



**SDS400**  
**Sectional directional**  
**control valves**

**TECHNICAL CATALOGUE**



## Features

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Sectional directional control valve for high flow, available for fixed displacements hydraulic pumps.

- From 1 to 10 work sections
- Open centre
- Optional carry-over port
- Main pilot relief valve on inlet cover and load check valve on every section
- Available wide range of port valves
- Available manual and hydraulic
- Diameter 30 mm (*1.18 in*) interchangeable spools

### Additional information

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

### WARNING!

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

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

9<sup>th</sup> edition November 2019

### SDS400

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### 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.

Nominal flow rating		400 l/min	105 US gpm
Max. pressure <sup>(1)</sup>	inlet port P and working ports A and B	315 bar	4600 psi
Max back pressure T	outlet port T	25 bar	360 psi
Internal leakage A(B)⇒T	Δp = 100 bar - 1450 psi	25 cm <sup>3</sup> /min	1.53 in <sup>3</sup> /min
	With port valves Δp = 100 bar - 1450 psi	30 cm <sup>3</sup> /min	1.83 in <sup>3</sup> /min
Fluid		olio a base minerale	
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		-/19/16 - ISO 4406	NAS 1638 - class 10
Ambient temperature for working conditions	with mechanical devices	from -40°C to 60°C	from -40°F to 140°F
	with hydraulic devices	from -30°C to 60°C	from -22°F to 140°F
Tie rod tightening torque		130 Nm	96 lbft

NOTE - <sup>(1)</sup> Intermittent pressure at max. 1 million cycles with specific internal testing.

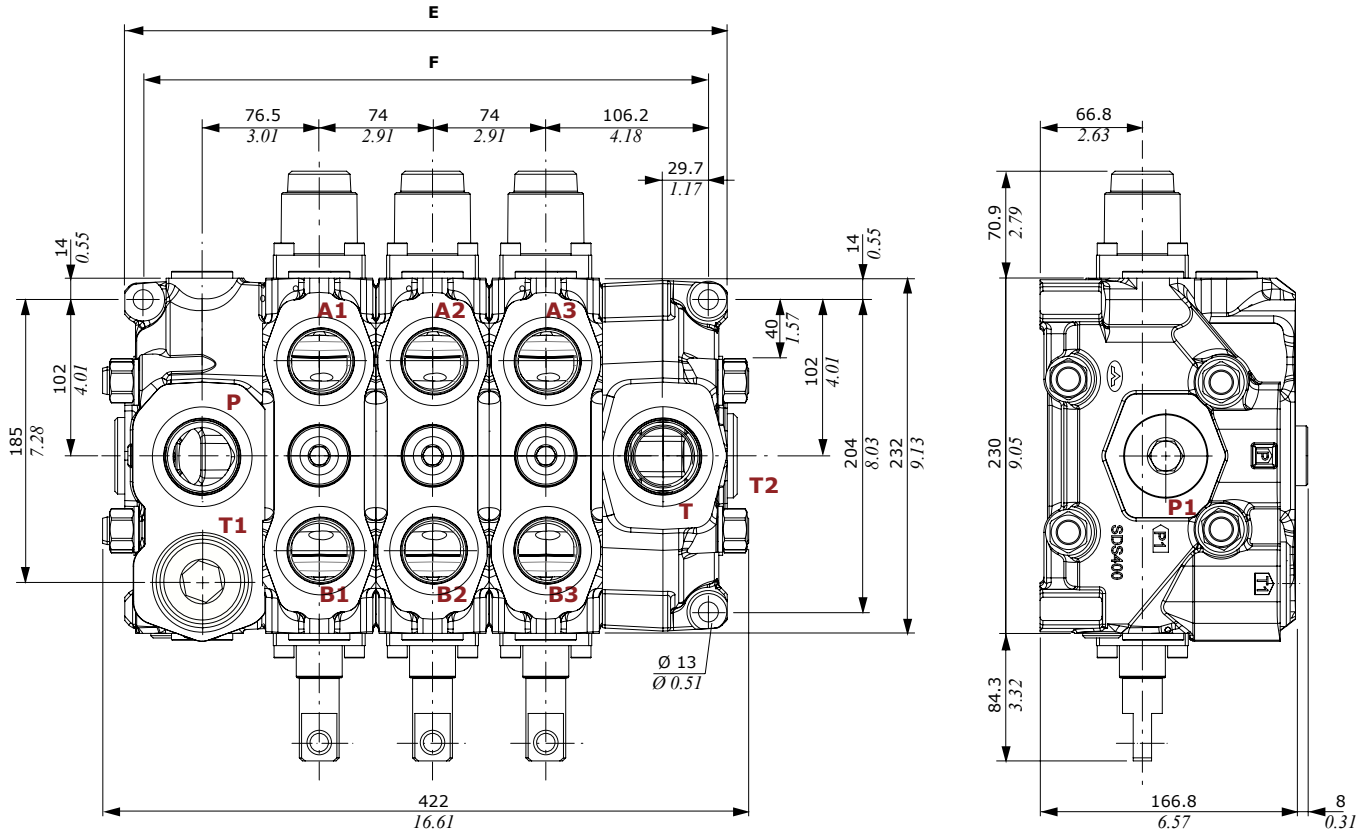
### Standard threads

REFERENCE STANDARD				
		BSP	UN-UNF	Flange connection
THREAD ACCORDING TO		ISO 228/1	ISO 263	ISO 6162
		BS 2779	ANSI B1.1 unified	SAE J518
CAVITY	ISO	1179-1	11926-1	
DIMENSION	SAE		J1926-1	SAE J518 code 61
ACCORDING TO	DIN	3852-2 shape X or Y		ISO 6162-1

PORTS THREADING				
MAIN PORTS	BSP	UN-UNF	flange connection (bolts threading)	
			ISO6162-1 (type 1)	SAE J518 code 61
Inlet <b>P</b>	G 1 1/2	1 7/8-12 (SAE 24)	DN 38 (M12)	1-1/2 (1/2-13 UNC)
Inlet <b>P1</b>	G 1 1/4	1 5/8-12 (SAE 20)	-	-
Port <b>A</b> and <b>B</b>	G 1 1/4	1 5/8-12 (SAE 20)	DN 32 (M10)	1-1/4 (7/16-14 UNC)
Outlet <b>T</b>	G 1 1/2	1 7/8-12 (SAE 24)	DN 38 (M12)	1-1/2 (1/2-13 UNC)
Outlet <b>T1</b>	G 1 1/2	1 7/8-12 (SAE 24)	DN 32 (M10)	1-1/4 (7/16-14 UNC)
Outlet <b>T2</b>	G 1 1/2	1 7/8-12 (SAE 24)	DN 32 (M10)	1-1/4 (7/16-14 UNC)
<b>M</b>	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE 6)
PILOT PORTS				
Hydraulic	G 3/8	3/4-16 (SAE 8)	G 3/8	9/16-18 (SAE 8)



Dimensional data

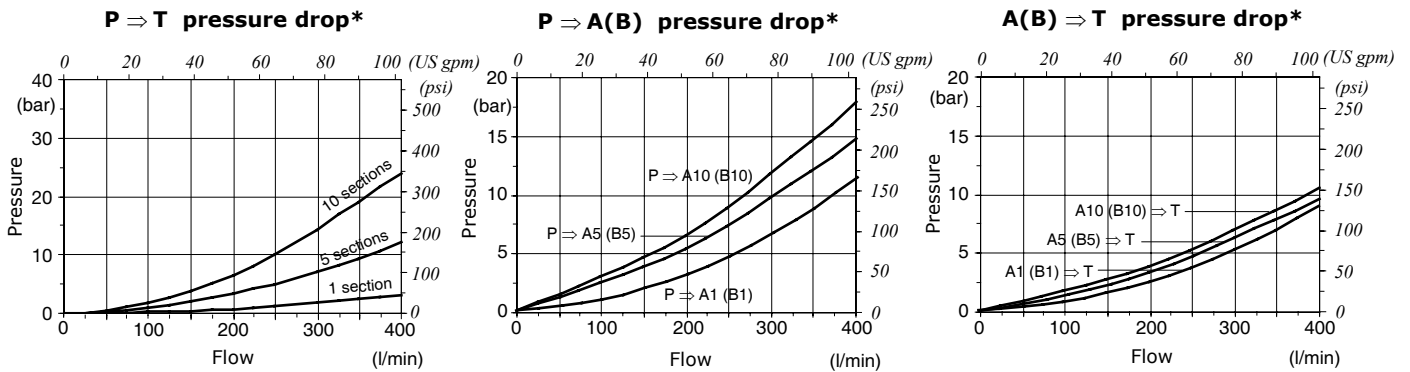


NOTE: Drawings and dimensions are referred to **BSP** thread configuration.

TYPE	E		F		Weight	
	mm	in	mm	in	Kg	lb
SDS400/1	247	9.72	221.2	8.71	44	97
SDS400/2	321	12.64	295.2	11.62	60.5	133.4
SDS400/3	395	15.55	369.2	14.53	77	169.8
SDS400/4	469	18.46	443.2	17.45	93.5	206.1
SDS400/5	543	21.37	517.2	20.36	110	242.5

TYPE	E		F		Weight	
	mm	in	mm	in	Kg	lb
SDS400/6	617	24.29	591.2	23.27	126.5	278.9
SDS400/7	691	27.20	665.2	26.19	143	315.3
SDS400/8	765	30.12	739.2	29.10	159.5	351.6
SDS400/9	839	33.03	813.2	32.01	176	388
SDS400/10	913	35.94	887.2	34.93	192.5	424.4

Performance data

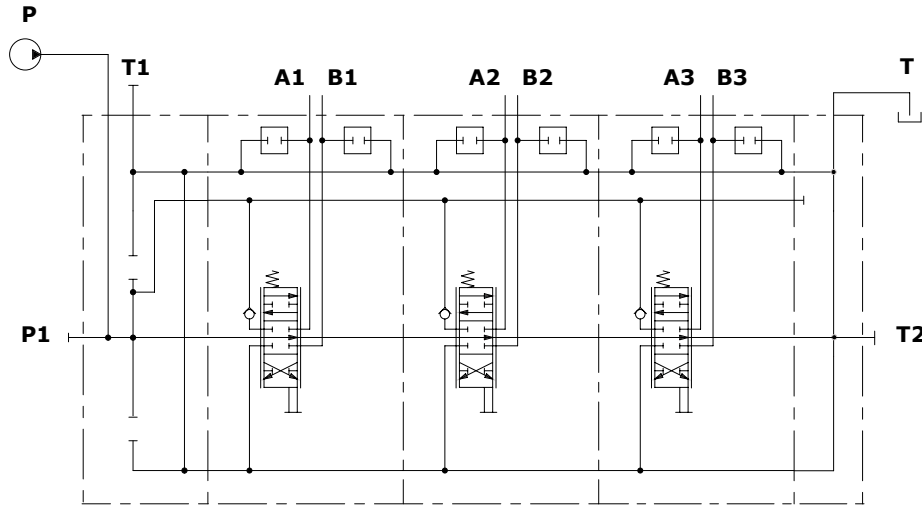


(\*): Referred to spool 103

**Hydraulic circuit**

**Parallel circuit**

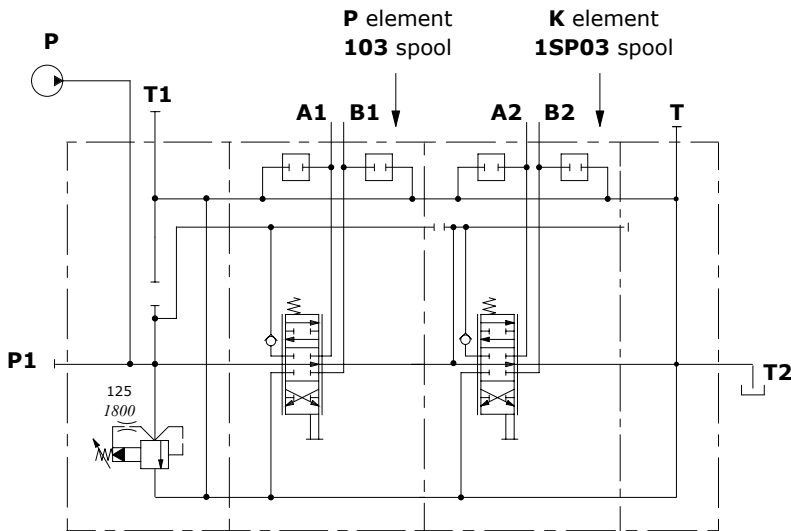
Standard configuration.



Description example:  
 SDS400/3/AD(SV)/103-8SLP/103-8SLP/103-8SLP/RD

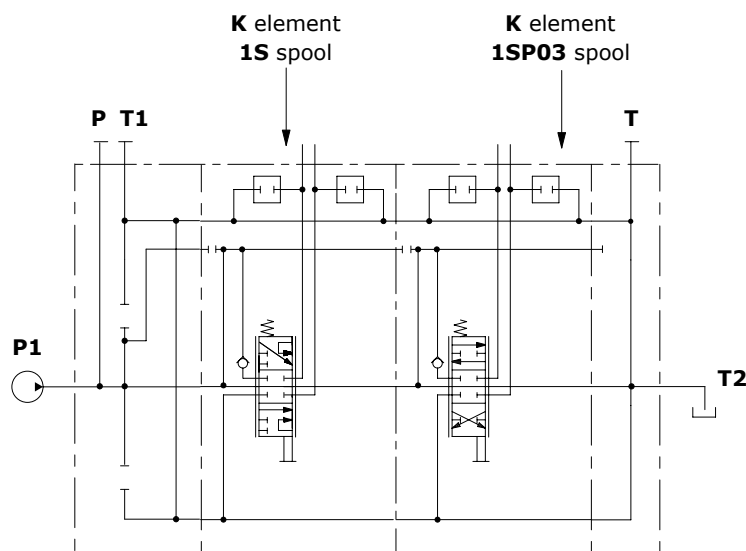
**Series-parallel (tandem) circuit**

A special working section kit is needed. Tandem section is fed from the free flow pressure line; it's excluded when an up stream section is operated.



