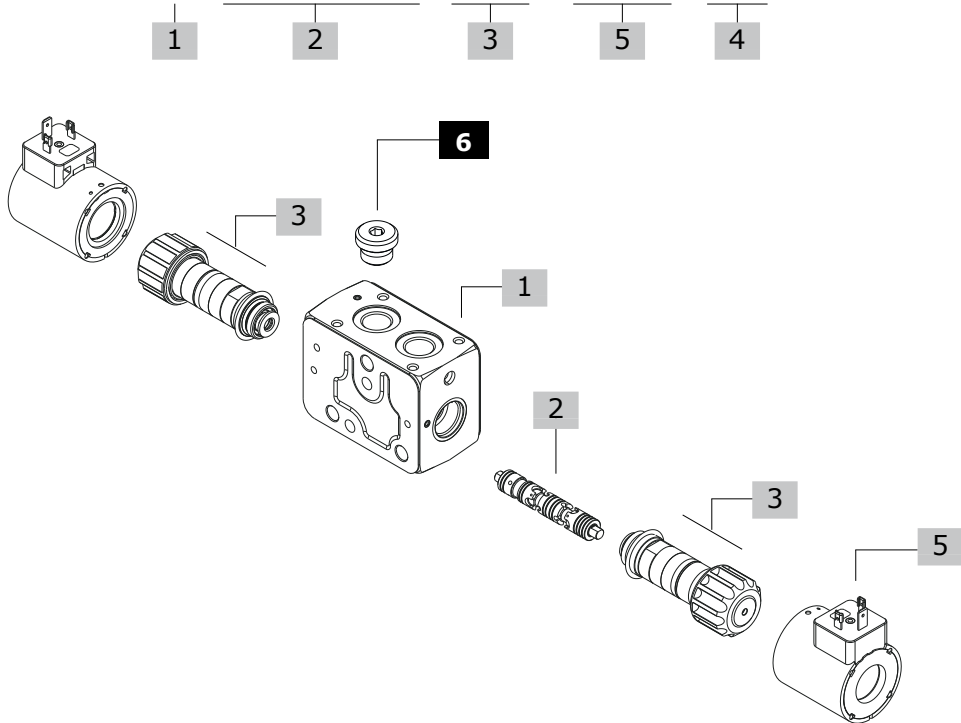
### Valve features

- Max. flow . . . . .: 40 l/min (10.5 US gpm)
- Max. pressure . . . . .: 380 bar (5510 psi)
- Internal leakage . . . . .: 0,25 cm<sup>3</sup>/min @ 210 bar  
(0.015 in<sup>3</sup>/min @ 3050 psi)

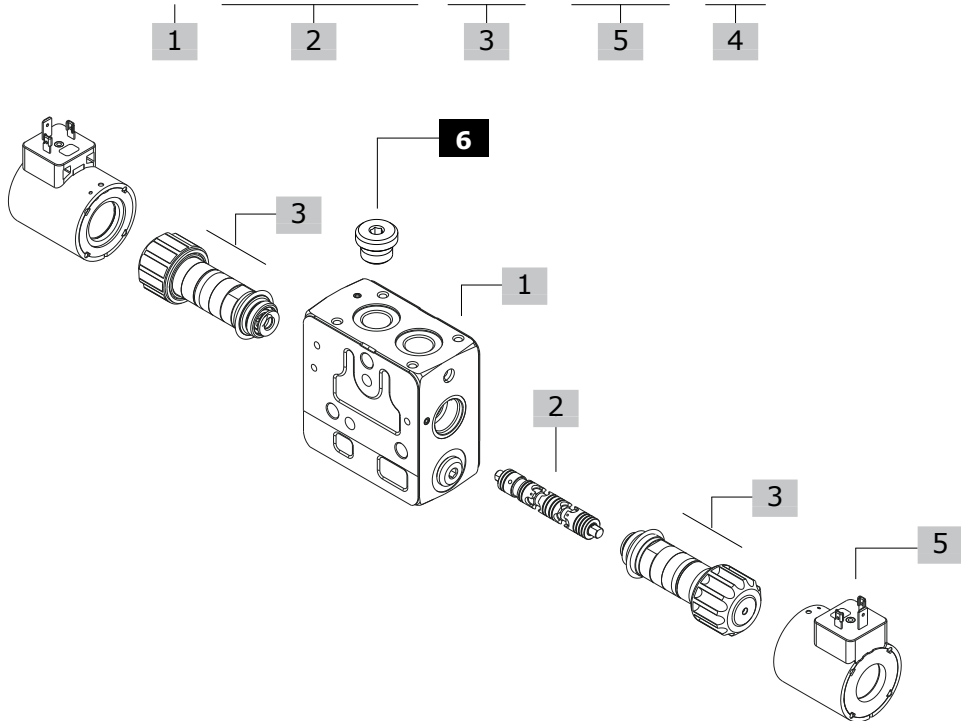
For coil features and options see **BER** coil on page 26 and 27

**Working section: part ordering codes** \_\_\_\_\_

**SDX060 / D - S105(25/25) 8ESZ3 - 12VDC - .....**



**SDX060 / C - S107(35/35) 8ESZ3 - 12VDC - .....**



## Working section: part ordering codes

**1 Working section body kit \* page 16****Section bodies are cast iron made**

| TYPE     | CODE       | DESCRIPTION     |
|----------|------------|-----------------|
| <b>D</b> | 5EL1027001 | Non-compensated |
| <b>C</b> | 5EL1027000 | Compensated     |

**3 Direct solenoid control page 18****For single acting plug the port not used**

| TYPE | CODE | DESCRIPTION |
|------|------|-------------|
|------|------|-------------|

**Proportional control**

|                  |           |                                                        |
|------------------|-----------|--------------------------------------------------------|
| <b>8ESZ1</b>     | 5CAN08128 | Single acting on port A                                |
| <b>8ESZ2</b>     | 5CAN08128 | Single acting on port B                                |
| <b>8ESZ3</b>     | 5CAN08129 | Double acting                                          |
| <b>8ESZ1LHD*</b> | 5CAN08130 | Single acting on port A with emergency lever operation |
| <b>8ESZ2LHD*</b> | 5CAN08130 | Single acting on port B with emergency lever operation |
| <b>8ESZ3LHD*</b> | 5CAN08131 | Double acting with emergency lever operation           |

**On/off control**

|                 |           |                                                        |
|-----------------|-----------|--------------------------------------------------------|
| <b>8ES1</b>     | 5CAN08134 | Single acting on port A                                |
| <b>8ES2</b>     | 5CAN08134 | Single acting on port B                                |
| <b>8ES3</b>     | 5CAN08135 | Double acting                                          |
| <b>8ES1LHD*</b> | 5CAN08132 | Single acting on port A with emergency lever operation |
| <b>8ES2LHD*</b> | 5CAN08132 | Single acting on port B with emergency lever operation |
| <b>8ES3LHD*</b> | 5CAN08133 | Double acting with emergency lever operation           |

\* Special spools required

**6 Plug for single actuation**

| CODE        | DESCRIPTION     |
|-------------|-----------------|
| 3XTAP817130 | 9/16-18 (SAE 6) |

**4 Section threading**

Specify threading always when it is different from BSP standard (see page 4)

**5 Coils page 26**

For list of available coils see pages of related sections

**2 Spool page 17**

Flow is referred to 9 bar (130 psi) stand-by (margin pressure)

**Spools for control without lever**

| TYPE                                                     | CODE        | DESCRIPTION                |
|----------------------------------------------------------|-------------|----------------------------|
| <b>Double acting, A and B closed in neutral position</b> |             |                            |
| <b>S101</b>                                              | XCU9X810001 | 5 l/min (1.3 US gpm) flow  |
| <b>S102</b>                                              | XCU9X810002 | 10 l/min (2.6 US gpm) flow |
| <b>S103</b>                                              | XCU9X810003 | 15 l/min (4 US gpm) flow   |
| <b>S104</b>                                              | XCU9X810004 | 20 l/min (5.3 US gpm) flow |
| <b>S105</b>                                              | XCU9X810005 | 25 l/min (6.6 US gpm) flow |
| <b>S106</b>                                              | XCU9X810006 | 30 l/min (7.9 US gpm) flow |
| <b>S107</b>                                              | XCU9X810007 | 35 l/min (9.2 US gpm) flow |

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

|             |             |                            |
|-------------|-------------|----------------------------|
| <b>S201</b> | XCU9X820001 | 5 l/min (1.3 US gpm) flow  |
| <b>S202</b> | XCU9X820002 | 10 l/min (2.6 US gpm) flow |
| <b>S203</b> | XCU9X820003 | 15 l/min (4 US gpm) flow   |
| <b>S204</b> | XCU9X820004 | 20 l/min (5.3 US gpm) flow |
| <b>S205</b> | XCU9X820005 | 25 l/min (6.6 US gpm) flow |
| <b>S206</b> | XCU9X820006 | 30 l/min (7.9 US gpm) flow |
| <b>S207</b> | XCU9X820007 | 35 l/min (9.2 US gpm) flow |

**Double acting, A and B partially to tank in neutral pos.**

|              |             |                            |
|--------------|-------------|----------------------------|
| <b>S2H01</b> | XCU9X825001 | 5 l/min (1.3 US gpm) flow  |
| <b>S2H02</b> | XCU9X825002 | 10 l/min (2.6 US gpm) flow |
| <b>S2H03</b> | XCU9X825003 | 15 l/min (4 US gpm) flow   |
| <b>S2H04</b> | XCU9X825004 | 20 l/min (5.3 US gpm) flow |
| <b>S2H05</b> | XCU9X825005 | 25 l/min (6.6 US gpm) flow |
| <b>S2H06</b> | XCU9X825006 | 30 l/min (7.9 US gpm) flow |
| <b>S2H07</b> | XCU9X825007 | 35 l/min (9.2 US gpm) flow |

