



**SDS 140**  
**Sectional directional**  
**control valves**  
**TECHNICAL CATALOGUE**



## Features

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### SDS140

Simple, compact and heavy duty designed sectional valve from 1 to 12 sections for open and closed centre hydraulic systems.

- Working section type Q and P (with direct and pilot port relief valves).
- Flow unloader system.
- Proportional electrohydraulic controls.
- Load Sensing circuit available.
- Spool position sensors option.

### 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.**

5<sup>th</sup> edition November 2017

### SDS140

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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	standard	90 l/min	24 US gpm
	for AN and AM inlet sections	120 l/min	32 US gpm
Max. pressure		315 bar	4600 psi
Back pressure (max.) on <b>T</b> outlet port	with mechanical devices	10 bar	145 psi
	with hydraulic/pneumatic devices	30 bar	435 psi
	with electrohydraulic devices	10 bar	145 psi
Internal leakage A(B)⇒T (standard)	Δp = 100 bar / 1450 psi	max. 10 cm <sup>3</sup> /min	max. 0.61 in <sup>3</sup> /min
	With port valves Δp = 100 bar / 1450 psi	max. 15 cm <sup>3</sup> /min	max. 0.91 in <sup>3</sup> /min
Fluid		Mineral base 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		-/19/16 - ISO 4406	NAS 1638 - class 10
Environmental temperature for working conditions	with mechanical devices	from -40°C to 60°C	from -40°F to 140°F
	with hydraulic/pneumatic devices	from -30°C to 60°C	from -22°F to 140°F
	with electrohydraulic devices	from -30°C to 50°C	from -4°F to 122°F
Tie rod tightening torque (wrench 13)		30 Nm	22 lbft

NOTE - For different conditions please contact our Sales Dept.

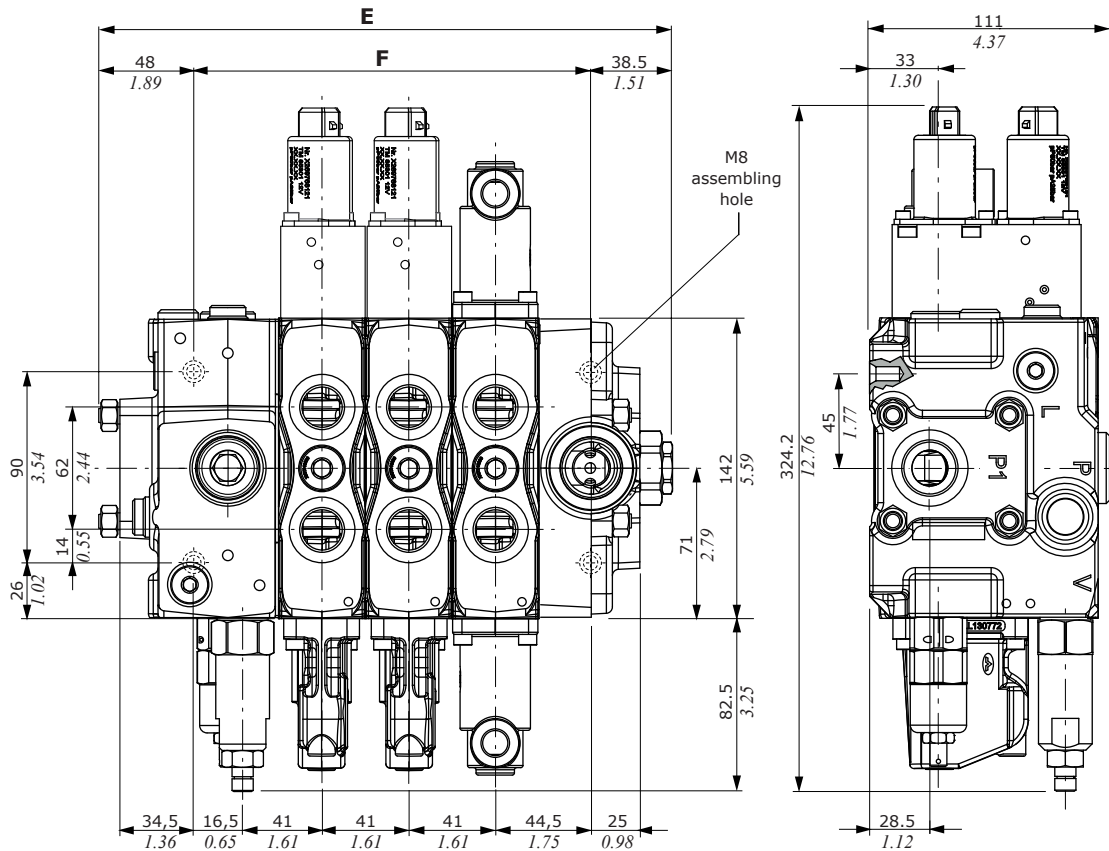
### Standard threads

REFERENCE STANDARD					
	BSP	UN-UNF	METRIC (*)	METRIC ISO (*)	NPTF
THREAD	ISO 228/1	ISO 263	ISO 262	ISO 262	ANSI B1.20.3
ACCORDING TO	BS 2779	ANSI B1.1 unified			
CAVITY	ISO 1179-1	11926-1	9974-1	6149	
DIMENSION	SAE	J1926-1		J2244	J476a
ACCORDING TO	DIN 3852-2, X or Y shape		3852-2, X or Y shape	3852-1, X or Y shape	

NOTE (\*) - Metric threading is available on request.

PORT THREADING			
MAIN PORTS	BSP	UN-UNF	METRIC
<b>P</b> inlet	G 3/4	7/8-14 (SAE 12)	M27x2
<b>A</b> and <b>B</b> ports	G 1/2	3/4-16 (SAE 8)	M22x1.5
<b>T</b> outlet and <b>C</b> carry-over	G 3/4	1 1/6-12 (SAE 12)	M27x2
PILOT PORTS			
Hydraulic	G 1/4	9/16-18 (SAE 6)	G 1/4
Pneumatic	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

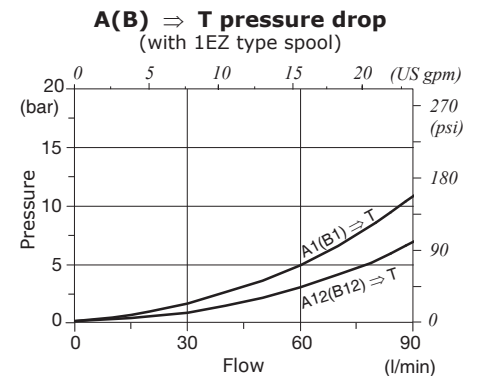
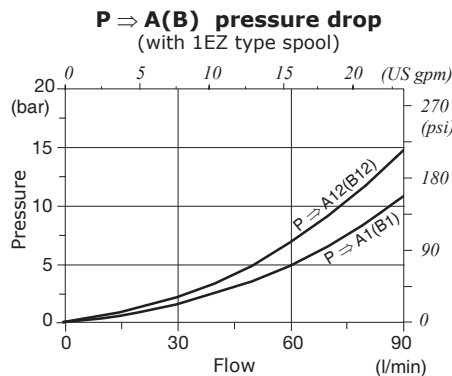
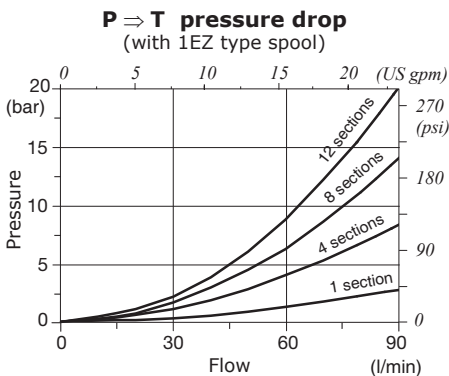


NOTES - Drawings and dimensions are referred to **BSP** thread configuration.  
For assembling hole of different inlet sections see related pages.

TYPE	E		F		Weight	
	mm	in	mm	in	Kg	lb
SDS140/1	188.5	7.42	102	4.01	15.2	33.51
SDS140/2	229.5	9.03	143	5.63	19.4	42.77
SDS140/3	270.5	10.65	184	7.24	23.6	52.03
SDS140/4	311.5	12.26	225	8.86	27.8	61.29
SDS140/5	352.5	13.88	266	10.47	32	70.55
SDS140/6	393.5	15.49	307	12.09	36.2	79.81

TYPE	E		F		Weight	
	mm	in	mm	in	Kg	lb
SDS140/7	434.5	17.11	348	13.7	40.4	89.07
SDS140/8	475.5	18.72	389	15.23	44.6	98.33
SDS140/9	516.5	20.33	430	16.93	48.8	107.58
SDS140/10	557.5	21.95	471	18.54	53	116.84
SDS140/11	598.5	23.56	512	20.16	57.2	126.1
SDS140/12	639.5	25.18	553	21.77	61.4	135.36

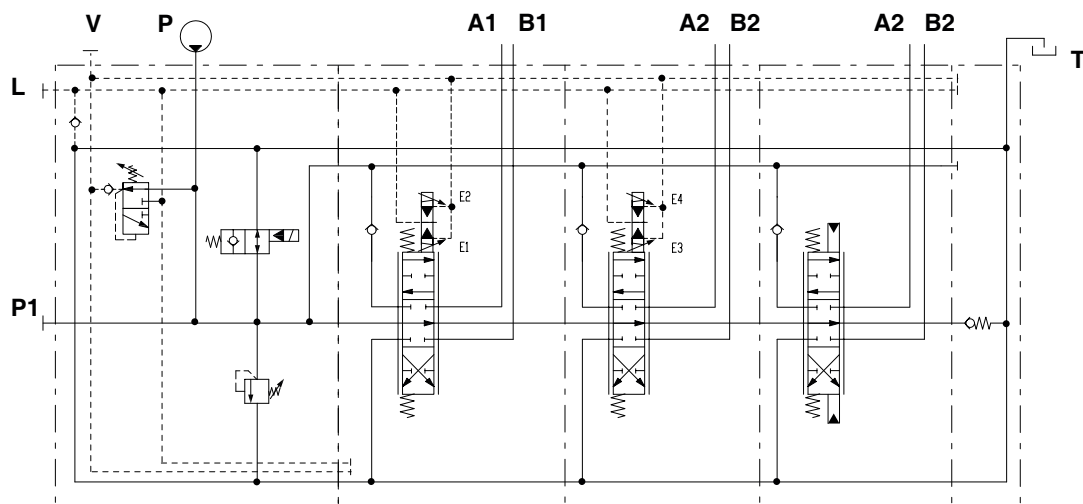
Performance data



### Hydraulic circuit

#### Parallel circuit

Example of configuration, open centre circuit.

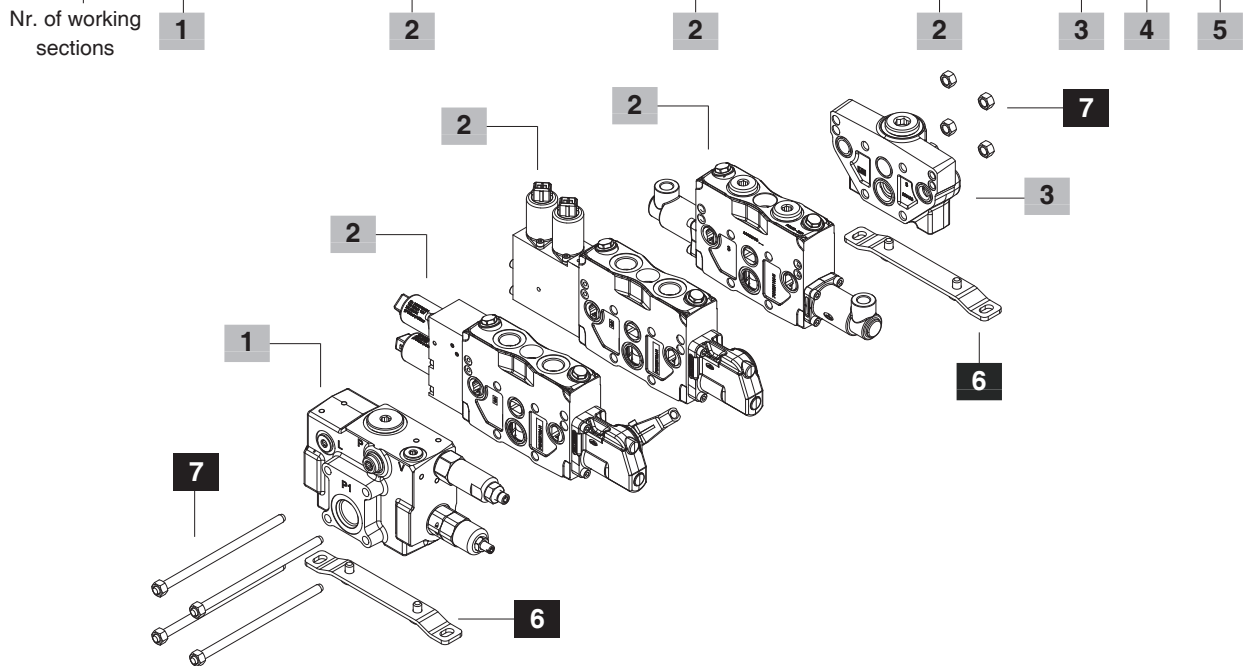


Description example:

SDS140/3/AD(YG3-175/ELNW)/QZ-1EZ8EZH3SLCQ/QZ-1EZ8EZH3SLCQ/QA-1M8IM/RVC-12VDC

Complete section ordering codes

SDS140 / 3 / AC(YG3-175) / PZ-1EZ8EZH3LQ.U3T / PZ-1EZ8EZ3SLCQ.U3T / PA1M8IM.U3T / RVC - .... - 12VDC



**1 Inlet section \*** page 8

TYPE: **AC(YG3-175)** CODE: 61D201000  
 DESCRIPTION: Side inlet port, with direct pressure relief valve and pressure reducing valve, pilot V and drain L ports plugged  
 TYPE: **ADT(SV)** CODE: 61D201001  
 DESCRIPTION: With upper inlet and side outlet ports, without pressure relief valve, with pressure reducing valve, pilot V and drain L ports plugged  
 TYPE: **AP-D(0.7)-SB8-Q40(XGM-270\ELNW)-12VDC** CODE: 61D201002  
 DESCRIPTION: With LS priority valve, pilot pressure relief valve, pressure reducing valve, unloading valve, upper inlet port and LS port open, pilot V and drain L ports plugged  
 TYPE: **AM(TGW3-175\ESFPW(NC)-12VDC)** CODE: 61D201003  
 DESCRIPTION: With compensator for open centre circuit, upper inlet and outlet port open, with LS relief valve, pressure reducing valve, unloading valve, pilot V and drain L ports plugged

**3 Outlet section \*** page 30

TYPE	CODE	DESCRIPTION
<b>RF</b>	61D301000	With side and upper outlet ports plugged
<b>RFC</b>	61D301004	As RF for M inlet section
<b>RC</b>	61D301001	With side port open, upper port plugged
<b>RVC</b>	61D301002	With back pressure valve, upper port open

**6 Fixing bracket \*\*** page 35

TYPE	CODE	DESCRIPTION
<b>STAF</b>	5STA125190	For AC, AD, ADT and AP inlet sections, with fixing screws
<b>STAF</b>	5STA125191	For AN ad AM inlet sections with fixing screws

NOTES (\*) - Codes are referred to **BSP** thread.  
 (\*\*) - For fixing bracket of AN and AM inlet section please contact our Sales Dept  
 For right inlet section please contact our Sales Dpt.

