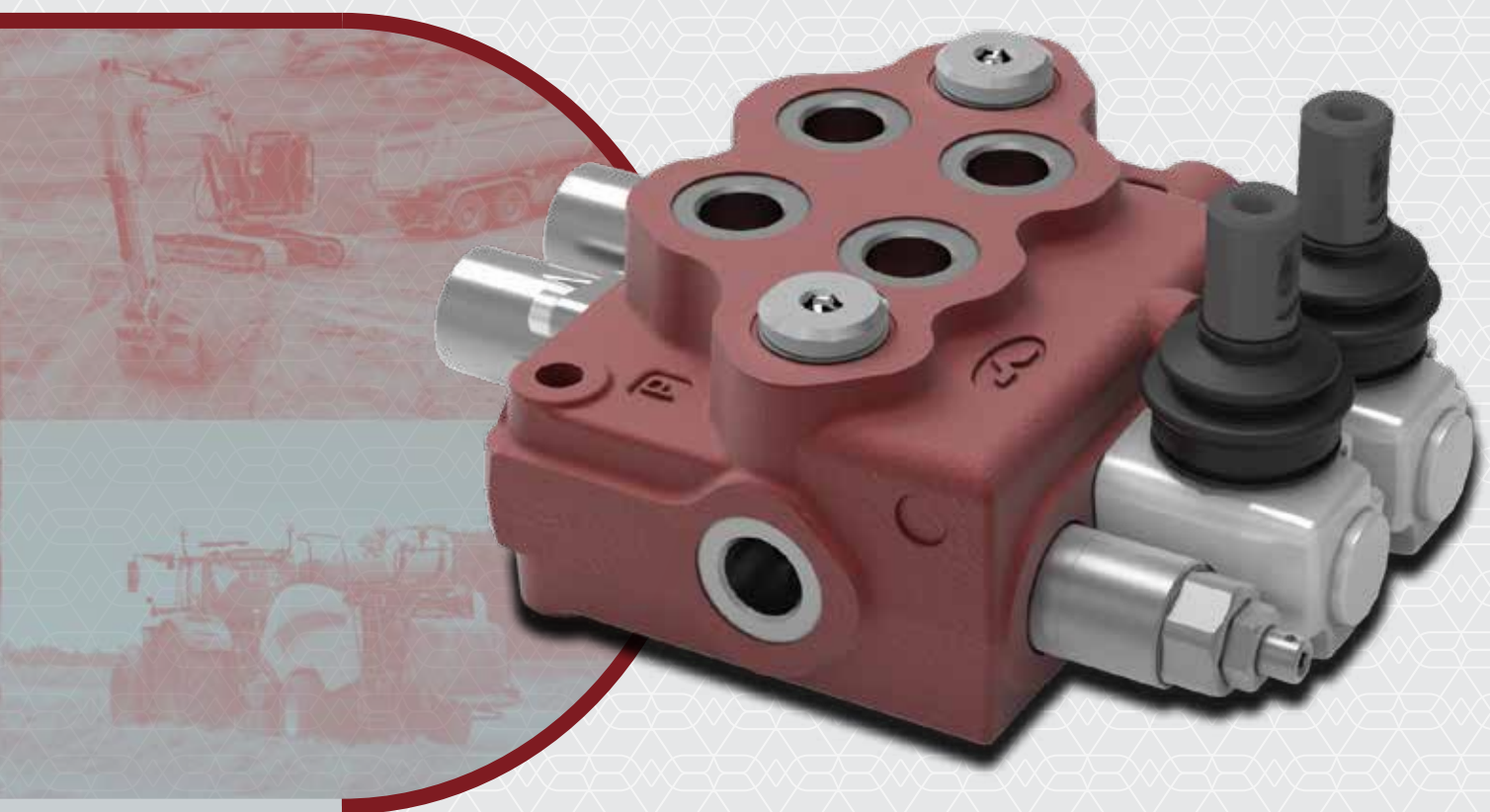


SD5

Monoblock Directional
Control Valve



DIRECTIONAL VALVES

Features

Simple, compact and heavy duty designed monoblock valves from 1 to 7 sections for open and closed centre hydraulic systems.

- Fitted with a main pressure relief valve and a load check valve.
- Available with parallel, series or tandem circuit.
- Optional carry-over port (only for parallel or tandem circuit).
- A wide variety of service port valve options.
- Actuation is manual, pneumatic, electro-pneumatic, hydraulic, electro-hydraulic, with solenoid and remote with flexible cables spool control kits.

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.

1st edition July 2026

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SD5

directional valve with left inlet

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SD5

directional valve with right inlet

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SDM105

directional valve with right inlet

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Working conditions

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

Nominal flow rating		45 l/min	12 US gpm
Max. pressure	parallel or tandem circuit	315 bar	4600 psi
	series circuit	250 bar	3600 psi
Back pressure (max.) on outlet T port		25 bar	362.5 psi
Standard internal leakage A(B)→T	Δp = 100 bar - 1450 psi with fluid and valve at 40°C - 46 cSt	3 cm ³ /min	0.18 in ³ /min
Fluid		Mineral oil	
Fluid temperature range	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 300 mm ² /s	from 15 to 300 cSt
	minimum	12 mm ² /s	12 cSt
	maximum	400 mm ² /s	400 cSt
Contamination level		19/16 - ISO 4406	NAS 1638 class 10
Environmental temperature for working conditions	with mechanical, pneumatic and hydraulic devices	from -40°C to 60°C	from -40°F to 140°F
	with electric devices	from -20°C to 60°C	from -4°F to 140°F

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

Standard threads

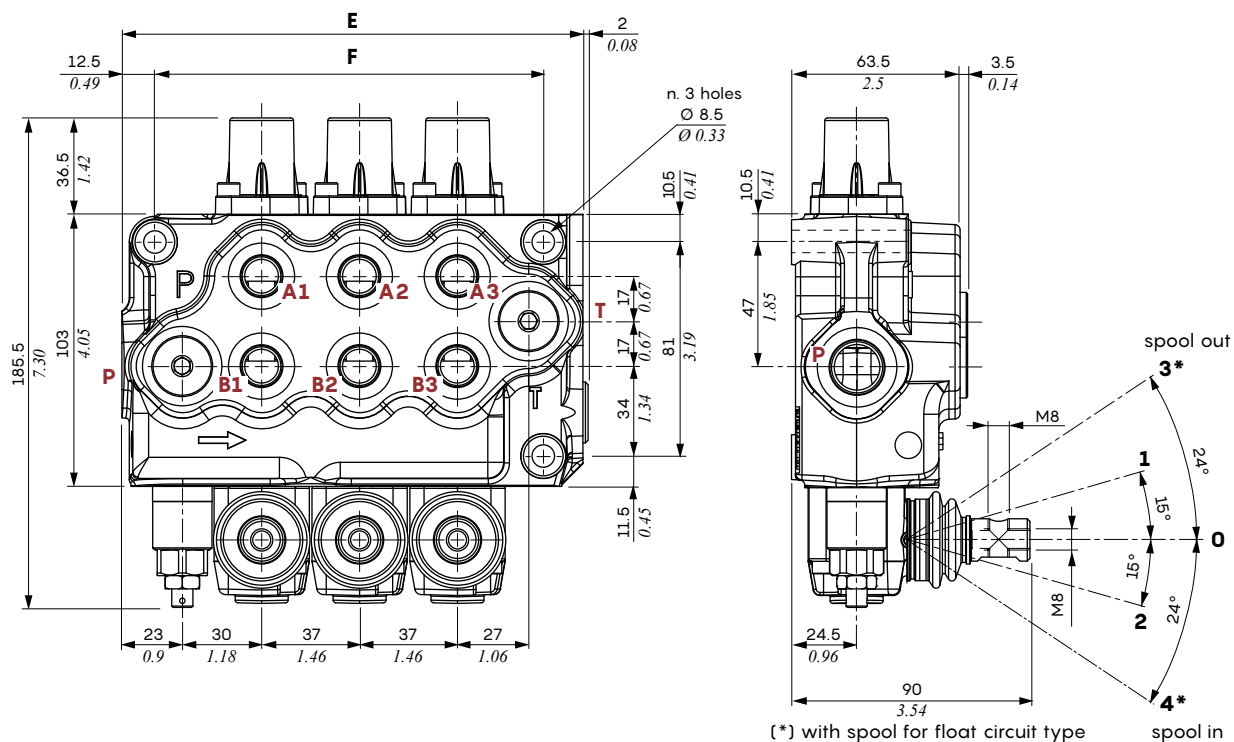
REFERENCE STANDARD					
		BSP	UN-UNF	METRIC	NPTF
THREAD		ISO 228/1	ISO 263		
ACCORDING TO		BS 2779	ANSI B1.1 unified	ISO 262	ANSI B1.20.3
CAVITY	ISO	1179-1	11926-1	9974-1	
DIMENSION	SAE		J1926-1	J2244	J476a
ACCORDING TO	DIN	3852-2 shape X or Y		3852-1 shape X or Y	

PORTS THREADING			
	BSP	UN-UNF	METRIC
P inlet and C carry-over	G 3/8	3/4-16 (SAE 8)	M18x1.5
A and B ports	G 3/8	9/16-18 (SAE 6)	M18x1.5
T outlet	G 3/8	3/4-16 (SAE 8)	M18x1.5
	G 1/2*		M22x1.5*
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27
Hydraulic controls	G 1/4	9/16-18 (SAE 6)	G 1/4

(*) - only for series circuit.

Parallel (SD5-P) and tandem (SD5-SP) circuit execution

Dimensional data



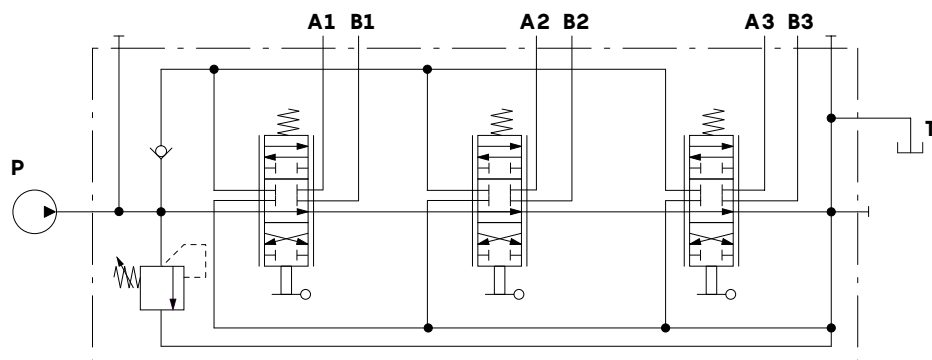
type circuit		E		F	
parallel	tandem	mm	in	mm	in
SD 5/1-P	-	100.5	3.96	73	2.87
SD 5/2-P	SD 5/2-SP	137.5	5.41	110	4.33
SD 5/3-P	SD 5/3-SP	174.5	6.87	147	5.79
SD 5/4-P	SD 5/4-SP	211.5	8.33	184	7.27
SD 5/5-P	SD 5/5-SP	248.5	9.78	221	8.7
SD 5/6-P	SD 5/6-SP	285.5	11.24	258	10.16
SD 5/7-P	SD 5/7-SP	322.5	12.7	295	11.61

Note - Drawings and dimensions are referred to a UN-UNF threading configuration.

Parallel (SD5-P) and tandem (SD5-SP) circuit execution

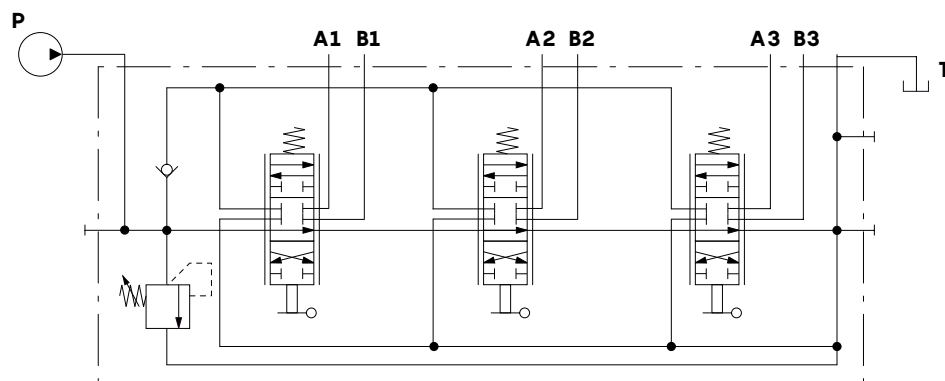
Hydraulic circuit

Parallel circuit execution (standard configuration)



Description example:
SD5/3-P(KG3—120)/18L/18L/18L/AET-SAE

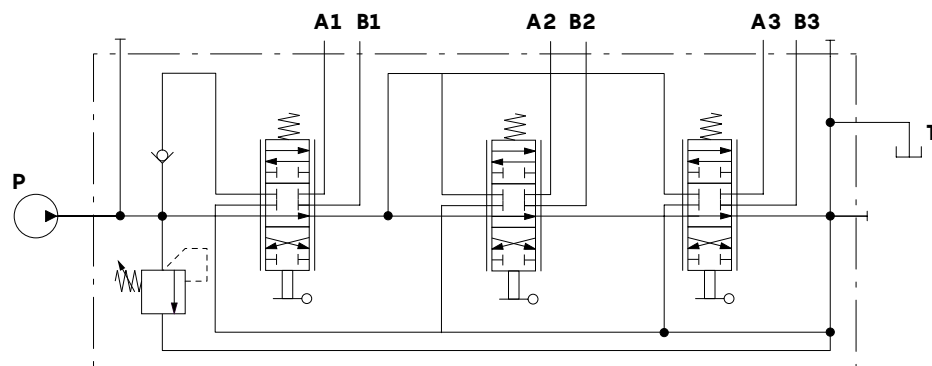
Parallel circuit execution (configuration with upper inlet and outlet)



Description example:
SD5/3-P(KG3—120)/18L/18L/18L/AET-PSA-SAE

Tandem circuit execution

The description of SD5 valve with tandem circuit is marked with letters "SP" and one figure which indicate the downstream sections for tandem connection.