**Spools for control with lever**

| TYPE                                                     | CODE        | DESCRIPTION                |
|----------------------------------------------------------|-------------|----------------------------|
| <b>Double acting, A and B closed in neutral position</b> |             |                            |
| <b>S101</b>                                              | 3CU9X810001 | 5 l/min (1.3 US gpm) flow  |
| <b>S102</b>                                              | 3CU9X810002 | 10 l/min (2.6 US gpm) flow |
| <b>S103</b>                                              | 3CU9X810003 | 15 l/min (4 US gpm) flow   |
| <b>S104</b>                                              | 3CU9X810004 | 20 l/min (5.3 US gpm) flow |
| <b>S105</b>                                              | 3CU9X810005 | 25 l/min (6.6 US gpm) flow |
| <b>S106</b>                                              | 3CU9X810006 | 30 l/min (7.9 US gpm) flow |
| <b>S107</b>                                              | 3CU9X810007 | 35 l/min (9.2 US gpm) flow |

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

|             |             |                            |
|-------------|-------------|----------------------------|
| <b>S201</b> | 3CU9X820001 | 5 l/min (1.3 US gpm) flow  |
| <b>S202</b> | 3CU9X820002 | 10 l/min (2.6 US gpm) flow |
| <b>S203</b> | 3CU9X820003 | 15 l/min (4 US gpm) flow   |
| <b>S204</b> | 3CU9X820004 | 20 l/min (5.3 US gpm) flow |
| <b>S205</b> | 3CU9X820005 | 25 l/min (6.6 US gpm) flow |
| <b>S206</b> | 3CU9X820006 | 30 l/min (7.9 US gpm) flow |
| <b>S207</b> | 3CU9X820007 | 35 l/min (9.2 US gpm) flow |

**Double acting, A and B partially to tank in neutral pos.**

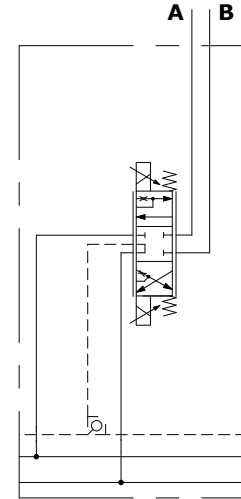
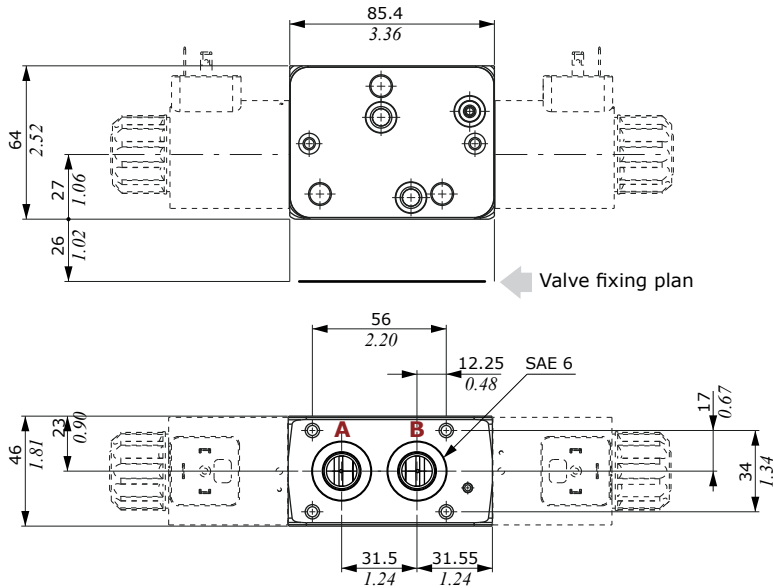
|              |             |                            |
|--------------|-------------|----------------------------|
| <b>S2H01</b> | 3CU9X825001 | 5 l/min (1.3 US gpm) flow  |
| <b>S2H02</b> | 3CU9X825002 | 10 l/min (2.6 US gpm) flow |
| <b>S2H03</b> | 3CU9X825003 | 15 l/min (4 US gpm) flow   |
| <b>S2H04</b> | 3CU9X825004 | 20 l/min (5.3 US gpm) flow |
| <b>S2H05</b> | 3CU9X825005 | 25 l/min (6.6 US gpm) flow |
| <b>S2H06</b> | 3CU9X825006 | 30 l/min (7.9 US gpm) flow |
| <b>S2H07</b> | 3CU9X825007 | 35 l/min (9.2 US gpm) flow |

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

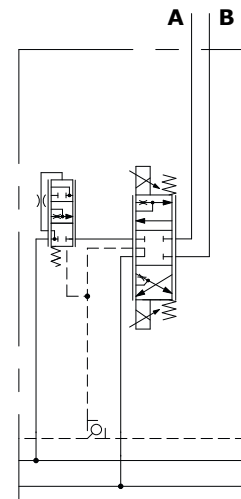
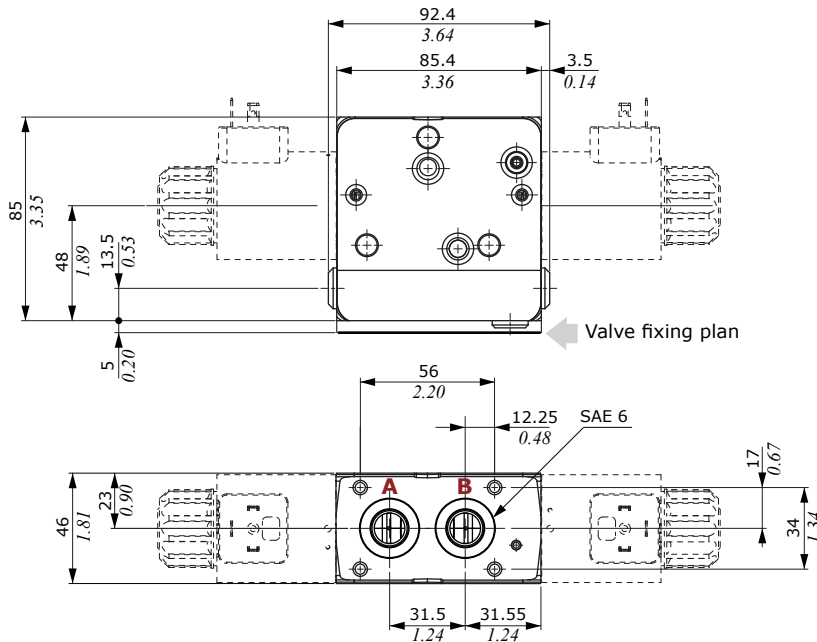
## Working section

### Dimensions and hydraulic circuit

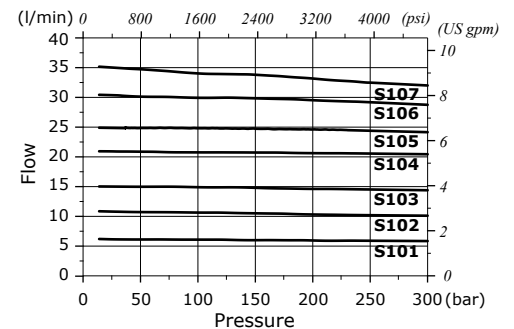
#### D type working section



#### C type working section



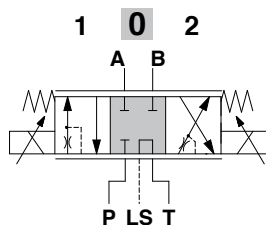
**Compensation curves**  
(compensated section)



## Spools

**Type 1 (S107)**

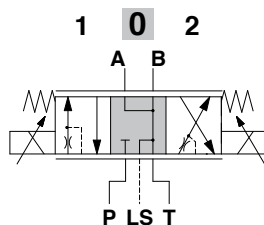
Double acting, A and B closed  
in neutral position

**Stroke**

position 1: + 3 mm (+0.12 in)  
position 2: - 3 mm (-0.12 in)

**Type 2 (S207)**

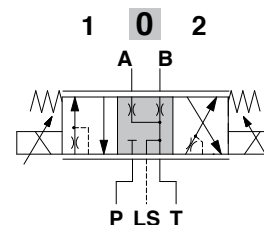
Double acting, A and B to tank  
in neutral position

**Stroke**

position 1: + 3 mm (+0.12 in)  
position 2: - 3 mm (-0.12 in)

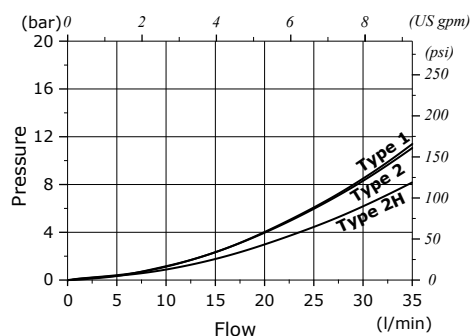
**Type 2H (S2H07)**

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

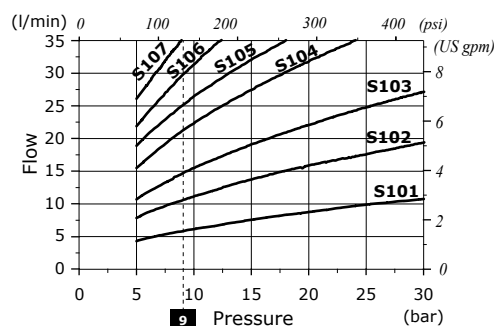
**Stroke**

position 1: + 3 mm (+0.12 in)  
position 2: - 3 mm (-0.12 in)