**2 Working section \*** page 18

TYPE: **PZ-1EZ8EZH3LQ.U3T-12VDC** CODE: 61D101000  
 DESCRIPTION: Parallel circuit arranged for port valves, horizontal electrohydraulic control, with lever  
 TYPE: **QZ-1EZ8EZH3SLCQ-12VDC** CODE: 61D101001  
 DESCRIPTION: Parallel circuit, without port valves, vertical electrohydraulic control, without lever  
 TYPE: **PZ-1EZ8EZ3SLCQ.U3T-12VDC** CODE: 61D101002  
 DESCRIPTION: Parallel circuit arranged for port valves, vertical electrohydraulic control, without lever  
 TYPE: **PA-1M8IM.U3T** CODE: 61D101003  
 DESCRIPTION: Parallel circuit arranged for port valves, proportional hydraulic control

**4 Valve threading**

Specify only if it is different from BSP standard (see page 4)

**5 Voltage** page 33

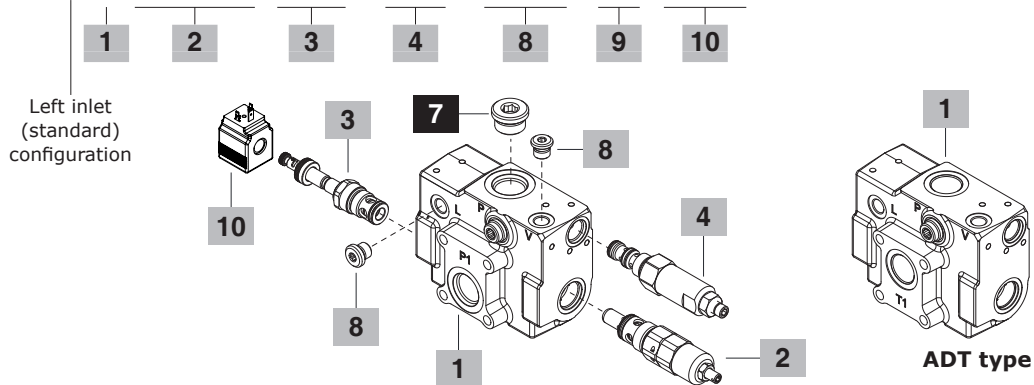
Coils voltage specification; for list of available coils see related pages

**7 Assembling kit**

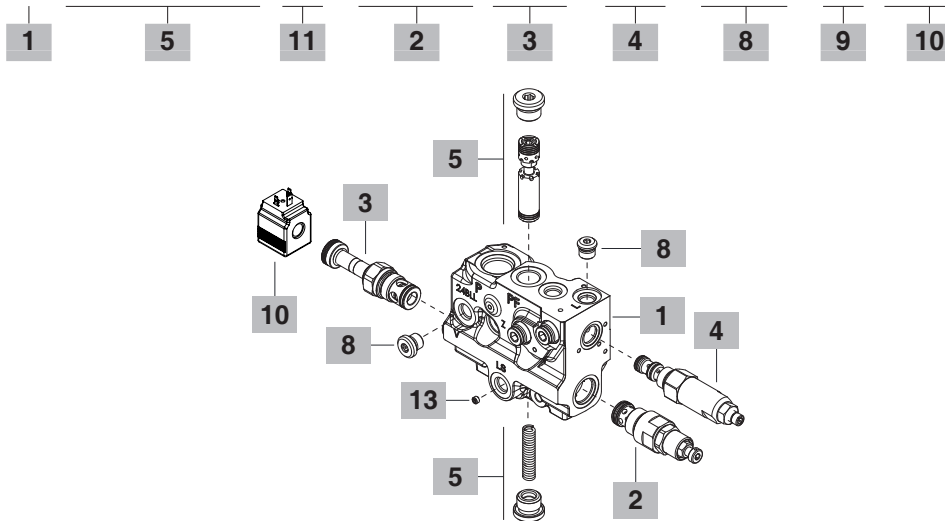
CODE	DESCRIPTION	CODE	DESCRIPTION
<b>For AD, AC, ADT, AN and AM inlet sections</b>			
5TIR108169	For 1 section valve	5TIR108415	For 7 sections valve
5TIR108210	For 2 sections valve	5TIR108456	For 8 sections valve
5TIR108251	For 3 sections valve	5TIR108497	For 9 sections valve
5TIR108292	For 4 sections valve	5TIR108538	For 10 sections valve
5TIR108333	For 5 sections valve	5TIR108579	For 11 sections valve
5TIR108374	For 6 sections valve	5TIR108620	For 12 sections valve
<b>For AP inlet section</b>			
5TIR108138	For 1 section valve	5TIR108382	For 7 sections valve
5TIR108177	For 2 sections valve	5TIR108424	For 8 sections valve
5TIR108220	For 3 sections valve	5TIR108465	For 9 sections valve
5TIR108262	For 4 sections valve	5TIR108506	For 10 sections valve
5TIR108301	For 5 sections valve	5TIR108547	For 11 sections valve
5TIR108342	For 6 sections valve	5TIR108588	For 12 sections valve

## Part ordering codes

FE SDS140 / A C (YG3-175 \ ELTW) - R(32) - TAP(VL) - ..... - 12VDC

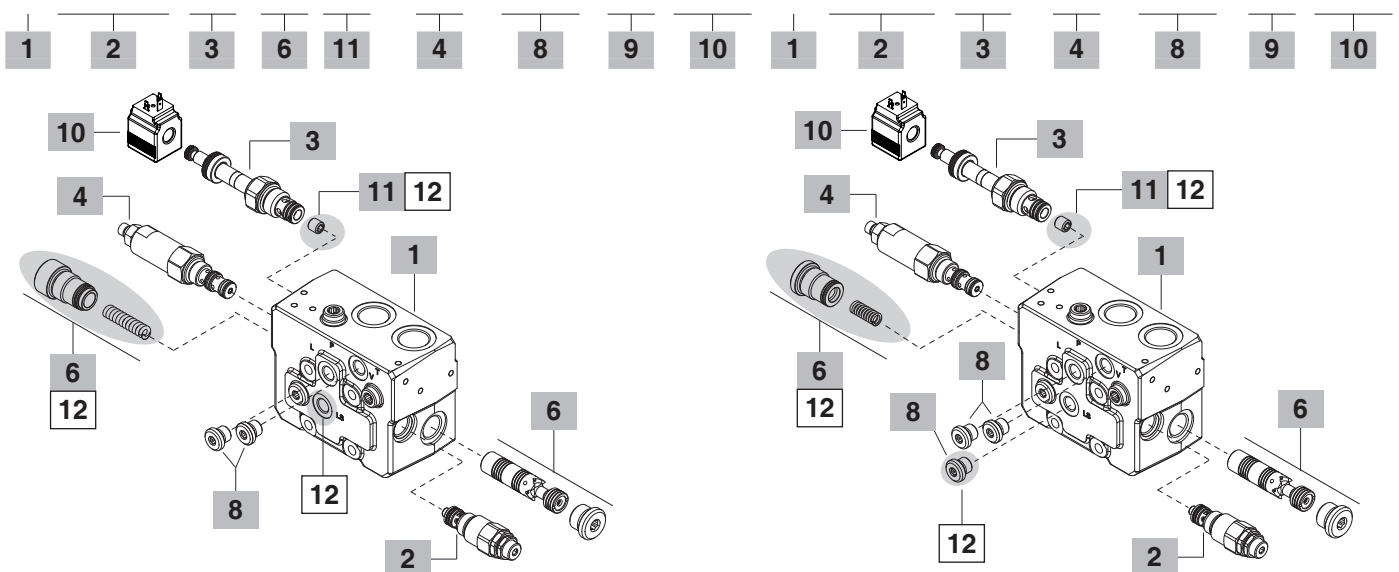


FE SDS140 / A P - D(0.7)-SB8-Q40-LS(1) (XGM-270 / ELNW) - R(32) - TAP(VL) - ..... - 12VDC



FE SDS140 / A N (TGW3-175/ESFP/SB20/FC3) - R(32) - TAP(VL) - .... - 12VDC

FE SDS140 / A M (TGW3-175/ESFF) - R(32) - TAP(VL) - ..... - 12VDC





1	Inlet section body kit*	page 10
TYPE: <b>SDS140/C-D</b>	CODE: 5FIA113300	
DESCRIPTION: With side and upper inlet ports, V pilot and L drain ports, arranged for pressure relief valve, unloading valve, pressure reducing valve		
TYPE: <b>SDS140/DT</b>	CODE: 5FIA113301	
DESCRIPTION: As previous one, with upper inlet and side outlet ports		
TYPE: <b>SDS140/P</b>	CODE: 5FIA113302	
DESCRIPTION: With upper inlet port, V pilot, L drain and LS ports, arranged for priority valve, pressure relief valve, unloading valve, pressure reducing valve		
TYPE: <b>SDS140/M-N</b>	CODE: 5FIA1133A0	
DESCRIPTION: With upper inlet and outlet port, V pilot, L drain and LS ports, arranged for LS pressure relief valve, unloading valve, pressure reducing valve		

2	Main pressure relief valve	page 13
<b>For C, D, DT inlet sections</b>		
Standard setting is referred to 10 l/min (2.6 US gpm).		
TYPE	CODE	DESCRIPTION
<b>SV</b>	XTAP526340	Relief valve blanking plug
<u>Y type direct operated</u>		
<b>(YG2-125)</b>	3XCAR110212	Range 80-160 bar (1160-2300 psi) standard setting 125 bar (1800 psi)
<b>(YG3-175)</b>	3XCAR110213	Range 100-250 bar (1450-3600 psi) standard setting 175 bar (2500)
<b>(YG4-250)</b>	3XCAR110214	Range 200-315 bar (2900-4600 psi) standard setting 250 bar (3600 psi)
<u>X type pilot operated</u>		
<b>(XGA-200)</b>	X006211350	Range 20-315 bar (290-4600 psi) standard setting 200 bar (2900 psi)

<b>For M, N inlet sections</b>		
Valves standard setting is referred to 5 l/min (1.3 US gpm) flow.		
TYPE	CODE	DESCRIPTION
<b>SV</b>	XTAP524340	Relief valve blanking plug
<u>Pilot operated type</u>		
<b>(TGW2-80)</b>	OMC09002000	Range 10-120 bar (145-1750 psi) std setting 80 bar (1160 psi)
<b>(TGW3-175)</b>	OMC09002001	Range 40-220 bar (580-3200 psi) std setting 175 bar (2550 psi)
<b>(TGW4-250)</b>	OMC09002002	Range 200-350 bar (2900-5100 psi) std setting 250 bar (3600 psi)
<b>(TGW5-300)</b>	OMC09002003	Range 290-385 bar (4200-5600 psi) std setting 300 bar (4350 psi)

7	Plug*
CODE	DESCRIPTION
3XTAP732200	G3/4 plug for C, D and DT section

8	Plug*
CODE	DESCRIPTION
3XTAP719150	G1/4 plug for V, L and LS ports
For V pilot and L drain ports description are:	
TYPE	DESCRIPTION
<b>TAP(VL)</b>	Plugs (2 pieces), standard: omitted in description
<b>NOTAP(L)</b>	Plug (1 piece)
<b>NOTAP(V)</b>	Plug (1 piece)
<b>NOTAP(VL)</b>	Without plugs

12	Circuit conversion kit
CODE	DESCRIPTION
5KIT530000	Circuit conversion from closed center to open center
5KIT530001	Circuit conversion from open center to closed center

3	Inlet valve options	page 16
<b>For C, D, DT inlet sections</b>		
TYPE	CODE	DESCRIPTION
<b>LT</b>	XTAP526340	Valve blanking plug
<b>F</b>	3XCAR410200	Inlet anti-cavitation valve
<b>L</b>	XCAR410311	Hydraulic operated unloader valve
<u>Solenoid operated unloading valve</u>		
<b>ELNW</b>	0EFW0062001	Without emergency
<b>ELTW</b>	0EFW0062000	Push & twist type with detent emergency
<b>ELPW</b>	0EFW0062002	Push-button emergency
<b>For P inlet section</b>		
TYPE	CODE	DESCRIPTION
<u>Solenoid operated unloading valve</u>		
<b>ELNW</b>	0EFW0062001	Without emergency
<b>ELTW</b>	0EFW0062000	Push & twist type with detent emergency
<b>ELPW</b>	0EFW0062002	With push-button emergency
<b>For N and M inlet section</b>		
TYPE	CODE	DESCRIPTION
<b>LT</b>	3XTAP826160	Valve blanking plug for M type with external pilot source or N type
<u>Solenoid operated unloading valve (NC)</u>		
<b>ESFNW(NC)</b>	0EF10002011	Without emergency
<b>ESFTW(NC)</b>	0EF10002013	Pull & twist with detent emergency
<b>ESFVW(NC)</b>	0EF10002012	With screw emergency
<b>ESFPW(NC)</b>	0EF10002010	With pull-button emergency

4	Pressure reducing valve	page 15
TYPE	CODE	DESCRIPTION
<b>R(32)</b>	4AC9539900	Valve with standard setting @ 32 bar (464 psi). Type omitted in description; specify only if it different from standard
<b>(RT)</b>	3XTP3535100	Valve blanking plug (SAE 8/3)

5	Priority valve kit
TYPE: <b>D(0.7)-SB8-Q40</b>	CODE: 5KIT440370
DESCRIPTION: Stand-by 8 bar (116 psi), regulated flow = 40 l/min (10.5 US gpm)	

6	Compensator kit	
TYPE	CODE	DESCRIPTION
<b>SB4</b>	5CAS318083	Standard 4 bar (58 psi) for M inlet section
<b>SB25</b>	5CAS318084	Standard 25 bar (362 psi) for N inlet section
Specify in description when it is different from standard.		

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

10	Coils	page 33
TYPE	CODE	DESCRIPTION
<b>12VDC</b>	4SLE001200A	<b>BER type</b> , 12 VDC, ISO4400 connector
For complete available coil list please see page 33.		

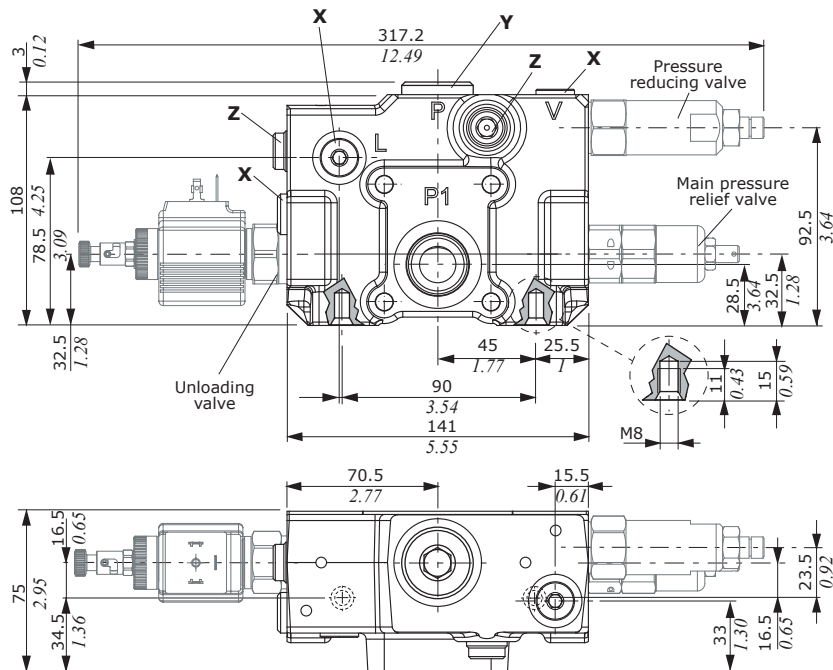
11	Metering hole	
TYPE	CODE	DESCRIPTION
<b>FC3.9</b>	3VT2710108	Standard for N inlet section
<b>FC5</b>	3VT2710106	Standard for M inlet section
Specify in description when it is different from standard.		

13	LS restrictor	
TYPE	CODE	DESCRIPTION
<b>NFC</b>	-	Without restrictor (omitted in description)
<b>LS(1)</b>	3VT2700065	Restrictor 1 mm diameter on LS port
Specify in description when it is different from standard. Different diameter are available, please contact our Sales Dpt.		
NOTE (*) – Codes are referred to <b>BSP</b> thread.		