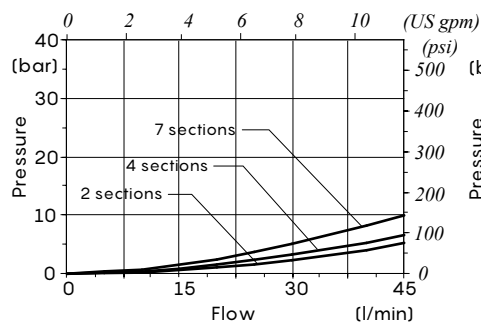
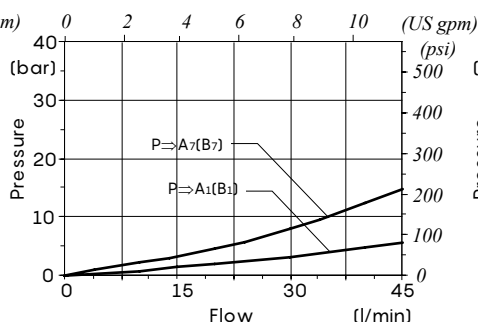
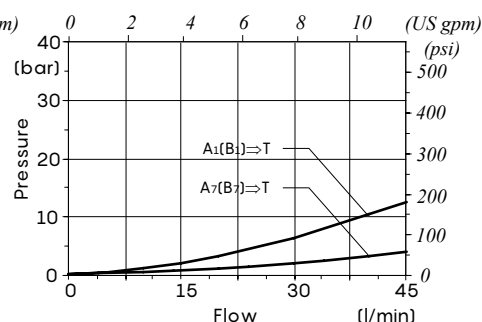


Description example:
SD5/3-SP2(KG3—120)/18L/18L/18L/AET-SAE

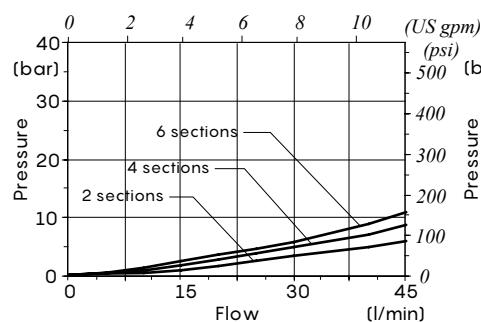
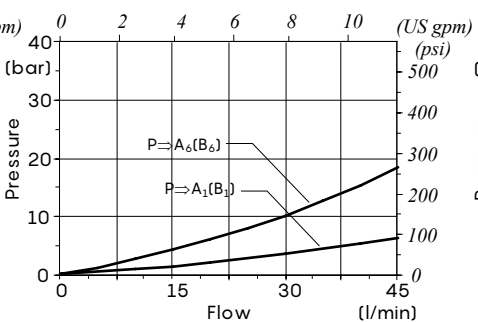
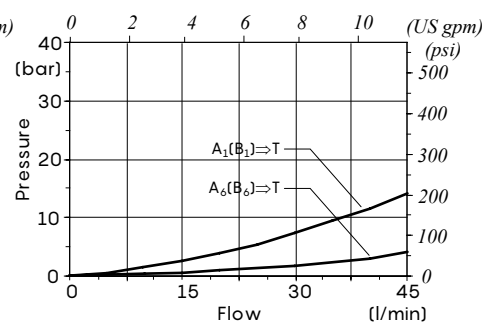
Parallel (SD5-P) and tandem (SD5-SP) circuit execution

Performances

Parallel circuit execution

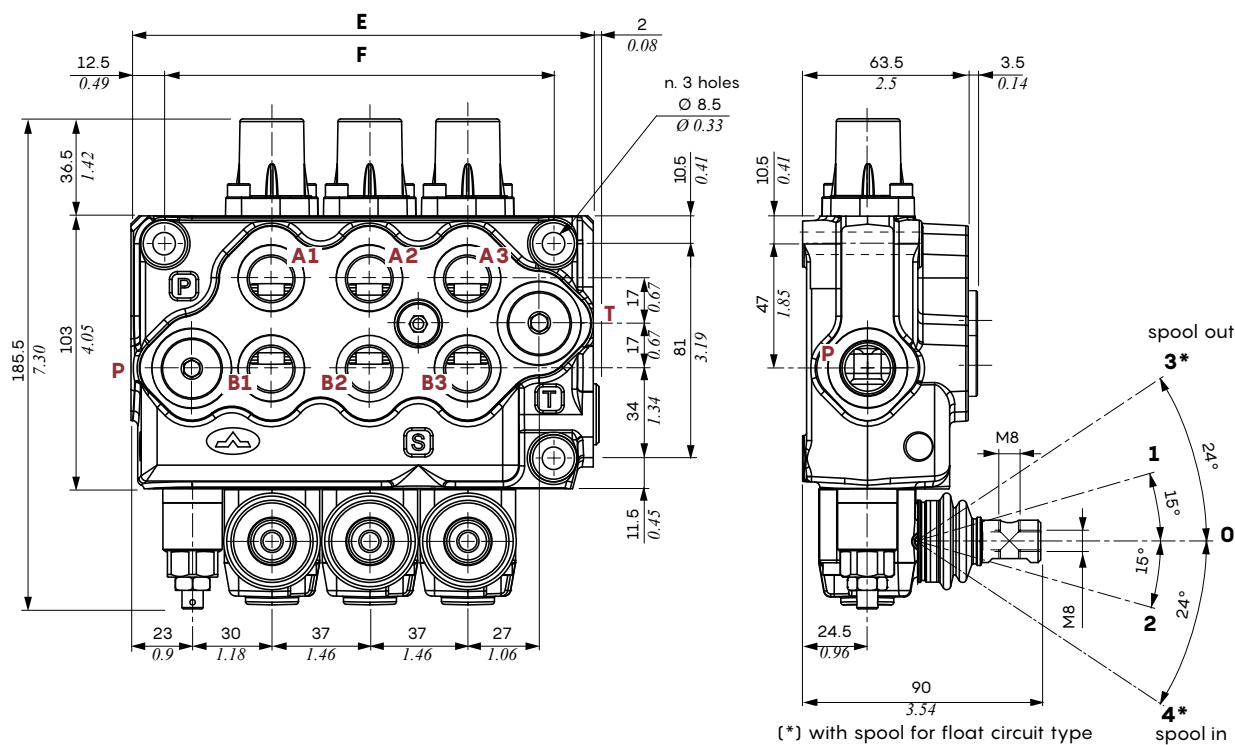
P $\Rightarrow$ T pressure drops**P $\Rightarrow$ A(B) pressure drops**
7 sections valve**A(B) $\Rightarrow$ T pressure drops**
7 sections valve

Tandem circuit execution

P $\Rightarrow$ T pressure drops**P $\Rightarrow$ A(B) pressure drops**
6 sections valve**A(B) $\Rightarrow$ T pressure drops**
6 sections valve

Series (SD5-S) circuit execution

Dimensional data

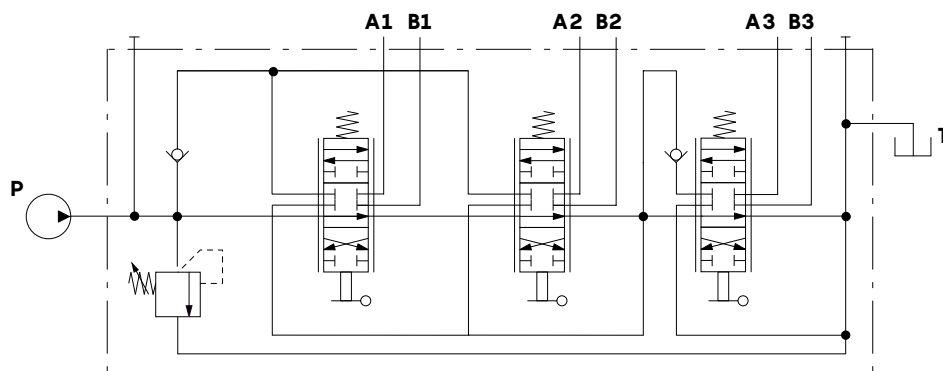


type	E		F	
	mm	in	mm	in
SD5/2-S	137.5	5.41	110	4.33
SD5/3-S	174.5	6.87	147	5.79
SD5/4-S	211.5	8.33	184	7.27
SD5/5-S	248.5	9.78	221	8.7
SD5/6-S	285.5	11.24	258	10.16
SD5/7-S	322.5	12.7	295	11.61

Note - Drawings and dimensions are referred to a UN-UNF threading configuration.

Hydraulic circuit

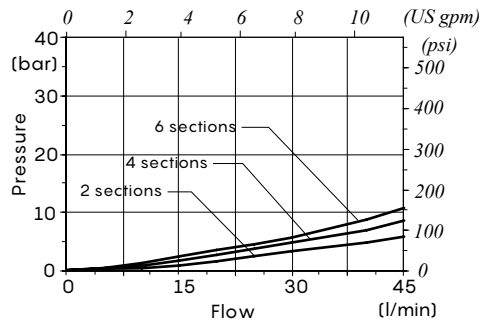
The description of SD5 valve with series circuit is marked with letters "S" and one figure which indicate the downstream sections for tandem connection.



Description example:
SD5/3-S1(KG3-120)/18L/18L/18L-SAE

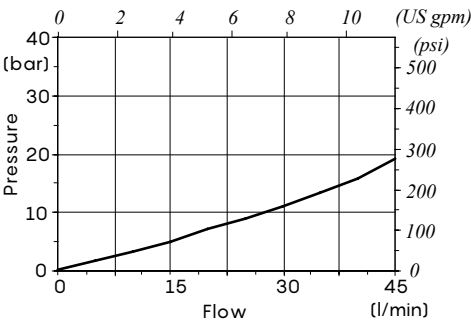
Performances

P⇒T pressure drops

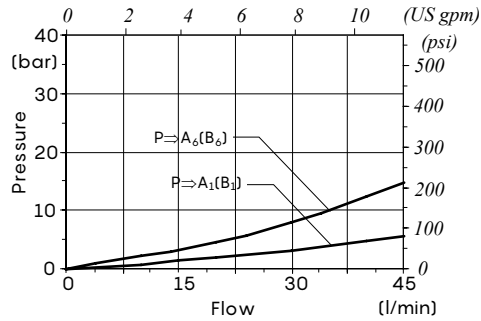


Pressure drops

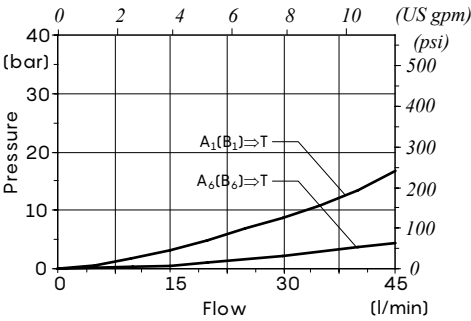
Between port A(B) before series connection and port A(B) after