**ut→T pressure drop**  
(compensated section)



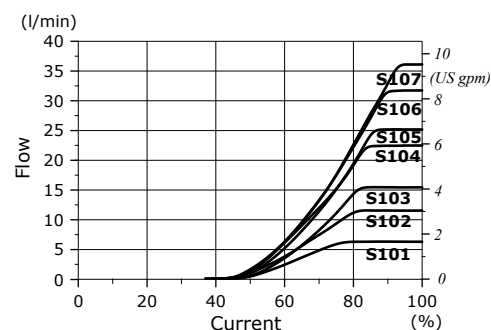
**Non-compensated working section**  
**Spool flow vs. Stand-by pressure**  
(margin pressure)



**Spool nominal flow @ 9 bar (130 psi)**  
**stand-by (margin pressure)**

S101 = 5 l/min (1.3 US gpm)  
S102 = 10 l/min (2.6 US gpm)  
S103 = 15 l/min (4 US gpm)  
S104 = 20 l/min (5.3 US gpm)  
S105 = 25 l/min (6.6 US gpm)  
S106 = 30 l/min (7.9 US gpm)  
S107 = 35 l/min (9.2 US gpm)

**Spool metering curves**  
(compensated section)

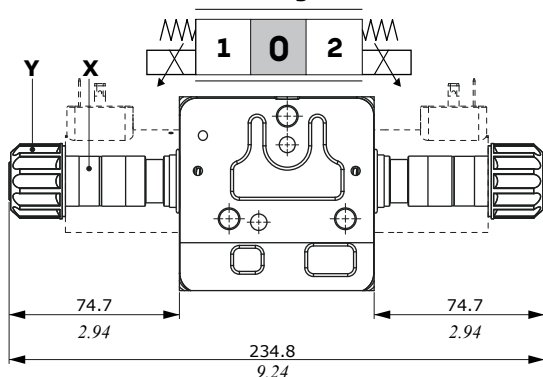


## Working section

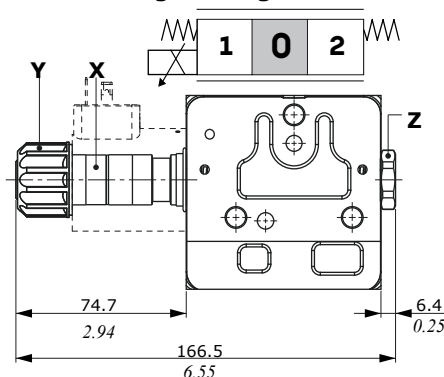
### Proportional solenoid control: 8ESZ1 - 8ESZ2 - 8ESZ3 types

When the section is configured with flangeable valve block, the coils on control must be rotated 180°.

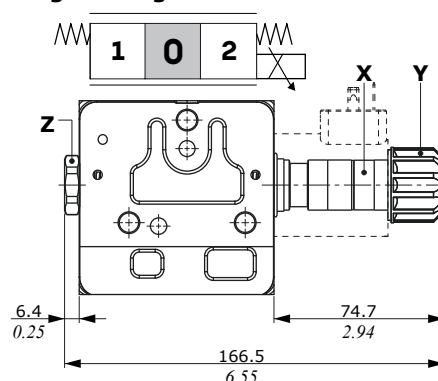
**8ESZ3: double acting control kit**



**8ESZ1: single acting on A control kit**



**8ESZ2: single acting on B control kit**



#### Wrenches and tightening torque

X = wrench 19 - 24 Nm (17.7 lbf ft)

Y = 5 Nm (3.69 lbf ft)

Z = wrench 24 - 24 Nm (17.7 lbf ft)

For coil options and features see

**45** coil on pages 26 and 27.

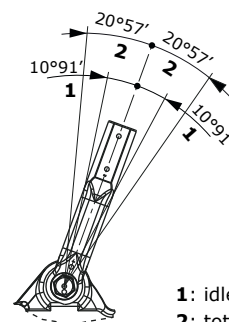
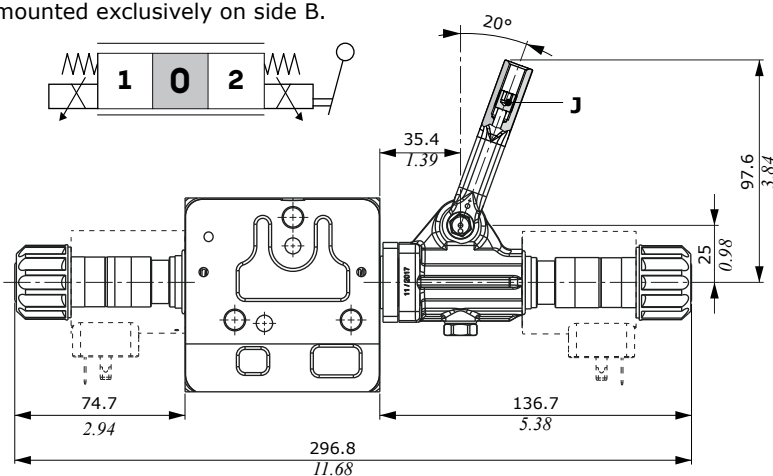
### Proportional electric control with lever : 8ESZ3LHD type

When the section is configured with flangeable valve block, the control (with coil) must be rotated 180°.

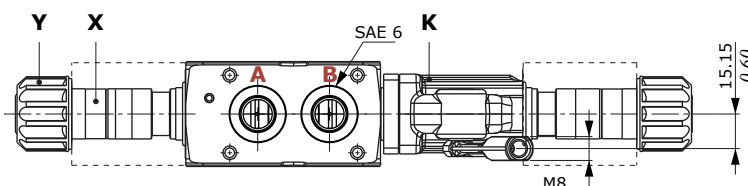
The control needs dedicated spools: see page 15 for list.

IMPORTANT: lever to be used only for emergency operation, not for continuative use.

**Note:** lever mounted exclusively on side B.



1: idle stroke angles  
2: total operation angles



#### Wrenches and tightening torque

J = wrench 4 - 9.8 Nm (7.2 lbf ft)

K = wrench 3 - 5 Nm (3.7 lbf ft)

X = wrench 19 - 24 Nm (17.7 lbf ft)

Y = 5 Nm (3.7 lbf ft)

#### Control features

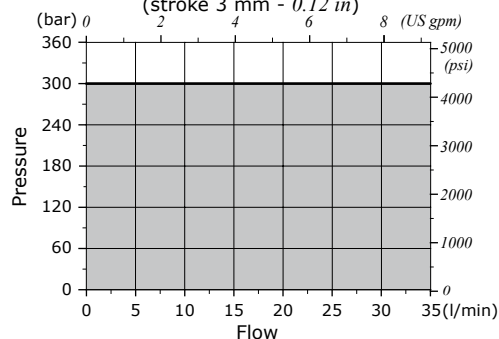
Max. back pressure on T . . : 30 bar (435 psi)

For coil options and features see **45** coil on pages 26 and 27.

When the section is configured with flangeable valve block, the coils on control must be rotated 180°.

### Operating condition

(stroke 3 mm - 0.12 in)



For coil options and features see **D15** coil on pages 26 and 27.

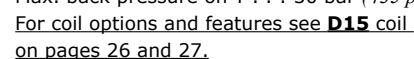
Technical drawing of the 1000 Series Base Unit. The drawing includes a front view and a side view. The front view shows a rectangular unit with a central display area and two large rectangular buttons below it. The side view shows the unit's profile with a connector on the left and a mounting bracket on the right. Dimensions are provided in millimeters (mm) and inches (in). The overall width is 169 mm (6.65 in). The height is 77.2 mm (3.04 in). The depth is 6.4 mm (0.25 in). The drawing also includes a top view showing the unit's layout with labels 1, 0, and 2.

Technical drawing of the front view of the 1000 Series Base Unit. The drawing shows a rectangular base unit with a central cutout and four mounting holes. Dimensions are provided in inches and millimeters. A coordinate system with X, Y, and Z axes is shown. A detail view of the mounting hole is also included.

Dimensions:

- Overall width: 16.9 inches (429 mm)
- Overall height: 6.4 inches (163 mm)
- Distance from left edge to center of mounting hole: 0.25 inches (6.4 mm)
- Distance from right edge to center of mounting hole: 3.04 inches (77.2 mm)

**Note:** lever mounted exclusively on side B.

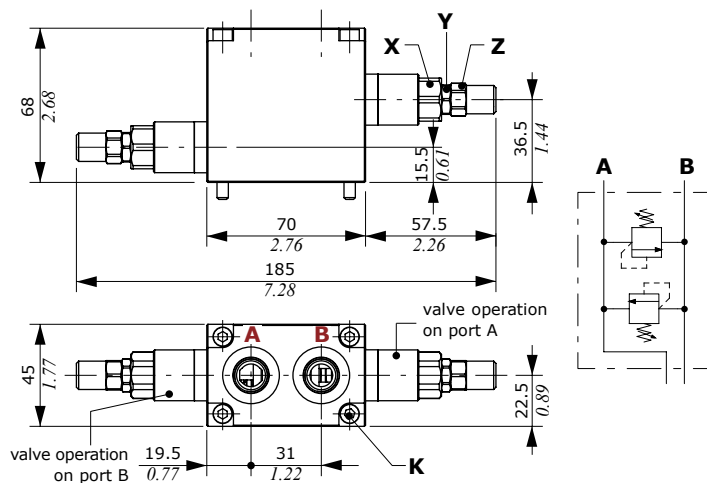


## Flangeable valve blocks

### Antishock valves with cross operation

Solenoid controls (with or without lever operation) must be rotated 180°.