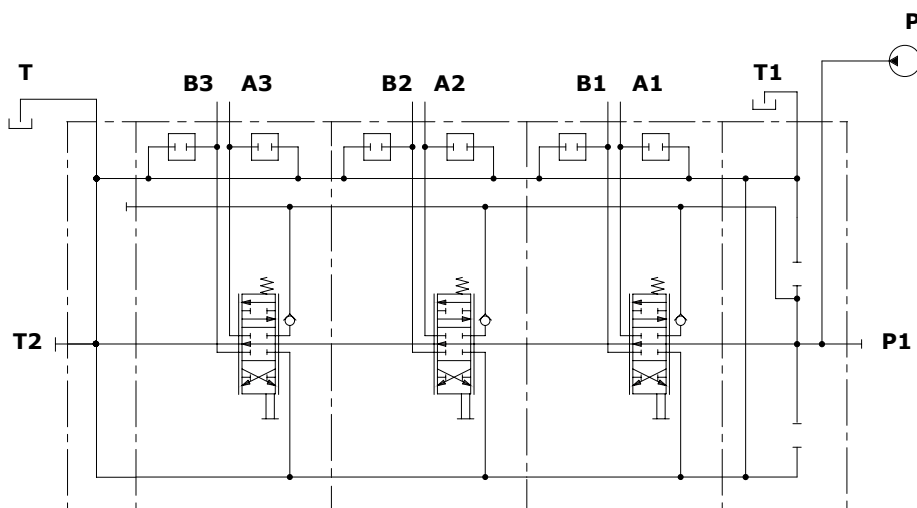
Description example:  
 SDS400/2/AC(XG-125)/103-8SLP/K-1SP03-8SLP/RC

Series circuit



Description example:  
SDS400/AC(SV)/K-1S-8SLP/K-1SP03-8SLP/RC

Right inlet directional valve

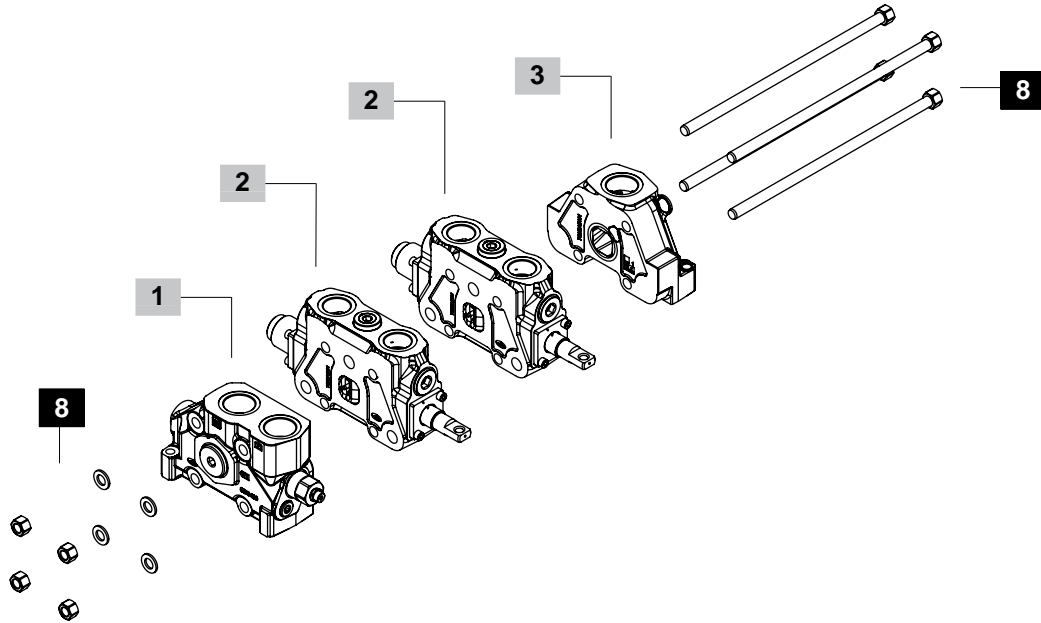
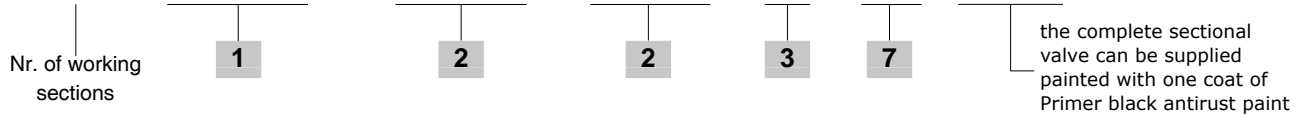


Description example:  
SDS400/3/BD(SV)/103-8SLP/103-8SLP/103-8SLP/RD

### Complete sections ordering codes

#### Standard configuration with upper inlet and outlet

**SDS400 / 2 / AD(XG3-250) / 103-8SLP / 103-8SLP / RD - ... - <CVN>**



#### 1 Inlet section \* page 10

TYPE: **SDS400/AC(XG3-250)-SAE** CODE: 61G205000  
 DESCRIPTION: With side inlet port and relief valve, P and T1 upper ports plugged

TYPE: **SDS400/AD(XG3-250)-SAE** CODE: 61G205001  
 DESCRIPTION: With upper inlet port and relief valve, P1 side port and T1 upper port plugged

TYPE: **SDS400/ADA-FS3U (XG3-250)** CODE: 61G205900  
 DESCRIPTION: Upper port with SAE J518 code 61, without side inlet, with relief valve

#### 2 Working section \* page 14

TYPE: **SDS400/103-8SLP-SAE** CODE: 61G105000  
 DESCRIPTION: Parallel circuit, double acting without lever, with spring return, arranged for port valves

TYPE: **SDS400/K-1SP03-8SLP-SAE** CODE: 61G105003  
 DESCRIPTION: Series-parallel circuit, double acting without, lever with spring return, arranged for port valves

TYPE: **SDS400/K-1S03-8SLP-SAE** CODE: 61G105004  
 DESCRIPTION: Series circuit, double acting without lever, with spring return, arranged for port valves

TYPE: **SDS400/P5Y-5RSA03-13SLPF-SAE** CODE: 61G105001  
 DESCRIPTION: Floating circuit with spool in, double acting without lever with spring return, arranged for port valves

TYPE: **SDS400/P5W-5RSB03-13CSLP-SAE** CODE: 61G105002  
 DESCRIPTION: Floating circuit with spool out, double acting without lever with spring return, arranged for port valves

#### 3 Outlet section \* page 28

TYPE: **SDS400/RC-SAE** CODE: 61G305000  
 DESCRIPTION: Side port open, upper port plugged

TYPE: **SDS400/RD-SAE** CODE: 61G305001  
 DESCRIPTION: Upper port open, side port plugged

TYPE: **SDS400/RE-SAE** CODE: 61G305002  
 DESCRIPTION: Upper port open and power-beyond

TYPE: **SDS400/RK-SAE** CODE: 61G305003  
 DESCRIPTION: For closed center circuit

TYPE: **SDS400/RDA-FS3U** CODE: 61G305900  
 DESCRIPTION: With SAE J518 code 61 flange connection, upper port, without side port

TYPE: **SDS400/RDAL-FS3U** CODE: 61G305902  
 DESCRIPTION: With SAE J518 code 61 flange connection, upper port, with side port plugged

TYPE: **SDS400/REAL-FS3U** CODE: 61G305901  
 DESCRIPTION: With SAE J518 code 61 flange connection, upper port, with carry-over

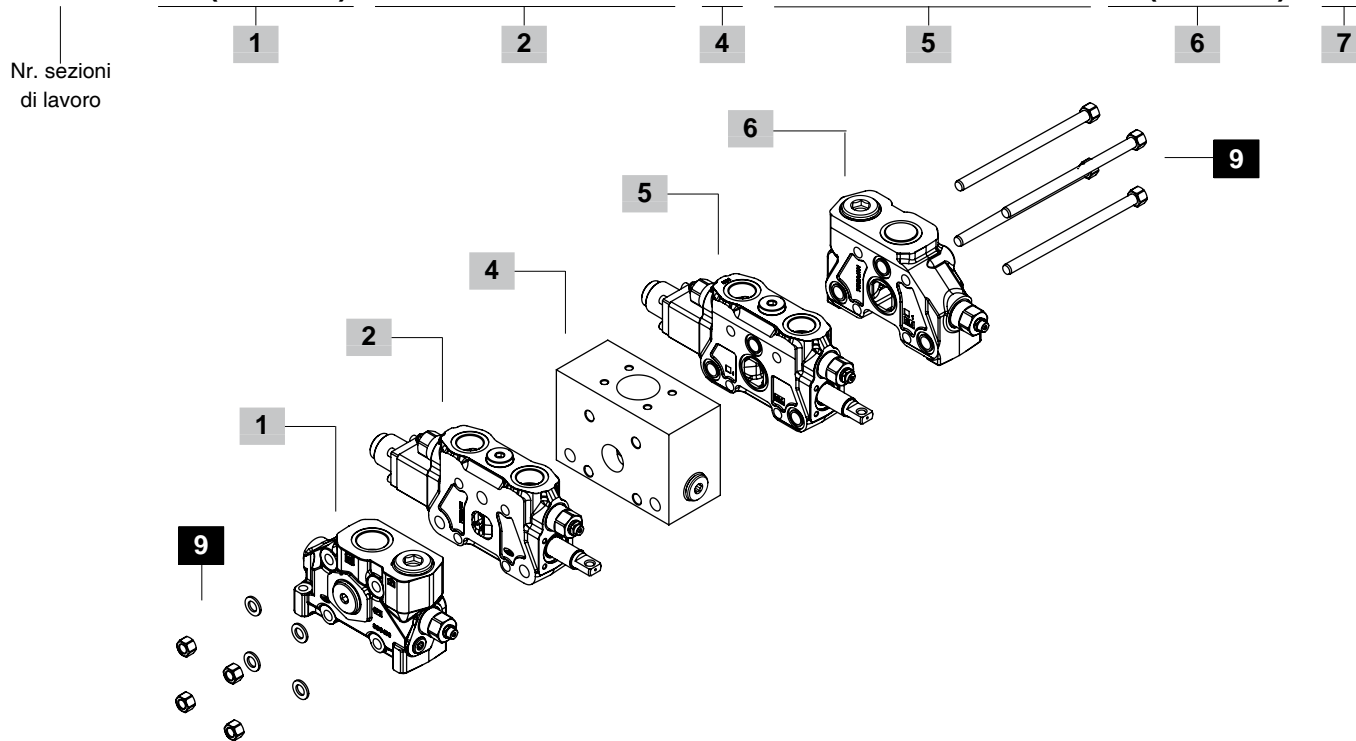
#### 7 Ports threading page 4

Specify only if different from standard **BSP** thread (see page 4), for flange connection according to SAE J518 code 61, indicate: **FS3U**.

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

Configuration with 2 upper inlets and mid return manifold

SDS400 / 2 /AD(XG3-250) / P5Y-5RSA03-13SLPF /CS1/ P5W-5RSA03-13SLPF / BD(XG3-250) - ...



**4 Mid return manifold \*** page 27

TYPE	CODE	DESCRIPTION
CS1-FS3U	61G405900	Mid return manifold with SAE J518 code 61 flange connection

**5 Working section for right inlet \***

TYPE: SDS400/ED-103-8SLP-SAE	CODE: 61G105005	DESCRIPTION: Parallel circuit, double acting without lever, with spring return, arranged for port valves
TYPE: SDS400/K-ED-1SP03-8SLP-SAE	CODE: 61G105006	DESCRIPTION: Series-parallel circuit, double acting without lever, with spring return, arranged for port valves
TYPE: SDS400/K-ED-1S03-8SLP-SAE	CODE: 61G105007	DESCRIPTION: Series circuit, double acting without lever, with spring return, arranged for port valves
TYPE: SDS400/P5Y-ED-5RSB03-13CSLP-SAE	CODE: 61G105008	DESCRIPTION: Floating circuit with spool out, double acting without lever, with spring return, arranged for port valves
TYPE: SDS400/P5W-ED-5RSA03-13SLPF-SAE	CODE: 61G105009	DESCRIPTION: Floating circuit with spool in, double acting without lever, with spring return, arranged for port valves

**6 Right inlet section \***

TYPE: SDS400/BC(XG3-250)-SAE	CODE: 61G205002	DESCRIPTION: With side inlet port and relief valve, P and T1 upper ports plugged
TYPE: SDS400/BD(XG3-250)-SAE	CODE: 61G205003	DESCRIPTION: With upper inlet port and relief valve, P1 side port and T1 upper port plugged
TYPE: SDS400/BDA-FS3U (XG3-250)	CODE: 61G205901	DESCRIPTION: Upper port with SAE J518 code 61 flange connection, without side inlet, with relief valve

**8 Assemb. kit without intermediate section**

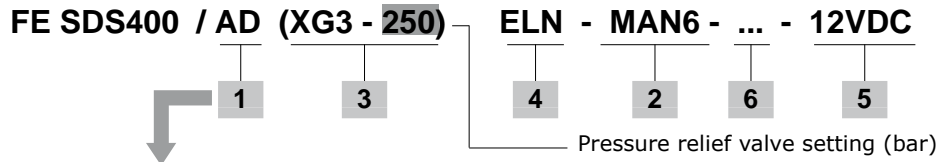
CODE	DESCRIPTION
5TIR116274	Tie rod kit for 1 working section directional valve
5TIR116348	Tie rod kit for 2 working sections directional valve
5TIR116422	Tie rod kit for 3 working sections directional valve
5TIR116496	Tie rod kit for 4 working sections directional valve
5TIR116570	Tie rod kit for 5 working sections directional valve
5TIR116644	Tie rod kit for 6 working sections directional valve
5TIR116718	Tie rod kit for 7 working sections directional valve
5TIR116792	Tie rod kit for 8 working sections directional valve
5TIR116866	Tie rod kit for 9 working sections directional valve
5TIR116940	Tie rod kit for 10 working sections directional valve