### Dimensional data and hydraulic circuit

#### Standard inlet cover configuration

**AC inlet section**  
dimensions are the same for AD inlet section



**Wrenches and tightening torques**

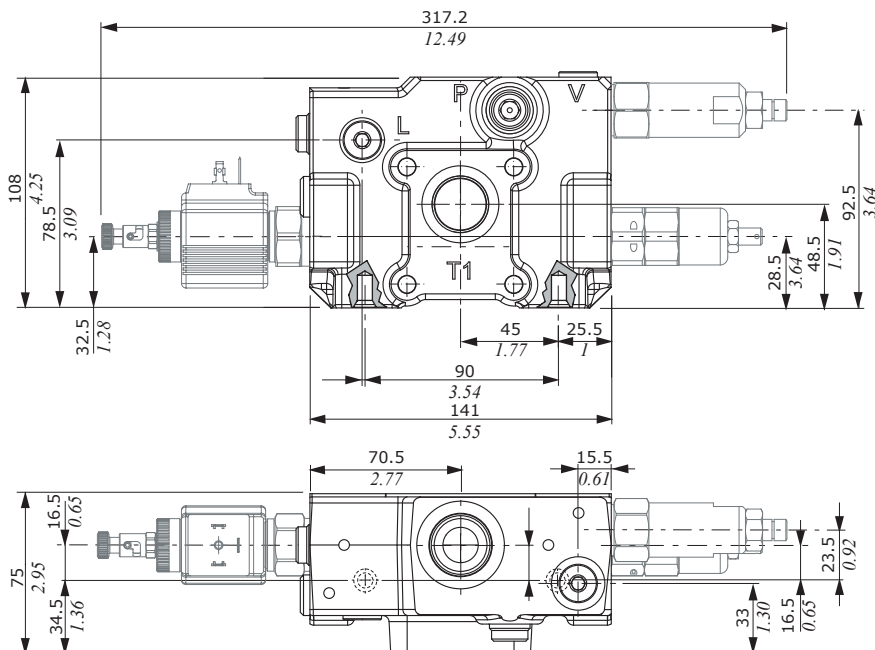
X = allen wrench 6 - 24 Nm (17.7 lbft)

Y = allen wrench 12 - 42 Nm (31 lbft)

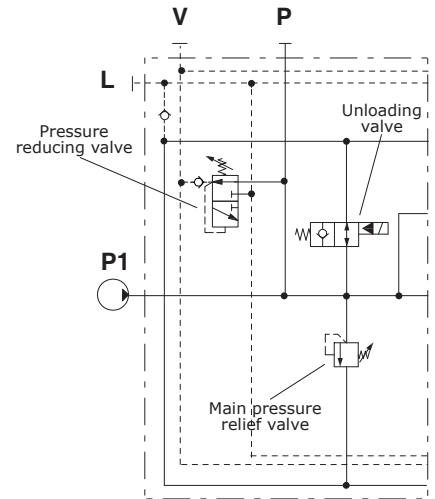
Z = wrench 8 - 42 Nm (31 lbft)

NOTE - for wrenches and tightening torques about valves, please see dedicated pages.

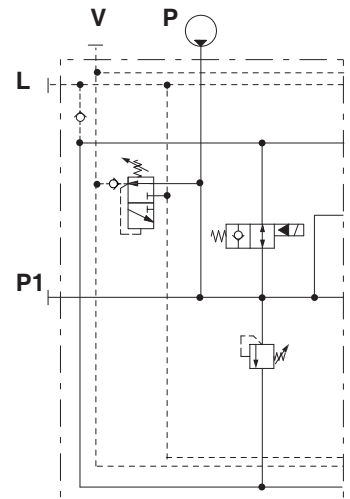
**ADT inlet section**



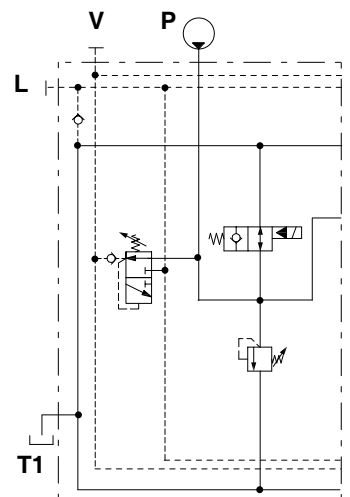
**AC inlet section with side inlet**



**AD inlet section with upper inlet**

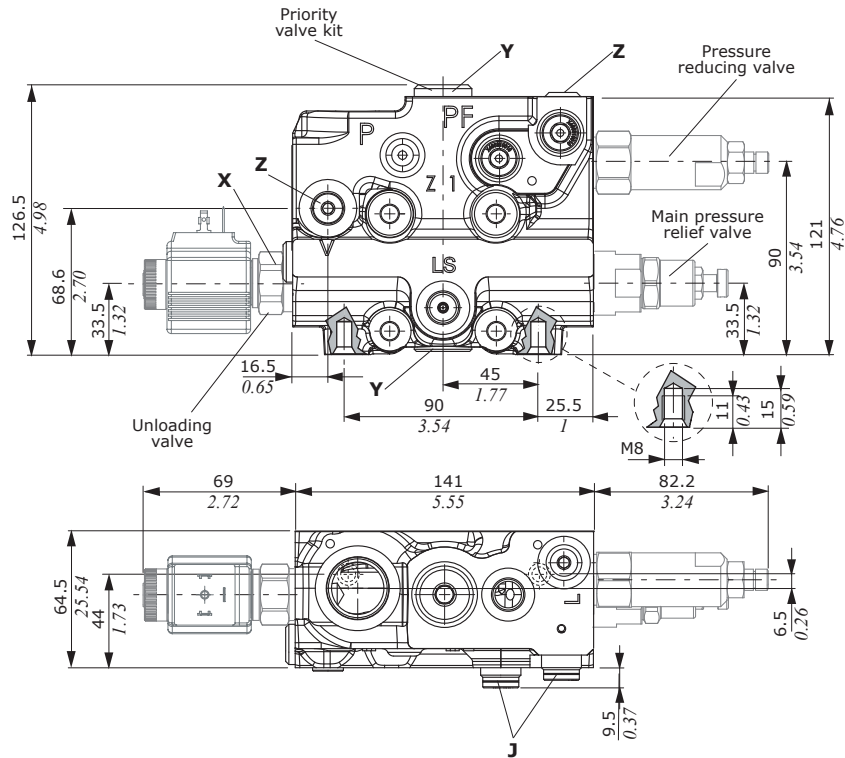


**ADT inlet section with upper inlet and side outlet**



Dimensional data and hydraulic circuit

Configuration with priority valve



**Wrenches and tightening torques**

X = allen wrench 6 - 24 Nm (17.7 lbft)

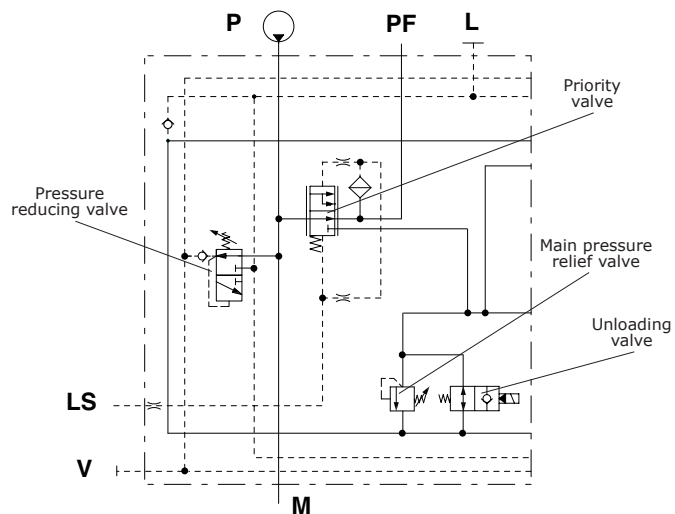
Y = allen wrench 8 - 24 Nm (17.7 lbft)

Z = allen wrench 6 - 24 Nm (17.7 lbft)

J = wrench 8 - 42 Nm (31 lbft)

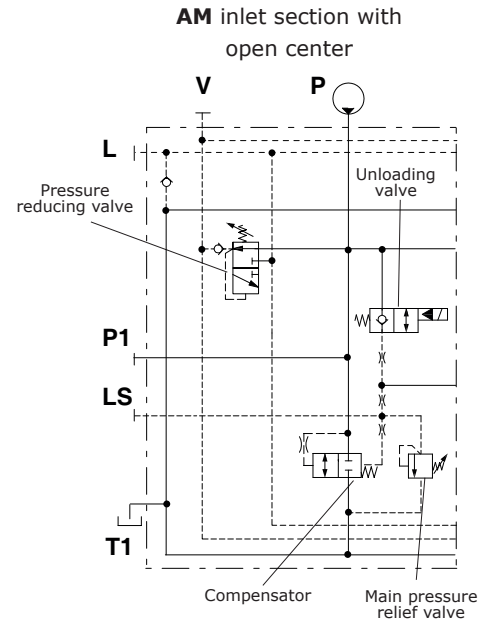
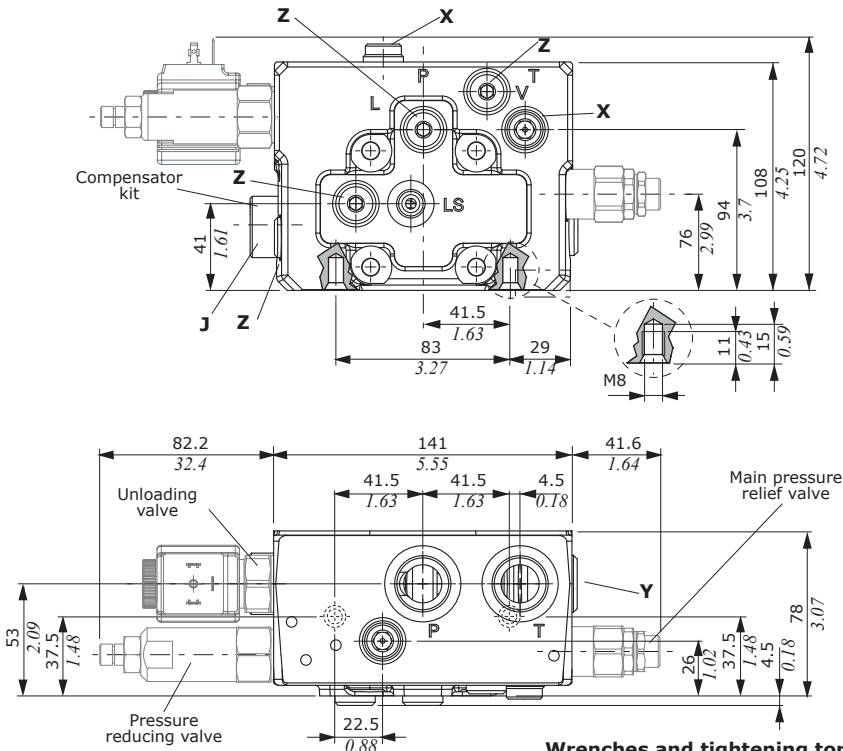
NOTE - for wrenches and tightening torques about valves, please see dedicated pages.

AP inlet section with priority valve



Dimensional data and hydraulic circuit

Inlet section configuration with flow unloader option

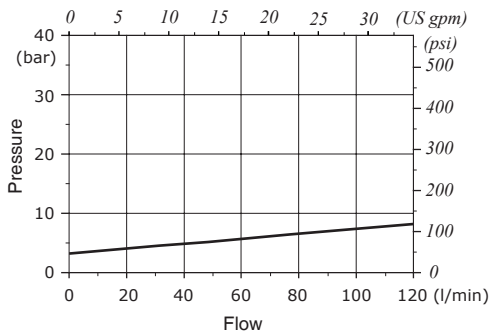


Wrenches and tightening torques

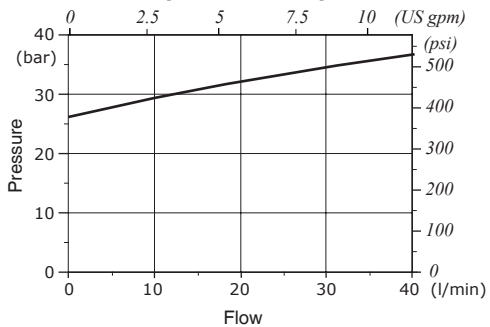
- X = wrench 8 - 42 Nm (31 lbft)
- Y = allen wrench 8 - 24 Nm (17.7 lbft)
- Z = allen wrench 6 - 24 Nm (17.7 lbft)
- J = allen wrench 10 - 42 Nm (31 lbft)

NOTE - for wrenches and tightening torques about valves, please see dedicated pages.

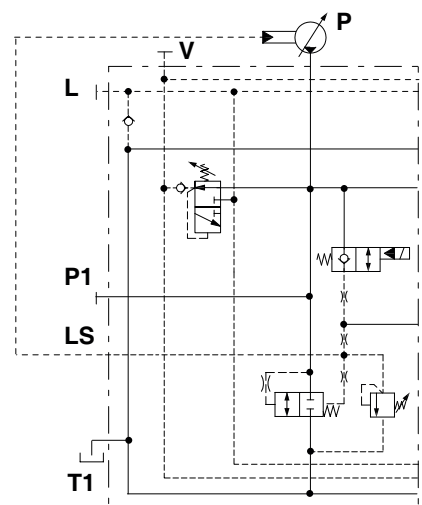
M compensator kit with unloading pressure drop



N compensator kit with unloading pressure drop



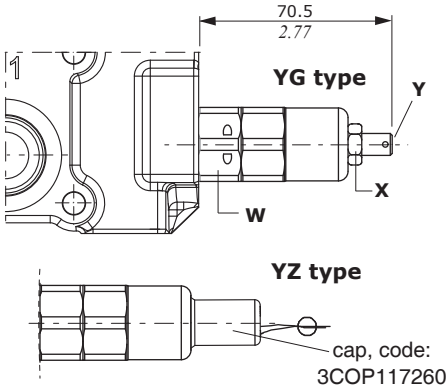
AN inlet section with closed center



Main pressure relief valves

Y.. type direct operated

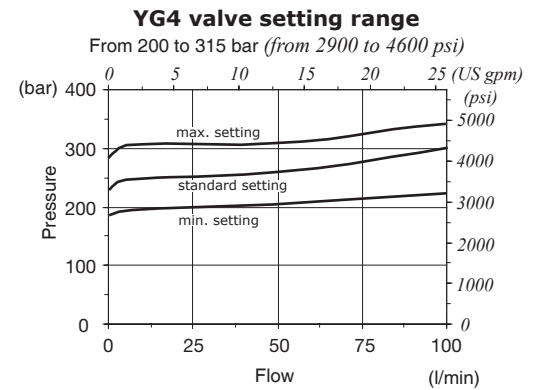
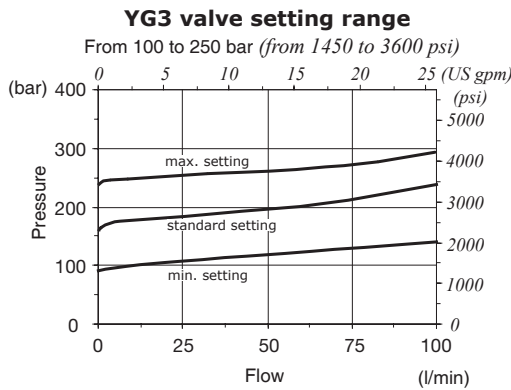
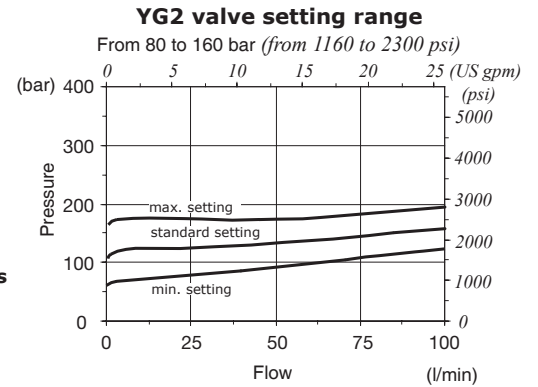
Configuration type:



**Legenda**  
**G:** adjustable with screw  
**Z:** valve set and locked with tamper proof cap

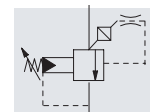
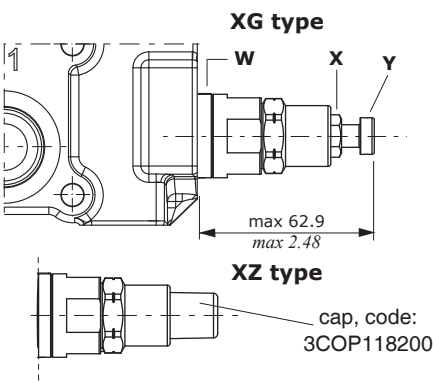
**Wrenches and tightening torques**  
**X =** wrench 13 - 24 Nm (17.7 lbft)  
**Y =** allen wrench 4  
**W =** wrench 27 - 42 Nm (31 lbft)

NOTE - Not for N and M inlet section.