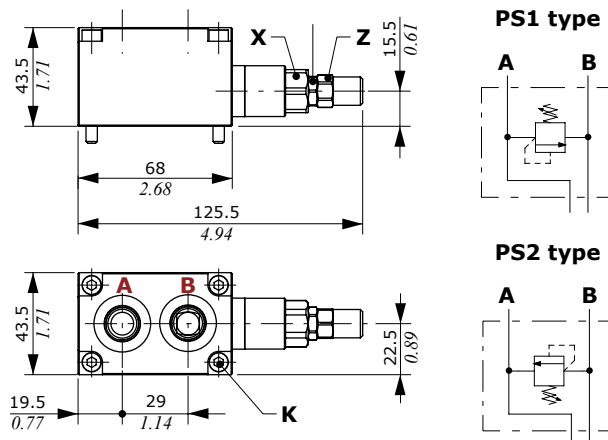
#### PS3 type: valves on both ports



NOTE: for valve block assembly direction refer to ports name

#### PS1 or PS2 types: valve on single port

(PS1 type is drawn: PS2 type has the valve mounted on the opposite side and the same dimensions)



#### Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbf)  
X = wrench 19 - 42 Nm (31 lbf)  
Y = wrench 13 - 24 Nm (17.7 lbf)  
Z = wrench 13 - 6.6 Nm (4.9 lbf)

### Ordering codes

| TYPE                             | CODE      | DESCRIPTION                                               |
|----------------------------------|-----------|-----------------------------------------------------------|
| <b>Complete antishock valves</b> |           |                                                           |
| <b>PS1(DC3-160)</b>              | 619001000 | Valve with operation on port A setting 160 bar (2320 psi) |
| <b>PS2(DC3-160)</b>              | 619001000 | Valve with operation on port B setting 160 bar (2320 psi) |
| <b>PS3(DC3-160\DC4-200)</b>      | 619001103 | Valves with operation on port A (160) and B (200)         |

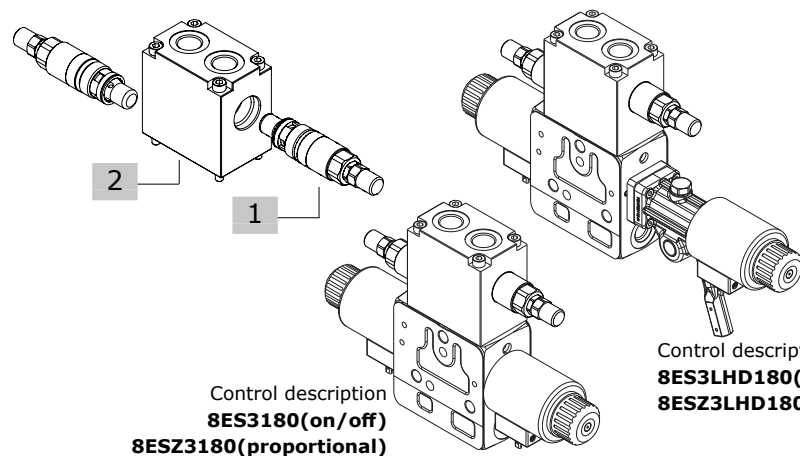
#### Part #1: Valve kit

Valve standard setting is referred to 5 l/min (1.3 US gpm) flow, considering the valve mounted on block.

|                  |            |                                                                     |
|------------------|------------|---------------------------------------------------------------------|
| <b>(DC2-60)</b>  | 1100520460 | Range 20-80 bar (290-1150 psi)<br>std setting 60 bar (870 psi)      |
| <b>(DC3-160)</b> | 1100520408 | Range 50-220 bar (725-3200 psi)<br>std setting 160 bar (2300 psi)   |
| <b>(DC4-280)</b> | 1100520414 | Range 180-350 bar (2600-5100 psi)<br>std setting 280 bar (4050 psi) |
| <b>PST</b>       | XTAP623282 | Valve blanking plug                                                 |

#### Part #2: Block body kit

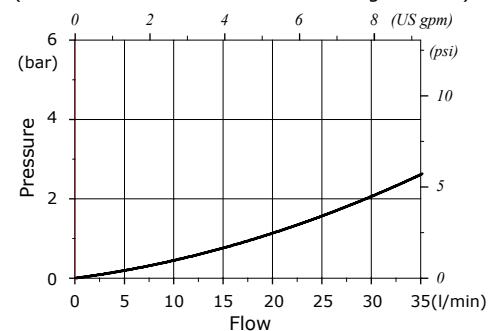
|                |            |                                 |
|----------------|------------|---------------------------------|
| <b>PS1-PS2</b> | 5COR245682 | For single valve on port A or B |
| <b>PS3</b>     | 5COR245680 | For valves on port A and B      |



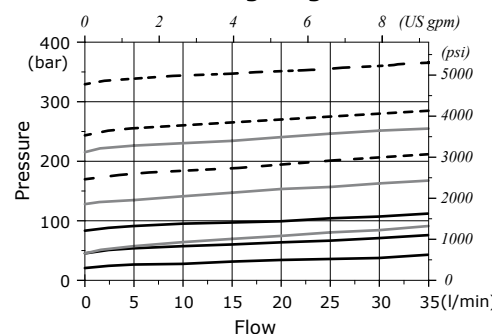
#### Antishock valve pressure drops

P→port - port→T

(curves are matched - without working sections)



#### Setting range



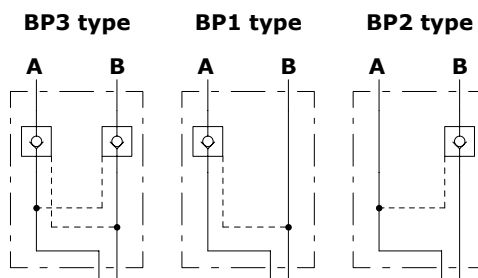
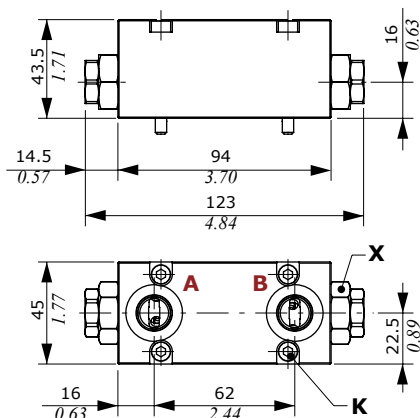
Control description  
8ES3180(on/off)  
8ESZ3180(proportional)

— Valve type DC2  
— Valve type DC3  
--- Valve type DC4

## Flangeable valve blocks

## Check valves

Solenoid controls (with or without lever operation) must be rotated 180°.



## Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbf·ft)

X = wrench 29 - 42 Nm (31 lbf·ft)

## Ordering codes

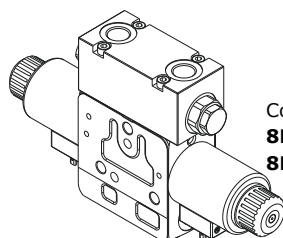
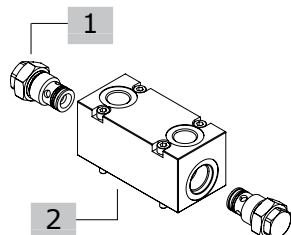
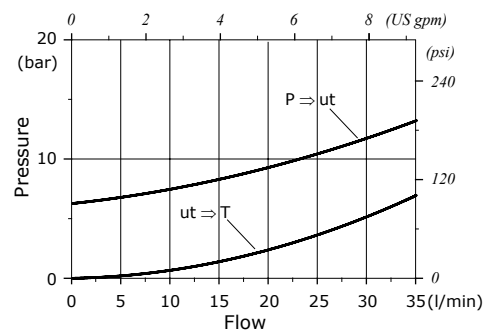
| TYPE                        | CODE      | DESCRIPTION             |
|-----------------------------|-----------|-------------------------|
| <b>Complete valve block</b> |           |                         |
| BP1-SAE                     | 619002001 | Valve on port A         |
| BP2-SAE                     | 619002001 | Valve on port B         |
| BP3-SAE                     | 619002101 | Valves on ports A and B |

**Part #1: Valve kit**

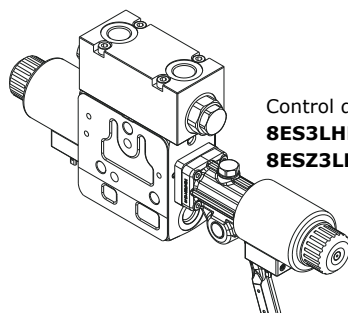
|     |            |                     |
|-----|------------|---------------------|
| BP  | 1300020402 | Check valve         |
| TBP | XTAP627260 | Valve blanking plug |

**Part #2: Body kit and piston**

|            |                |
|------------|----------------|
| 5COR245891 | Block body kit |
| 3PIS214480 | Piston         |

Check valve pressure drop  
(without working sections)

Control description  
8ES3180(on/off)  
8ESZ3180(proportional)