**9 Assemb. kit with intermediate section**

CODE	DESCRIPTION
5TIR116458	Tie rod kit for 2 working sections directional valve
5TIR116532	Tie rod kit for 3 working sections directional valve
5TIR116606	Tie rod kit for 4 working sections directional valve
5TIR116680	Tie rod kit for 5 working sections directional valve
5TIR116754	Tie rod kit for 6 working sections directional valve
5TIR116828	Tie rod kit for 7 working sections directional valve
5TIR116902	Tie rod kit for 8 working sections directional valve
5TIR116976	Tie rod kit for 9 working sections directional valve
5TIR11699A	Tie rod kit for 10 working sections directional valve

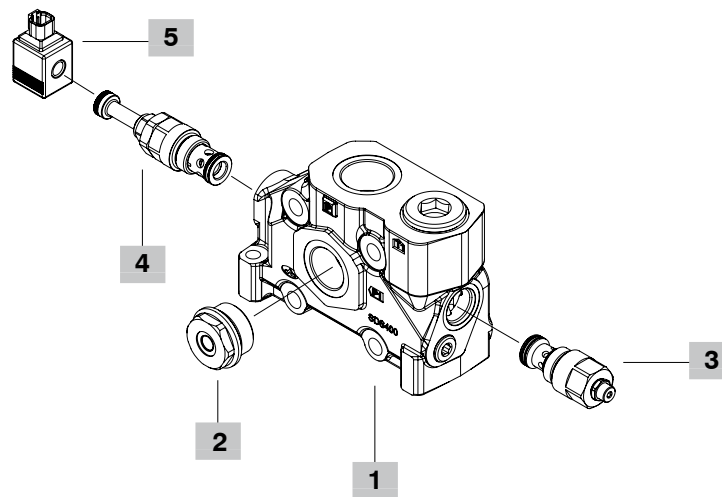
NOTE (\*) - Codes are referred to UN-UNF thread.

## Parts ordering codes



### Available configurations

- AC:** lateral inlet port
- AD:** top inlet port, lateral port plugged
- ADA FS3:** Only top inlet, SAE flange



### 1 Inlet section body \* page 11

TYPE: <b>AC-AD-SAE-NOTAP(T1)</b>	CODE: 5FIA140701
DESCRIPTION: Standard body, lateral inlet port or upper inlet port, T1 upper port open	
TYPE: <b>AC-AD-SAE</b>	CODE: 5FIA140700
DESCRIPTION: Standard body, lateral inlet port or upper inlet port, T1 upper port plugged	
TYPE: <b>ADA-FS3U</b>	CODE: 5FIA140790
DESCRIPTION: Body ISO 6162-1 type 1 flange connection, T1 upper port with blind flange	

### 2 Parts \*

TYPE	CODE	DESCRIPTION
<b>For AD inlet section</b>		
-	3XTAP848220	SAE20 plug (omitted in description)
<b>MAN6</b>	XGIU641242	SAE20/SAE6 MAN pressure gauge arrangement
<b>For AC inlet section</b>		
-	4TAP854220	SAE24 plug (omitted in description)

### 3 Main relief valve page 12

Standard setting is referred to 10 l/min - 2.6 USgpm flow

TYPE	CODE	DESCRIPTION
<b>XG2</b>	OMP16002013	Setting range 50-220 bar (725-3200 psi) Standard setting 150 bar (2200 psi)
<b>XG3</b>	OMP16002014	Setting range 150-350 bar (2200-5100 psi) Standard setting 250 bar (3600 psi)

### 4 Inlet relief valve options page 13

TYPE	CODE	DESCRIPTION
<b>SV</b>	XTAP540480	Relief valve blanking plug
<b>F</b>	X395320000	Inlet anti-cavitation valve
<b>L</b>	X277510000	Hydraulic operated unloader valve
<b>Solenoid operated unloader valve</b>		
<b>ELN</b>	0EFW2772000	Without emergency
<b>ELP</b>	0EFW2772001	Push-button emergency
<b>ELV</b>	0EFW2772002	Screw type emergency
<b>ELT</b>	0EFW2772003	Push and twist type with detent emergency

### 5 Coils page 29

TYPE	CODE	DESCRIPTION
<b>12VDC</b>	4SLE001200	Coil type <b>BER</b> , ISO4400 integrated type 12 VDC

For complete available coils list see page 27

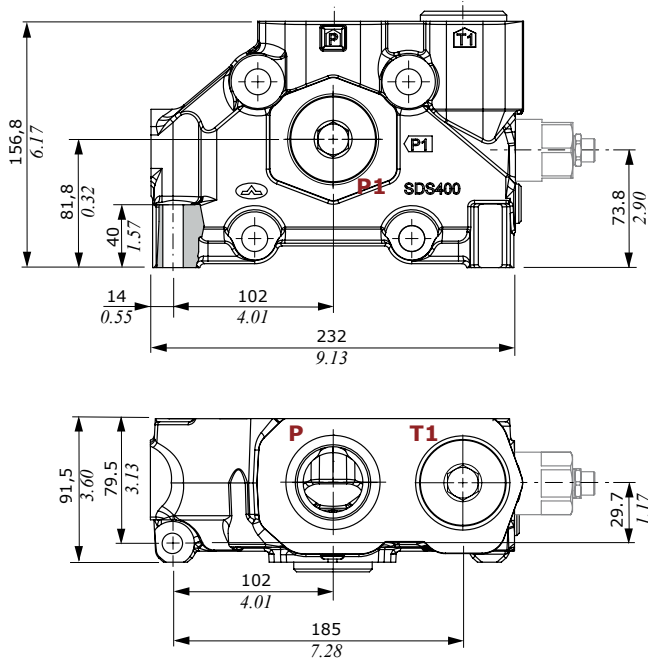
### 6 Ports threading page 4

Specify only if different from standard **BSP** thread (see page 4), for flange connection according to SAE J518 code 61, indicate: **FS3U**.

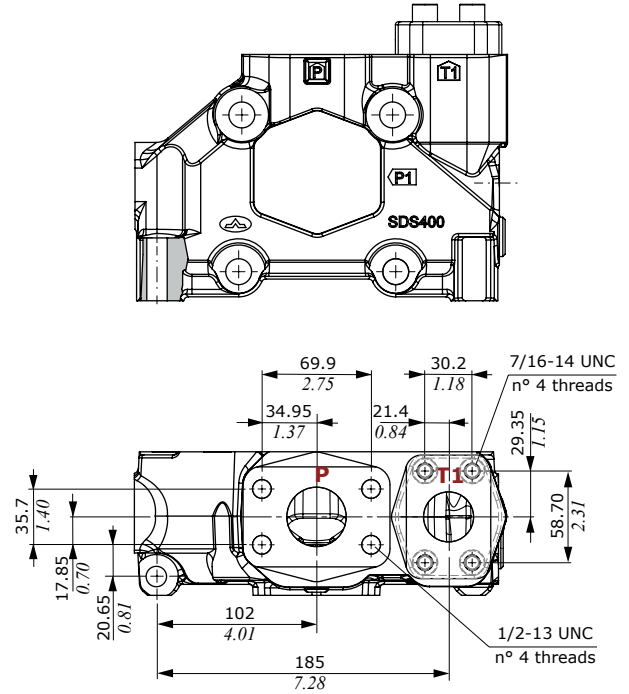
NOTE (\*) - Codes are referred to **UN-UNF** thread.

Dimensional data and hydraulic circuit

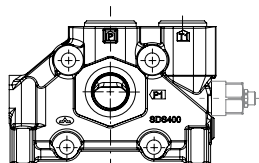
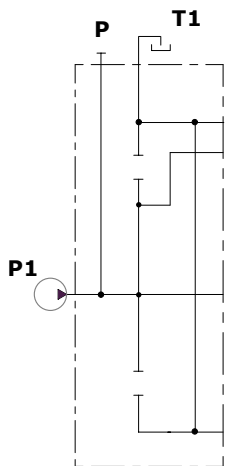
AC-AD type



AD FS3U type  
(SAE flange connection)

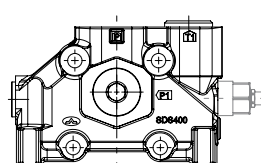
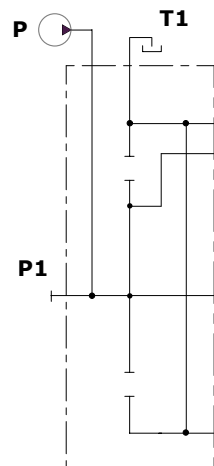


For left inlet directional valve, side port



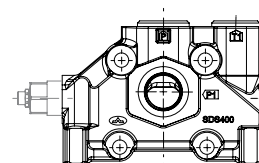
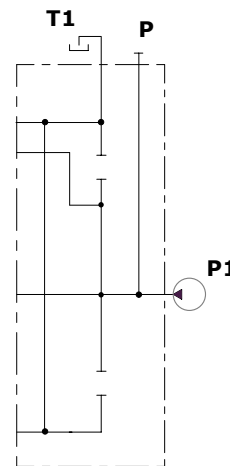
Description example:  
AC(SV)

For left inlet directional valve, upper port



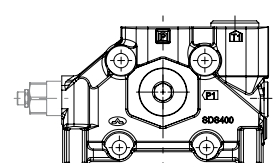
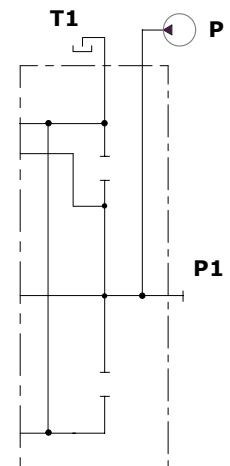
Description example:  
AD(SV)

For right inlet directional valve, side port



Description example:  
BC(SV)

For right inlet directional valve, upper port



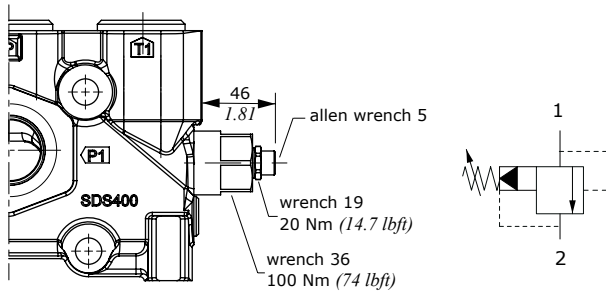
Description example:  
BD(SV)

## Main relief valve

### Pilot operated main relief valve

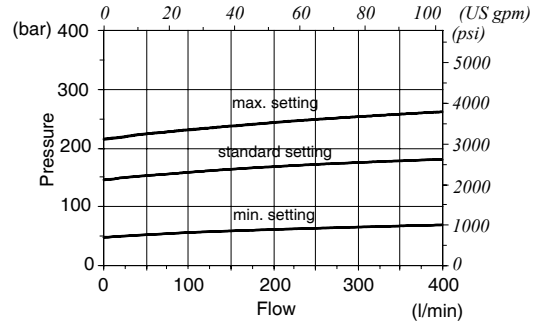
Description example: **X G 3 - 250**

Valve setting (bar)  
Spring type



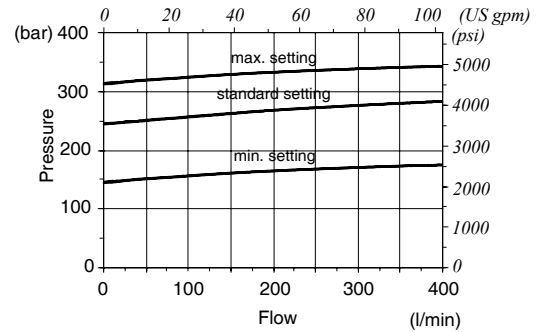
#### XG2 valve setting range

From 50 to 220 bar (725-3200 psi)



#### XG3 valve setting range

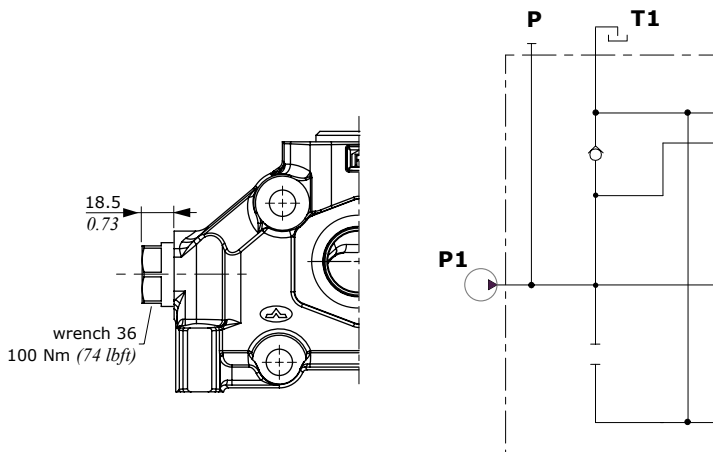
From 150 to 350 bar (2200-5100 psi)