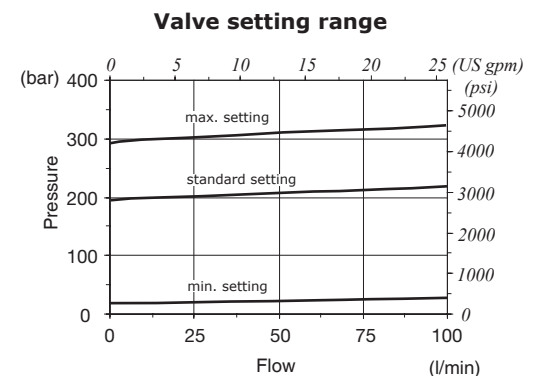
X..A type pilot operated

Configuration type:

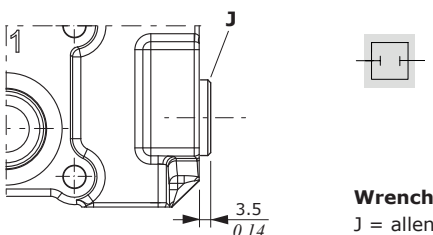


**Legenda**  
**G:** adjustable with screw  
**Z:** valve set, with tamper proof cap

**Wrenches and tightening torques**  
**X =** wrench 13 - 24 Nm (17.7 lbft)  
**Y =** wrench 6  
**W =** wrench 27 - 42 Nm (31 lbft)



SV relief valve blanking plug

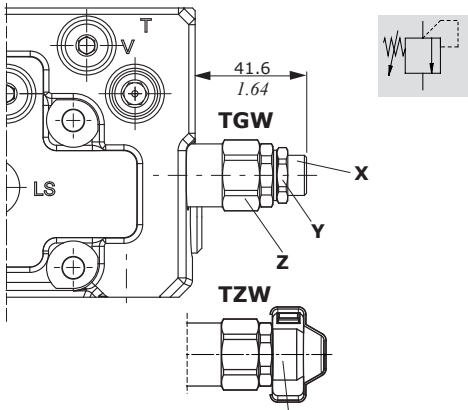


**Wrenches and tightening torques**  
**J =** allen wrench 10 - 24 Nm (17.7 lbft)

Main pressure relief valves

T type pilot operated

For AM and AN inlet sections setting types



Legenda

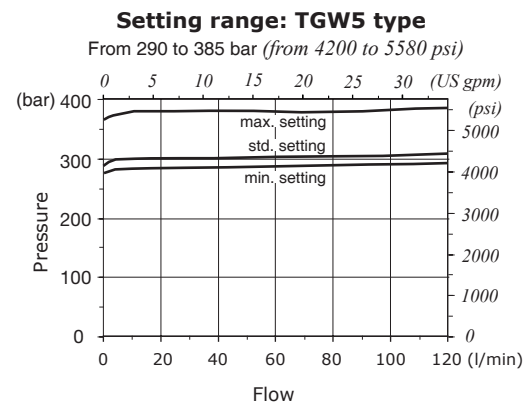
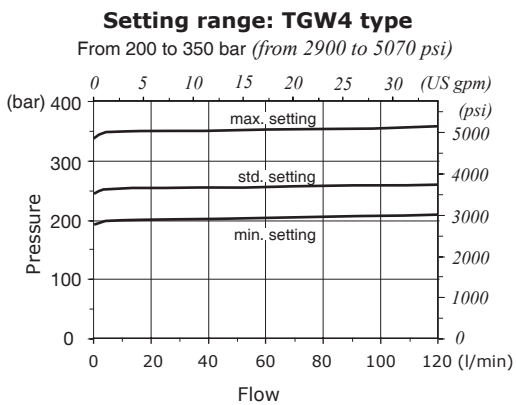
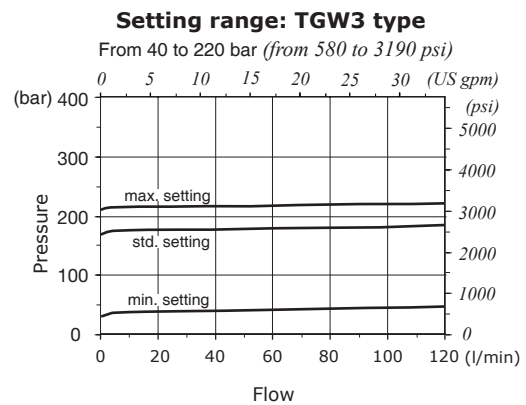
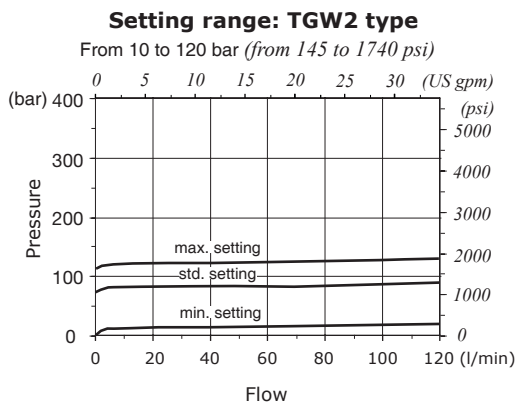
- TGW: free setting
- TZW: valve set with tamper proof cap

Wrenches and tightening torques

- X = allen wrench 5
- Y = wrench 19 - 20 Nm (14.7 lbf)
- Z = wrench 24 - 42 Nm (31 lbf)

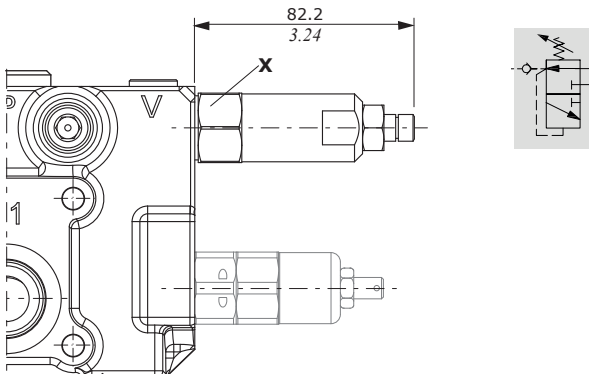
cap, code:  
4COP126301, n.2 pcs  
RAL3003 pigmented

Pressure relief valve setting example on type M inlet section



Pressure reducing valve

R(32) type



**Wrenches and tightening torques**

X = wrench 24 - 30 Nm (22 lbft)

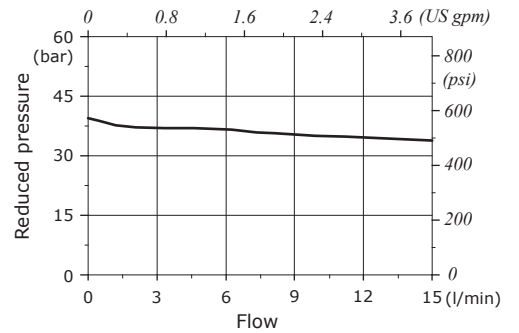
**Pressure reducing valve features**

Reduced press. range . . : from 3.5 to 35 bar  
(from 50 to 500 psi)

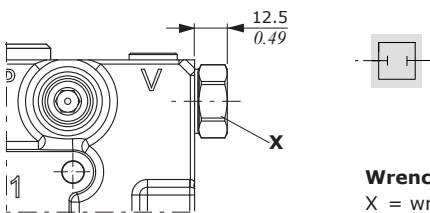
Max. inlet pressure . . . : 420 bar (5500 psi)

Nominal flow . . . . . : 15 l/min (4 US gpm)

**Pressure reducing valve diagram  
Reduced pressure vs. Flow**



**RT valve blanking plug**

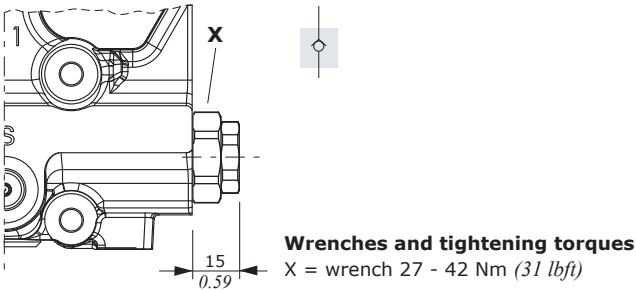


**Wrenches and tightening torques**

X = wrench 24 - 30 Nm (22 lbft)

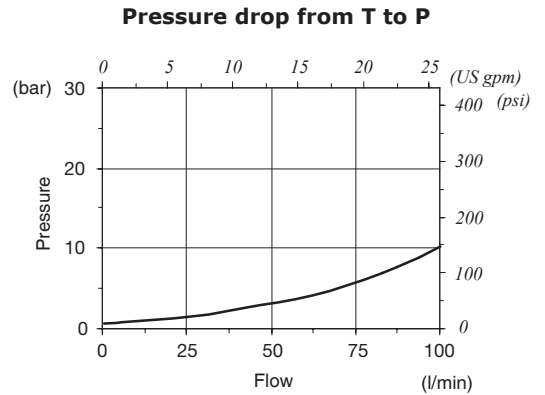
Inlet valve options

F anti-cavitation valve



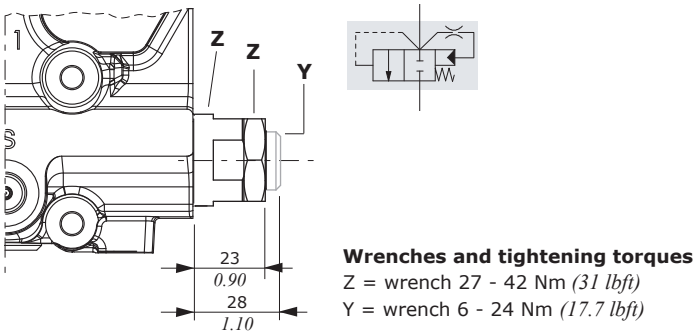
Features

Nominal flow . . . . .: 90 l/min (23.77 US gpm)  
 Internal leakage . . . . .: 2 cm<sup>3</sup>/min @ 100 bar (0.122 in<sup>3</sup>/mm @ 1450 psi)

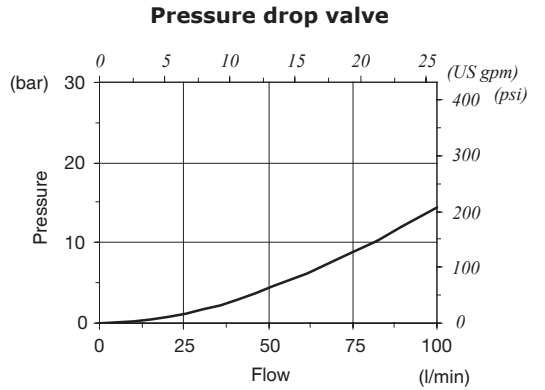


Unloading valves

Hydraulic operated



NOTE - For safety reasons the valve is supplied with blanking plug



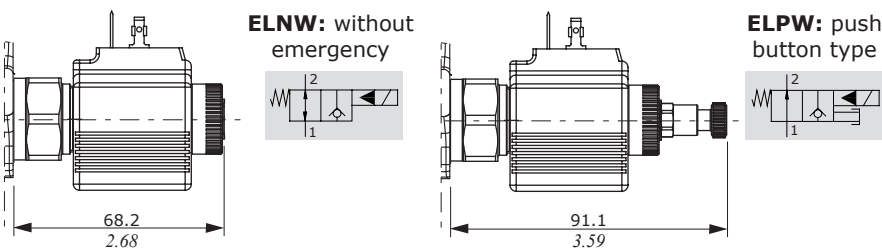
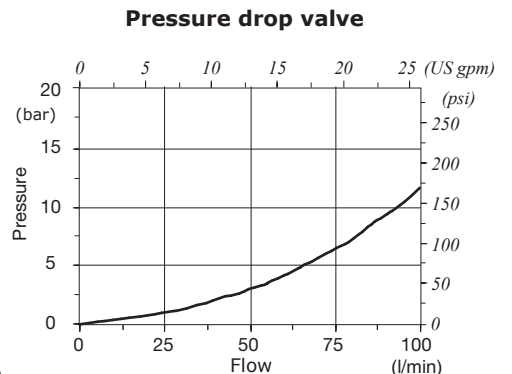
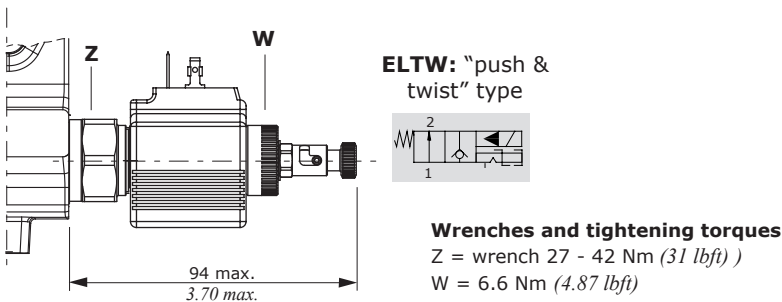
Valve L type features

Nominal flow . . . . .: 90 l/min (24 US gpm)  
 Internal leakage.. . . .: 18 cm<sup>3</sup>/min @ 100 bar (1.1 in<sup>3</sup>/mm @ 1450 psi)

Solenoid operated

Emergency with push button and spring return; for detent position turn the button after press it.

**WARNING:** the manual override option is only for emergency operation, not for continuative operation.



Features

Nominal flow . . . . .: 100 l/min (26.4 US gpm)  
 Max. pressure. . . . .: 315 bar (4600 psi)  
 Internal leakage.. . . .: 1 cm<sup>3</sup>/min @ 100 bar (0.061 in<sup>3</sup>/mm @ 1450 psi)

For **BER** coils features and options see page 33

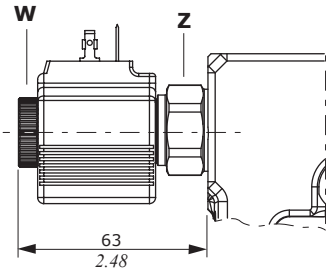


Unloading valves

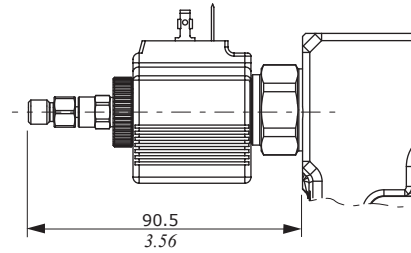
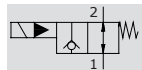
Solenoid operated for M and N inlet sections

Emergency with pull button and spring return; for detent position turn the button after pull it.

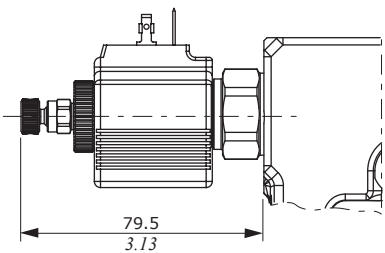
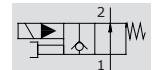
**WARNING:** the manual override option is intended for emergency use, not for continuous duty operation.