P⇒A(B) pressure drops
6 sections valve



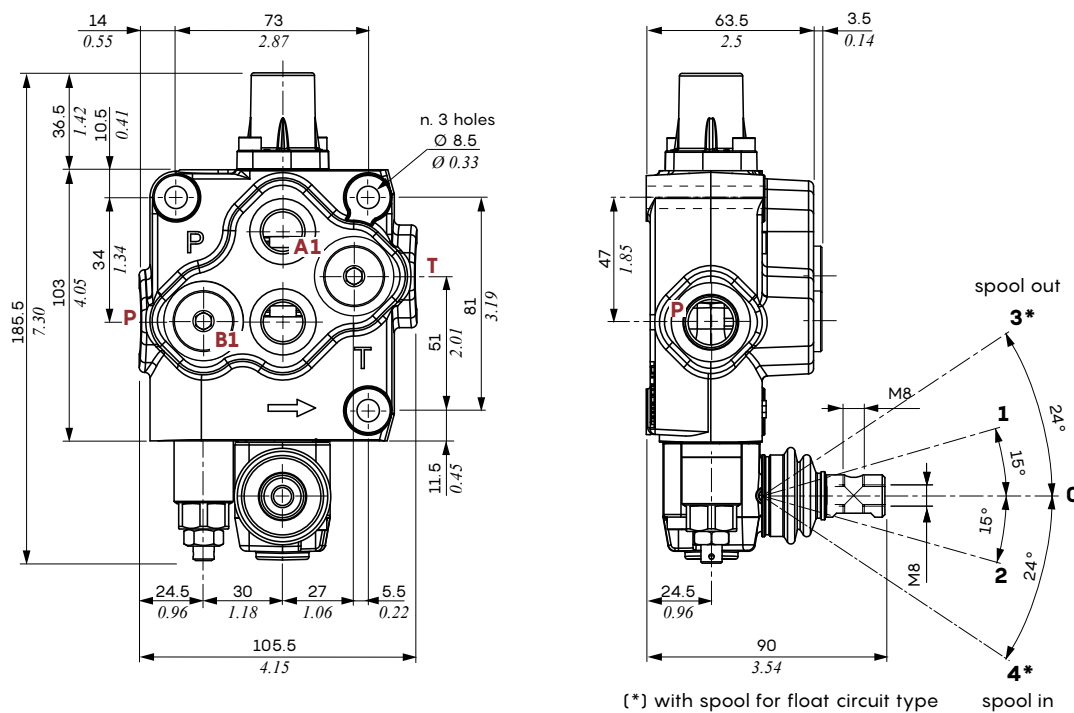
A(B)⇒T pressure drops
6 sections valve



Single section monoblock valve (SD5/1-N)

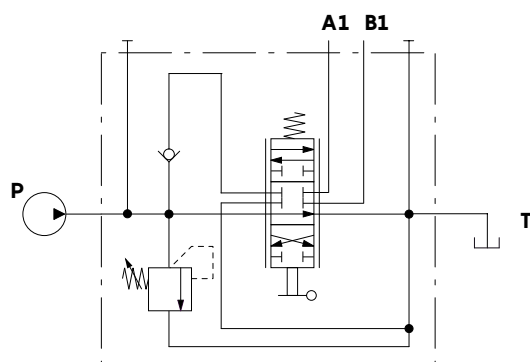
Dimensional data

Execution with one working section. It can be used in hydraulic circuit where carry-over doesn't required. For controls, spool positioning and valves, refer to directional valve with parallel circuit.



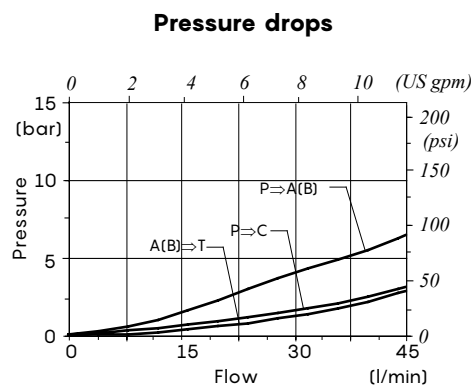
Note - Drawings and dimensions are referred to a UN-UNF threading configuration.

Hydraulic circuit



Description example:
SD5/1-N(KG3-120)/18L-SAE

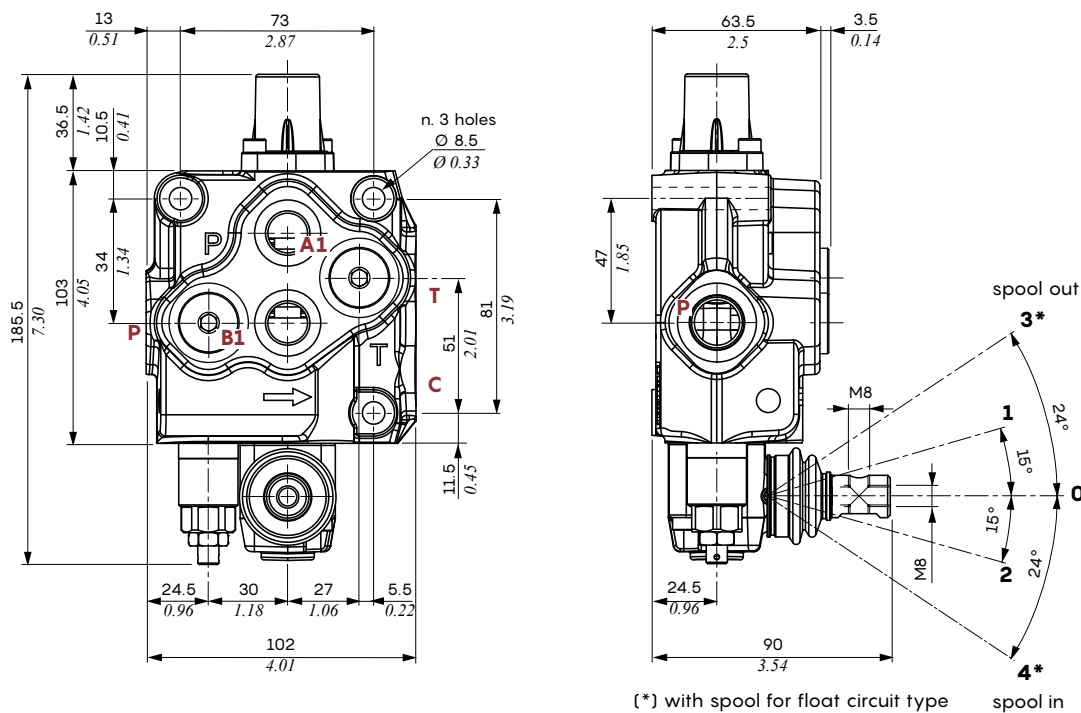
Performance



Single section monoblock valve (SD5/1-D)

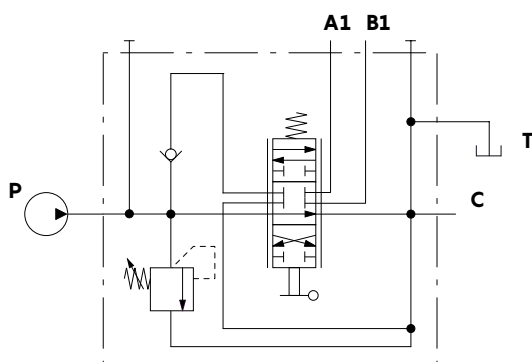
Dimensional data

Execution with one working section. It can be used in hydraulic circuit where carry-over is required. For controls, spool positioning and valves, refer to directional valve with parallel circuit.



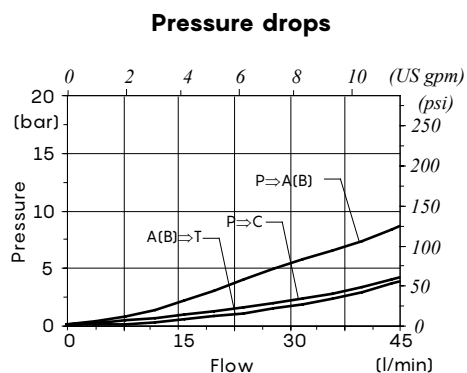
Note - Drawings and dimensions are referred to a **UN-UNF** threading configuration.

Hydraulic circuit



Description example:
SD5/1-D(KG3-120)/18L-SAE

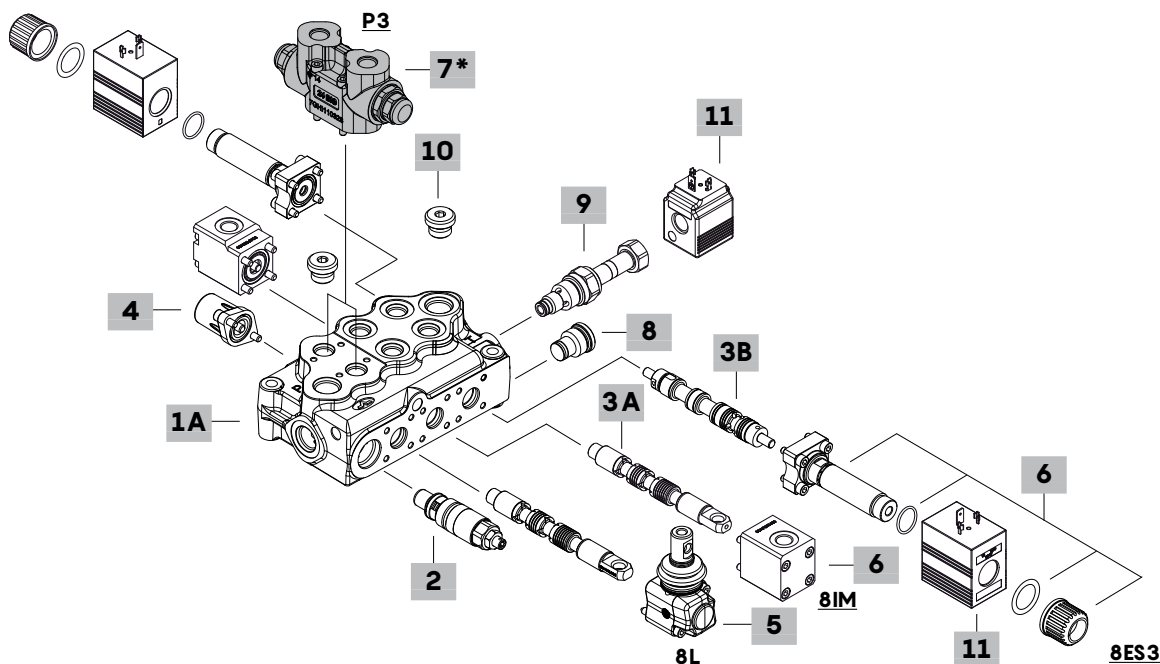
Performance



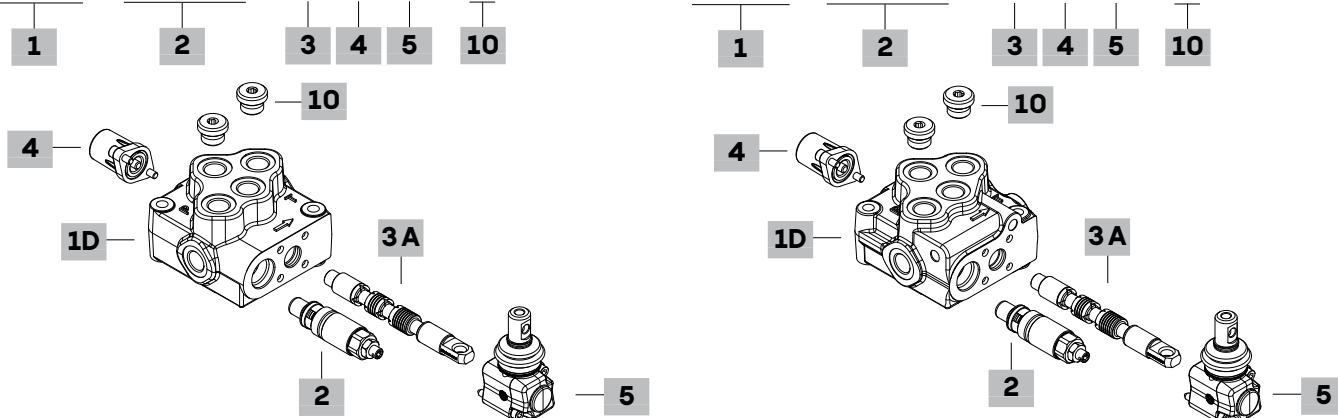
nr. of sections Valve setting (bar)

SD5/3-P (JG3-120) / VD11 / 1 8 L / 1 8IM/ 1 8ES3 . P3(G3-100) / AET-ELNW(NO) -SAE - 12VDC - <CVN>

1 2 7* 3 4 5 3 6 3 6 7* 8 9 10 11 Optional painting **



SD5/1-D (KG3-120) / 1 8 L - SAE - <CVN>



(**) SD5 valve can be supplied with one coat of black paint (CVN configuration). For different colour please contact our Sales Dpt.