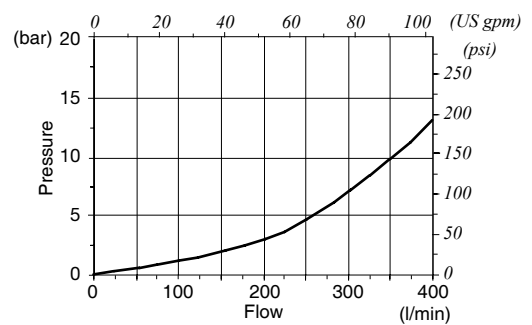
## Inlet relief valve options

### Anticavitation valve

Description example: AC (XG3 - 150) F



#### Pressure drop T1 ⇒ P





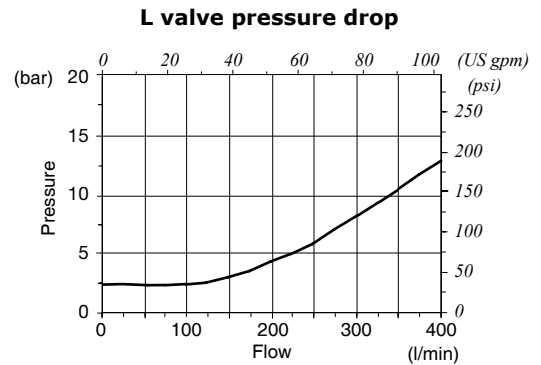
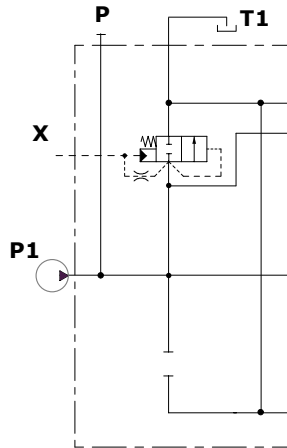
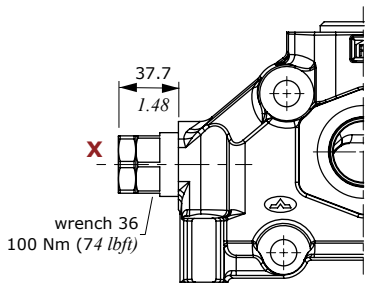
Inlet relief valve options

Unloader valves

Description example: AC (XG3 - 150) L

Hydraulic operated valve: L

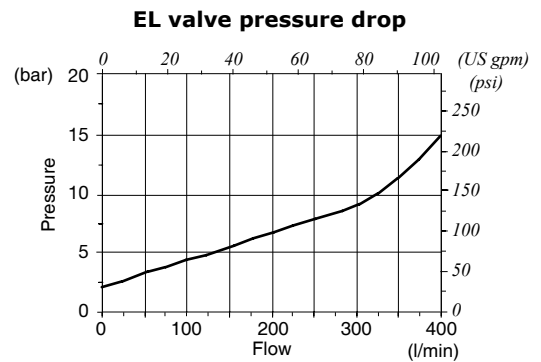
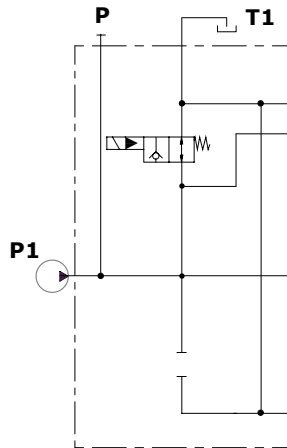
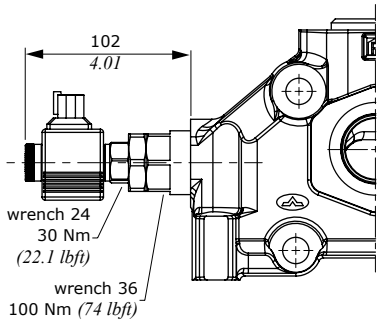
Solenoid operated valve: EL



Features

Max. flow . . . . . : 400 l/min - 105 US gpm

Internal leakage . . . . . : from 2 to 18 cm<sup>3</sup>/min @ 100 bar  
(from 0.12 to 1.1 in<sup>3</sup>/min @ 1450 psi)

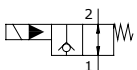


Features

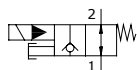
Max. flow . . . . . : 400 l/min (105 US gpm)

Internal leakage . . . . . : from 2 to 18 cm<sup>3</sup>/min @ 100 bar  
(from 0.12 to 1.1 in<sup>3</sup>/min @ 1450 psi)

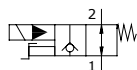
**ELN:** without emergency



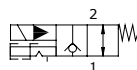
**ELP:** push button type



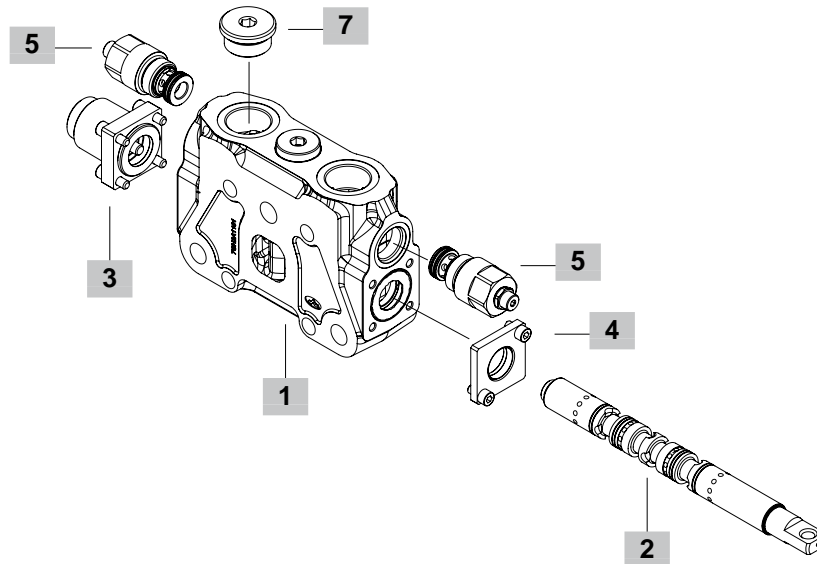
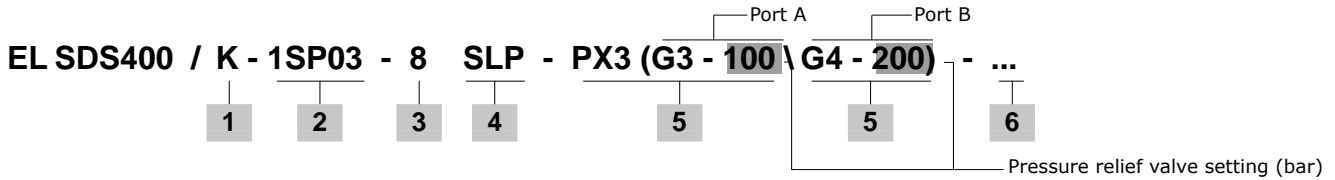
**ELV:** screw type



**ELT:** "push & twist" type



## Parts ordering codes (mechanical control)



### 1 Working section kit \* page 16

TYPE	CODE	DESCRIPTION
<b>P-SAE</b>	5EL1407001	Parallel circuit; standard spool, arranged for port valves ("type" omitted in description)
<b>K-SAE</b>	5EL1407201	For series and series-parallel circuit; arranged for port valves, need spool type <b>1S</b> for series circuit and spool type <b>1SP</b> for series-parallel circuit
<b>P-FS3U</b>	5EL1407900	As type P with SAE J518 code 61 flange connection
<b>K-FS3U</b>	5EL1407903	As type K with SAE J518 code 61 flange connection

#### For floating circuit

Needs dedicated positioners (**13-14**) and spools (**5RSA-5RSB**); for left and right inlet combinations see page 20

<b>P5Y</b>	5EL1407200	Arranged for port valves
<b>P5W</b>	5EL1407700	Arranged for port valves
<b>P5Y-FS3U</b>	5EL1407901	As type P5Y with SAE J518 code 61 flange connection
<b>P5W-FS3U</b>	5EL1407902	As type P5W with SAE J518 code 61 flange connection

**2 Spools <sup>(1)</sup> page 18**

TYPE	CODE	DESCRIPTION
<b>101</b>	3CU2810000	Double acting, 3 positions, with A and B closed in neutral position Q=200 l/min (53 USgpm)
<b>102</b>	3CU2810001	As previous Q=300 l/min (79 USgpm)
<b>103</b>	3CU2810002	As previous Q=400 l/min (106 USgpm)
<b>201</b>	3CU2825000	Double acting, 3 positions, with A and B open to tank in neutral position Q=200 l/min (53 USgpm)
<b>202</b>	3CU2825001	As previous Q=300 l/min (79 USgpm)
<b>203</b>	3CU2825002	As previous Q=400 l/min (106 USgpm)
<b>2H03</b>	3CU2824002	Double acting, 3 positions, with A and B partially connected to tank in neutral position Q=400 l/min (106 USgpm)
<b>303</b>	3CU2831000	Single acting on A, 3 positions, B plugged Q=400 l/min (106 USgpm)
<b>1S</b>	3CU2810100	Series spool, double acting, 3 positions, with A and B closed in neutral position
<b>2S</b>	3CU2825100	Series spool, double acting, 3 positions, with A and B open to tank in neutral position
<b>1SP01</b>	3CU2813000	Series-parallel spool, double acting, 3 positions, with A and B closed in neutral position Q=200 l/min (53 USgpm)
<b>1SP02</b>	3CU2813001	As previous Q=300 l/min (79 USgpm)
<b>1SP03</b>	3CU2813002	As previous Q=400 l/min (106 USgpm)

**For floating circuit**

Needs dedicated sections (**P5Y-P5W**) positioners (**13-14**); for left and right inlet combinations see page 20

<b>5RSA01</b>	3CU2844000	Double acting spool with A and B closed in neutral position, 4 positions, floating 4 <sup>th</sup> position, with spool in, restricted on port A return flow Q=200 l/min (53 USgpm)
<b>5RSA02</b>	3CU2844001	As previous Q=300 l/min (79 USgpm)
<b>5RSA03</b>	3CU2844002	As previous Q=400 l/min (106 USgpm)
<b>5RSB01</b>	3CU2844003	Double acting spool with A and B closed in neutral position, 4 positions, floating 4 <sup>th</sup> position, with spool out, restricted on port B return flow Q=200 l/min (53 USgpm)
<b>5RSB02</b>	3CU2844004	As previous Q=300 l/min (79 USgpm)
<b>5RSB03</b>	3CU2844005	As previous Q=400 l/min (106 USgpm)

**3 "A" side spool positioner page 20**

TYPE	CODE	DESCRIPTION
<b>8</b>	5V0810B000	3 positions with spring return in neutral position
<b>11</b>	5V1110B000	3 positions, detent in all positions
<b>13</b>	5V1310B000	4 positions with spring return in neutral position, detent in 4 <sup>th</sup> position with spool-in; <b>need spool 5RSA</b>
<b>13C</b>	5V1310B001	4 positions with spring return in neutral position, detent in 4 <sup>th</sup> position with spool-out; <b>need spool 5RSB</b>
<b>14</b>	5V1410B000	4 positions, detent in all position. 4 <sup>th</sup> position with spool-in; <b>need spool 5RSA</b>
<b>14C</b>	5V1410B001	4 positions, detent in all position. 4 <sup>th</sup> position with spool-out; <b>need spool 5RSB</b>

**4 "B" side options page 22**

TYPE	CODE	DESCRIPTION
<b>LB1-3</b>	5LEV30B000	Open steel lever for positioner <b>type 8-11-13C-14C</b>
<b>LBF1-3</b>	5LEV30B001	Open steel lever for positioner <b>type 13-14</b>
<b>SLP</b>	5COP140000	Without lever, with dust-proof plate positioner <b>type 8-11-13C-14C</b>
<b>SLPF</b>	5COP140001	Without lever, with dust-proof plate positioner <b>type 13-14</b>

**5 Port valves page 25**

Valves standard setting is referred to 10 l/min - 2.64 USgpm flow

TYPE	CODE	DESCRIPTION
<b>UT</b>	XTAP540110	Blanking plug for ports A and B
<b>C</b>	X33132A000	Anticavitation valve
<b>UX(G-160)</b>	X331421160	Pilot anti-shock and anticavitation valve Setting range 50-350 bar (725-5100 psi) Standard setting 160 bar (2300 psi)

**Pilot operated antishock valves**

<b>PX(G2-150)</b>	X33121B150	Setting range 50-220 bar (725-3200 psi) Standard setting 150 bar (2200 psi)
<b>PX(G3-250)</b>	X33121B250	Setting range 150-350 bar (2200-5100 psi) Standard setting 250 bar (3600 psi)

**Antishock valves**

<b>P(YG3-175)</b>	X331129175	Setting range 100-200 bar (1450-2900 psi) Standard setting 175 bar (2500 psi)
<b>P(YG4-250)</b>	X331129250	Setting range 150-315 bar (2200-4600 psi) Standard setting 250 bar (3600 psi)

**6 Ports threading page 4**

Specify only if different from standard **BSP** thread (see page 4), for flange connection according to SAE J518 code 61, indicate: **FS3U**.

**7 Plug for single acting spool \***

CODE	DESCRIPTION
3XTAP848220	SAE20 plug
4FL1080211	1-1/4 blind flange

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

(1) - Spools partially connect to tank type **1RSA** and **1RSB** on request.