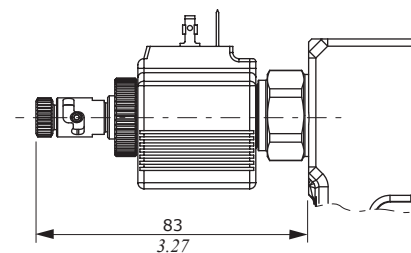
**ESFNW(NC):**  
without emergency



**ESFPW(NC):** pull button type



**ESFVW(NC):**  
screw type



**ESFTW(NC):**  
"pull & twist" type

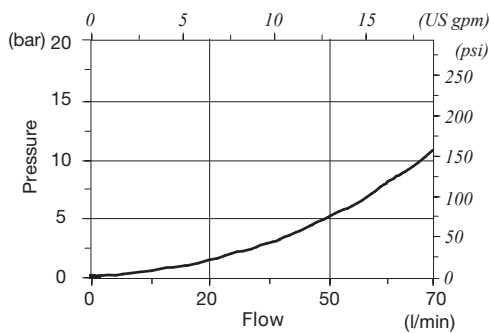


**Wrenches and tightening torques**

Z = wrench 27 - 42 Nm (31 lbf<sub>t</sub>)

W = 6.6 Nm (4.87 lbf<sub>t</sub>)

**Pressure drop valve**



**Features**

Nominal flow . . . . . : 70 l/min (78 US gpm)

Max. pressure. . . . . : 350 bar (5100 psi)

Internal leakage . . . . . : 25 cm<sup>3</sup>/min @ 210 bar  
(0.015 in<sup>3</sup>/min @ 3050 psi)

For **BER** coils features and options see page 33

## Part ordering codes

Standard: omitted in description      valve setting (bar)

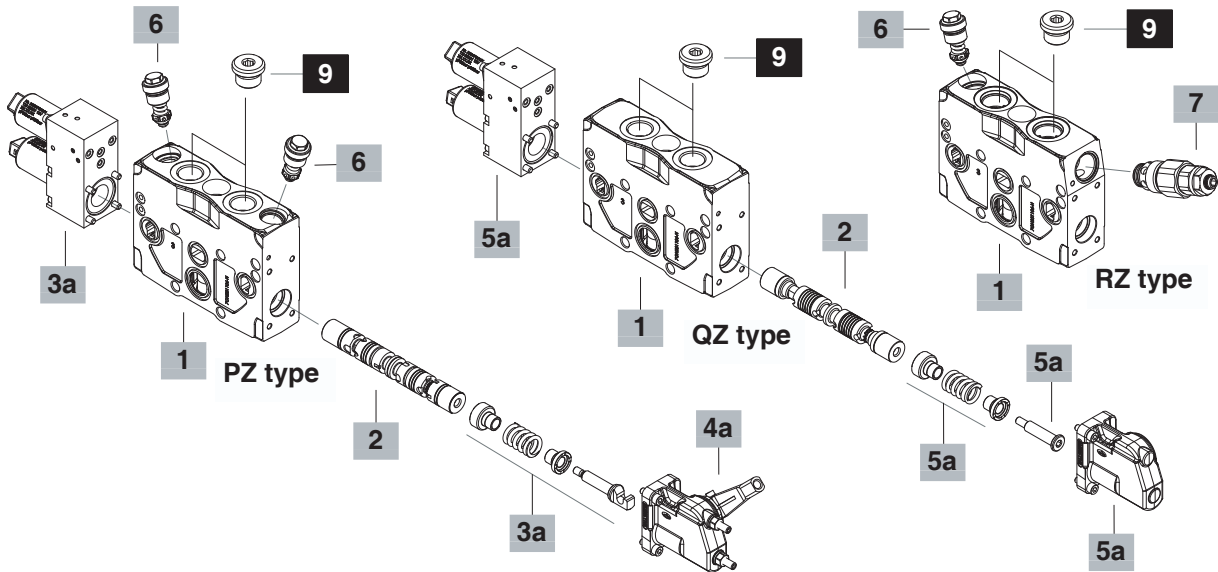
EL SDS140 / PZ - 1EZ 8EZH3 LQF3(20) . U3(220) - .... - 12VDC

1    2a    3a    4a    3a      6    8    3a

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

EL SDS140 / QZ - 1EZ 8EZH3SLCQ - .... - 12VDC

1    2a      5a      8    5a



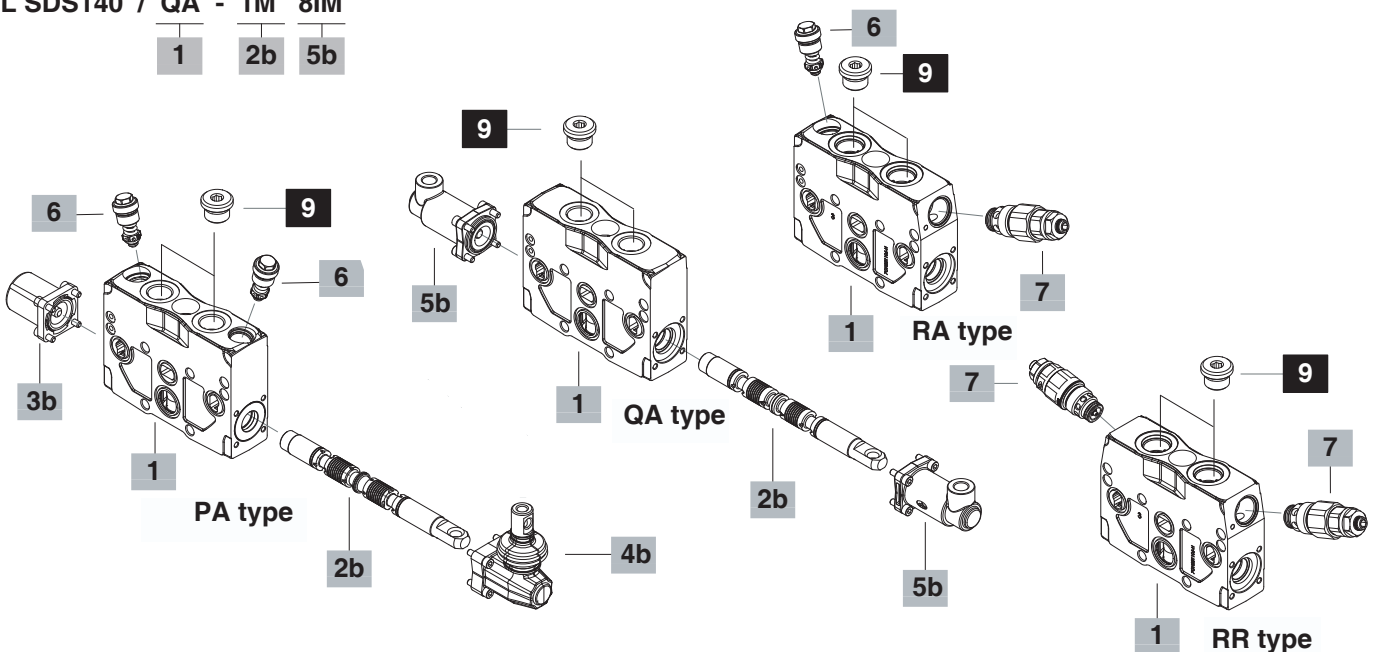
EL SDS140 / PA - 1 8 L . U3 (200) - .... -

1    2    3b    4b      6    8

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

EL SDS140 / QA - 1M 8IM

1    2b    5b



## Part ordering codes

**1 Working section kit \* page 21**

TYPE	CODE	DESCRIPTION
<b>For electrohydraulic controls</b>		
<b>QZ</b>	5EL1133010	Parallel circuit without port valves arrangement
<b>PZ</b>	5EL1133005	Parallel circuit arranged for antishock valves
<b>RZ</b>	5EL1133006	As PZ with pilot operated antishock and anticavitation valve (on B side)
<b>For mechanical controls</b>		
<b>QA</b>	5EL1133014	Parallel circuit without port valves arrangement
<b>PA</b>	5EL1133004	Parallel circuit arranged for antishock valves
<b>RA</b>	5EL1133003	As PA arranged for pilot operated antishock and anti-cavitation valve (on B side)
<b>RR</b>	5EL1133015	Parallel circuit arranged with 2 ports for anti-shock and anticavitation valves, without pilot lines: <b>must be positioned as last electrohydraulic control section</b>
<b>For proportional hydraulic controls</b>		
<b>QA-IM</b>	5EL1133014A	Parallel circuit without port valves arrangement
<b>PA-IM</b>	5EL1133004A	Parallel circuit arranged for antishock valves
<b>RA-IM</b>	5EL1133003A	As PA arranged for pilot operated antishock and anticavitation valve (on B side)
<b>RR-IM</b>	5EL1133015A	Parallel circuit arranged with 2 ports for antishock and anticavitation valves, without pilot lines: <b>must be positioned as last electrohydraulic control section</b>

**2b Spools page 23**

TYPE	CODE	DESCRIPTION
<b>For mechanical and proportional hydraulic controls</b>		
<b>1</b>	3CU2310100	Double acting, 3 positions, with A and B closed in neutral position
<b>1CSG</b>	3CU2310250	As type 1, with fine metering suggested for flow up to 70 l/min (18.5 US gpm)
<b>1M</b>	3CU2310130	As type 1 with metering suggested for flow rates above to 70 l/min (18.5 US gpm)
<b>1A</b>	3CU2321100	Double acting, 3 positions, with A open to tank in neutral position
<b>1B</b>	3CU2322100	Double acting, 3 positions, with B open to tank in neutral position
<b>2</b>	3CU2325100	Double acting, with A and B open to tank in neutral position
<b>2CSG</b>	3CU2325255	As type 2, with fine metering suggested for flow up to 70 l/min (18.5 US gpm)
<b>2H</b>	3CU2325225	Double acting, with A and B partially open to tank in neutral position
<b>3</b>	3CU2331110	Single acting on A, 3 positions, B plugged, <b>G1/2 plug is required</b>
<b>4</b>	3CU2335100	Single acting on B, 3 positions, A plugged, <b>G1/2 plug is required</b>
<b>4M</b>	3CU2335110	As type 4 with metering suggested for flow rates above to 70 l/min (18.5 US gpm), <b>G1/2 plug is required</b>

**3b "A" side spool positioners**

See SD8 catalogue, code D1WWEB05E.

**4b "B" side spool control kit**

See SD8 catalogue, code D1WWEB05E.

**2a Spools page 23**

TYPE	CODE	DESCRIPTION
<b>For electrohydraulic controls</b>		
<b>1EZ</b>	3CU2910001	Double acting, 3 positions, with A and B closed in neutral position
<b>1CSGEZ</b>	3CU2910003	As type 1, with fine metering suggested for flow up to 70 l/min (18.5 US gpm)
<b>1MEZ</b>	3CU2910004	Double acting, 3 positions, with A and B closed in neutral position with metering suggested for flow rates above to 70 l/min (18.5 US gpm)
<b>2MEZ</b>	3CU2925000	Double acting, with A and B open to tank in neutral position, with metering suggested for flow rates above to 70 l/min (18.5 US gpm)
<b>2CSGEZ</b>	3CU2925003	As type 2, with fine metering suggested for flow up to 70 l/min (18.5 US gpm)
<b>3MEZ/4MEZ</b>	3CU2925001	As type 3 or 4 (according to orientation*) with metering suggested for flow rates above to 70 l/min (18.5 US gpm), <b>G1/2 plug is required</b>

(\* ) With the key on the B side (visible to the operator) the spool is in configuration 4. With the key on side A (not visible to the operator) the spool is in configuration 3.

**3a One-side electrohydraulic control page 26****Combine to "B" side options**

TYPE	CODE	DESCRIPTION
<b>8EZH3(20)-12VDC</b>	5IDR601302	With AMP connector, horizontal configuration
<b>8EZH3(20)-24VDC</b>	5IDR601303	With AMP connector, horizontal configuration
<b>8EZH34(20)-12VDC</b>	5IDR601308	With Deutsch connector, horizontal configuration
<b>8EZH34(20)-24VDC</b>	5IDR601309	With Deutsch connector, horizontal configuration
<b>8EZ3(20)-12VDC</b>	5IDR601304	With AMP connector, vertical configuration
<b>8EZ3(20)-24VDC</b>	5IDR601305	With AMP connector, vertical configuration
<b>8EZ34(20)-12VDC</b>	5IDR601306	With Deutsch connector, vertical configuration
<b>8EZ34(20)-24VDC</b>	5IDR601307	With Deutsch connector, vertical configuration

With spool position sensor: **vertical configuration only**

<b>8EZ34SPSD(20)-12VDC</b>	CODE: 5IDR601312
DESCRIPTION: Deutsch connector and digital sensor	
<b>8EZ34SPSD-24VDC</b>	CODE: 5IDR601313
DESCRIPTION: Deutsch connector and digital sensor	
<b>8EZ34SPSL-0.5(A)-4.5(B)-12VDC</b>	CODE: 5IDR601316
DESCRIPTION: Deutsch connector and analog sensor	
<b>8EZ34SPSL-0.5(A)-4.5(B)-24VDC</b>	CODE: 5IDR601317
DESCRIPTION: Deutsch connector and analog sensor	

Different spring setting are available: 17, 20 and 23 bar (246, 290 and 333 psi). Type standard (20) is omitted. Specify in description when it is different from standard.

**4a "B" side options page 27**

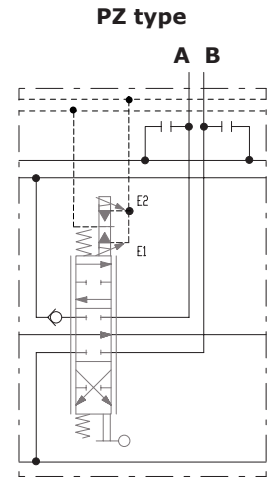
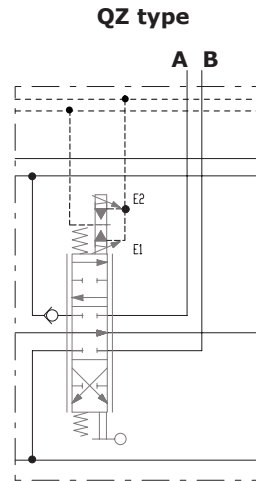
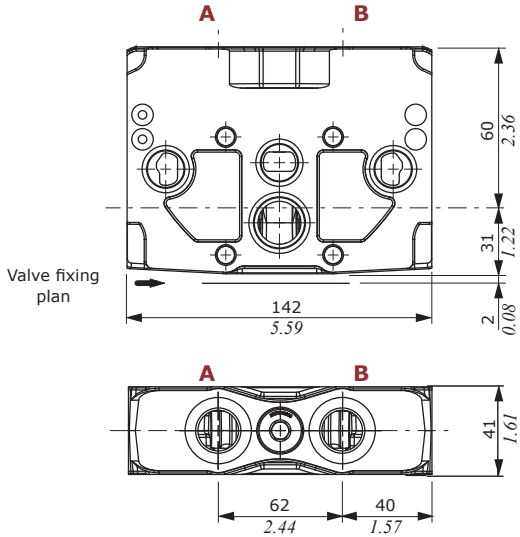
TYPE	CODE	DESCRIPTION
<b>For one-side electrohydraulic control</b>		
<b>LQ</b>	5LEV100700	Lever box
<b>LQF3</b>	5LEV100701	Lever box with spool stroke limiter

NOTE (\*) – Codes are referred to **BSP** thread

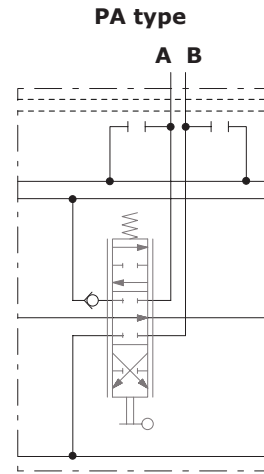
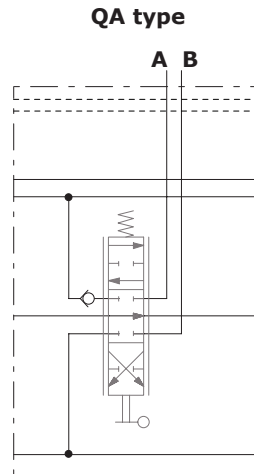
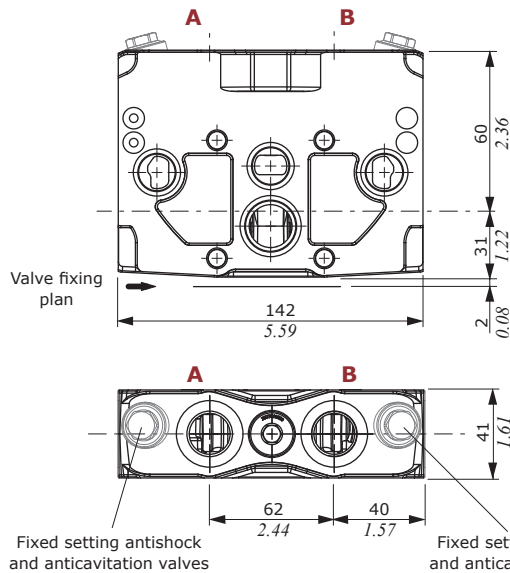