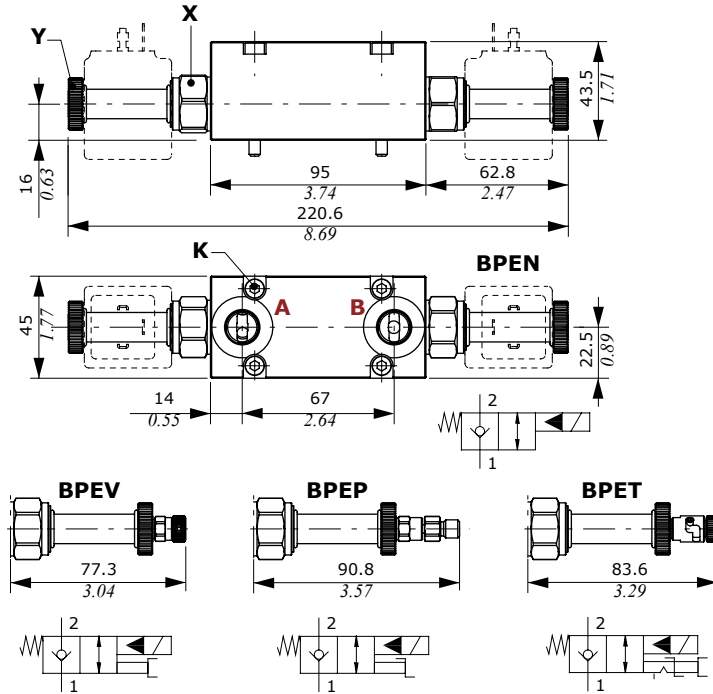
Control description  
8ES3LHD180(on/off)  
8ESZ3LHD180(proportional)

## Flangeable valve blocks

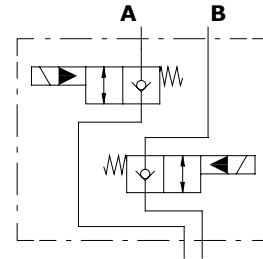
### Solenoid operated check valves

Solenoid controls (with or without lever operation) must be rotated 180°.

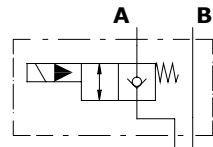
#### BPE(NC) type: normally closed circuit



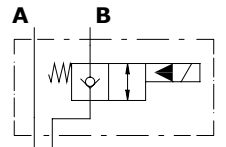
#### BPEN3(NC) type



#### BPEN1(NC) type



#### BPEN2(NC) type



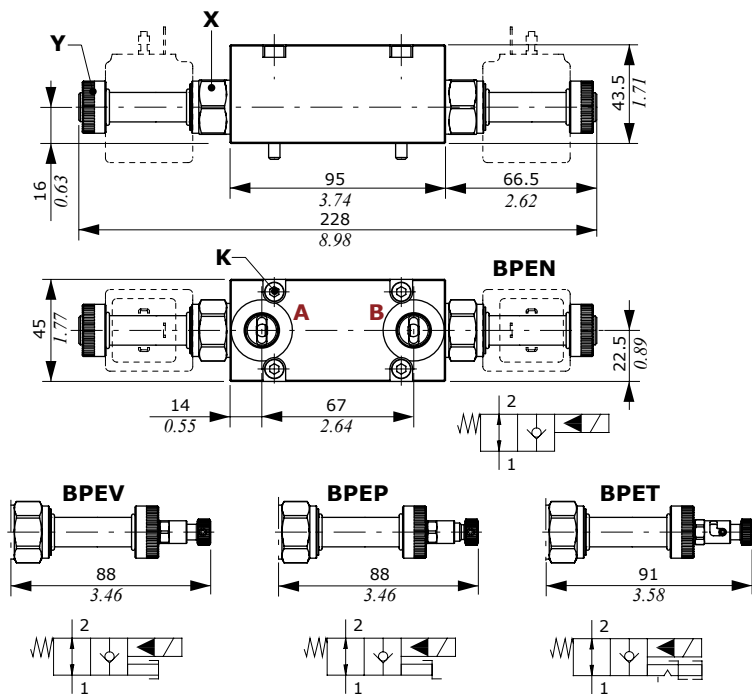
#### Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbf<sub>t</sub>)

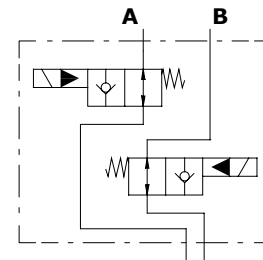
X = wrench 24 - 30 Nm (22 lbf<sub>t</sub>)

Y = 5 Nm (3.7 lbf<sub>t</sub>)

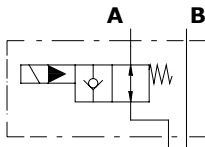
#### BPE(NA) type: normally open circuit



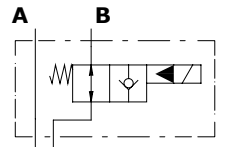
#### BPEN3(NA) type



#### BPEN1(NA) type



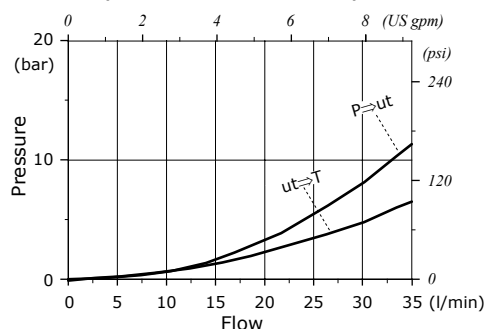
#### BPEN2(NA) type



## Flangeable valve blocks

## Solenoid operated check valves

**Check valve pressure drop**  
(curves without section)



## Ordering codes

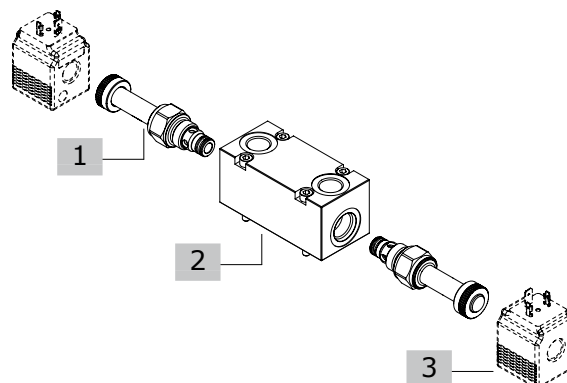
| TYPE                                      | CODE        | DESCRIPTION                                      |
|-------------------------------------------|-------------|--------------------------------------------------|
| <b>Complete valve block, without coil</b> |             |                                                  |
| <b>BPEN1(NC)-WC-SAE</b>                   | Y64S367001  | On ports A, NC circuit, without manual emergency |
| <b>BPEN2(NC)-WC-SAE</b>                   | Y64S367001  | As previous, on port B                           |
| <b>BPEN3(NC)-WC-SAE</b>                   | Y64S367000  | As previous, on ports A and B                    |
| <b>Part #1: Valve kit</b>                 |             |                                                  |
| <b>TBPE</b>                               | 3XTAP822150 | Valve blanking plug                              |
| <b>Normally closed circuit</b>            |             |                                                  |
| <b>BPEN(NC)</b>                           | 0EC08002032 | Without manual emergency                         |
| <b>BPEV(NC)</b>                           | 0EC08002037 | With screw type emergency                        |
| <b>BPEP(NC)</b>                           | 0EC08002036 | With pull-button emergency                       |
| <b>BPET(NC)</b>                           | 0EC08002038 | With "pull & twist" emergency                    |
| <b>Normally open circuit</b>              |             |                                                  |
| <b>BPEN(NA)</b>                           | 0EC08002031 | Without manual emergency                         |
| <b>BPEV(NA)</b>                           | 0EC08002034 | With screw type emergency                        |
| <b>BPEP(NA)</b>                           | 0EC08002033 | With push-button emergency                       |
| <b>BPET(NA)</b>                           | 0EC08002035 | With "push & twist" emerg.                       |

**Part #2: Block body kit**

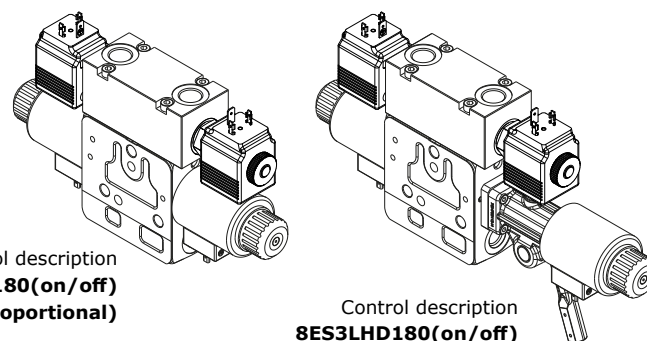
**BPE3-SAE** 5COR245951 Block body kit

**Part #3: Coil**

Valves needs type BER coil, see page 26.