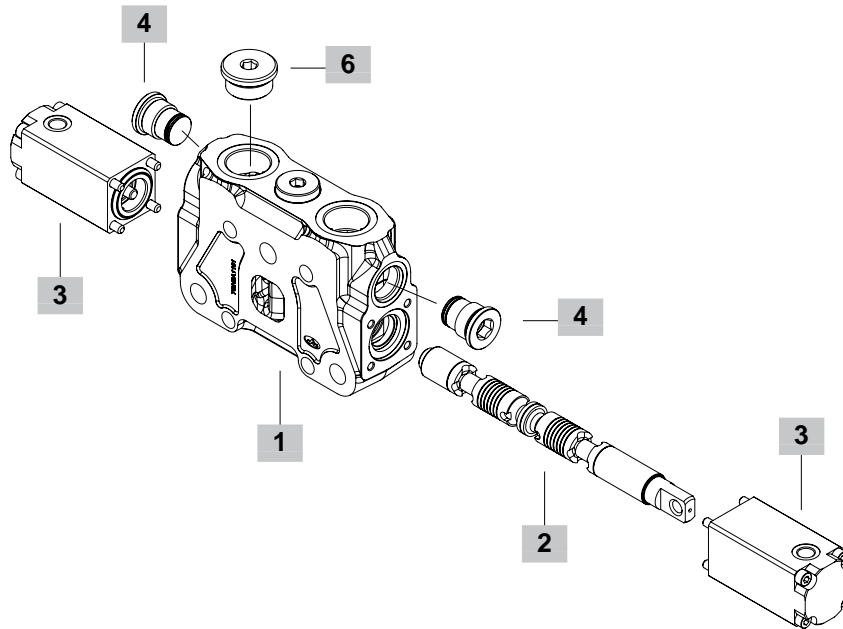
Dedicated spools for applications available on request.

## Parts ordering codes (proportional hydraulic control)

EL SDS400 / (P) - 103 - 8IM ...

P type omitted in description

1	2	3	5
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### 1 Working section kit \* page 17

TYPE	CODE	DESCRIPTION
<b>P(IM)-SAE</b>	5EL1407001A	Parallel circuit; standard spool, arranged for port valves ("type" omitted in description)
<b>K(IM)-SAE</b>	5EL1407700A	For series and series-parallel circuit; arranged for port valves, need spool type <b>1S</b> for series circuit and spool type <b>1SP</b> for series-parallel circuit
<b>P-FS3U(IM)</b>	5EL1407900A	As type P with ISO6162-1 type 1 lange connection
<b>K-FS3U(IM)</b>	5EL1407903A	As type K with ISO6162-1 type 1 lange connection

#### For floating circuit

Needs dedicated positioner (**13IM**) and spools (**5RSA-5RSB**); for left and right inlet combinations see page 20

<b>P5Y(IM)</b>	5EL1407200	Arranged for port valves
<b>P5Y-FS3U(IM)</b>	5EL1407901	As type P5Y with ISO6162-1 type 1 flange connection

### 2 Spools page 18

See page 14

### 3 Complete controls \* page 23

TYPE	CODE	DESCRIPTION
<b>8IM</b>	5IDR20B700	Double side proportional hydraulic control with spring return to neutral
<b>13IM</b>	5IDR20B710	Double side proportional hydraulic control with spring return to neutral, for floating circuit with spool-in. <b>Need spool 5RSA</b>

### 4 Port valves page 25

See page 15

### 5 Ports threading page 4

Specify only if different from standard **BSP** thread (see page 4), for flange connection according to SAE J518 code 61, indicate: **FS3U**.

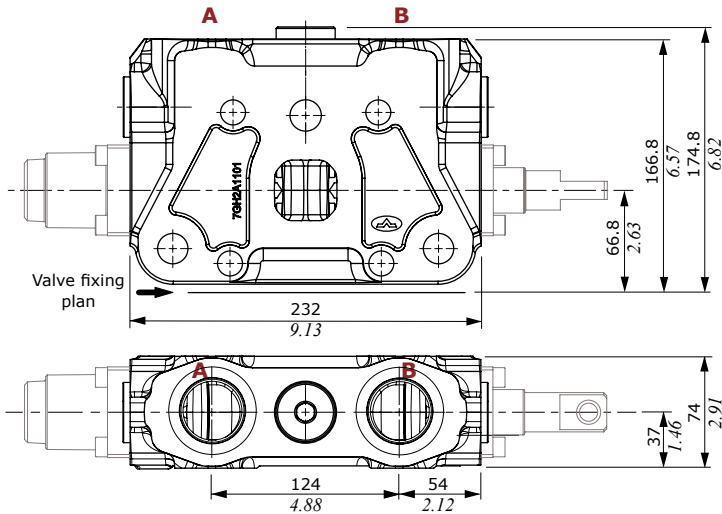
### 6 Plug for single acting spool \*

CODE	DESCRIPTION
3XTAP848220	Plug SAE 20
4FL1080211	1 1/4 blind flange

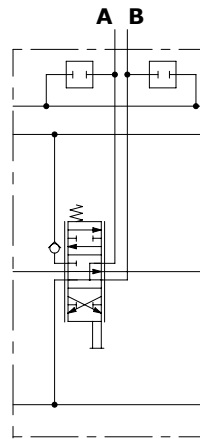
NOTE (\*) - Codes are referred to **UN-UNF** thread.

Dimensional data and hydraulic circuit

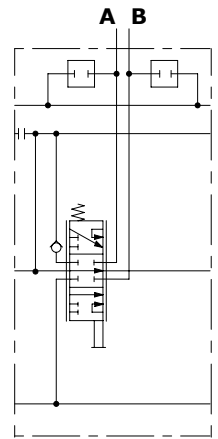
Type P/K



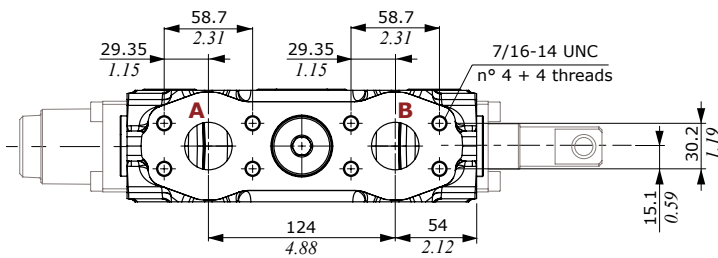
Type P



Type K



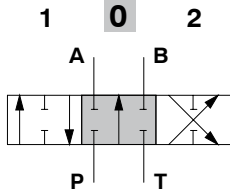
Type P/K-FS3U  
(SAE flange connection)



Spools

**Type 1 (101/102/103) spool**

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

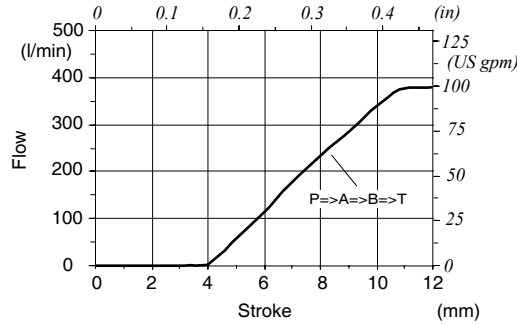


**Spool stroke**

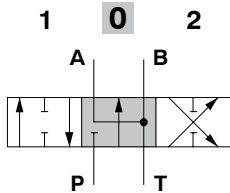
position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

**Type 1 spool metering**

$Q_{in} = 400 \text{ l/min} / (105 \text{ US gpm}) - P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$



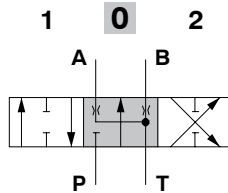
**Type 2 (201/202/203) spool**  
Double acting, 3 positions, with A and B open to tank in neutral position



**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

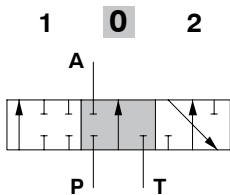
**Type 2H (2H03) spool**  
Double acting, 3 positions, with A and B partially connected to tank in neutral position



**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

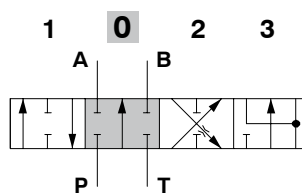
**Type 3 (303) spool**  
Single acting on A, 3 positions, B plugged



**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

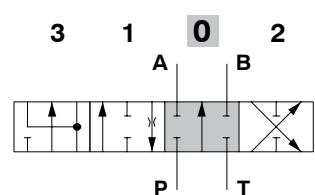
**Type 5RSA (01/02/03) spool**  
Double acting spool with A and B closed in neutral position, 4 positions, with spool in, floating 4th position, restricted on port A return flow



**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)  
position 3: + 20 mm (+0,79 in)

**Type 5RSB (01/02/03) spool**  
Double acting spool with A and B closed in neutral position, 4 positions, with spool out, floating 4th position, restricted on port B return flow

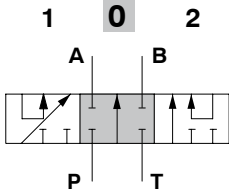


**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)  
position 3: - 20 mm (+0,79 in)

**Type 1S spool**

Series spool, double acting,  
3 positions, with A and B closed in  
neutral position

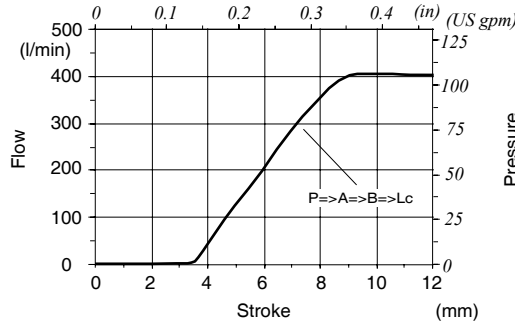


**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

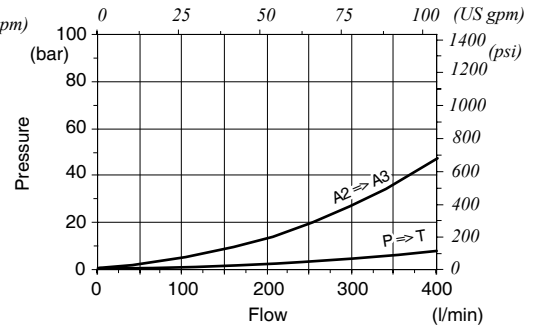
**Type 1S spool metering**

$$Q_{in} = 400 \text{ l/min} / (105 \text{ US gpm}) - P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$$



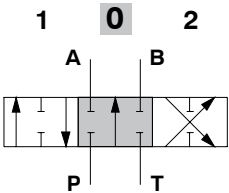
**Type 1S spool pressure drop**

(3 sections, series on section 2)



**Type 1SP (1SP01/1SP02/1SP03) spool**

Series-parallel spool, double acting,  
3 positions, with A and B closed in  
neutral position

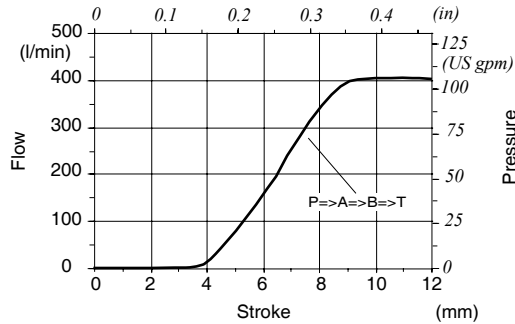


**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

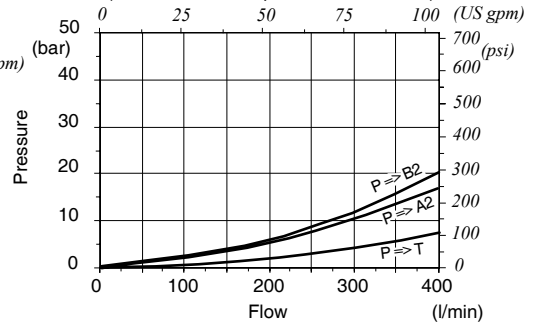
**Type 1SP spool metering**

$$Q_{in} = 400 \text{ l/min} / (105 \text{ US gpm}) - P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$$



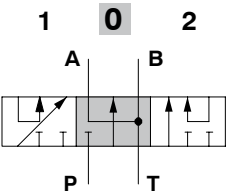
**Type 1SP spool pressure drop**

(3 sections, series-parallel on section 2)



**Type 2S spool**

Series spool, double acting,  
3 positions, with A and B open to  
tank in neutral position

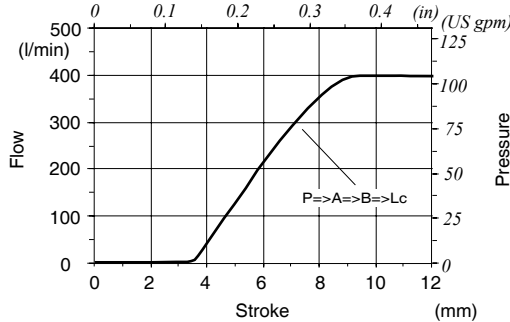


**Spool stroke**

position 1: - 12 mm (-0,47 in)  
position 2: + 12 mm (+0,47 in)

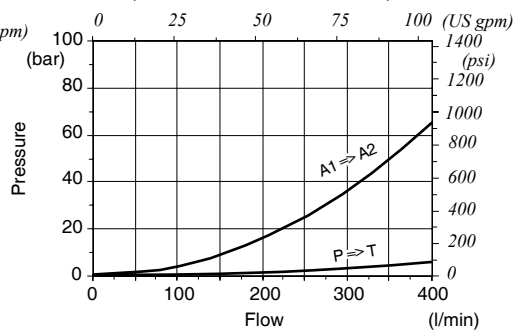
**Type 2S spool metering**

$$Q_{in} = 400 \text{ l/min} / (105 \text{ US gpm}) - P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$$



**Type 2S spool pressure drop**

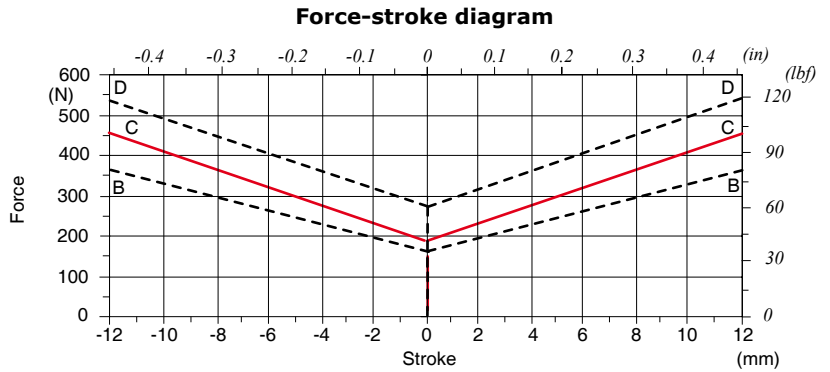
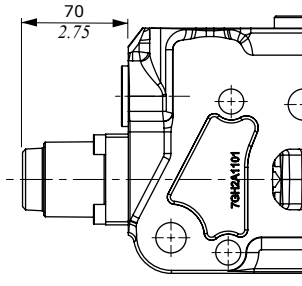
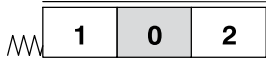
(2 sections, series on section 1)



"A" side spool positioners

**8 type: with spring return**

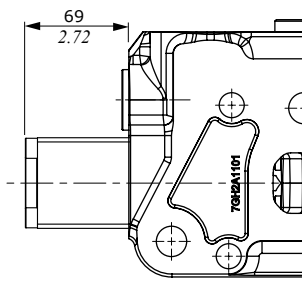
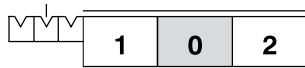
It's supplied with standard spring type C (see force-stroke diagram). Available with spring type B (**8MB** code: 5V0810B004) and type D (**8MD** code: 5V0810B002).