Dimensional data and hydraulic circuit

**Q type**  
(Dimensions are the same for QZ and QA)

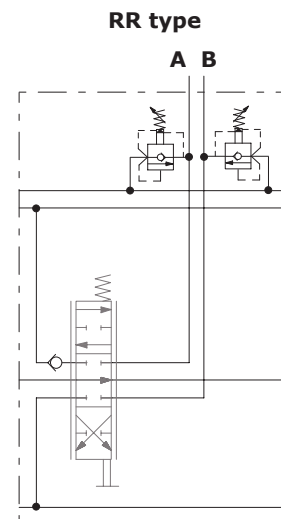
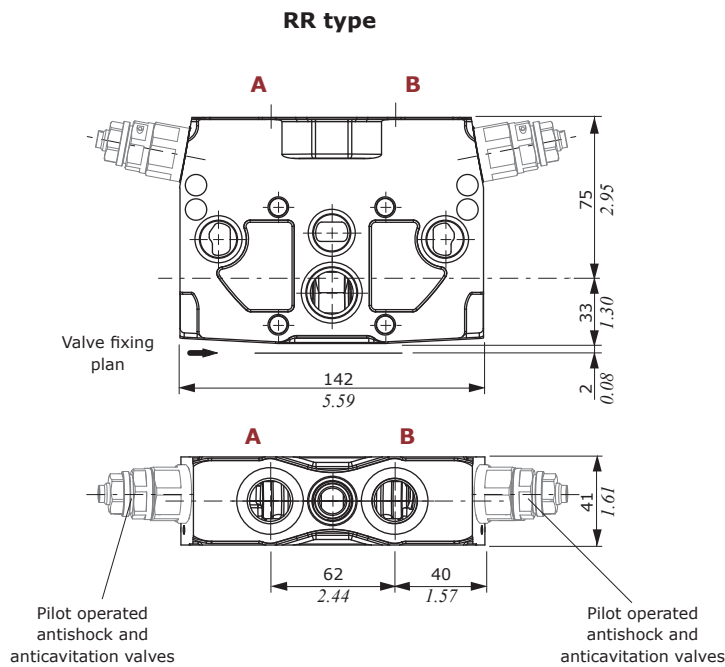
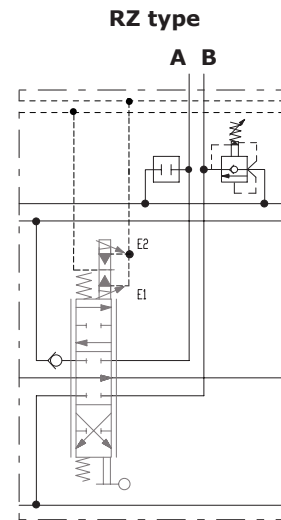
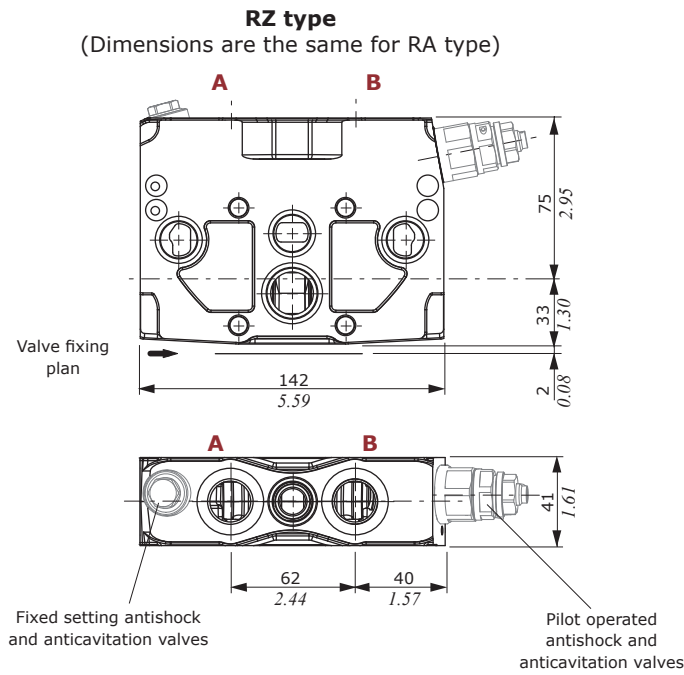


**P type**  
(Dimensions are the same for PZ and PA)



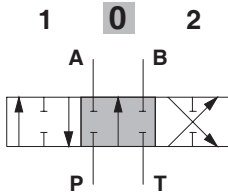
**Dimensional data and hydraulic circuit**

Without pilot lines; must be positioned after all electrohydraulic elements.



**1 (1CSG/1M/  
1CSGEZ/1MEZ) type spool**

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

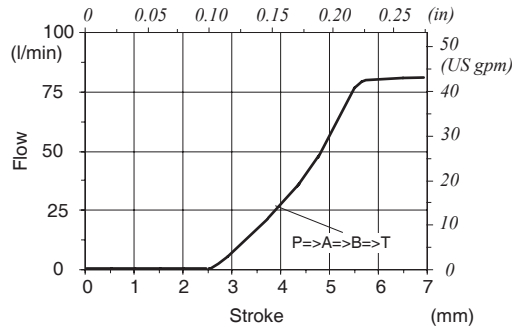


**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**1 type spool metering**

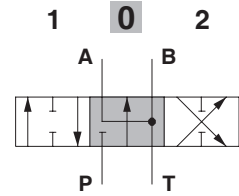
$Q_{in} = 80 \text{ l/min (42 US gpm)}$

$P_{(on ports)} = 100 \text{ bar (1450 psi)}$



**2 (2CSG/2CSGEZ/2MEZ)  
type spool**

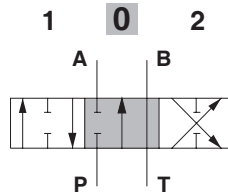
Double acting, 3 positions, with A and B open to tank in neutral position



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**1B type spool**

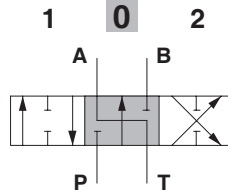
Double acting, 3 positions, with B open to tank in neutral position



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**1A type spool**

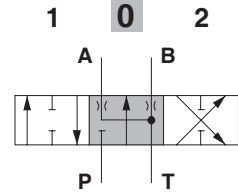
Double acting, 3 positions, with A open to tank in neutral position



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**2H type spool**

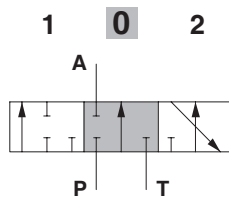
Double acting, 3 positions, with A and B partially open to tank in neutral position



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**3 (3MEZ) type spool**

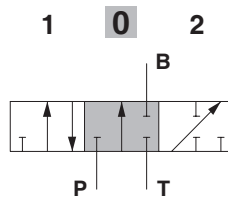
Single acting on A, 3 positions, B plugged, needs G1/2 plug



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

**4 (4M/4MEZ) type spool**

Single acting on B, 3 positions, A plugged, needs G1/2 plug



**Spool stroke**  
position 1: + 7 mm (+ 0.28 in)  
position 2: - 7 mm (- 0.28 in)

### Electrohydraulic controls

#### Performance data

Following specifications are measured with:

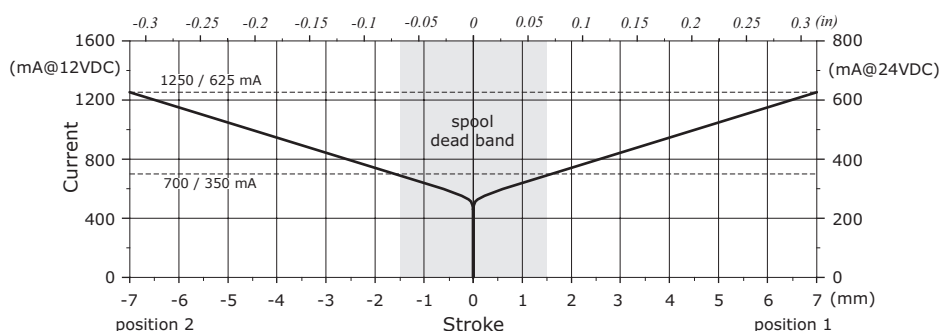
- mineral oil of 46 mm<sup>2</sup>/s (46 cSt) viscosity at 40°C (104°F) temperature.
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication
- 12 VDC and 24 VDC nominal voltage with tolerance ± 10%.

Following electrohydraulic controls need CED100X or CED400X electronic unit; for information contact Sales Department.

Specifications		
<b>Electric specifications</b>		<b>8EZ3</b>
Coil impedance	12 VDC	4.72 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption		0
<u>Controls configured with lever box</u>		
Hysteresis max. <sup>(1)</sup>	external drain	7%
	internal drain	9%
Time response	from 0 ⇒ 100% and from 100% ⇒ 0 of stroke	< 50 ms
Min. flow control signal	12 VDC	700 mA
	24 VDC	350 mA
Flow control signal	12 VDC	1250 mA
	24 VDC	625 mA
Dither frequency	low frequency	150 Hz
	high frequency	180 Hz - 200 mA
Insertion		100%
Coil insulation		Class H (180°C - 356°F)
Connector type		AMP JPT - Deutsch DT
Weather protection (connector)		IP65 (type JPT) - IP69K (type DT)
<b>Hydraulic specifications</b>		
Max. pressure		50 bar (725 psi)
Max. back pressure		10 bar (145 psi)

NOTE (1) hysteresis is indicated at nominal supply voltage and  $f = 0.008$  Hz for one cycle (one cycle = neutral ⇒ full A ⇒ neutral ⇒ full B ⇒ neutral). For the calculation rules, please see "Appendix A" on page 35.

**Type 8EZ3: Stroke vs. Current diagram**





Electrohydraulic controls

**Spool position sensor**

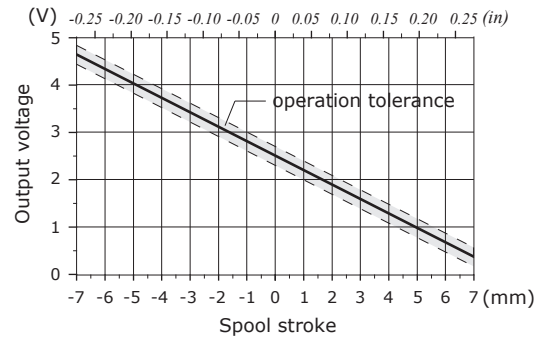
The sensor can be ordered exclusively through the EZ type electrohydraulic controls; please see page 19 for available control list.

**SPSL sensor**

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

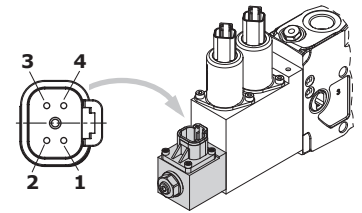
Working conditions		
Voltage supply		5 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 <sup>6</sup>
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke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

SPSL sensor output signal



**Deutsch DT04-4P connector**

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



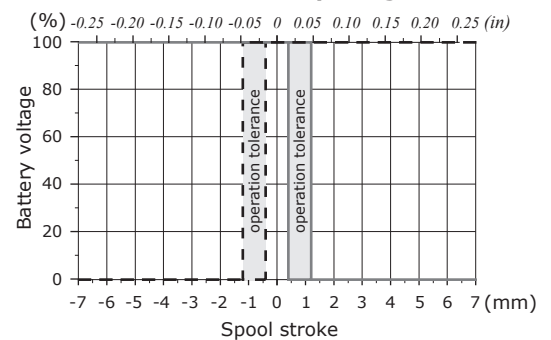
Deutsch DT06-4S mating connector, code 5CON140072

**SPSD sensor**

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

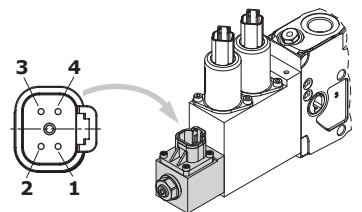
Working conditions		
Voltage supply		from 9 to 32 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 <sup>6</sup>
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical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

SPSP sensor output signal



**Deutsch DT04-4P connector**

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



Deutsch DT06-4S mating connector, code 5CON140072

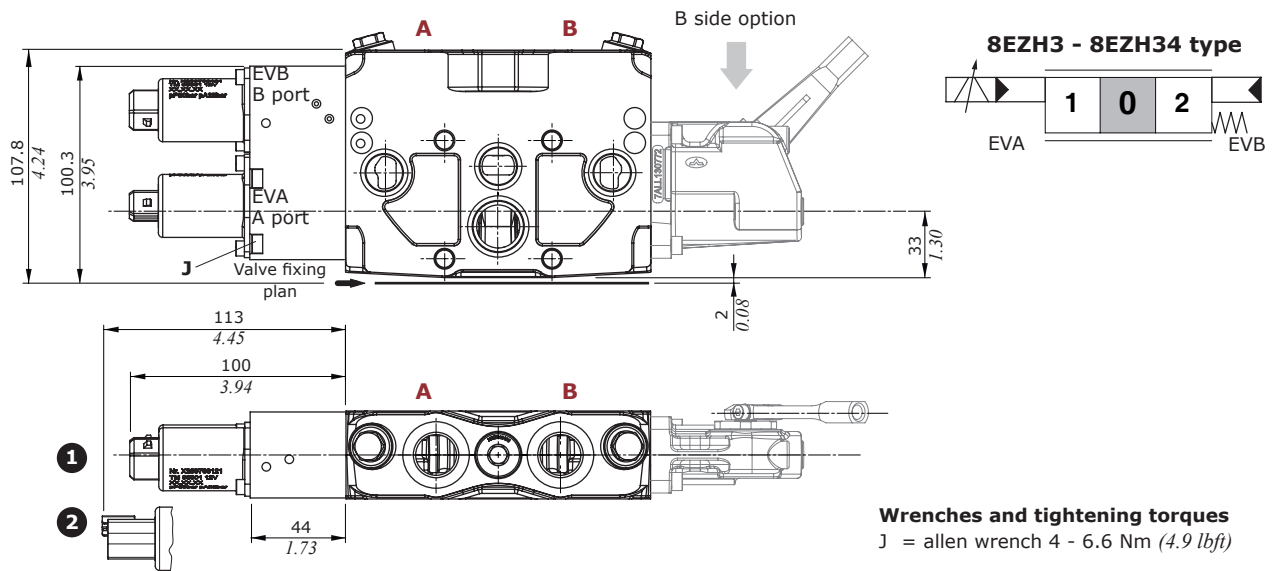
Electrohydraulic controls

One-side electrohydraulic control

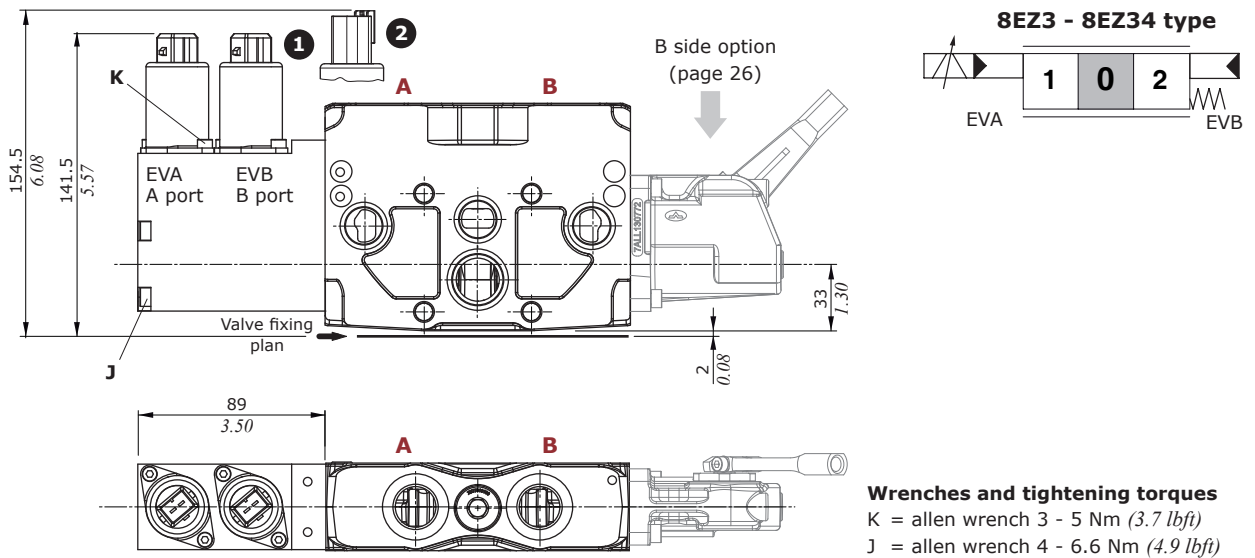
Control type

- 1 : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
- 2 : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