Ordering codes

1A Body kit for parallel circuit execution ⁽¹⁾Available body kit for mixed pilot controls ⁽²⁾

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

For mechanical controls ⁽¹⁾

SD5/1-P	5KC1197000	1 section
SD5/2-P	5KC1227000	2 sections
SD5/3-P	5KC1247000	3 sections
SD5/4-P	5KC1277000	4 sections
SD5/5-P	5KC1317000	5 sections
SD5/6-P	5KC1357000	6 sections
SD5/7-P	5KC13E7000	7 sections

For proportional hydraulic and ON/OFF electric controls

SD5/1-P-IM-ES	5KC1197100	1 section
SD5/2-P-IM-ES	5KC1227100	2 sections
SD5/3-P-IM-ES	5KC1247100	3 sections
SD5/4-P-IM-ES	5KC1277100	4 sections
SD5/5-P-IM-ES	5KC1317100	5 sections
SD5/6-P-IM-ES	5KC1357100	6 sections
SD5/7-P-IM-ES	5KC13E7100	7 sections

1B Body kit for tandem circuit execution ⁽¹⁾The letter "SP" and one figure indicate the downstream sections for tandem connection ⁽²⁾

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

For mechanical controls

SD5/2-SP1	5KC1187000	2 sections
SD5/3-SP2	5KC1267000	3 sections
SD5/4-SP3	5KC1297000	4 sections
SD5/5-SP4	5KC1337000	5 sections
SD5/6-SP5	5KC1377000	6 sections
SD5/7-SP6	5KC13F7000	7 sections

For proportional hydraulic and ON/OFF electric controls

SD5/2-SP1-IM-ES	5KC1187000A	2 sections
SD5/3-SP2-IM-ES	5KC1267000A	3 sections
SD5/4-SP3-IM-ES	5KC1297000A	4 sections
SD5/5-SP4-IM-ES	5KC1337000A	5 sections
SD5/6-SP5-IM-ES	5KC1377002A	6 sections
SD5/7-SP6-IM-ES	5KC13F7000A	7 sections

1C Body kit for series circuit execution ⁽¹⁾The letter "S" and one figure indicate the downstream sections for series connection ⁽²⁾

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

For mechanical controls

SD5/2-S1	5KC1157040	2 sections
SD5/3-S1	5KC1257000	3 sections
SD5/4-S1	5KC1287000	4 sections
SD5/5-S1	5KC1327003	5 sections
SD5/6-S1	5KC1367000	6 sections

For proportional hydraulic and ON/OFF electric controls

SD5/2-S1-IM-ES	5KC1157040A	2 sections
SD5/3-S1-IM-ES	5KC1257000A	3 sections
SD5/4-S1-IM-ES	5KC1287000A	4 sections
SD5/5-S1-IM-ES	5KC1327003A	5 sections
SD5/6-S1-IM-ES	5KC1367000A	6 sections

1D Body kit for single section execution ⁽¹⁾

TIPO	CODE	DESCRIPTION
------	------	-------------

SD5/1-N	5KC1207040 ⁽¹⁾	Without "carry-over", for mechanical control
SD5/1-N-IM-ES	5KC1207140 ⁽¹⁾	As SD5/1-N for proportional hydraulic and ON/OFF controls
SD5/1-D	5KC1217000 ⁽¹⁾	As SD5/1-N with "carry-over"
SD5/1-D-IM-ES	5KC1217100	As SD5/1-N-IM-ES with "carry-over"

2 Main pressure relief valves

page 20

Standard setting is referred to 10 l/min (26 US gpm).

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

SV XTAP623282 Valve blanking plug**VMD5 type K (directly controlled)**

(KG1-30)	5KIT105121	Range from 20 to 50 bar (from 290 to 725 psi), std setting 30 bar (435 psi)
(KG2-80)	5KIT105122	Range from 40 to 100 bar (from 580 to 1450 psi), std setting 80 bar (1160 psi)
(KG3-120)	5KIT105123	Range from 80 to 200 bar (from 1160 to 2900 psi), std setting 120 bar (1740 psi)
(KG4-220)	5KIT105124	Range from 180 to 315 bar (from 2610 to 4570 psi), std setting 220 bar (3190 psi)

VMD5 type J (Zero-leak directly controlled)

(JNG1-20)	5KIT105500	Range from 10 to 40 bar (from 145 to 580 psi), std setting 20 bar (290 psi)
(JNG2-60)	5KIT105512	Range from 40 to 60 bar (from 580 to 870 psi), std setting 60 bar (870 psi)
(JNG3-120)	5KIT105513	Range from 50 to 190 bar (from 725 to 2755 psi), std setting 120 bar (1740 psi)
(JNG4-250)	5KIT105514	Range from 160 to 315 bar (from 2320 to 4570 psi), std setting 250 bar (3625 psi)

3A Spools for mechanical and hydraulic controls page 22Spools indicated with (*) can also be used on proportional hydraulic controls. For dedicated body see **1B**.

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

Doppio effetto, 3 posizioni

1^(*)	3CU1210130	A and B closed in neutral position
1[S]	3CU1210133 ⁽²⁾	As type 1, with low leakage
1[XS]	3CU1210131 ⁽²⁾	As type 1, with extra low leakage
1[XL]	3CU1210132 ⁽²⁾	As type 1, with low friction
1CP	3CU1210141	With positive overlap
1A	3CU1221130	With A connect to tank in neutral position
1B	3CU1222130	With B connect to tank in neutral position
1(11A)	3CU1210320 ^{(2) (3)}	As type 1, for pressure kick-out: it requires 11A control kit with additional body machining
1(9A-21A)	3CU1210330 ^{(2) (3)}	As type 1, for pressure kick-out: it requires 9A-21A control kit with additional body machining
1CS^(*)	3CU1210200	As type 1, metering type
1CSVR	3CU1211200	As type 1, fine metering type, with load check valve
1CEX^(*)	3CU1210230	As type 1, extra metering type
1CEX X	3CU1210231	As type 1, extra fine metering type
1A-CEX	3CU1221230	With A to tank in neutral position, extra metering type
1B-CEX	3CU1222230	With B to tank in neutral position, extra metering type
1CSD	3CU1210201 ⁽²⁾	As type 1, for flow up to 15 l/min (3.96 US gpm): it requires additional body machining
1CSE	3CU1210202 ⁽²⁾	As type 1, for flow up to 35 l/min (9.25 US gpm), it requires additional body machining
1CSF	3CU1210203 ⁽²⁾	As type 1, for flow up to 45 l/min (11.89 US gpm), it requires additional body machining

Notes - (1) Codes are referred to **UN-UNF** threads - (2) Please contact our Sales Dpt for more information - (3) Not usable on bodies with series circuits.

Ordering codes

3A Spools for mechanical and hydraulic controls page 22

Spools indicated with (*) can also be used on proportional hydraulic controls. For dedicated body see **1B**.

TYPE	CODE	DESCRIPTION
Double acting, 3 positions		
1AH-CEX	3CU1221225	With A partially connect to tank in neutral position, extra metering type
1BH-CEX	3CU1222225	With B partially connect to tank in neutral position, extra metering type
2(*)	3CU1225130	A and B connect to tank in neutral position
2CSE	3CU1225142 ⁽²⁾	As type 2, for flow up to 30 l/min (7.92 US gpm), it requires additional body machining ⁽²⁾
2CEX(*)	3CU1225230	As type 2, extra metering type
2CEX X	3CU1225231	As type 2, extra fine metering type
2H-CEX(*)	3CU1225225	With A and B partially connect to tank in neutral position, fine metering type
2HCSE	3CU1225212 ⁽²⁾	As type 2H(CEX), for flow up to 30 l/min (7.92 US gpm), it requires additional body machining ⁽²⁾
2HSA	3CU1225200	With A partially connect to tank in neutral position, metering type
6(*)	3CU1250130	As type 1, with closed center
7	3CU1255130	A and B connect to tank in neutral position with closed center

Single acting type, 3 positions

3(*)	3CU1231130	Single acting in A, it requires port plug on B ⁽²⁾
4	3CU1235120	Single acting in B, it requires port plug on A ⁽²⁾ and (CR) control kits

Regenerative circuit type ⁽²⁾

8F	3CU1261100	Double acting, 3 positions, regenerative in position 1, it requires additional body machining ⁽²⁾
8P	3CU1261210	Double acting, 3 positions, regenerative in position 2, it requires additional body machining ⁽²⁾
8(13FZ)	3CU1262120	Double acting, 4 positions, regenerative in position 3 (4 th pos.), spool in (lever to pull), it requires A side controls type 13FZ and 13FZ1 and additional body machining ⁽²⁾
8(17F)	3CU1263130	As previous with B partially connect to tank in neutral position, it requires A side controls type 17FZ and additional body machining ⁽²⁾

Float circuit type ⁽²⁾

5DY	3CU1242220	Double acting, 4 positions, floating in pos. 3 (4 th pos.), spool in (lever to pull), it requires A side controls type 13N, 14NZ and 13IM and additional body machining ⁽²⁾
5WY	3CU1242320	As type 5DY with check valve on A it requires A side controls type 13NZ and 14NZ and additional body machining ⁽²⁾
5(14A)	3CU1242330	As type 5DY for pressure kick-out, it requires A side controls type 14A and additional body machining ⁽²⁾
5PY	3CU1245620	Double acting, 4 positions, floating in pos. 3 (4 th pos.), spool out (lever to push), it requires A side controls type 13FZ and 13FZ1 and additional body machining ⁽²⁾

3B Spools for direct solenoid control kit page 22

TYPE	CODE	DESCRIPTION
ON/OFF direct solenoid control kit		
1ES	3CU1210011	Double acting, 3 positions, A and B closed in neutral position
1AES	3CU1221026	Double acting, 3 positions with A to tank in neutral position
2ES	3CU1225011	Double acting, 3 positions with A and B to tank in neutral position
2HES	3CU1225227	Double acting, 3 positions with A and B partially connect to tank in neutral position
3ES	3CU1231011	3 positions, single acting in A, it requires plug on B
ON/OFF direct solenoid control kit with lever		
1(ES3LHE)	3CU1210017	Double acting, 3 positions, A and B closed in neutral position
2(ES3LHE)	3CU1225015	Double acting, 3 positions with A and B to tank in neutral position
3(ES3LHE)	3CU1231012	3 positions, single acting in A, it requires plug on B

4 A side controls page 27

TYPE	CODE	DESCRIPTION
7	5V07105000	Free control
3 positions, spring return		
6	5V06105000	Spring return in neutral position (non-kit components)
8	5V08105000	Spring return in neutral position (spring kit pre-assembled)
8WPO	5V08105003	As type 8, water proof type
8F2	5V08105101	Spool stroke limiter in B
8TCL	5V08105300	Flexible cable control arrangement
8TL	5V08105310	Double control arrangement
8D	5V08105200	M6 female threaded pin extension
8D1	5V08105210	Ø8 (Ø 0.31) hollow pin extension
8D2	5V08105220	Perno uscente filettato maschio M8
8D3	5V08105230	M8 female threaded pin extension
17	5V17105000	Spring return in position 1 from position 2, free neutral position
17TCL	5V17105300	As type 17 with flexible cable control arrangement
18ME	5V18405100	Spring return in position 2
18TCL	5V18105300	As type 18ME with flexible cable control arrangement
18DB	5V18105240	As type 18ME, M6 female threaded pin extension
3 positions, with detent		
8RM2-12VDC	5V08105590	Electromagnetic detent in position 2, spring return in neutral position
9	5V09105010	Detent in position 1
9BZ	5V09202010	As type 9, Zama execution
9TCL	5V09105300	As type 9 with flexible cable control arrangement
9D	5V09105200	As type 9 with M6 female threaded pin extension

Notes - (1) Codes are referred to **UN-UNF** threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

4	A side controls	page 27
TYPE	CODE	DESCRIPTION
3 positions, with detent		
10	5V10105010	Detent in position 2
10BZ	5V10202010	As type 10 Zama execution
10TCL	5V10105300	As type 10 with flexible cable control arrangement
10TL	5V10105310	As type 10, double control arrangement
10D	5V10105200	As type 10 with M6 female threaded pin extension
11	5V11105000	Detent in all positions
11WPO	5V11105004	As 11 type, water proof type
11B	5V11205000	Detent in positions 1 and 2
11BZ	5V11202010	As type 11, Zama execution
11TCL	5V11105300	As type 11 with flexible cable control arrangement
11TL	5V11105310	As type 11, double control arrangement
11D	5V11105200	As type 11, with M6 female threaded pin extension
11D2	5V11105220	As type 11, with M8 male threaded pin extension
12	5V12105000	Detent in positions 1 and 2
21	5V21105003	Detent in position 2 and spring return in position 1
2 positions, spring return		
17A	5V17105050	Positions 1-0, spring return in position 1
18BME	5V18405000	Positions 2-0, spring return in position 2
19	5V19105000	Positions 1-0, spring return in position 0
20	5V19105000	Positions 2-0, spring return in position 0
2 positions, with detent		
15	5V15105000	Positions 1-0, detent in both positions
15WPO	5V15105002	As type 15, water proof type
16	5V16105000	Positions 2-0, detent in both positions
16WPO	5V16105003	As previous, water proof type
Control kit with pressure kick-out		
9A	5V09505000	3 positions, detent in position 1, kick-out to neutral position, it requires spool type 1(21A-9A)
11A	5V11505000	3 positions, detent in positions 1 and 2, kick-out to neutral position, it requires spool type 1(11A). Not for use with series circuit bodies.
21A	5V21505000	3 positions, detent in position 1, kick-out to position 2, it requires spool type 1(21A-9A). Not for use with series circuit bodies.
Spool positioning control, electric signal		
8SPSL	5V08105550	As type 8, Hall effect sensor