Spring type **B**: stroke 0 = 165 N (37.09 lbf), stroke 12 = 374 N (84.07 lbf)  
 Spring type **C**: stroke 0 = 190 N (42.71 lbf), stroke 12 = 455 N (102.28 lbf)  
 Spring type **D**: stroke 0 = 280 N (62.94 lbf), stroke 12 = 544 N (122.29 lbf)

**11 type: with detent**

Detent in all positions.



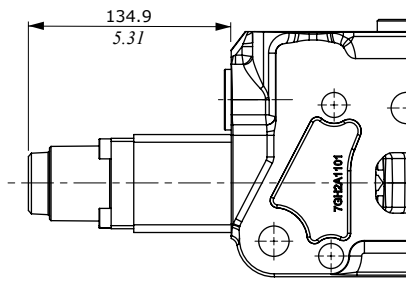
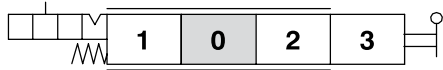


"A" side spool positioners

For floating circuit

13 type

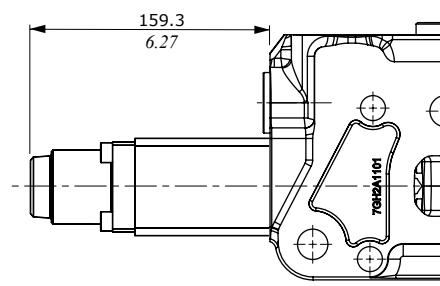
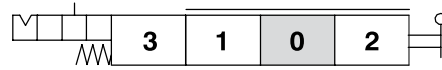
4 positions, spring return in neutral position, detent in 4<sup>th</sup> position with spool in. Needs spool type **5RSA**.



Working section  
**P5Y** cod. 5EL1403200 (left inlet)  
**P5W** cod. 5EL1403201 (right inlet)

13C type

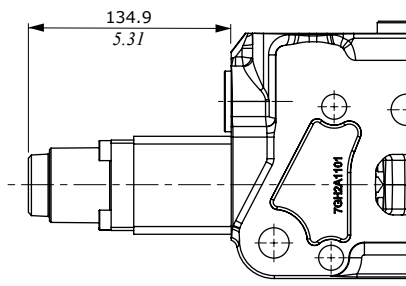
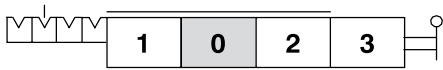
4 positions, spring return in neutral position, detent in 4<sup>th</sup> position with spool out. Needs spool type **5RSB**.



Working section  
**P5W** cod. 5EL1403201 (left inlet)  
**P5Y** cod. 5EL1403200 (right inlet)

14 type

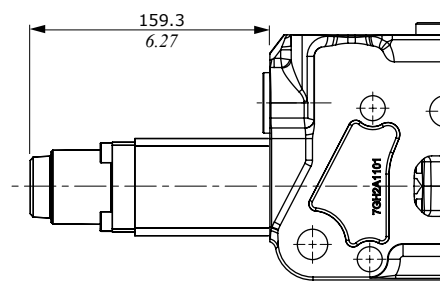
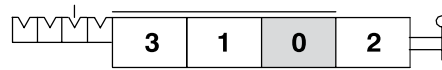
Detent in 4 positions, 4<sup>th</sup> position with spool-in. Needs spool type **5RSA**.



Working section  
**P5Y** cod. 5EL1403200 (left inlet)  
**P5W** cod. 5EL1403201 (right inlet)

14C type

Detent in 4 positions, 4<sup>th</sup> position with spool-out. Needs spool type **5RSB**.

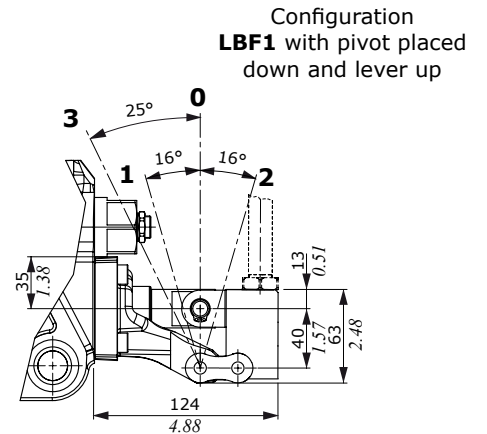
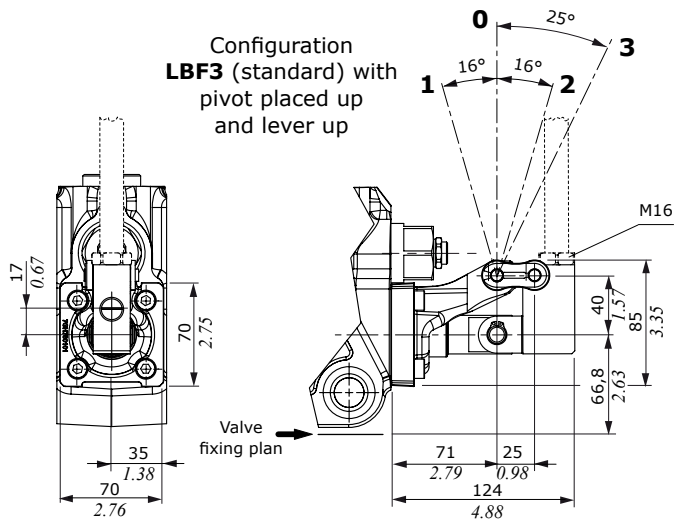
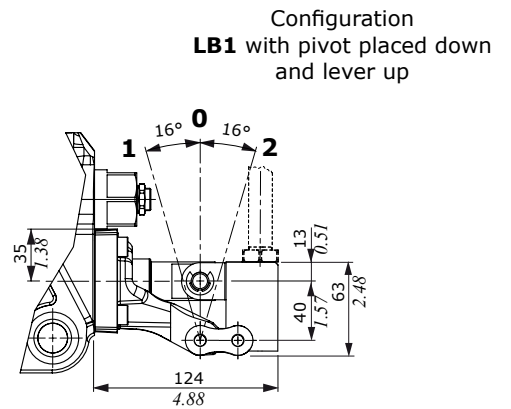
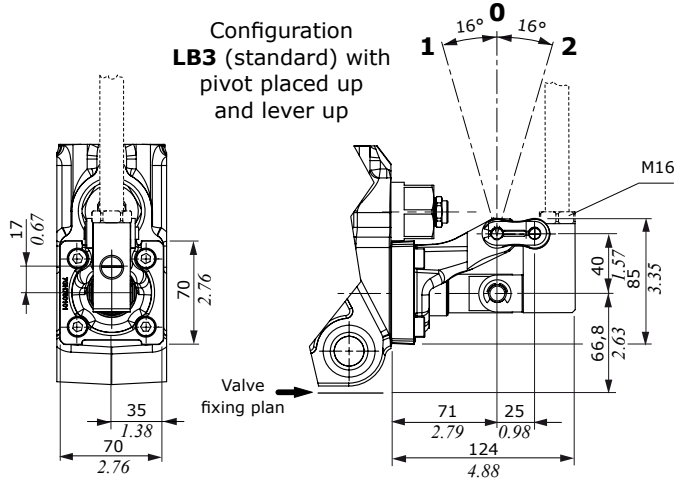
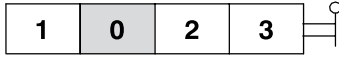


Working section  
**P5W** cod. 5EL1403201 (left inlet)  
**P5Y** cod. 5EL1403200 (right inlet)

**"B" side options**

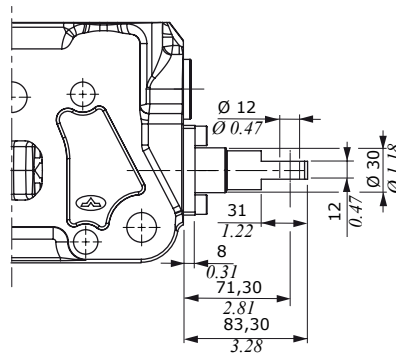
**LB and LBF types: steel lever control**

Type **LB** for positioner type **8-11-13C-14C**. Type **LBF** with seals for positioner type **13** and **14**. Dimensions are the same.



**SLP and SLPF types: dust-proof plate**

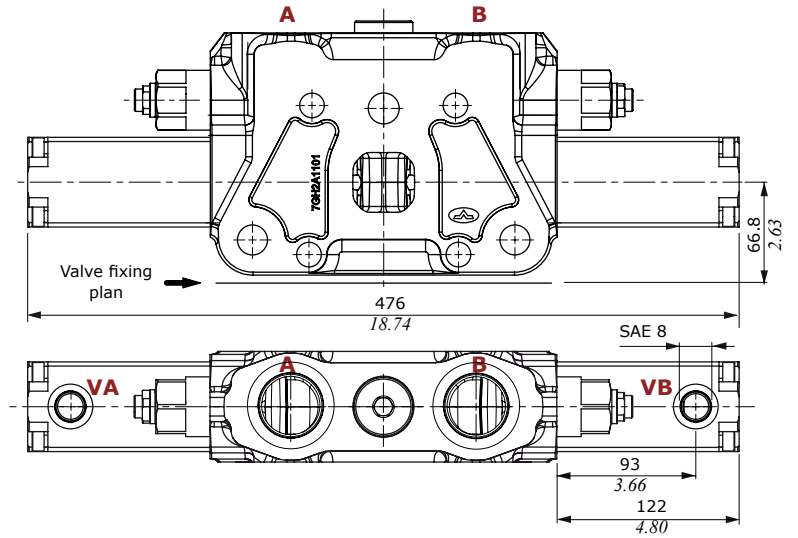
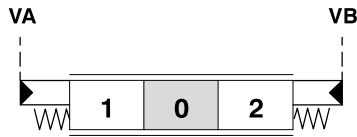
Type **SLP** for positioner type **8-11-13C-14C**. Type **SLPF** with seals for positioner type **13** and **14**. Dimensions are the same.



Proportional hydraulic control

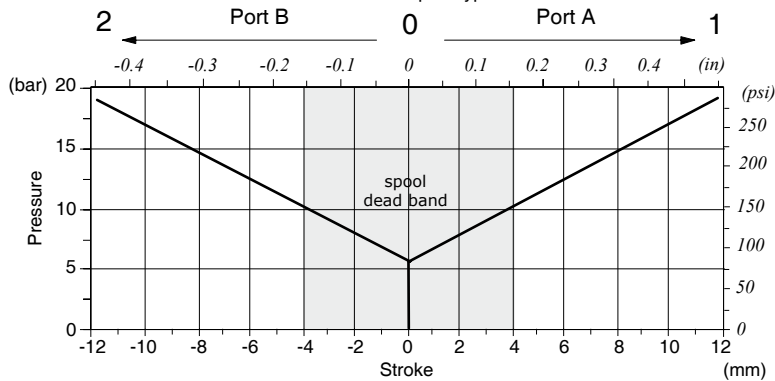
8IM type

Double side proportional hydraulic control with spring return to neutral.