Control description  
**8ES3180(on/off)**  
**8ESZ3180(proportional)**



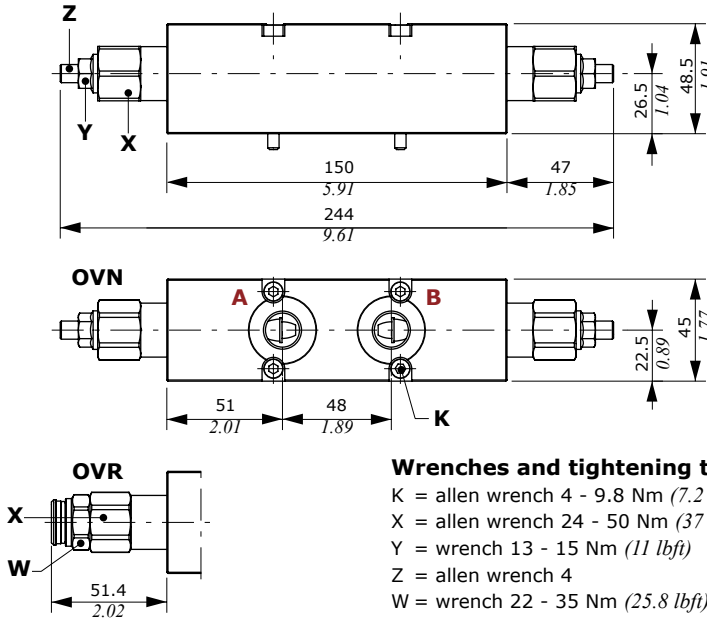
Control description  
**8ES3LHD180(on/off)**  
**8ESZ3LHD180(proportional)**

## Flangeable valve blocks

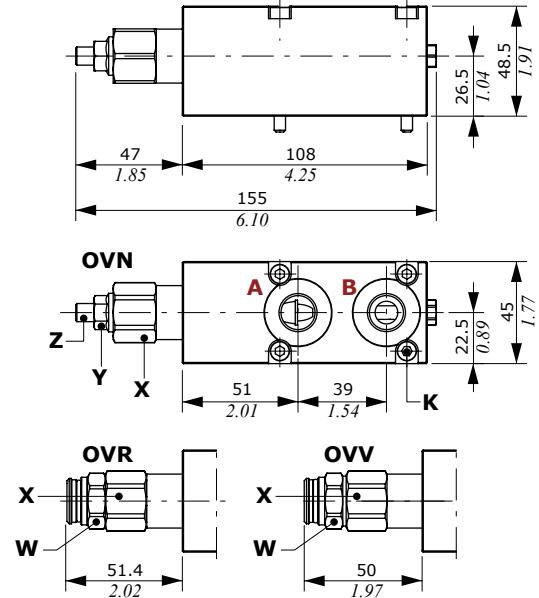
### Counterbalance valves

Solenoid controls (with or without lever operation) must be rotated 180°.

#### Double acting valve



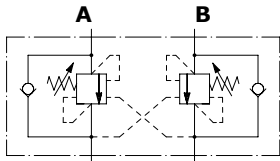
#### Single acting valve



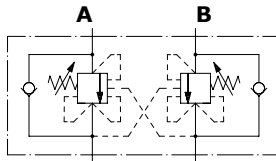
#### Wrenches and tightening torque

K = allen wrench 4 - 9.8 Nm (7.2 lbft)  
X = allen wrench 24 - 50 Nm (37 lbft)  
Y = wrench 13 - 15 Nm (11 lbft)  
Z = allen wrench 4  
W = wrench 22 - 35 Nm (25.8 lbft)

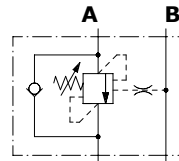
#### OVN301 type



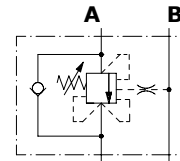
#### OVR301 type



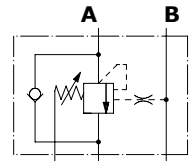
#### OVN101 type



#### OVR101 type



#### OVV101 type



### Ordering codes

TYPE CODE DESCRIPTION

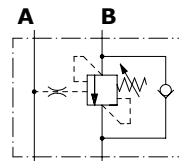
#### Single counterbalance valves

**OVN101-SAE** 1515322200 On port A, load sensitive, pilot ratio = 4  
**OVN201-SAE** 1515322200 As previous one, on ports B  
**OVR101-SAE** 1515422200 On port A, relief comp., pilot ratio = 4  
**OVR201-SAE** 1515422200 As previous one, on ports B  
**OVV101-SAE** 1515522200 On port A, vented type, pilot ratio = 4  
**OVV201-SAE** 1515522200 As previous one, on port B

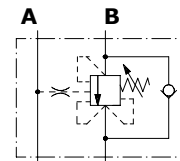
#### Double counterbalance valves

**OVN301-SAE** 1555222200 Load sensitive, pilot ratio = 4  
**OVR301-SAE** 1555322200 Relief compensated, pilot ratio = 4

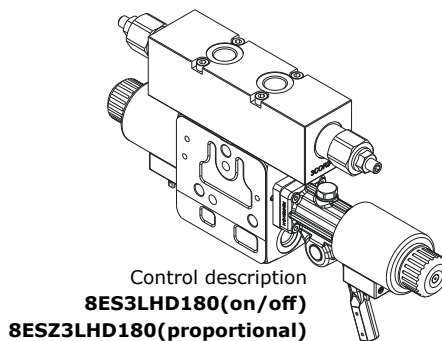
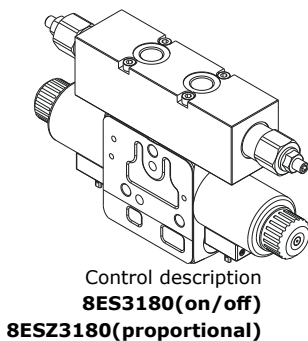
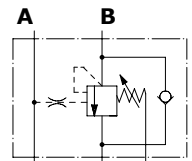
#### OVN201 type



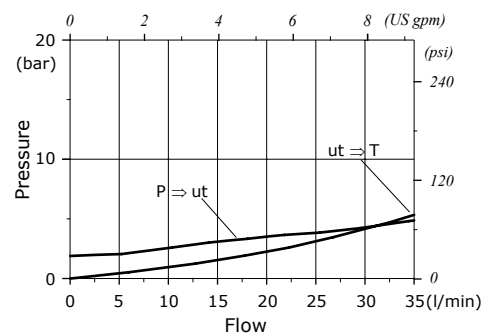
#### OVR201 type



#### OVV201 type



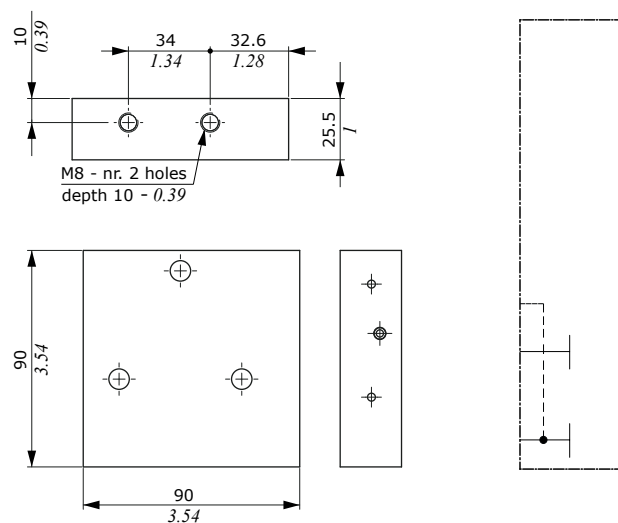
### Counterbalance valves pressure drop (without working sections)