4	A side controls	page 27
TYPE	CODE	DESCRIPTION
Spool control with microswitch		
8MG1(NO)	5V08105670	As type 8 with microswitch in position 1, NO contact
8MG2(NO)	5V08105680	As type 8 with microswitch in position 2, NO contact
8MG3(NO)	5V08105660	As type 8 with microswitch in positions 1 and 2, NO contact
8MG3(NC)	5V08105662	As type 8 with microswitch in positions 1 and 2, NC contact
8MG39(NO)	5V08105669	As 8MG3(NO) with integrated connector
8MG19\29 (NC\NC)	5V08105678	As type 8, 2 microswitches NC
8MG19\29 (NO\NO)MC	5V08105679	As type 8, 2 microswitches NO, soft spring type C
11BZMG3(NC)	5V11205601	As type 11B with microswitch in positions 1 and 2
Spool control kit with prearranged centralized microswitch		
These controls are for SD5/1 composition with IP51. Other compositions are available with IP51 and IP67. See complete range at dedicated page 40		
8MS1	5V08105510	Switch in position 1
8MS2	5V08105520	Switch in position 2
8MS3	5V08105500	Switch in positions 1 and 2
11MS3	5V01105500	As 8MS3 with detent
Pneumatic controls		
8P	5V08105701	ON/OFF type with spring return in neutral position
8PNB	5V08105718	As type 8P, waterproof
8PNBZ	5V08105717	Proportional pneumatic control
8EPNB3	5V08105745	ON/OFF electropneumatic control, 12VDC
	5V08105746	ON/OFF electropneumatic control, 24VDC
ON/OFF electrohydraulic controls		
Manifold kit and backpressure valve are required, see dedicated page 44		
8ED3(NFC)	5V08105755	Without coils and restrictor
8ED3	5V08105350	Type ON/OFF, spring return in neutral position 12VDC
	5V08105351	Type ON/OFF, spring return in neutral position 24VDC
19ED1	5V19105350	Type ON/OFF, 2 positions (1 and 0), spring return in position 0, 12VDC
	5V19105351	As type 19ED1, 24VDC
20ED2	5V20105350	Type ON/OFF, 2 positions (2 and 0), spring return in position 0, 12 VDC
For floating circuit		
13NZ	5V13305010	4 positions, detent in position 3 spring return in neutral position, for 5DY and 5WY spools
14NZ	5V14305010	4 positions, detent in positions 1, 2, 3, spring return in neutral position, for 5DY and 5WY spools
13QN	5V13405020	4 positions, detent in pos. 3, spring return in neutral position, for 5PY spool

Notes - (1) Codes are referred to UN-UNF threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

4 A side controls		page 27
TYPE	CODE	DESCRIPTION
For floating circuit		
13QNK 4	5V13405022	As type 13QN with solenoid spool lock in neutral, 12VDC, for 5PY spool
14A	5V14505000	4 positions, detent in positions 1, 2, 3, spring kick-out in neutral position, for 5(14A) spool
For regenerative circuit		
13FZ	5V13505400	4 positions, spring return in neutral position, for 8(13FZ) spool
13FZ1	5V13605010	As previous detent in position 1, for 8(13FZ) spool
17F	5V17005100	4 positions, spring return in position 1, for 8(17F) spool
Short stroke (CR) spool control kits for spool type 4		
8CR	5V08105022	3 positions, spring return in neutral position
8CRWPO	5V08105021	As type 8CR, waterproof
8PNBCR	5V08105719	ON/OFF pneumatic control with spring return in neutral position, waterproof
9BZCR	5V09202022	3 positions, detent in position 1 and spring return in neutral position, Zama execution
10BZCR	5V10202022	3 positions, detent in position 2 and spring return in neutral position, Zama execution
11CR	5V11105022	Detent in 3 positions
11CRWPO	5V11105024	As type 11CR, waterproof
12CR	5V12105022	Detent in positions 1 and 2
16 CR	5V16105022	2 positions (position 2 and 0), detent in both positions
17 CR	5V17105022	Spring return in position 1, free neutral position
19CR	5V19105022	2 positions (position 1 and 0) spring return in neutral position
20CR	5V19105022	2 positions (position 2 and 0) spring return in neutral position
8ED3CR	5V08105358	ON/OFF electrohydraulic control with spring return in neutral position, 12 VDC, it requires manifold kit, see page 45
	5V08105359	As previous, 24VDC, it requires manifold kit, see page 45

5 B side controls		page 52
TYPE	CODE	DESCRIPTION
Aluminium lever kits		
L	5LEV105000	Standard lever kit
LSG	5LEV105000S	As type L, waterproof
LSGF1	5LEV105102S	As previous, stroke adjustment
LM10	5LEV205000	M10 thread lever kit
LSGM10	5LEV205000S	As type LM10, waterproof
LW	5LEV105005	With rust preventer treatment
LWM10	5LEV205005	As type LW with M10 thread
L1	5LEV105050	With dull lever for P valves (see pag. 69)
LSG1	5LEV105050S	As type L1, waterproof
L1F1	5LEV105150	As type L1 with spool stroke adjustment
LSG1F1	5LEV105150S	As type L1F1, waterproof
LF1	5LEV105102	Spool stroke adjustment
LF1M10	5LEV205100	As type LF1 with M10 thread
L9	5LEV105950	With spool extension
LSG9	5LEV105950S	As type L9, waterproof
Cast iron lever kits		
LG	5LEV105805	Cast iron lever kit
LFG	5LEV105800	With spool stroke adjustment in both directions
Steel lever kits		
LB3	5LEV305000	With upper pivot
LB3M10	5LEV305050	As type LB3, with M10 thread
LB1	5LEV305100	With low pivot
Aluminium lever kits with detent		
LE	5LEV505000	Detent in neutral position
LEB	5LEV605000	Safety lever box
LEB5	5LEV605030	Detent in positions 1 and 2 with safety lever box
LSGEB5	5LEV605001S	As type LEB5, waterproof
LEBS	5LEV605100	As type LEB with arrangement for auxiliary valves
LUP	5LEV805005	As type LEB with horizontal safety lever box
LSGUP	5LEV805005S	As type LUP, waterproof
LUP(R150)	5LEV805010	As type LUP with short handlever
LSGUP(R150)F1	5LEV805012S	As type LUP(R150), waterproof with spool stroke limiter on port A
Joystick for 2 section operation		
LCN1-4	5CLO305100	Mechanical joystick, right drive, with nylon bearing
LCN2-3	5CLO305101	Mechanical joystick, left drive, with nylon bearing
LCA1-4	5CLO305055	Mechanical joystick, right drive, with bronze bearing
LCA2-3	5CLO305056	Mechanical joystick, left drive, with bronze bearing
Other devices		
SLP	5COP105000	Dustproof plate
SLCZ	5COP205030	With endcap
SLCZWP	5COP205031	As type SLCZ, waterproof
TQ50	5TEL105110	Cable connection

Notes - (1) Codes are referred to UN-UNF threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

6 Complete controls page 59

TYPE	CODE	DESCRIPTION
Proportional hydraulic pilot control kit⁽¹⁾		
8IM	5IDR205071	Pilot control kit
13IM	5IDR205730	Pilot control kit for floating circuit
ON/OFF direct solenoid control kits		
8ES3	5CAN08025	Double acting
8ES1	5CAN08024	Single acting in A
8ES2	5CAN08024	Single acting in B
8ES3LHE	5CAN08092	Double acting with manual override for emergency only

7 Auxiliary valves page 62

See page 62

8 Outlet port option page 77

TIPO	CODICE	DESCRIZIONE
AE-SAE8	3XGIU527470 ⁽¹⁾	SAE8 carry-over sleeve
AEK	3XTAP522282	Closed center plug
AET	XTAP623170	Open center plug

9 Unloader valves page 79

TYPE	CODE	DESCRIPTION
L	XCAR405300	With hydraulic pilot unloader valve
ELNW(NO)	0EFW0132002	Solenoid valve without manual emergency, NO circuit
ELTW(NO)	0EFW0132000	Solenoid valve with "push&twist" manual emergency, NO circuit
ELPW(NO)	0EFW0132001	Solenoid valve with push-button manual emergency, NO circuit
ELNW(NC)	0EFW0132003	Solenoid valve without manual emergency, NC circuit
AET-LT	XTAP523370	Valve blanking plug

10 Port plugs⁽¹⁾

Omitted if it is BSP thread.

For description with side or upper inlet and outlet **(PSA)** configuration see page 6.

CODE	DESCRIPTION
3XTAP822150	SAE8 plug

11 Coils page 116**For complete available coil list and connectors page 114**

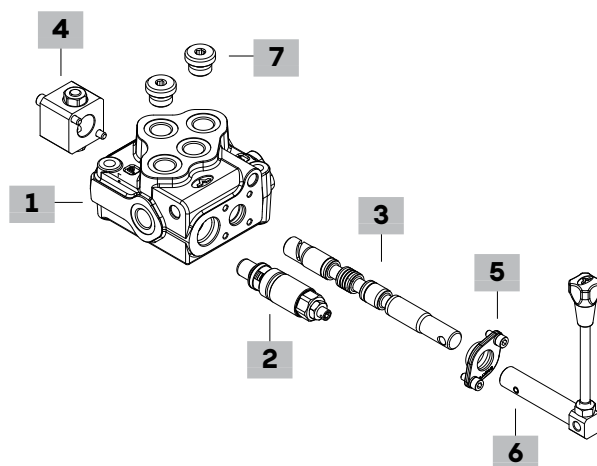
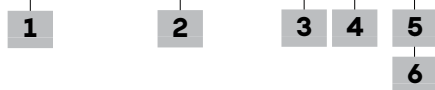
TYPE	CODE	DESCRIPTION
12VDC-BER	4SLE001200A	Type BER, 12VDC, ISO4400 connector, for unloader valve
12VDC-D12	4SOL412012	Type D12, 12VDC, ISO4400 connector, for ON/OFF direct solenoid control kits
12VDC-BT	4SL3000120	Type BT, 12VDC, ISO4400 connector, for electrohydraulic ON/OFF spool control kit

Notes - (1) Codes are referred to **UN-UNF** threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

Rotary spool control kit configuration

SD5/1-P (KG3-120) / 1 R LL

**1 Body kit⁽¹⁾**

TYPE	CODE	DESCRIPTION
SD5/1-P	5KC1197000	1 sezione

For other body kit see page 13

2 Main pressure relief valves

TYPE	CODE	DESCRIPTION
(KG3-120)	5KIT105123	Range from 80 to 200 bar (from 1450 to 2900 psi), standard setting 120 bar (1740 psi)

For other valves see page 13

3 Spools page 22

TYPE	CODE	DESCRIPTION
1(R)	3CU1210553	Double acting type, 3 positions A and B closed in neutral position
2(R)	3CU1225551	Double acting type, 3 positions A and B connect to tank in neutral position

4 A side controls page 51

TYPE	CODE	DESCRIPTION
R	5ROT105000	Rotary control kit

5 B side controls page 59

TYPE	CODE	DESCRIPTION
SLP	5COP105000	Dustproof plate

6 Optional B side controls

TYPE	CODE	DESCRIPTION
L	3XGIU422620	Joint with lever
LL	3XGIU422990	Long Joint with lever

7 Port plugs⁽¹⁾

CODE	DESCRIPTION
3XTAP822150	SAE8 plug

Notes - (1) Codes are referred to UN-UNF threads

5 positions manually operated configuration

SD5/1-D(SV) / 9A(S) 11D5 L - SVR

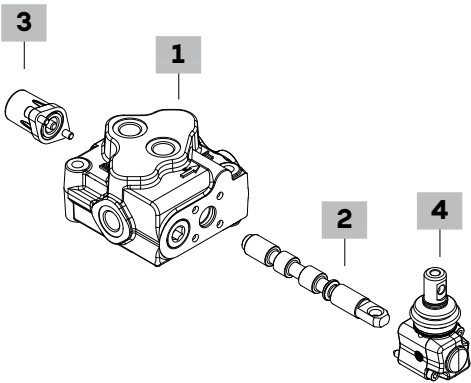
1

2

3

4

1



1 Body kit⁽¹⁾
TYPE: **SD5/1-D(SV)/BSP/9L-PSL-SVR** CODE: 5KC1218900S
DESCRIPTION: Body kit with A and B side ports, without main pressure relief valve and without check valve for 5 positions manually operated

2 Spools		page 26
TYPE	CODE	DESCRIPTION
9A(S)	3CU1280600	Double acting, 5 positions with A and LC to tank and B on pressure in neutral position
9L(S)	3CU1280610	Doppio effetto, 5 posizioni con A-LC-B chiusi in posizione centrale

3 A side control		pag. 51
TYPE	CODE	DESCRIPTION
11D5	5V11905200	With detent in all positions

4 B side control		pag. 59
TYPE	CODE	DESCRIPTION
L	5LEV105000	Lever kit
SLP	5COP105000	Dustproof plate

Notes - (1) Codes are referred to UN-UNF threads

Main pressure relief valves

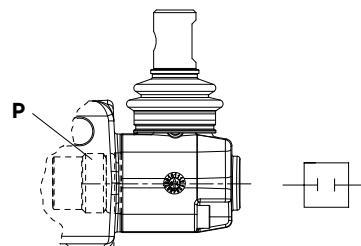
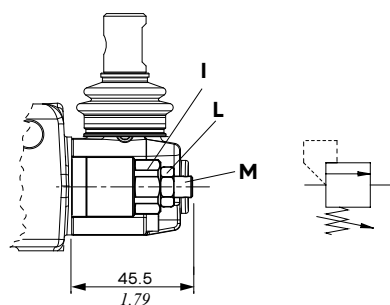
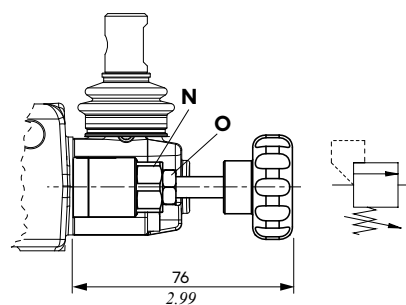
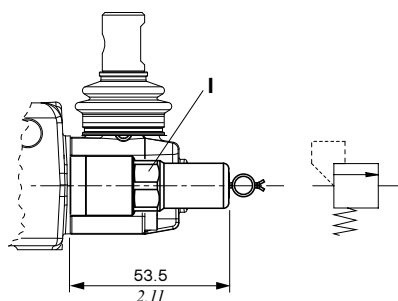
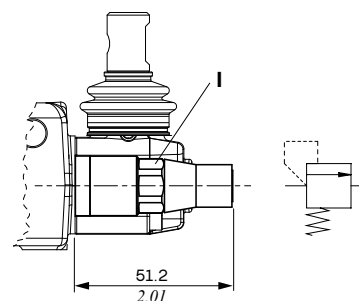
Dimensions and hydraulic circuit