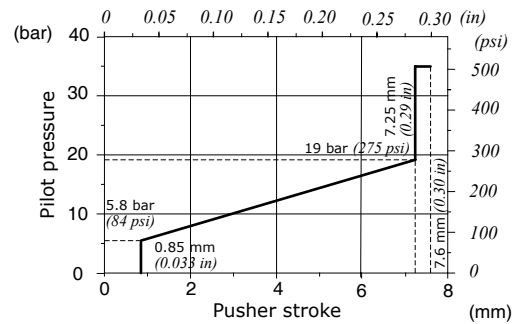


Pressure - stroke diagram

Referred to spool type 1



Pressure control curve on port VA and VB: type 033



Features

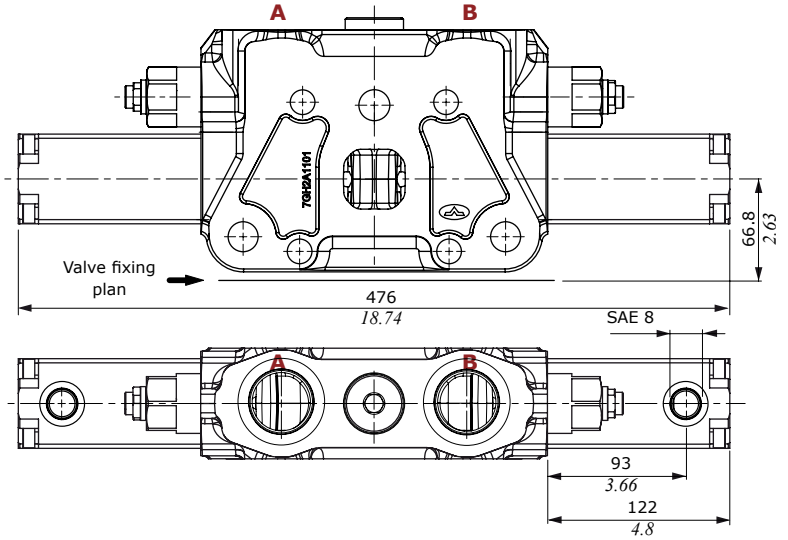
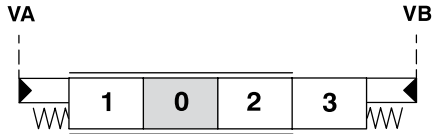
Pilot pressure . . . . . : min. 22 bar (320 psi)  
 max. 100 bar (1450 psi)

## Complete controls

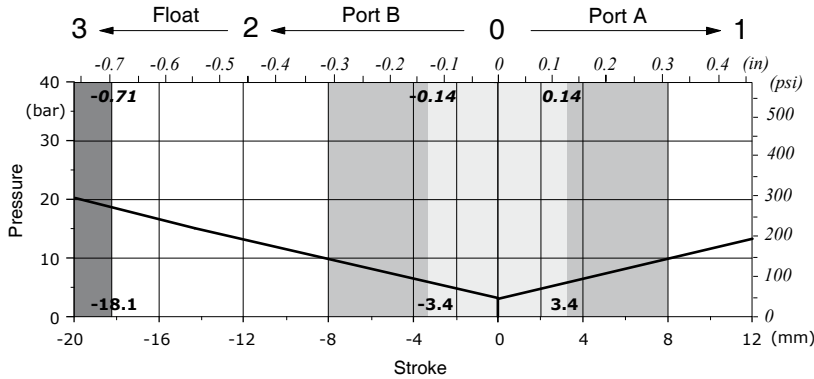
### Proportional hydraulic control

#### 13IM type

Double side proportional hydraulic control with spring return to neutral, for floating circuit.

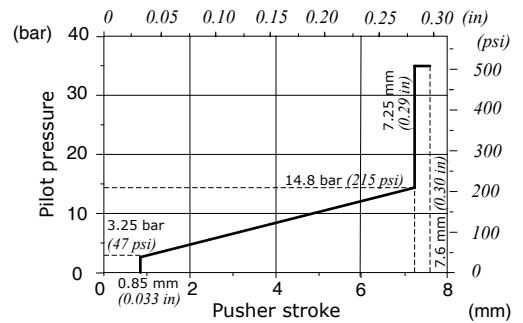


Pressure-stroke diagram

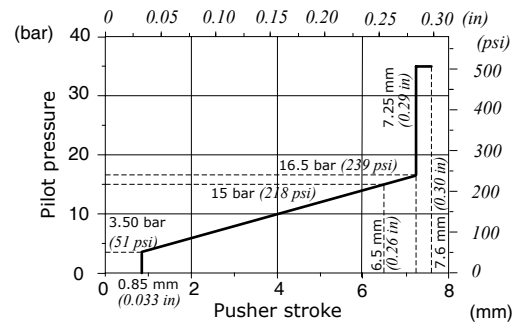


- Floating area
- Metering zone
- Spool dead band

Pressure control curve on position 1: 0010 type



Pressure control curve on position 2 and float: E0096 type



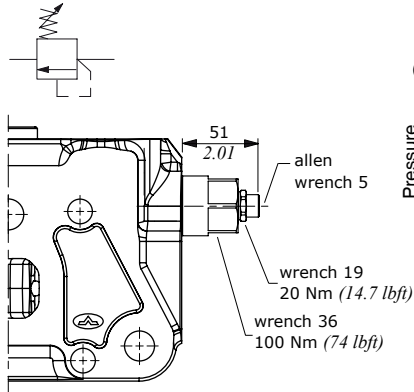
#### Features

Pilot pressure . . . . . : min. 22 bar (320 psi)  
 max. 100 bar (1450 psi)

**Pilot operated antishock valves**

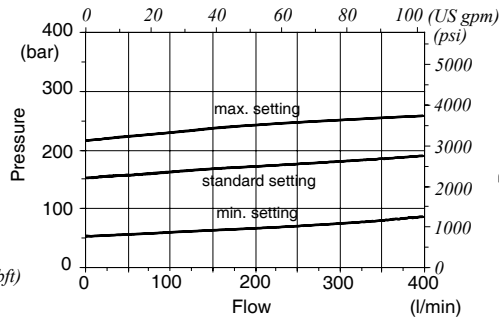
**PX 1 (G3)**

- Setting range
- 1 Mounted on port A
- 2 Mounted on port B
- 3 Mounted on port A and B



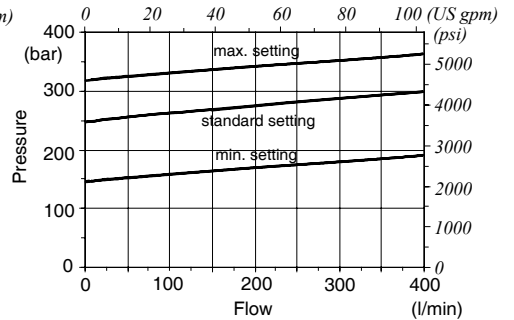
**G2 setting range**

From 50 to 220 bar (from 725 to 3200 psi)



**G3 setting range**

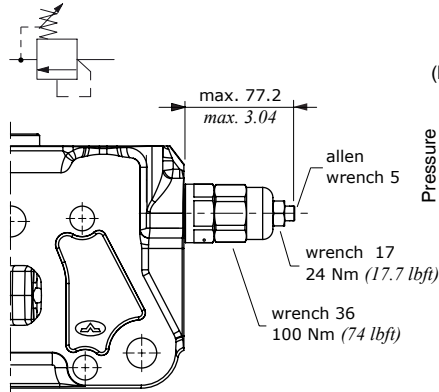
From 150 to 350 bar (from 2150 to 5100 psi)



**Antishock valves**

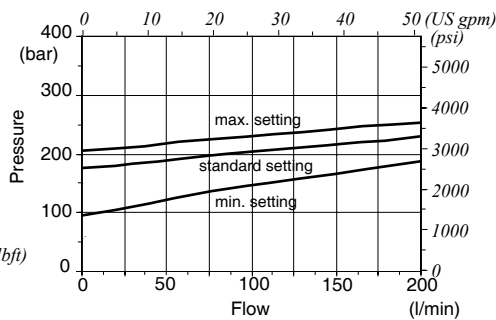
**P 1 (YG4)**

- Setting range
- 1 Mounted on port A
- 2 Mounted on port B
- 3 Mounted on port A and B



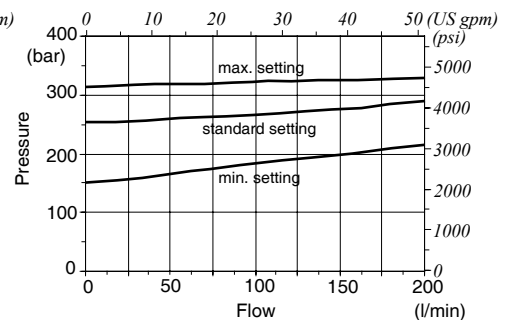
**YG3 setting range**

From 100 to 200 bar (from 1450 to 2900 psi)



**YG4 setting range**

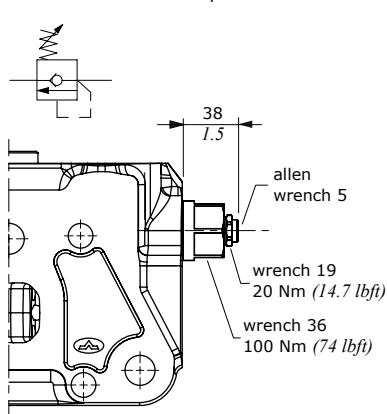
From 150 to 315 bar (from 2200 to 4600 psi)



**Antishock and anticavitation valves**

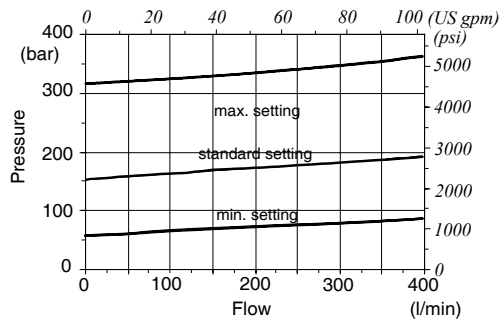
**UX 1**

- 1 Mounted on port A
- 2 Mounted on port B
- 3 Mounted on port A and B

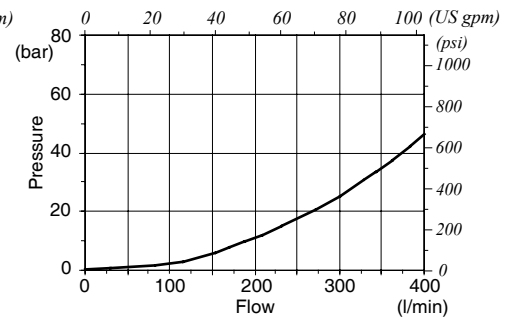


**Setting range**

From 50 to 350 bar (from 725 to 5100 psi)



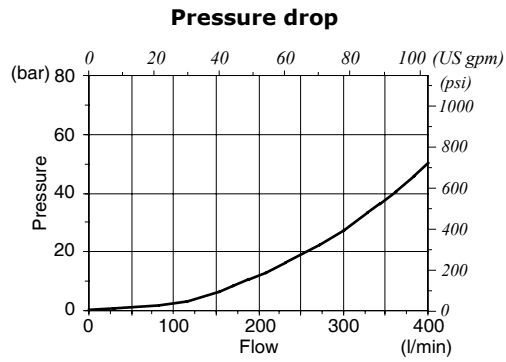
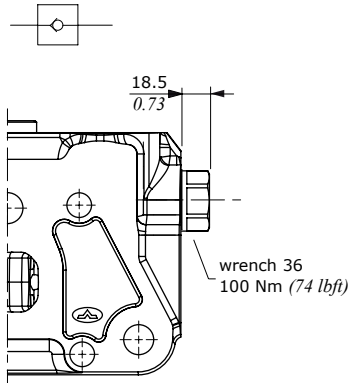
**Pressure drop**



## Anticavitation valves

### C 1

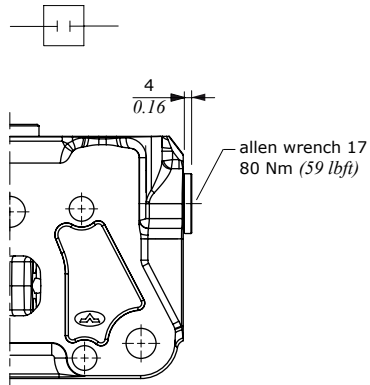
- 1 Mounted on port A
- 2 Mounted on port B
- 3 Mounted on port A and B