With horizontal valves: 8EZH3 type (standard)



With vertical valves: 8EZ3 type

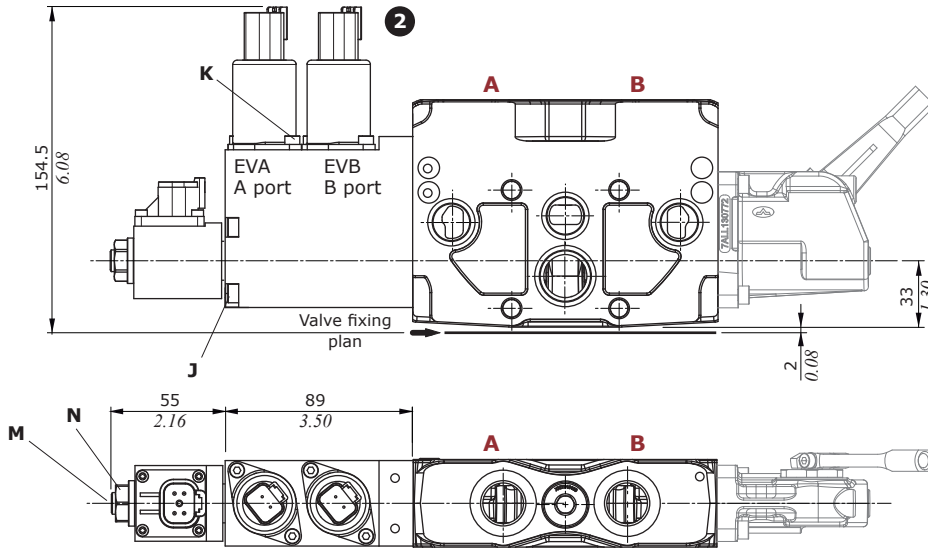


One-side electrohydraulic control

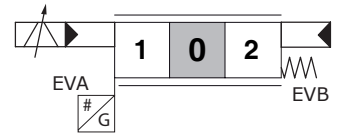
Control type

②: With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

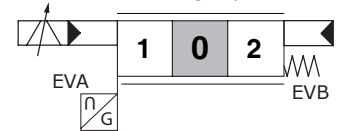
8EZ3SPSD control with spool position sensor



8EZ34SPSD type  
CANbus interface



8EZ34SPSL type  
Analog input



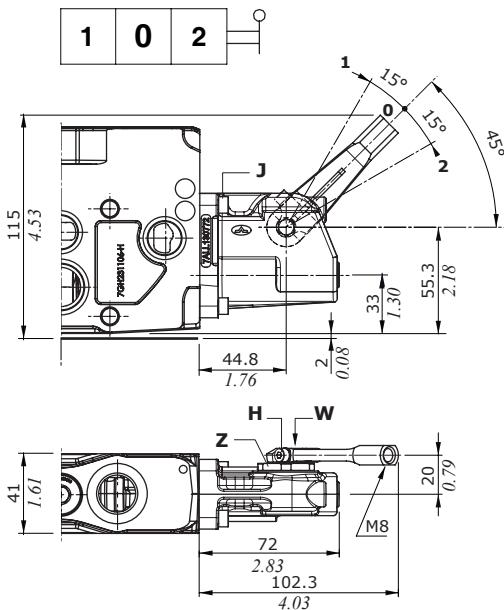
Wrenches and tightening torques

- K = allen wrench 3 - 5 Nm (3.7 lbf<sub>t</sub>)
- J = allen wrench 4 - 6.6 Nm (4.9 lbf<sub>t</sub>)
- M = wrench 4 - 9.8 Nm (7.2 lbf<sub>t</sub>)
- N = wrench 17 - 9.8 Nm (7.2 lbf<sub>t</sub>)

"B" side options

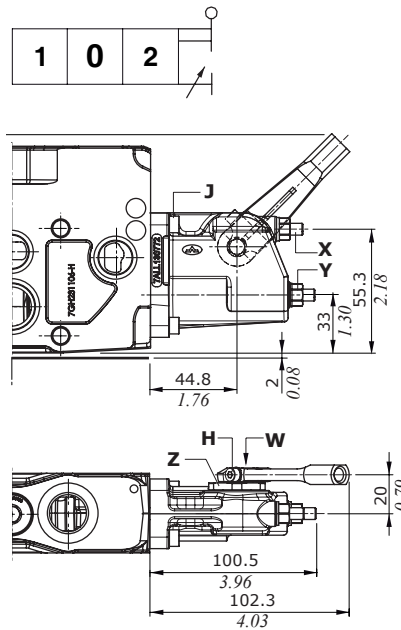
These options are available for one-side electrohydraulic controls only.

LQ type



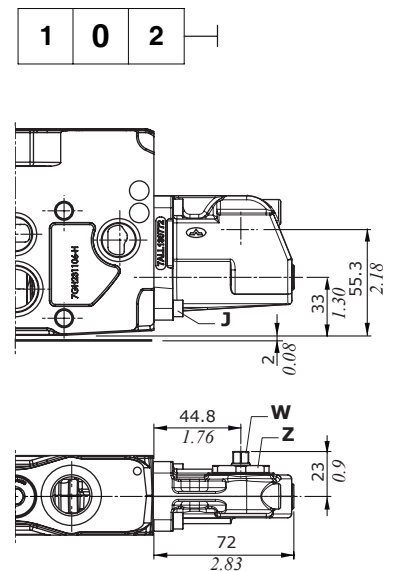
LQF3 type

Spool stroke limiter on ports A and B



LQSL type

Without lever



Wrenches and tightening torques

- H = allen wrench 3 - 6.6 Nm (4.9 lbf<sub>t</sub>)
- J = allen wrench 4 - 6.6 Nm (4.9 lbf<sub>t</sub>)
- X = allen wrench 3
- Y = wrench 10 - 9.8 Nm (7.2 lbf<sub>t</sub>)
- Z = wrench 29 - 24 Nm (17.7 lbf<sub>t</sub>)
- W = wrench 8

Electrohydraulic controls

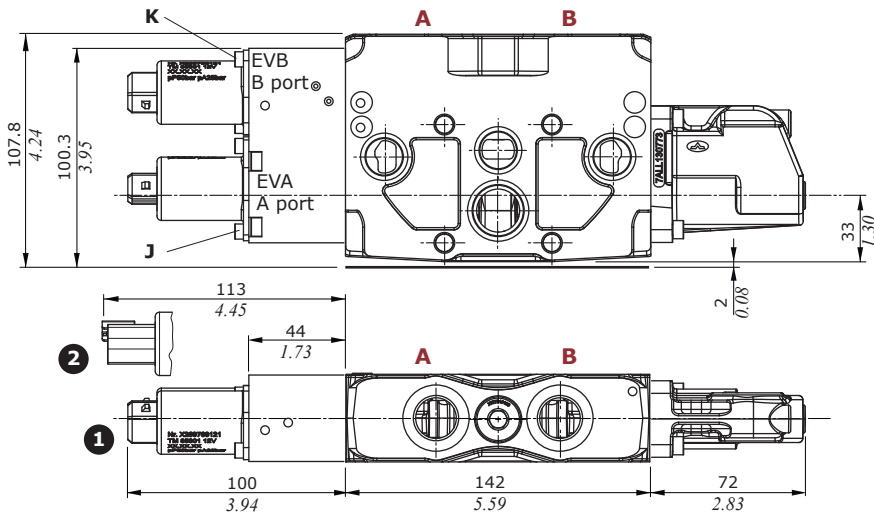
Complete one-side electrohydraulic control

Controls already comprehensive of endcap on B side.

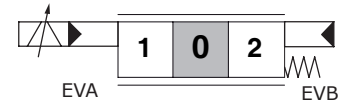
Control types

- 1 : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
- 2 : With Deutsch DT04 connector - Deutsch DT06-2S code mating connector: 5CON140031

8EZHS3LCQ complete control (standard)



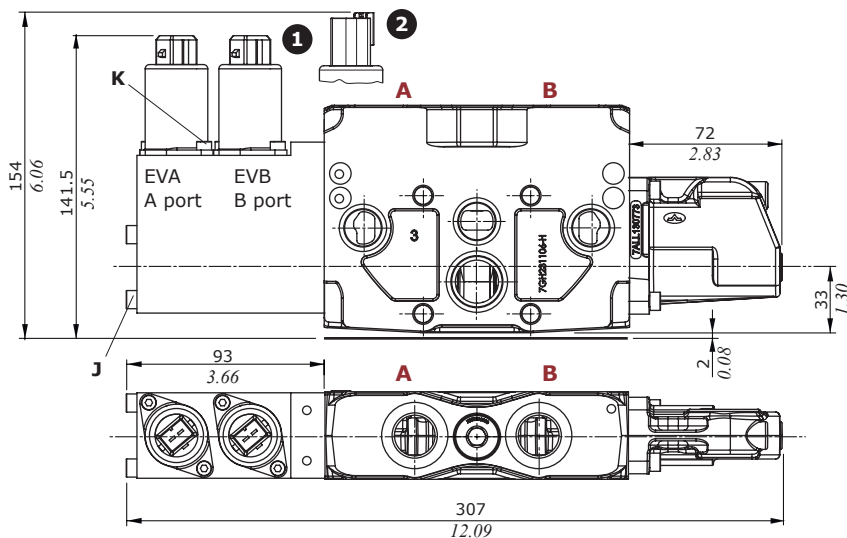
8EZHS3LCQ - 8EZHS4SLCQ type



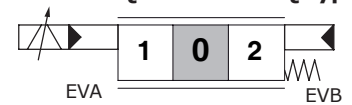
Wrenches and tightening torques

- K = allen wrench 3 - 5 Nm (3.7 lbft)
- J = allen wrench 4 - 6.6 Nm (4.9 lbft)

8EZ3SLCQ complete control



8EZ3SLCQ - 8EZ34SLCQ type

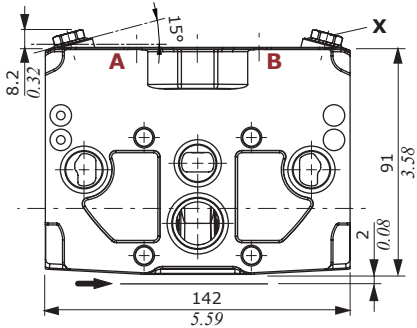


Wrenches and tightening torques

- J = allen wrench 4 - 6.6 Nm (4.9 lbft)
- K = allen wrench 3 - 5 Nm (3.7 lbft)

**Anti-shock and anti-cavitation valves**

For flow rates up to 60 l/min (16 US gpm) and higher valve setting.



**Wrenches and tightening torques**  
X = wrench 13 - 24 Nm (17.7 lbf)

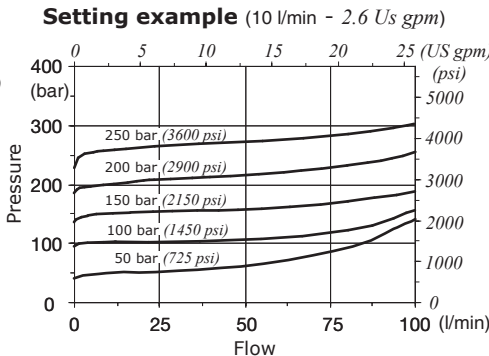
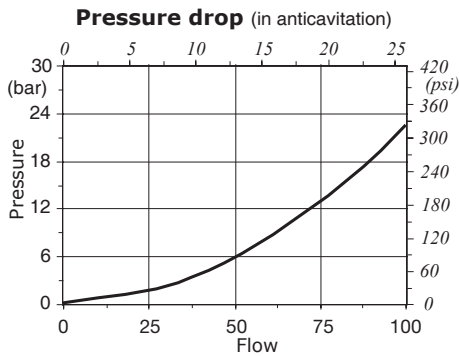
**U type**



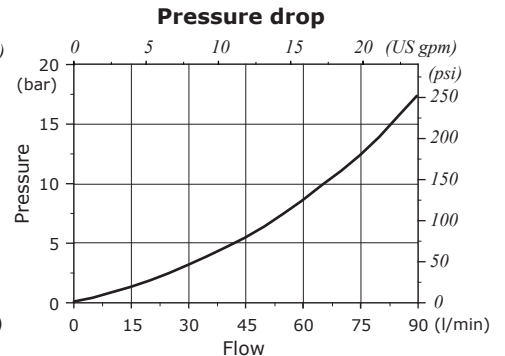
**C type**



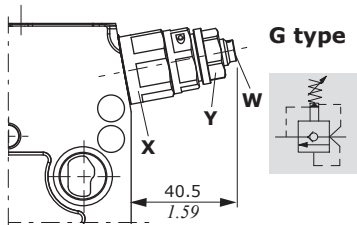
**U type: antishock valves with prefill**



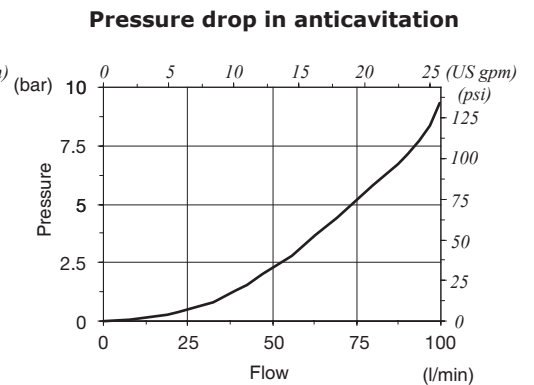
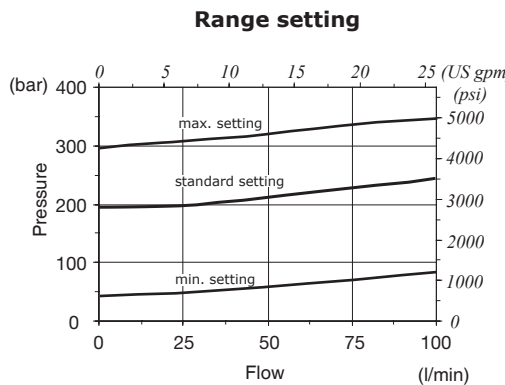
**C type: anticavitation valves**



**Pilot operated anti-shock and anti-cavitation valve UXW type**

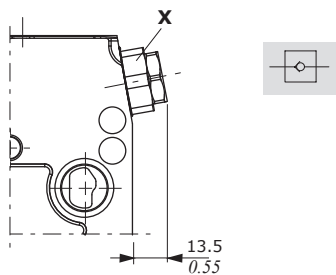


**Legenda**  
G: adjustable with screw  
**Wrenches and tightening torques**  
X = wrench 24 - 42 Nm (31 lbf)  
Y = wrench 17 - 24 Nm (17.7 lbf)  
W = wrench 5

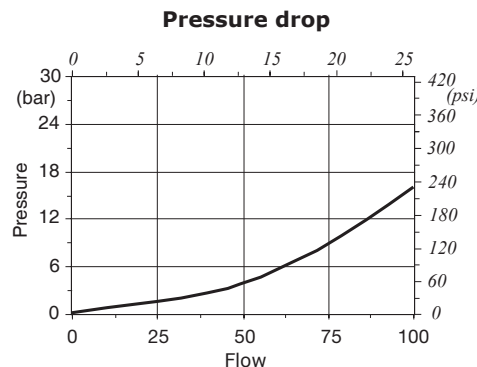


NOTE - It can not be used with mechanical controls with lever.