Description example: **K G 1 - 30**

type:
 directly controlled = **K**
 zero-leak directly = **JN**
 controlled

valve setting (bar)
 spring type
 configuration:
G = with screw
V = with handwheel
H = set and locked
ZT = fix setting with plastic cap

Relief valve blanking plug

Type G configuration
with screwType V configuration
with handwheelType H configuration
set and lockedType ZT configuration
fix setting with plastic cap

Wrenches and tightening torques

P = allen wrench 10 - 42 Nm (31 lbft)

I = wrench 19 - 42 Nm (31 lbft)

L = wrench 13 - 24 Nm (17.7 lbft)

M = allen wrench 4

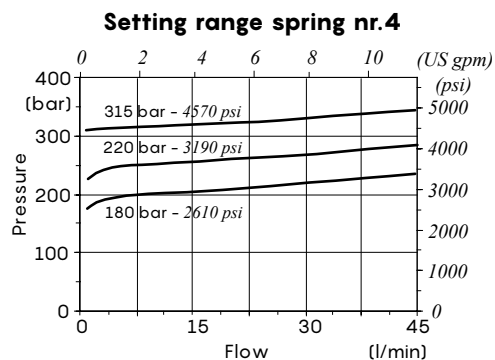
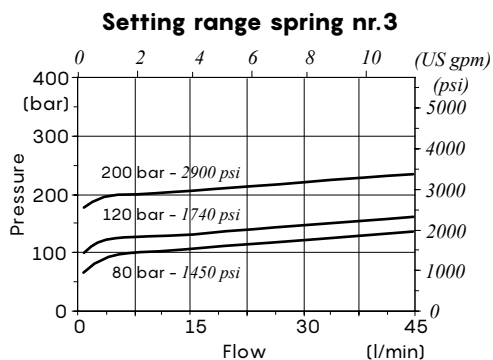
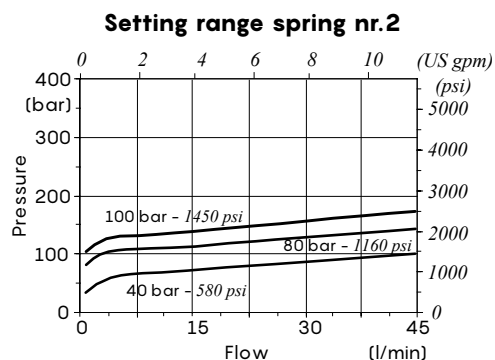
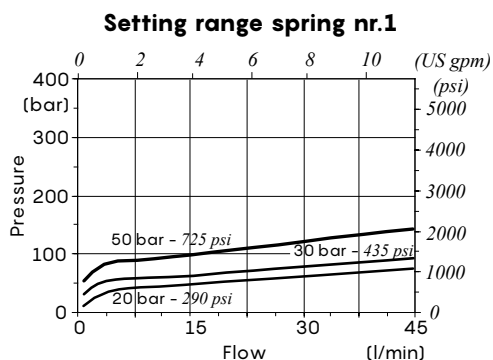
N = wrench 19 - 50 Nm (36.9 lbft)

O = wrench 13 - 30 Nm (22.1 lbft)

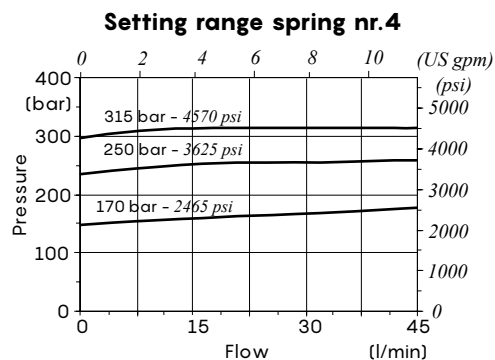
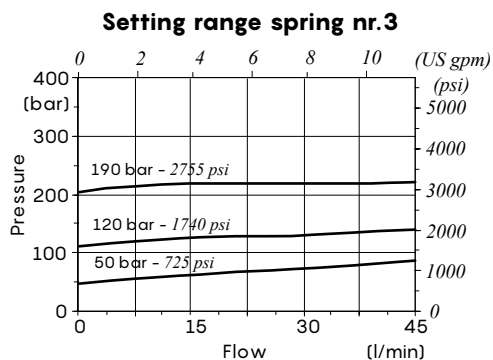
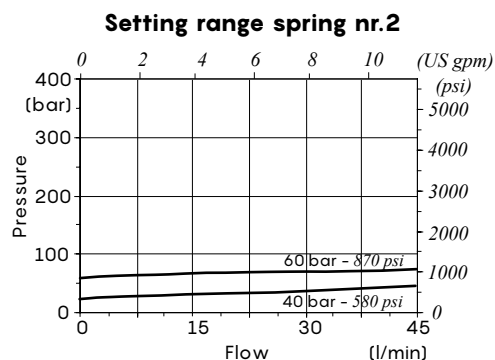
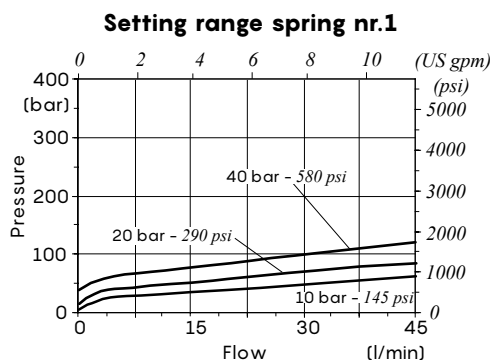
Main pressure relief valves

Performance data

Type K valve



Type JN valve

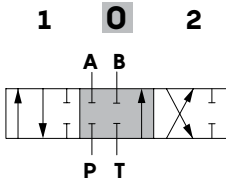


Spools

Double acting

Spool types 1 (1[S]-1[XS]-1[XL]-1R-1CS-1CEX-1CP-1CEXX-1CSD-1CSE-1CSF-1ES-1[ES3LHE])

3 positions, A and B closed in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

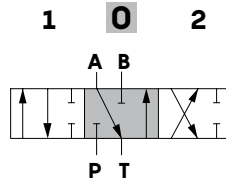
for 1ES and 1[ES3LHC]

nominal position 1: + 3.4 mm (+0.134 in)

nominal position 2: - 3.4 mm (-0.134 in)

Spool types 1A (1ACEX-1AES)

3 positions, with A connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

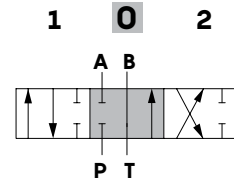
for 1AES

nominal position 1: + 3.4 mm (+0.134 in)

nominal position 2: - 3.4 mm (-0.134 in)

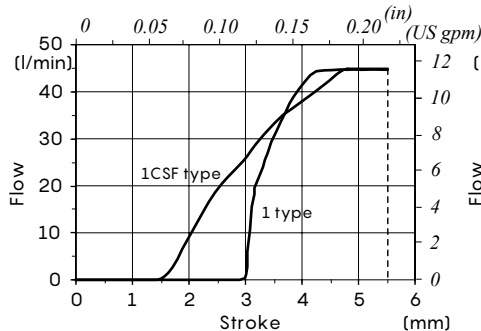
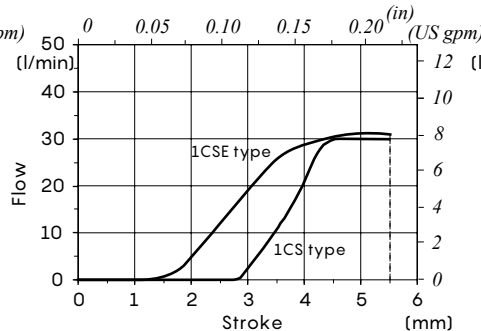
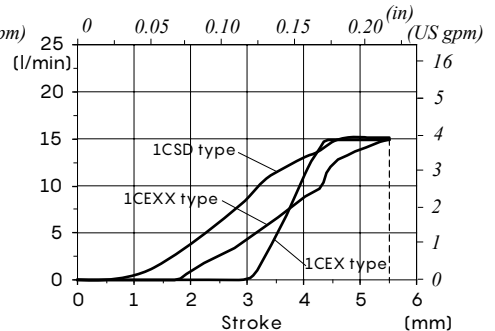
Spool types 1B (1BCEX)

3 positions, with B connect to tank in neutral position

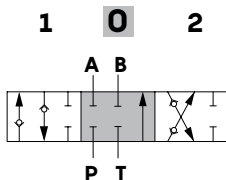
**Stroke**

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

Spool metering types 1-1CSF $P \Rightarrow A(B) \Rightarrow B(A) \Rightarrow T$ $Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$ $P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$ **Spool metering types 1CS-1CSE** $P \Rightarrow A(B) \Rightarrow B(A) \Rightarrow T$ $Q_{in} = 30 \text{ l/min} / (7.92 \text{ US gpm})$ $P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$ **Spool metering types 1CSD-1CEX-1CEXX** $P \Rightarrow A(B) \Rightarrow B(A) \Rightarrow T$ $Q_{in} = 15 \text{ l/min} / (3.96 \text{ US gpm})$ $P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$ **Spool type 1 CSVR**

3 positions, A and B closed in neutral position, with load check valve

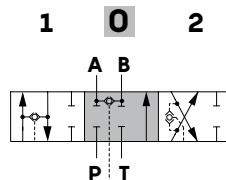
**Stroke**

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

Spool type 1A (11A)

3 positions, with A and B closed in neutral position, for pressure kick-out



KICK-OUT

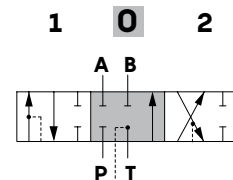
Stroke

position 1: + 5.2 mm (+0.205 in)

position 2: - 5.2 mm (-0.205 in)

Spool type 1A (9A-21A)

3 positions, with A and B closed in neutral position, for pressure kick-out



KICK-OUT

Stroke

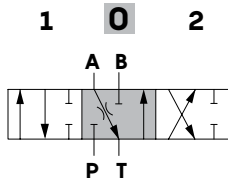
position 1: + 5.2 mm (+0.205 in)

position 2: - 5.2 mm (-0.205 in)

Double acting

Spool type 1AHCEX

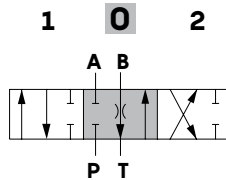
3 positions, with A partially connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool type 1BHCEX

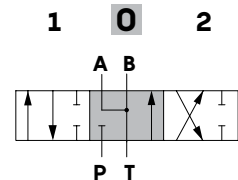
3 positions, with B partially connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool types 2 (2CSE-2R-2CEX-2CEXX-2ES-2[ES3LHE])

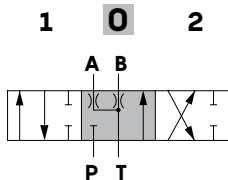
3 positions, with A and B connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)
for 1AES, 2ES and 2[ES3LHC]
nominal position 1: + 3.4 mm (+0.134 in)
nominal position 2: - 3.4 mm (-0.134 in)

Spool types 2HCEX (2HCSE-2HES)

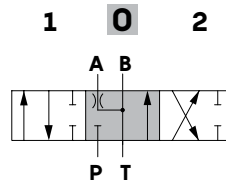
3 positions, with A and B partially connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)
for 2HES
position 1: + 3.4 mm (+0.134 in)
position 2: - 3.4 mm (-0.134 in)

Spool type 2HSA

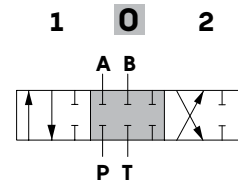
3 positions, with A partially connect to tank in neutral position