## Valve blanking plugs

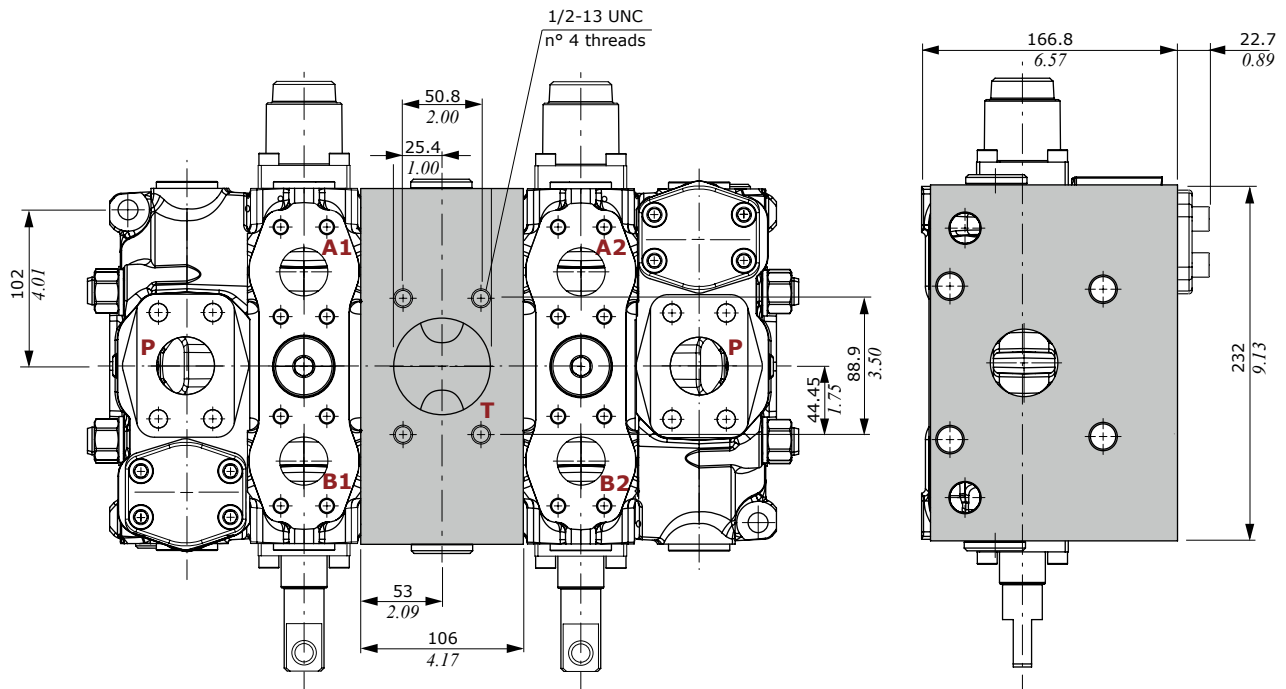
### P 3 T

- 1 Mounted on port A
- 2 Mounted on port B
- 3 Mounted on port A and B

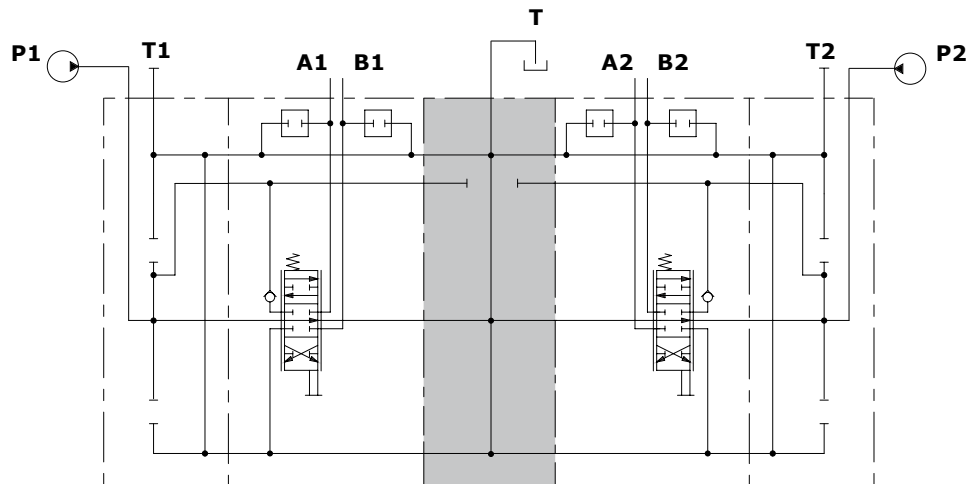


CS1 mid return manifold

Mid return manifold for directional valve with left and right inlet both; it allows 2 independent circuits with common outlet. 2" 1/2 flange connection, according to SAE J518 code 61.



Hydraulic circuit



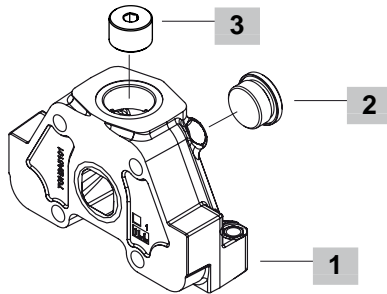
Description example:  
SDS400/2/AD(SV)/18SLP/CS1/18SLP/BC(SV)

### Parts ordering codes

FS SDS400 / RK - ...  
 **4**

#### Available configurations

- RC:** Side outlet
- RD:** Upper outlet
- RDA-FS3U:** Only upper outlet with ISO flange connection
- RDAL-FS3U:** Upper outlet with ISO flange connection and side port plugged
- RE:** Upper outlet and carry-over
- REAL-FS3U:** As type RE with ISO flange connection
- RK:** Closed centre circuit: upper outlet, pressure line plugged



#### 1 Outlet section body \*

CODE	DESCRIPTION
3FIA240700	Outlet section body with threaded ports
3FIA240791	Outlet section body with SAE J518 flange
3FIA240790	Outlet section body with SAE J518 flange connection, without side port

#### 2 Plug

CODE	DESCRIPTION	CODE	DESCRIPTION
4TAP854220	SAE 24 plug	4FL1080211	1-1/4 blind flange

#### 3 Circuit options

CODE	QTY	DESCRIPTION
3TAP640251	1	M39x2 tapered plug for carry-over (RE) and closed centre (RK) options

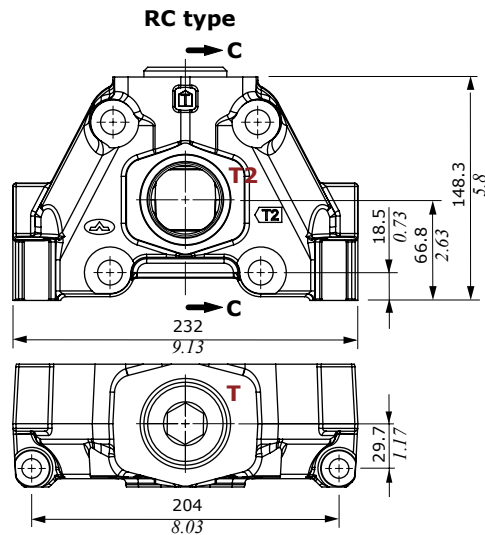
#### 4 Ports threading

page 4

Specify only if different from standard **BSP** thread (see page 4), for flange connection according to SAE J518 code 61, indicate: **FS3U**.

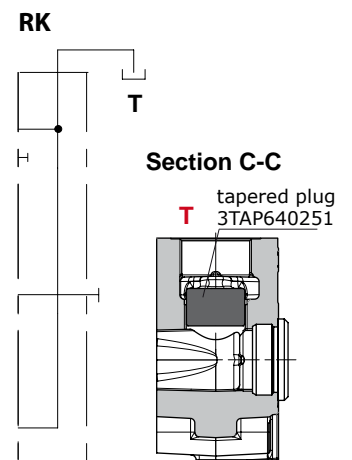
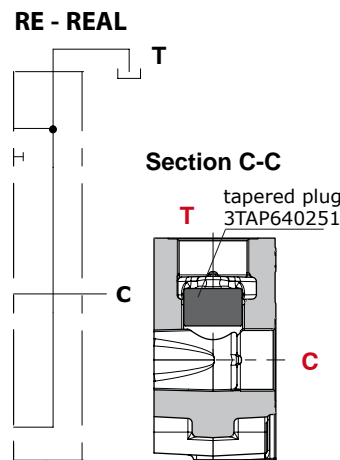
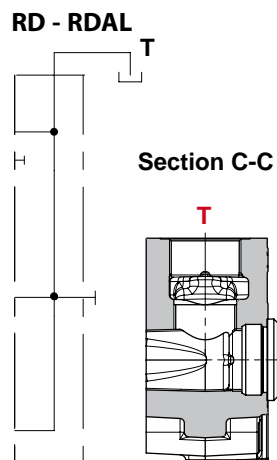
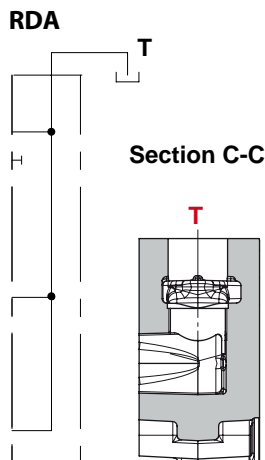
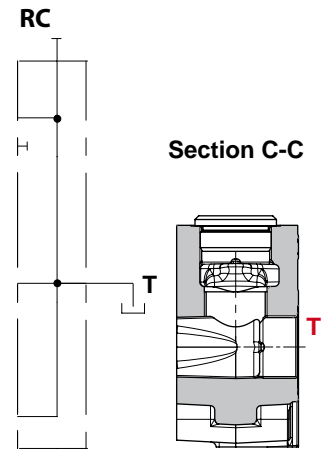
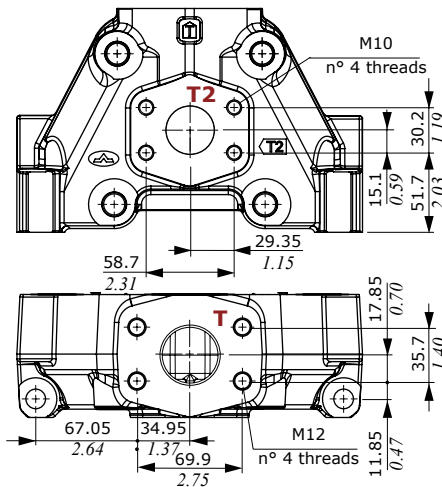
NOTE (\*) - Codes are referred to **UN-UNF** thread.

### Dimensional data and hydraulic circuit



#### REAL-FS3U type (ISO flange connection)

Note: The outlet section body RDE is without side port.



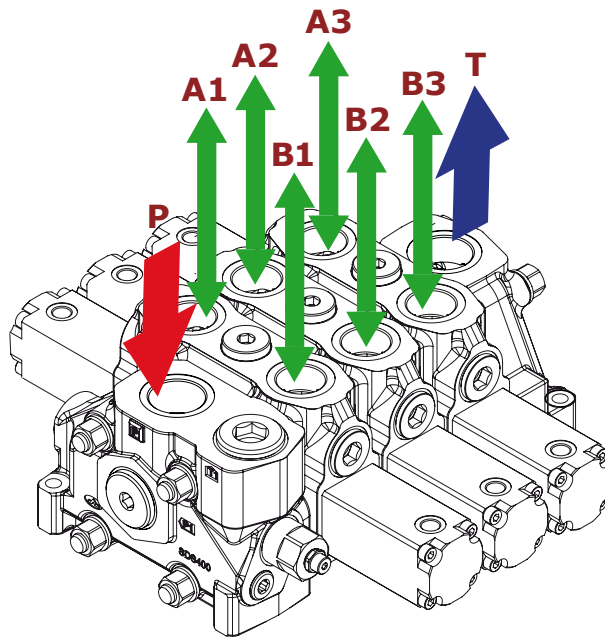


Installation and maintenance

The SDS400 valve is assembled and tested as per the technical specification of this catalogue.

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

- the valve can be assembled in any position; in order to prevent working section deformation and spool sticking mount the product on a flat surface;
- In order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the valve;
- prior to painting, ensure plastic port plugs are tightly in place.



Fitting tightening torque - Nm (lbft)

THREAD TYPE	port P	ports A, B	port T	Hydraulic pilot
BSP	G 1 1/2	G 1 1/4	G 1 1/2	G 3/8
With O-Ring seal	240 (177)	190 (140)	240 (177)	35 (25.8)
With copper washer	240 (177)	190 (140)	240 (177)	35 (25.8)
With steel and rubber washer	240 (177)	190 (140)	240 (177)	35 (25.8)
UN-UNF	1 7/8-12 (SAE 24)	1 5/8-12 (SAE 20)	1 7/8-12 (SAE 24)	3/4-16 (SAE 8)
With O-Ring seal	240 (177)	200 (147)	240 (177)	49 (36.1)
SAE J518 CODE 61 ISO 6162-1 type 1 (bolts threading)	1 1/2 [1/2-13 UNC] DN 38 [M12]	1 1/4 [7/16-14 UNC] DN 32 [M10]	1 1/2 [1/2-13 UNC] DN 38 [M12]	-
	62-79 (47.5-58.3)	48-62 (35.4-45.7)	62-79 (45.7-58.3)	-

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

Coils

Types and ordering codes

Coil type	Voltage	Connectors		
		ISO4400	Deutsch DT	AMP JPT
BER	12VDC	4SLE001200	4SLE00202 4SLE001201 (2)	4SLE001203
	24VDC	4SLE002400 4SLE302400(1)	4SLE002402 4SLE002401 (2)	4SLE002403
	48VDC	4SLE304800(1)	-	-
	110VDC	4SLE311000(1)	-	-
	220VDC	4SLE322000(1)	-	-
	220VDC	4SL1032200 (1)	-	-
<b>Mating connectors</b>		4CN1009995	5CON140031	5CON003

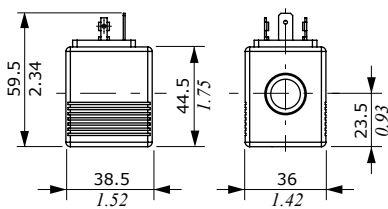
Notes: (1) to use only with rectifier connector - (2) perpendicular type

Voltage	ISO 4400 mating connector with rectifier
	BER type coil
12VDC	-
24VDC	4CN3010240
48VDC	4CN3010480
110VDC	4CN3011100
220VDC	4CN3012200

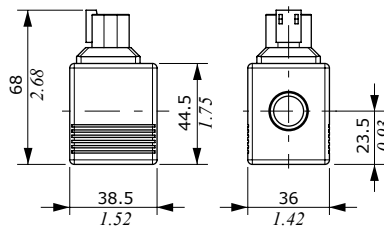
Dimensions and features

BER type

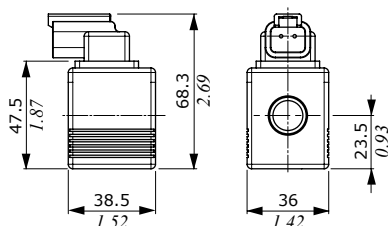
ISO4400 connector



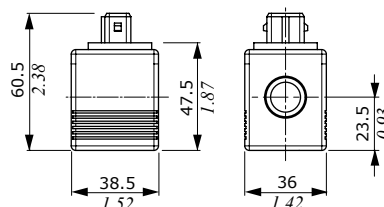
DEUTSCH connector  
(perpendicular type)



DEUTSCH connector  
(parallel type)



AMP JPT connector



Features

- Nominal voltage tolerance. . . . . : ±10%
- Power rating . . . . . : 19.3 W - 12VDC  
: 19.2 W - 24VDC  
: 19.2 W - 48VDC  
: 19.2 W - 110VDC  
: 19.3 W - 220VDC
- Nominal current. . . . . : 1.61 A - 12VDC  
: 0.80 A - 24VDC  
: 0.40 A - 48VDC  
: 0.17 A - 110VDC  
: 0.09 A - 220VDC
- Coil insulation : Class H  
: 180°C (356° F)
- Weather protection. . . . . : IP65 - ISO4400  
: IP69K - Deutsch DT  
: IP65 - AMP JPT
- Insertion. . . . . : 100%





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D1WWEB03A  
9<sup>th</sup> edition November 2019

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