## Dimensions and hydraulic circuit

## Without port arrangement

## RF type



## Accessories

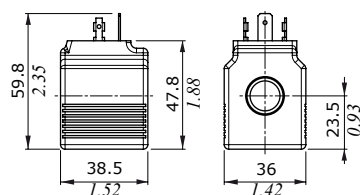
## Coils and connectors

| Application on                    | Coil type                  | Voltage                    | Connectors                   |                               |                              |                               |                            |                                  |   |                                             |
|-----------------------------------|----------------------------|----------------------------|------------------------------|-------------------------------|------------------------------|-------------------------------|----------------------------|----------------------------------|---|---------------------------------------------|
|                                   |                            |                            | ISO4400                      | Deutsch DT                    | AMP JPT                      | Packard Weatherpack           | Packard Metri-pack         | Flying leads (without connector) |   |                                             |
| Solenoid operated unloading valve | BER                        | 10 VDC                     | 4SLE001000A                  | -                             | -                            | -                             | -                          | -                                |   |                                             |
|                                   |                            | 12 VDC                     | 4SLE001200A                  | 4SLE001201A <sup>(5)</sup>    | 4SLE001203A <sup>(4)</sup>   | 4SLE001210A <sup>(2)</sup>    | 4SLE001214A <sup>(2)</sup> | 4SLE001207A                      |   |                                             |
|                                   |                            |                            | 4SLE001217A <sup>(3)</sup>   | 4SLE001202A <sup>(5)</sup>    | 4SLE001211A <sup>(3-4)</sup> |                               |                            |                                  |   |                                             |
|                                   |                            |                            | 4SLE001216A <sup>(3-5)</sup> |                               |                              |                               |                            |                                  |   |                                             |
|                                   |                            |                            | 4SLE001206A <sup>(2)</sup>   |                               |                              |                               |                            |                                  |   |                                             |
|                                   |                            | 14 VDC                     | -                            | 4SLE001400A <sup>(5)</sup>    | 4SLE001403A <sup>(3-4)</sup> | -                             | -                          | -                                |   |                                             |
|                                   |                            |                            |                              | 4SLE001401A <sup>(3-5)</sup>  |                              |                               |                            |                                  |   |                                             |
|                                   |                            |                            |                              | 4SLE001402A <sup>(3-4)</sup>  |                              |                               |                            |                                  |   |                                             |
|                                   |                            | 24 VDC                     | 4SLE002400A                  | 4SLE002401A <sup>(4)</sup>    |                              |                               |                            |                                  |   |                                             |
|                                   |                            |                            | 4SLE002408A <sup>(3)</sup>   | 4SLE002407A <sup>(3-4)</sup>  | 4SLE002403A <sup>(4)</sup>   | -                             | -                          | 4SLE002404A                      |   |                                             |
|                                   | 4SLE302400A <sup>(1)</sup> | 4SLE002402A <sup>(5)</sup> |                              |                               |                              |                               |                            |                                  |   |                                             |
| Solenoid operated check valve     | BER                        | 28 VDC                     | -                            | 4SLE002802A <sup>(5)</sup>    | 4SLE002800A <sup>(4)</sup>   | -                             | -                          | -                                |   |                                             |
|                                   |                            | 48 VDC                     | 4SLE004800A                  | -                             | -                            | -                             | -                          | -                                |   |                                             |
|                                   |                            |                            | 4SLE304800A <sup>(1)</sup>   |                               |                              |                               |                            |                                  |   |                                             |
|                                   |                            | 110VDC                     | 4SLE011000A                  | -                             | -                            | -                             | -                          | -                                |   |                                             |
|                                   |                            |                            | 4SLE311000A <sup>(1)</sup>   |                               |                              |                               |                            |                                  |   |                                             |
|                                   |                            | 220 VDC                    | 4SLE022000A                  | -                             | -                            | -                             | -                          | -                                |   |                                             |
|                                   |                            |                            | 4SLE322000A <sup>(1)</sup>   |                               |                              |                               |                            |                                  |   |                                             |
|                                   |                            | Controls                   | 45                           | 12VDC                         | 4SOL545012                   | 4SOL545013                    | 4SOL545014                 | -                                | - | -                                           |
|                                   |                            |                            |                              | 24VDC                         | 4SOL545024                   | 4SOL545025                    | 4SOL545026                 | -                                | - | -                                           |
|                                   |                            |                            | D15C                         | 12VDC                         | 4SOL515012-C                 | 4SOL515014-C <sup>(3-5)</sup> | -                          | -                                | - | 4SOL515019-C<br>4SOL515020-C <sup>(3)</sup> |
| 14VDC                             | -                          |                            |                              | -                             | 4SOL515016A-C <sup>(3)</sup> | -                             | -                          | -                                |   |                                             |
| 24VDC                             | 4SOL515024-C               |                            |                              | 4SOL515025-C <sup>(3-5)</sup> | -                            | -                             | -                          | -                                |   |                                             |
|                                   |                            |                            |                              |                               |                              |                               |                            |                                  |   |                                             |

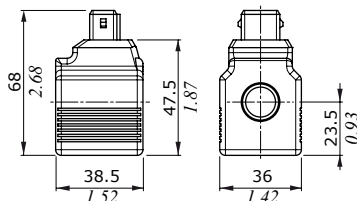
Notes: (1) supply with AC and use only with rectifier connector - (2) with flying leads - (3) with bidirectional diode - (4) integrated perpendicular type - (5) integrated parallel type

### Tipo BER type

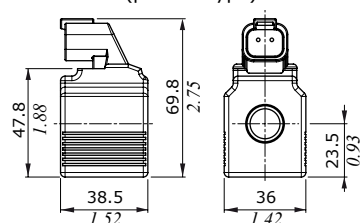
### ISO4400 connector



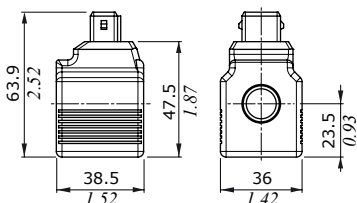
**DEUTSCH DT04 connector**  
(perpendicular type)



### DEUTSCH DT04 connector (parallel type)



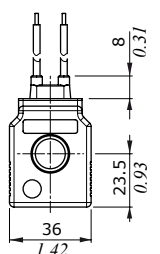
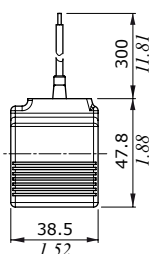
### AMP JPT connector



## Features

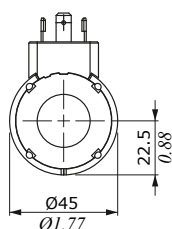
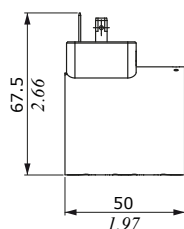
|                                     |                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal voltage tolerance . . . . . | : ±10%                                                                                                                                                                                                            |
| Power rating . . . . .              | : 19.2 W - 10/12/24/48/<br>110/220 VDC<br>: 19 W - 24/110/220 RAC<br>: 19.2 W - 48 RAC                                                                                                                            |
| Max. operating current . . . . .    | : 1.9 A - 10 VDC<br>: 1.61 A - 12 VDC<br>: 0.80 A - 24 VDC<br>: 0.40 A - 48 VDC<br>: 0.17 A - 110 VDC<br>: 0.09 A - 220 VDC<br>: 0.89 A - 24 RAC<br>: 0.45 A - 48 RAC<br>: 0.19 A - 110 RAC<br>: 0.09 A - 220 RAC |
| Coil insulation . . . . .           | : Classe H (180°C)                                                                                                                                                                                                |
| Weather protection . . . . .        | : IP65 - ISO4400<br>: IP69K - Deutsch DT<br>: IP65 - AMP JPT<br>: IP67 - Weatherpack<br>: IP67 - Metri-pack                                                                                                       |
| Insertion . . . . .                 | : 100%                                                                                                                                                                                                            |

## Flying leads

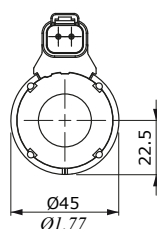
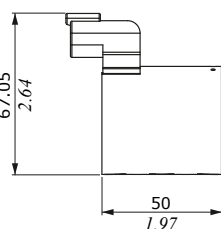


Technical drawing of a pump assembly. A horizontal dimension line indicates a distance of 200 mm. A vertical dimension line indicates a height of 7.87 mm. The drawing shows a pump body with a horizontal outlet pipe and a vertical inlet pipe.

### ISO4400 connector



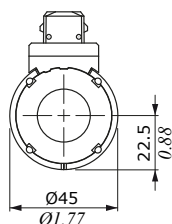
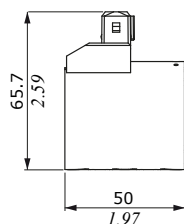
## DEUTSCH DT04 connector



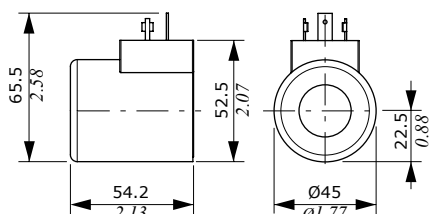
## Features

|                                     |                                                                 |
|-------------------------------------|-----------------------------------------------------------------|
| Nominal voltage tolerance . . . . . | : $\pm 10\%$                                                    |
| Power rating . . . . .              | : 20.9 W a 12 VDC                                               |
|                                     | : 23.7 W a 24 VDC                                               |
| Max. operating current . . . . .    | : 1.94 A - 12 VDC                                               |
|                                     | : 1.10 A - 24VDC                                                |
| Coil insulation . . . . .           | : Classe F (155°C)                                              |
| Weather protection. . . . .         | : IP65 - ISO4400                                                |
|                                     | : IP69K - Deutsch DT                                            |
|                                     | : IP67 - AMP JPT                                                |
| Insertion . . . . .                 | : Continuous with ambient temperature $\leq 50^{\circ}\text{C}$ |
| Dither frequency . . . . .          | :                                                               |
| low frequency . . . . .             | : 100 Hz                                                        |
| high frequency. . . . .             | : 80 Hz - 350 mA                                                |

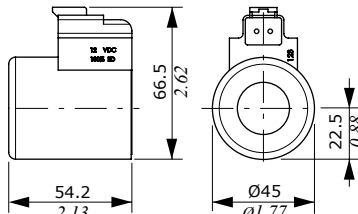
### AMP JPT connector



### ISO4400 connector



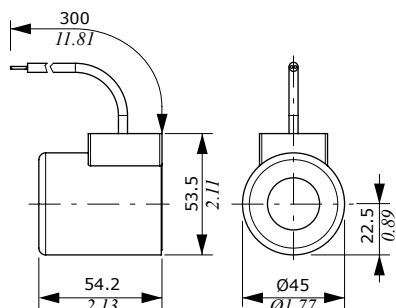
## DEUTSCH DT04 connector



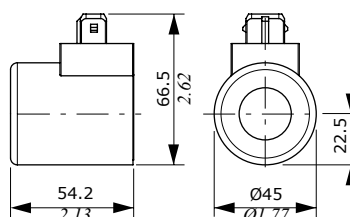
## Features

Nominal voltage tolerance : ±10%  
Power rating . . . . . : 38 W @  
                                        12/14/24/ VDC  
Max. operating current . . : 3.16 A @ 12 VDC  
                                        : 2.75 A @ 14VDC  
                                        : 1.58 A @ 24VDC  
Coil insulation . . . . . : Class H  
                                        (180°C - 356°F)  
Weather protection . . . . IP65 - ISO4400  
                                        : IP69K - Deutsch DT  
                                        : IP65 - AMP JPT  
Insertion . . . . . : 100%