**Stroke**

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool type 6

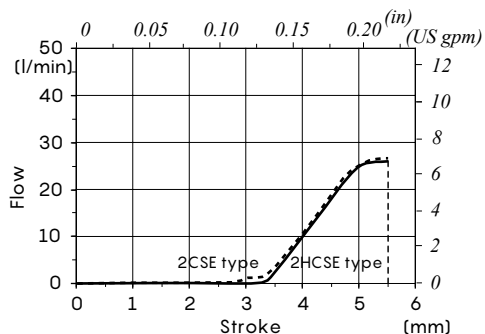
3 positions, with closed center

**Stroke**

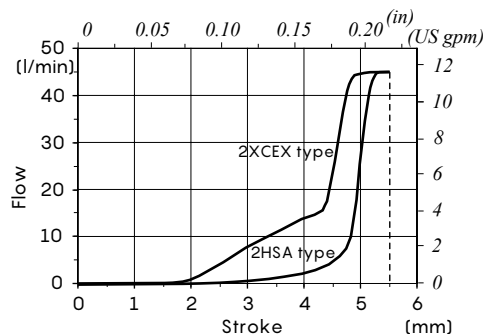
position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool metering types 2CSE-2HCSE

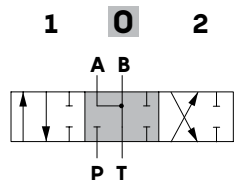
$P \Rightarrow A(B) \Rightarrow B(A) \Rightarrow T$
 $Q_{in} = 30 \text{ l/min} / (7.92 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$

**Spool metering types 2H(CEX)-2HSA**

$P \Rightarrow A(B) \Rightarrow B(A) \Rightarrow T$
 $Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 140 \text{ bar} / (2030 \text{ psi})$

**Spool type 7**

3 positions, closed center with A and B connect to tank in neutral position

**Stroke**

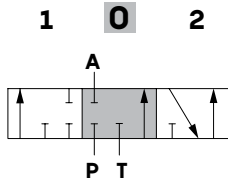
position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spools

Single acting

Spool type 3 (3ES-3[ES3LHE])

3 positions, single acting in A



Stroke

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

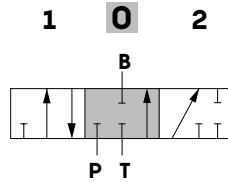
for 3ES and 3[ES3LHC]

nominal position 1: + 3.4 mm (+0.134 in)

nominal position 2: - 3.4 mm (-0.134 in)

Spool type 4

3 positions, single acting in B



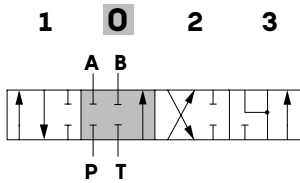
Stroke

position 1: + 4 mm (+0.157 in)

position 2: - 4 mm (-0.157 in)

Double acting for float circuit type

Spool type 5DY

4 positions, floating in position 3
(4th position), spool in

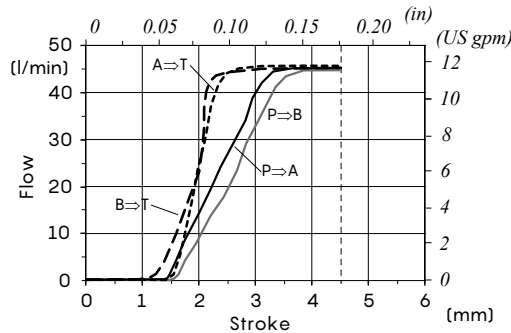
Stroke

position 1: + 4.5 mm (+0.177 in)

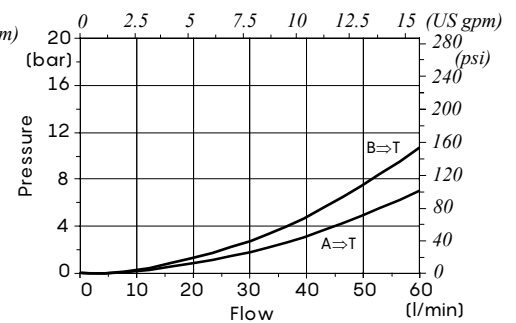
position 2: - 4.5 mm (-0.177 in)

position 3: - 9 mm (-0.354 in)

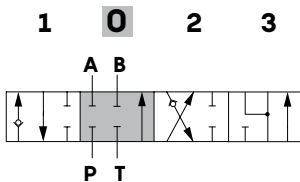
Spool metering type 5DY

 $Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$ $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$ 

Pressure drop in position 3

SdC2449_cursori5PY-5WY 5DY
come da vecchio catalogo

Spool type 5WY

4 positions, floating in position 3
(4th position), spool in, with check
valve on A

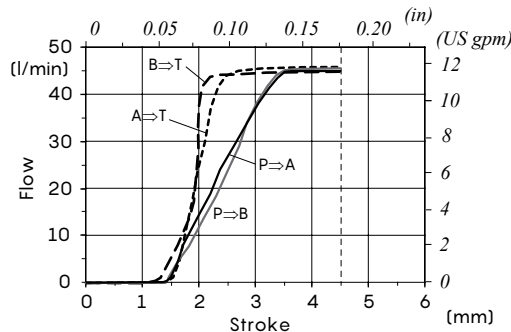
Stroke

position 1: + 4.5 mm (+0.177 in)

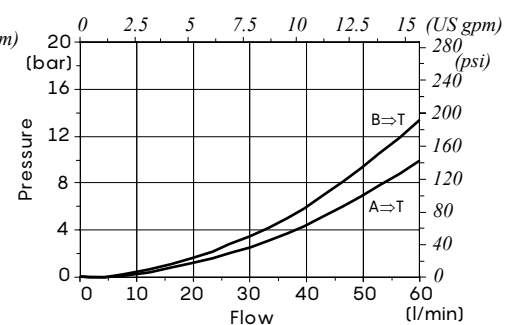
position 2: - 4.5 mm (-0.177 in)

position 3: - 9 mm (-0.354 in)

Spool metering type 5WY

 $Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$ $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$ 

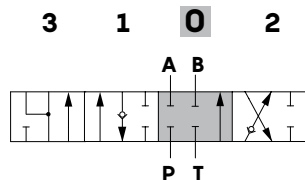
Pressure drop in position 3



Double acting for float circuit type

Spool type 5PY

4 positions, floating in position 3
[4th position], spool out, with check
valve on B

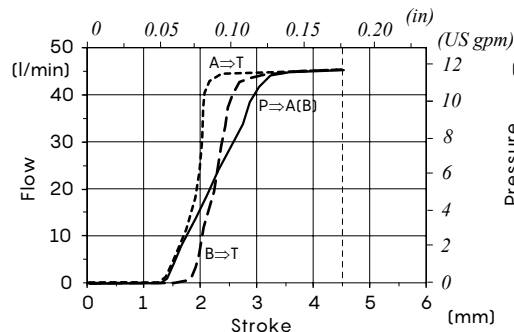


Stroke

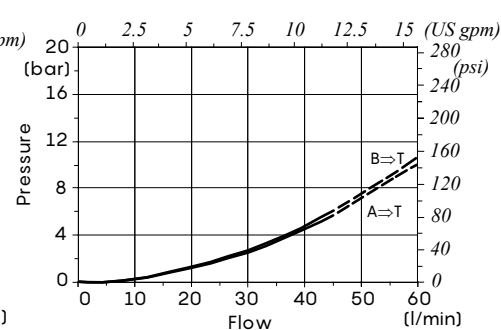
position 3: + 9 mm (+0.354 in)
position 1: + 4.5 mm (+0.177 in)
position 2: - 4.5 mm (-0.177 in)

Spool metering type 5PY

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$

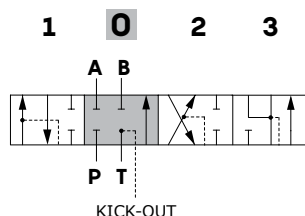


Pressure drop in position 3



Spool type 5(14A)

4 positions, floating in position 3
[4th position], spool in, **for pressure
kick-out**

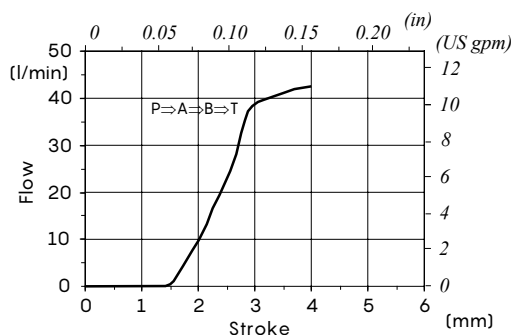


Stroke

position 1: + 4 (+0.157 in)
position 2: - 4 (-0.157 in)
position 3: - 9.5 (-0.374 in)

Spool metering type 5(14A)

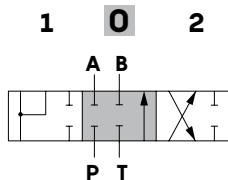
$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$



Regenerative circuit type

Spool type 8F

3 positions, regenerative in position 1

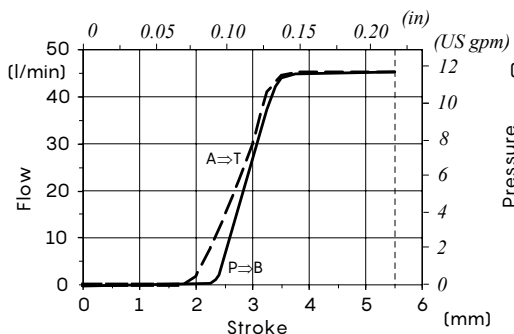


Stroke

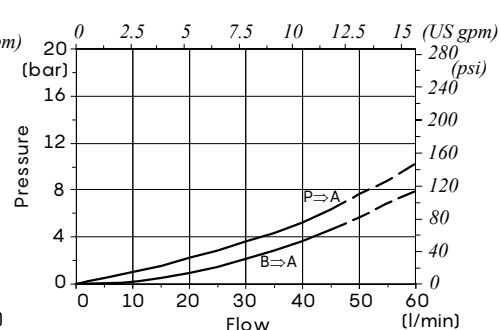
position 1: + 5.5 (+0.216 in)
position 2: - 5.5 (-0.216 in)

Spool metering type 8F

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$



Pressure drop in position 1

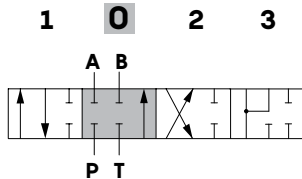


Spools

Regenerative circuit type

Spool type 8(13FZ)

4 positions, regenerative in position 3,
spool in, it requires 13FZ and 13FZ1
control kits

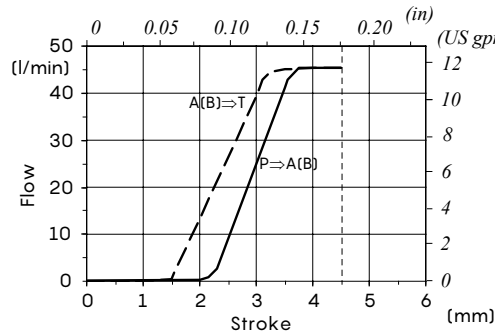


Stroke

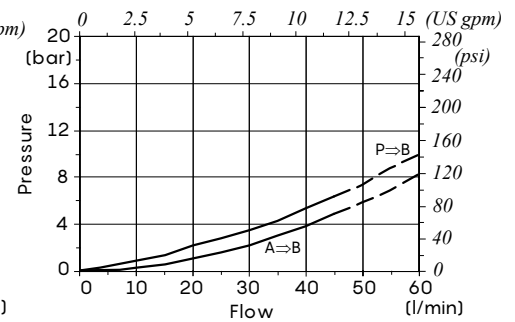
position 1: + 4.5 mm (+0.177 in)
position 2: - 4.5 mm (-0.177 in)
position 3: - 7.5 mm (-0.295 in)

Spool metering type 8(13FZ)

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$

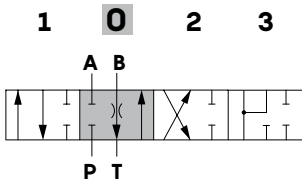


Pressure drop in position 3



Spool type 8(17F)

4 positions, regenerative in position 3,
with B partially connect to tank in neutral
position, it requires 17FZ control kits

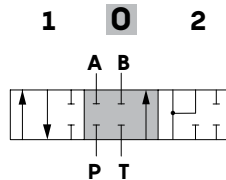


Stroke

position 1: 0
position 0: - 5 mm (-0.197 in)
position 2: - 10 mm (-0.394 in)
position 3: - 13.5 mm (-0.531 in)

Spool type 8P

3 positions, regenerative in position 2



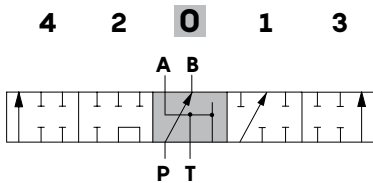
Stroke

position 1: + 5.5 (+0.216 in)
position 2: - 5.5 (-0.216 in)

Double acting, 5 positions

Spool type 9A(S)

With A and LC to tank and B on
pressure in neutral position

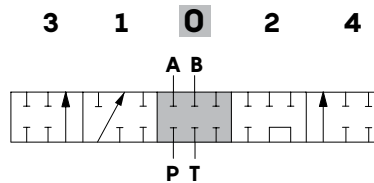


Stroke

position 4: + 8 mm (+0.315 in)
position 2: + 4 mm (+0.157 in)
position 1: - 4 mm (-0.157 in)
position 3: - 8 mm (-0.315 in)