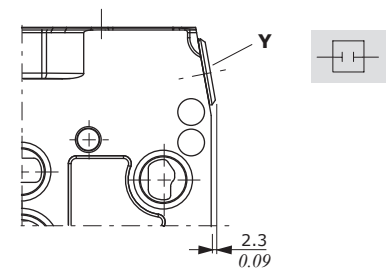
**Anti-cavitation valve C type**



**Wrenches and tightening torques**  
X = wrench 24 - 42 Nm (31 lbf)



**Valve blanking plug**

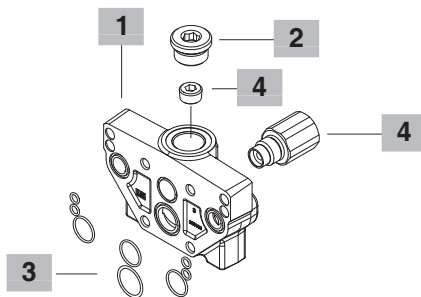


**Wrenches and tightening torques**  
Y = allen wrench 10 - 42 Nm (31 lbf)

### Part ordering codes

#### FS SDS140 / RC

- RC** With side outlet: **requires external pilot source**
- RD** With upper outlet: **requires external pilot source**
- RE** With upper outlet and side carry-over sleeve: **requires external pilot source**
- RVC** With back pressure valve: **requires internal pilot source, to build up pressure**
- RF** With side and upper ports plugged for N, DT type inlet section and for M type inlet section with **external pilot source**
- RFC** As RF with tapered plug with metering hole for M type inlet sections with **internal pilot source**
- RDC** As RD with tapered plug with metering hole for M type inlet section with **internal pilot source**



#### 1 Outlet section \*

CODE	DESCRIPTION
3FIA213300	Outlet section body

#### 2 Plug \*

CODE	DESCRIPTION
3XTAP732200	G 3/4 plug

#### 3 O-ring seals

CODE	DESCRIPTION
4GUA118818	O-ring 18.77x1.78 NBR 70 SH (3 pieces)
4GUA125118	O-ring 25.12x1.78 NBR 70 SH (1 piece)
4GUA106818	O-ring 6.75x1.78 NBR 70 SH (4 pieces)

#### 4 Circuit option\* page 31

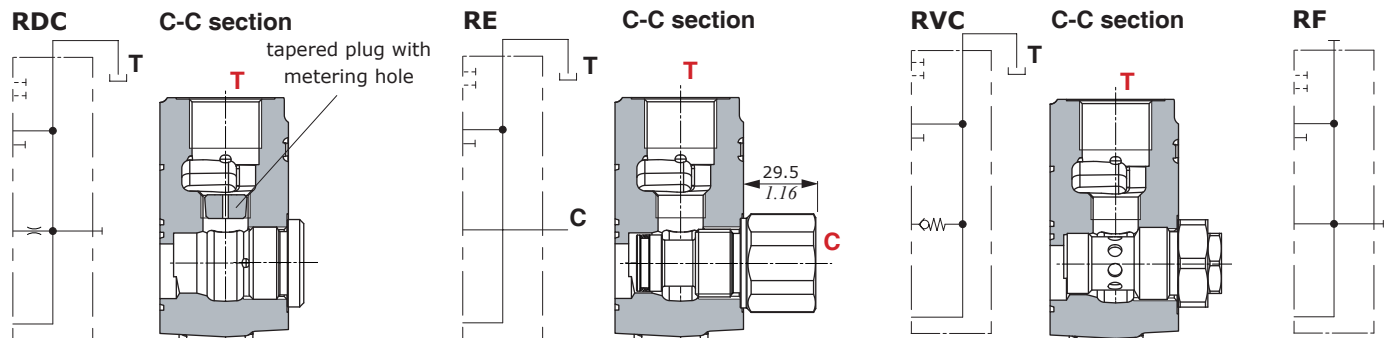
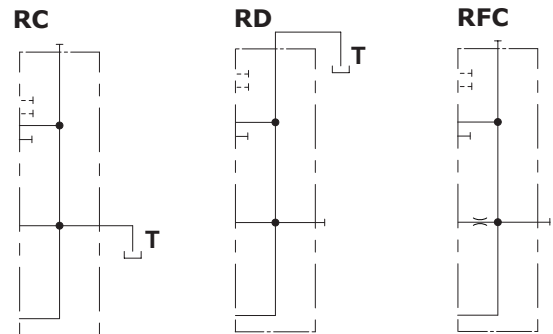
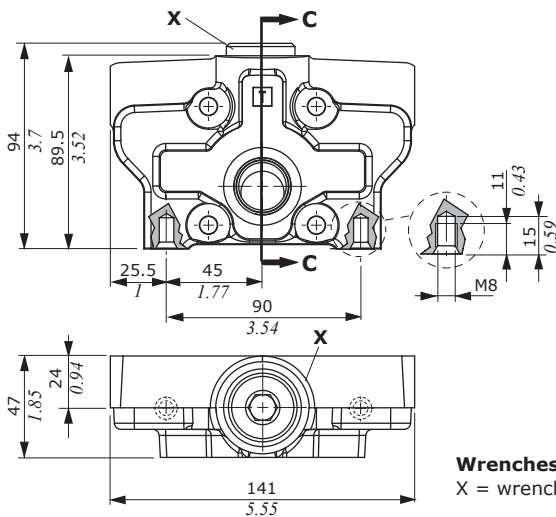
CODE	DESCRIPTION
XGIU536695	Junction for carry-over (RE)
X147600007(*)	VRC back pressure valve for RVC configuration
3VT2730100	FC5 plug with metering hole for RFC and RDC

#### 5 Section threading

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

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

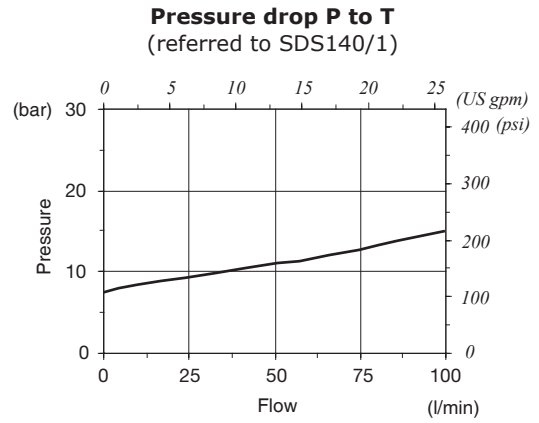
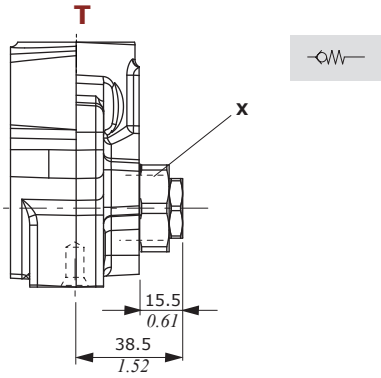
### Dimensional data and hydraulic circuit



**Circuit option**

The VRC valve is assembled on flow through passage of outlet cover; it's necessary to provides pilot pressure to the actuator.

**VRC back pressure valve**



**Wrenches and tightening torques**

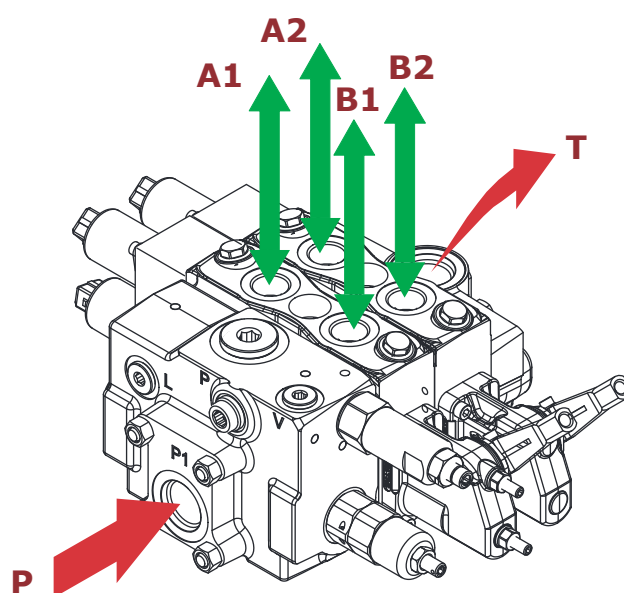
X = wrench 32 - 42 Nm (31 lbft)

## Installation and maintenance

The SDS140 valves are assembled and tested as per the technical specifications of this catalogue.

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

- the valve can be assembled in any position; in order to prevent 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 washdown directly on the valve;
- prior to painting, ensure plastic port plugs are tightly in place.



### Fitting tightening torque - Nm (*lbft*)

THREAD TYPE	P port	A, B ports	T, C ports	LS signal
BSP	G 3/4	G 1/2	G 3/4	G 1/4
With O-Ring seal	90 - 66.4	50 - 36.9	90 - 66.4	20 - 14.7
With copper washer	90 - 66.4	60 - 44.3	90 - 66.4	25 - 18.4
With steel and rubber washer	70 - 51.6	60 - 44.3	70 - 51.6	16 - 11.8
UN-UNF	7/8-14 (SAE 12)	3/4-16 (SAE 8)	7/8-14 (SAE 12)	9/16-18 (SAE 6)
With O-Ring seal	90 - 66.4	60 - 44.3	90 - 66.4	30 - 22.1
METRIC	M27x2	M22x1.5	M27x2	M14x1.5
With O-Ring seal	100 - 73.7	60 - 44.3	100 - 73.7	35 - 25.8

NOTE – This torque is recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer has to be consulted.



## Types and ordering codes

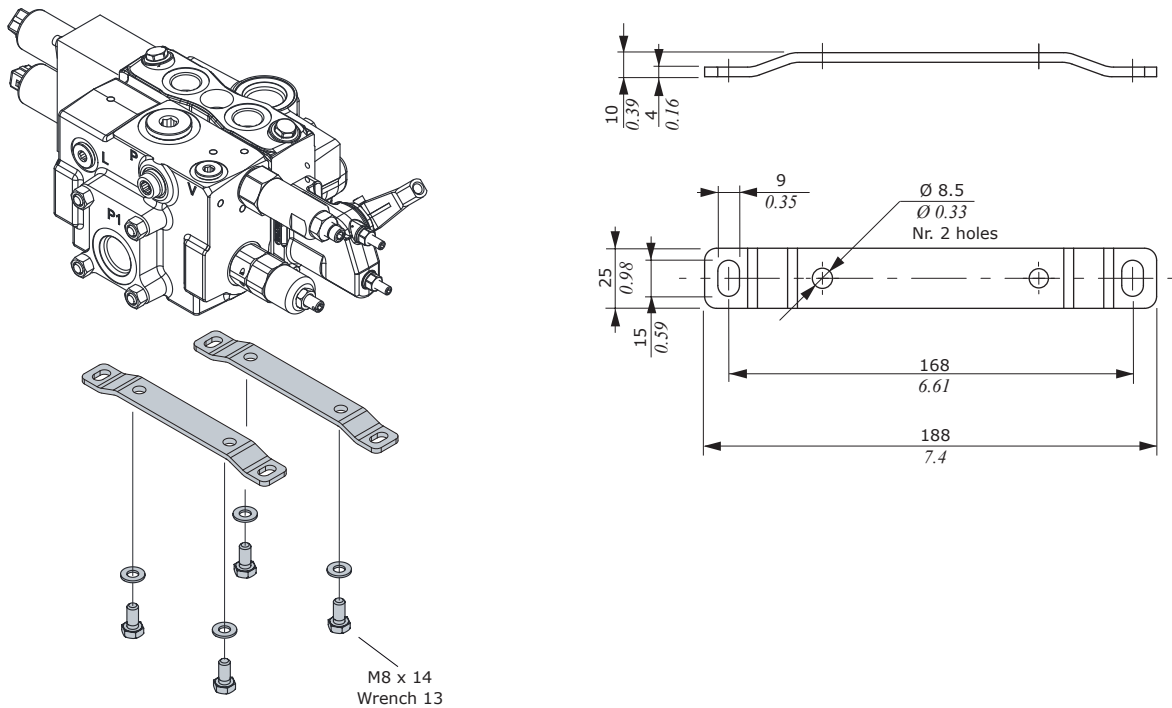
Coil type	Voltage	Connectors					
		ISO4400	Deutsch DT	AMP JPT	Packard Weatherpack	Packard Metri-pack	Flying leads (without conn.)
BER	10 VDC	4SLE001000A	-	-	-	-	-
	12 VDC	4SLE001200A	4SLE001201A <sup>(5)</sup>	4SLE001203A <sup>(4)</sup>	4SLE001210A <sup>(2)</sup>	4SLE001214A <sup>(2)</sup>	4SLE001207A
		4SLE001217A <sup>(3)</sup>	4SLE001209A <sup>(3-4)</sup>	4SLE001211A <sup>(3-4)</sup>	-	-	-
			4SLE001202A <sup>(5)</sup>	4SLE001216A <sup>(3-5)</sup>	-	-	-
	14 VDC	-	4SLE001206A <sup>(2)</sup>	4SLE001403A <sup>(3-4)</sup>	-	-	-
			4SLE001400A <sup>(5)</sup>	4SLE001401A <sup>(3-5)</sup>	-	-	-
	24 VDC	4SLE002400A	4SLE001402A <sup>(3-4)</sup>	4SLE002403A <sup>(4)</sup>	-	-	4SLE002404A
		4SLE002408A <sup>(3)</sup>	4SLE002401A <sup>(4)</sup>	-	-	-	-
	28 VDC	4SLE302400A <sup>(1)</sup>	4SLE002402A <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>	-	-	-	-	-	
<b>Mating connectors</b> (for connector with rectifier see following table)		4CN1009995	5CON140031	5CON003	5CON001	5CON017	-

NOTES - <sup>(1)</sup> supply with AC and use only with rectifier connector - <sup>(2)</sup> with flying leads - <sup>(3)</sup> with bidirectional diode  
<sup>(4)</sup> with unidirectional diode - <sup>(5)</sup> integrated perpendicular type - <sup>(6)</sup> integrated parallel type

Voltage	ISO 4400 mating connector with rectifier	
	BER type coil	BT type coil
24 VDC	4CN1010240	4CN3010240
48 VDC	4CN1010480	4CN3010480
110 VDC	4CN1011100	4CN3011100
220 VDC	4CN1012200	4CN3012200



Fixing brackets



NOTE - For fixing bracket code please see page 7.

Painting

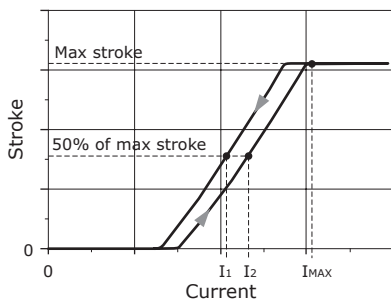
SDS140 valve can be supplied with one coat of black paint (**CVN** configuration).  
 Description example: SDS140/2/AC(YG3-175)-R(32)/PZ-1EZ8EZHZ3LQ.U3T/RD-**<CVN>**  
 NOTE - For different colour please contact our Sales Dpt.

Appendix A

**Electrohydraulic controls: hysteresis calculation rule**

Hysteresis is calculated as the difference between control currents ( $I_2 - I_1$ ), needed to reach 50% of nominal spool stroke, referred to maximum control current  $I_{MAX}$ , needed to reach 100% of spool stroke.  
 $I_2$  is determined on spool stroke increase line,  $I_1$  is determined on spool stroke decrease line.

**Example diagram for data detection**



$$\text{Hysteresis \%} = \frac{I_2 - I_1}{I_{MAX}} \times 100$$



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Walvoil S.P.A. • 42124 Reggio Emilia • Italy • Via Adige, 13/D • Tel. +39.0522.932411 • Fax +39.0522.300984  
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