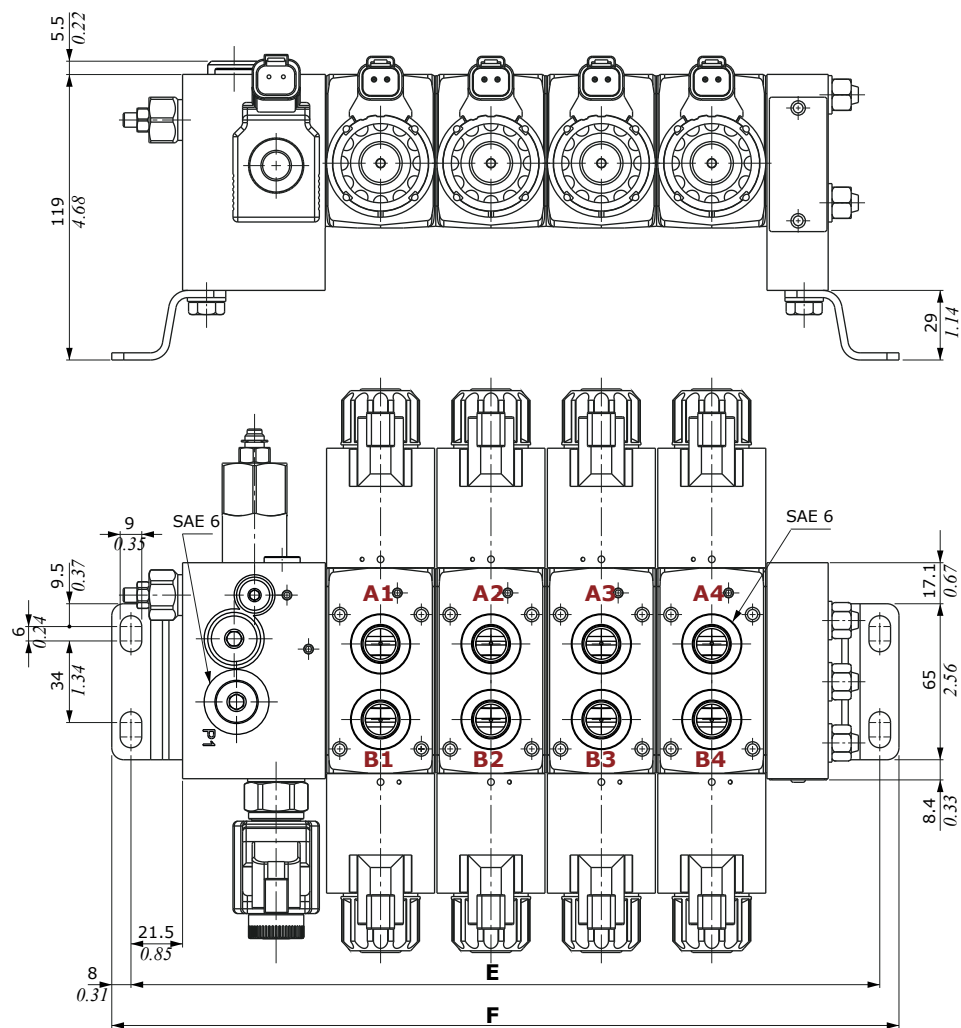
## Flying leads



### AMP JPT connector



Staffe di fissaggio



| TYPE     | with section AN1 type (see drawing) |       |     |       | with section AN2 type |       |     |       |
|----------|-------------------------------------|-------|-----|-------|-----------------------|-------|-----|-------|
|          | E                                   |       | F   |       | E                     |       | F   |       |
|          | mm                                  | in    | mm  | in    | mm                    | in    | mm  | in    |
| SDX060/1 | 174                                 | 6.85  | 190 | 7.48  | 174                   | 6.85  | 190 | 7.48  |
| SDX060/2 | 220                                 | 8.66  | 236 | 9.29  | 220                   | 8.66  | 236 | 9.29  |
| SDX060/3 | 266                                 | 10.47 | 282 | 11.10 | 266                   | 10.47 | 282 | 11.10 |
| SDX060/4 | 312                                 | 12.28 | 328 | 12.91 | 312                   | 12.28 | 328 | 12.91 |
| SDX060/5 | 358                                 | 14.09 | 374 | 14.72 | 358                   | 14.09 | 374 | 14.72 |
| SDX060/6 | 404                                 | 15.90 | 420 | 16.53 | 404                   | 15.90 | 420 | 16.53 |
| SDX060/7 | 450                                 | 17.71 | 466 | 18.34 | 450                   | 17.71 | 466 | 18.34 |
| SDX060/8 | 496                                 | 19.52 | 512 | 20.15 | 496                   | 19.52 | 512 | 20.15 |

## Installation and maintenance

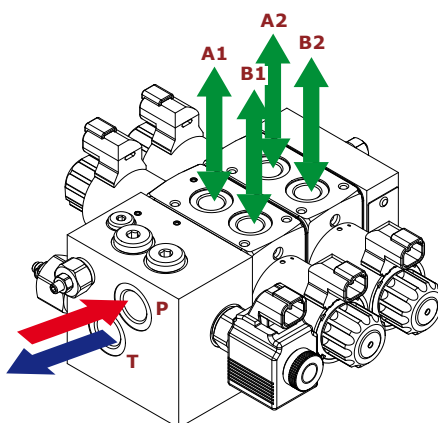
The SDX060 valves are assembled and tested as per the technical specifications of this catalogue.

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

- the valves can be assembled in any position; in order to prevent body deformation and spool sticking, mount the products on a flat surface;
- In order to prevent the possibility of water entering into the spool control kit, do not use high pressure wash down directly on the valves;
- Before painting, ensure plastic port plugs are tightly in their place.

### Fittings tightening torque (Nm-lbft)

| THREAD TYPE                  | P-T ports      | A-B ports           | LS ports            |
|------------------------------|----------------|---------------------|---------------------|
| BSP                          | G 1/2          | G 3/8               | G 1/4               |
| With O-Ring seal             | 50 - 37        | 35-25.8 • 50*-37*   | 25 - 18.4           |
| With copper washer           | 60 - 44.3      | 40-29.5 • 60*-44.3* | 30 - 22             |
| With steel and rubber washer | 60 - 44.3      | 30-22 • 60*-44.3*   | 16 - 11.8           |
| UN-UNF                       | 3/4-16 (SAE 8) | 9/16-18 (SAE 6)     | 7/16-20(SAE 4)      |
| With O-Ring seal             | 35 - 25.8      | 30-22 • 35**-25.8** | 18-13.3 • 30**-22** |



NOTE – These torques are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finishing. The manufacturer must be consulted.





## WALVOIL NEL MONDO | WALVOIL WORLDWIDE

### WALVOIL S.P.A.

#### DIREZIONE E COORDINAMENTO INTERPUMP GROUP S.P.A.

Sede principale, Filiali e Uffici di rappresentanza  
Headquarters, Subsidiaries and Representative Offices

### WALVOIL S.P.A. SEDE PRINCIPALE | HEADQUARTERS

Via Adige, 13/D - 42124 Reggio Emilia - Italy

TEL. +39 0522 932411

info@walvoil.com | www.walvoil.com

### AUSTRALASIA | AUSTRALASIA

#### WALVOIL FLUID POWER AUSTRALASIA PTY LTD

6 Leonard Avenue, Toukley NSW 2263, Sydney, Australia

TEL. +61 413 739 938

australasia@walvoil.com

### BRASILE | BRAZIL

#### INTERPUMP HYDRAULICS BRASIL LTDA | WALVOIL DIVISION

Rua Gilberto de Zorzi, 525 - Bairro Forqueta 95115-730

Caxias do Sul (RS)

TEL. +55 54 3289 7000

infobrasil@walvoil.com

### CANADA | CANADA

#### WALVOIL CANADA INC.

3100, Rue Jacob Jordan, Terrebonne, Qc J6X 4J6, Canada

TEL. +1 450 477 1076 Ext:2225

info@walvoilcanada.com | www.walvoilcanada.com

### CINA | CHINA

#### WALVOIL FLUID POWER (DONGGUAN) CO. LTD

1st Floor, the Third Factory Area, Sijia, Shijie Town, Dongguan City

Guangdong province, China.

TEL. +86 769 81816189-8020

info@walvoil.com.cn | www.walvoil.com.cn

### COREA DEL SUD | SOUTH KOREA

#### WALVOIL FLUID POWER KOREA LTD.

(17818)80-15, Oseongsandan 1Ro, Oseong-myun,

Pyeongtaek-si Gyeonggi-do

Republic of Korea 451-872

TEL. +82 31 682 6030

info@walvoil.co.kr | www.walvoil.co.kr

### FRANCIA | FRANCE

#### WALVOIL FLUID POWER FRANCE

362 rue de La Jaunais, Vritz - 44540 Vallons-de-l'Erdre

TEL. +33 2 41 94 41 06

france@walvoil.com

### INDIA | INDIA

#### WALVOIL FLUID POWER (INDIA) PVT. LTD.

No. 1, 2<sup>nd</sup> Cross, 2<sup>nd</sup> Main, KIADB Industrial Area, Attibele, Anekal Taluk

Bangalore - 562107.

TEL. +91 80 0614 24000

info@walvoil.co.in | www.walvoil.co.in

### MESSICO | MEXICO

#### WALVOIL FLUID POWER MEXICO S.A. DE C.V.

Julian Sepulveda Davila #109, Parque Industrial SG, cp. 66640, Apodaca

Nuevo León, Mexico

### U.S.A. | U.S.A.

#### WALVOIL FLUID POWER CORP. | HEADQUARTERS

4111 North Garnett Tulsa, OK 74116, USA

TEL. +1 918 858 7100

info@walvoilusa.com | www.walvoilusa.com

#### WALVOIL FLUID POWER CORP.

1109, Technology Drive, Red Wing, MN 55066, U.S.A.

TEL. +1 651 212 6400

info@walvoilusa.com | www.walvoilusa.com



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