Spool type 9L(S)

With A, B and LC closed in
neutral position



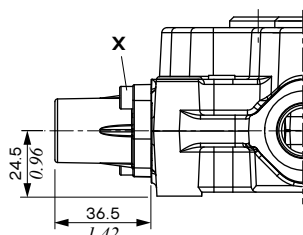
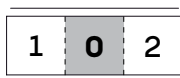
Stroke

position 3: + 8 mm (+0.315 in)
position 1: + 4 mm (+0.157 in)
position 2: - 4 mm (-0.157 in)
position 4: - 8 mm (-0.315 in)

A side controls

Free control

Type 7



Wrenches and tightening torques
 X= allen wrench 4–6.6 Nm (4.9 lbf)

3 positions, spring return in neutral position

control kit	Ordering code with		
	C type spring	D type spring	E type spring
8	5V08205000	5V08105000	5V08405000
8WPO	5V08205003	5V08105003	5V08405003
8F2	5V08205101	5V08105101	5V08405101
8D	5V08205200	5V08105200	5V08405200
8D1	/	5V08105210	/
8D2	5V08205220	5V08105220	/
8D3	/	5V08105230	5V08405230
8TL	5V08105310	5V08105312	5V08105314
8TCL	5V08105300	/	5V08405300

Note: bold code represent standard version

Type 6

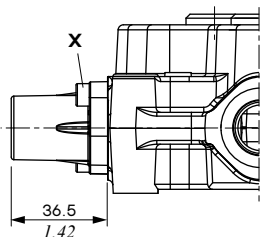
Not pre-assembled kit

Type 8

With pre-assembled kit
 (standard D spring)

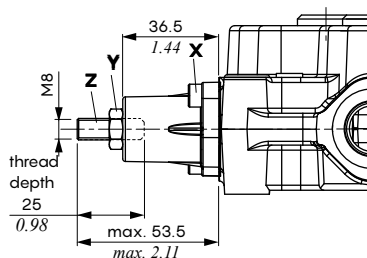
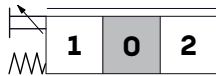
Type 8WPO

Water proof type



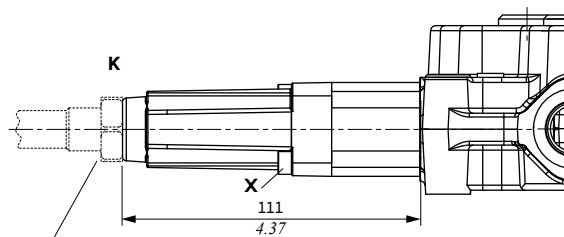
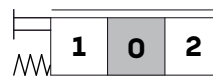
Type 8F2

Spool stroke limiter on port B



Type 8TCL

As type 8 flexible cable control arrangement

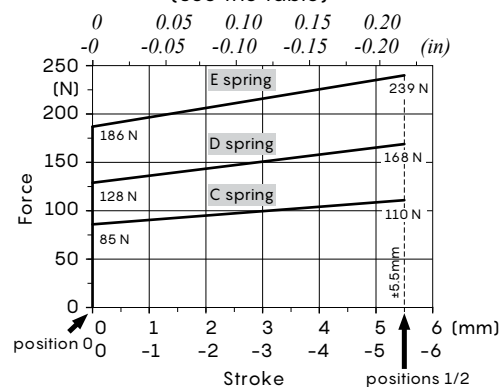


Flexible cable type CD and CG not included, see dedicated remote controls catalogue

Wrenches and tightening torques
 X= allen wrench 4–6.6 Nm (4.9 lbf)
 Y= wrench 13–24 Nm (17.7 lbf)
 Z= allen wrench 4
 K= wrench 24

Force–Stroke diagram

(see the table)

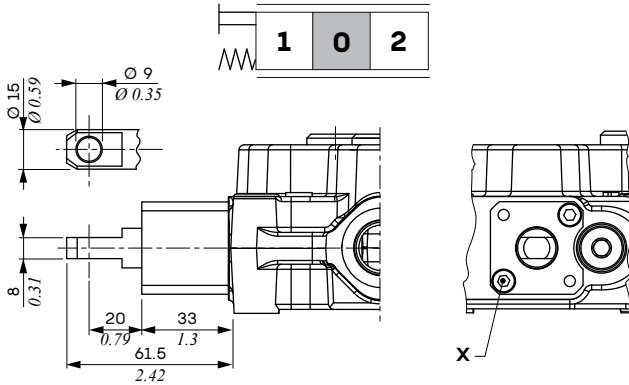


A side controls

3 positions, spring return in neutral position

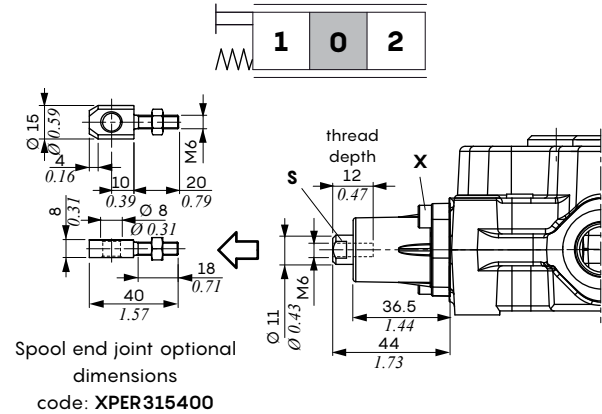
Type 8TL

As type 8, double control arrangement

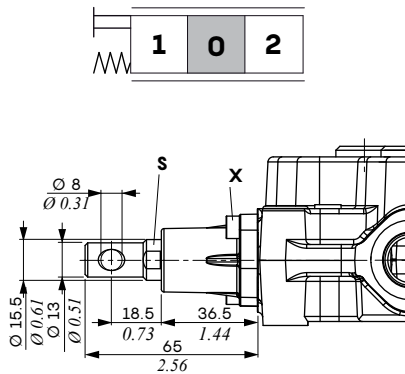


Type 8D

As type 8, M6 female threaded pin extension

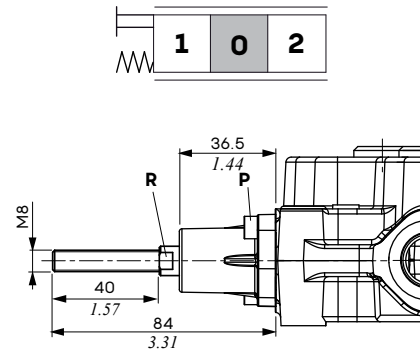


Type 8D1

As type 8, $\varnothing 8$ ($\varnothing 0.31$) hollow pin extension

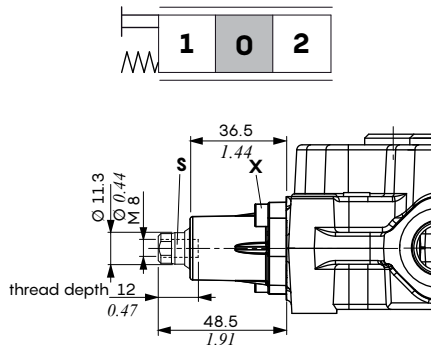
Type 8D2

As type 8, M8 male threaded pin extension



Type 8D3

As type 8, M8 female threaded pin extension



Wrenches and tightening torques

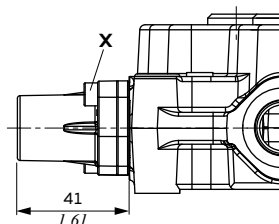
- X= allen wrench 4–6.6 Nm (4.9 lbf)
- S= wrench 9–9.8 Nm (7.2 lbf)
- R= wrench 9–10 Nm (7.4 lbf)
- P= allen wrench 4–7.5 Nm (5.5 lbf)

A side controls

3 positions, spring return in position 1 or 2

Type 17

Spring return in position 1



Wrenches and tightening torques

X= allen wrench 4–6.6 Nm (4.9 lbf)

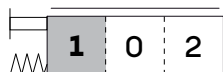
K= wrench 24

S= allen wrench 9–9.8 Nm (7.2 lbf)

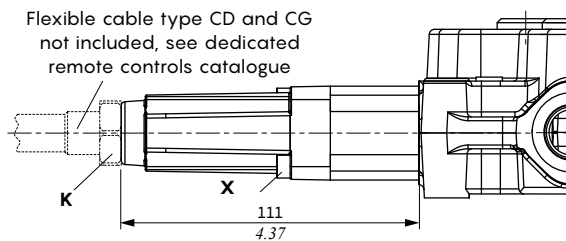
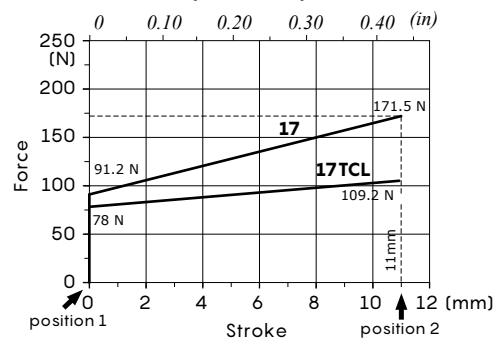
R= allen wrench 4–7.5 Nm (5.51 lbf)

Type 17TCL

As type 17, flexible cable control arrangement

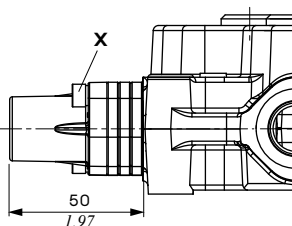
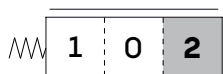


Flexible cable type CD and CG not included, see dedicated remote controls catalogue

Force–Stroke diagram
(17–17TCL)

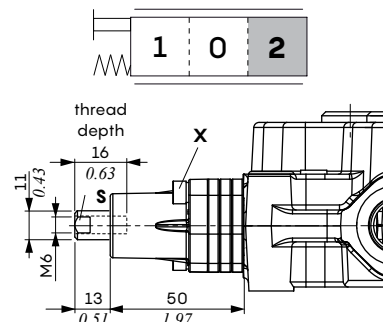
Type 18ME

Spring return in position 2



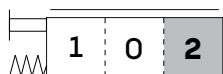
Type 18DB

As type 18ME, M6 female threaded pin extension

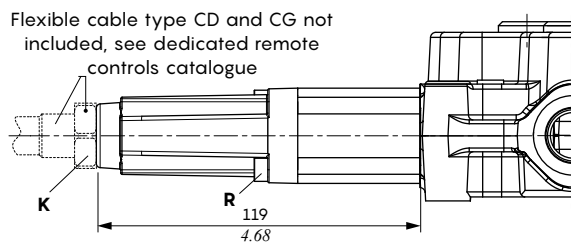
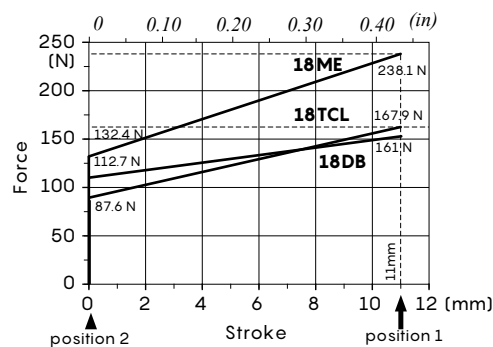


Type 18TCL

As type 18ME, flexible cable control arrangement



Flexible cable type CD and CG not included, see dedicated remote controls catalogue

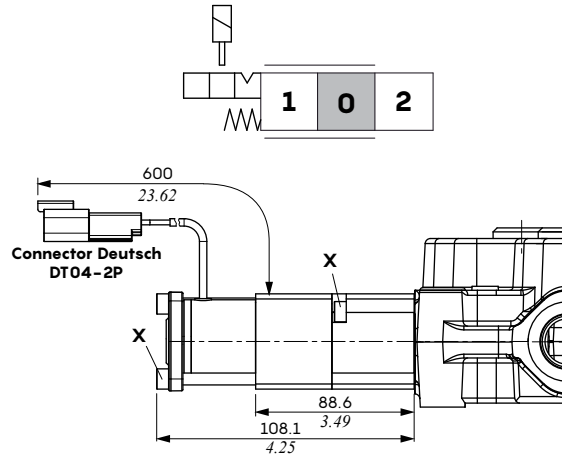
Force–Stroke diagram
(18ME–18DB–18TCL)

A side controls

3 positions, with detent, spring return in neutral position

Type 8RM2

Electromagnetic detent in position 2



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

S= allen wrench 9-9.8 Nm (7.2 lbf)

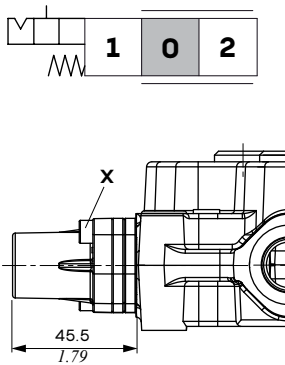
K= allen wrench 24

Technical features

Nominal voltage.....	12 VDC
Power rating	5.5 W
Resistance at 20°C.....	26.5 Ohm
Min unlocking force.....	45 N
Duty cycle.....	100%

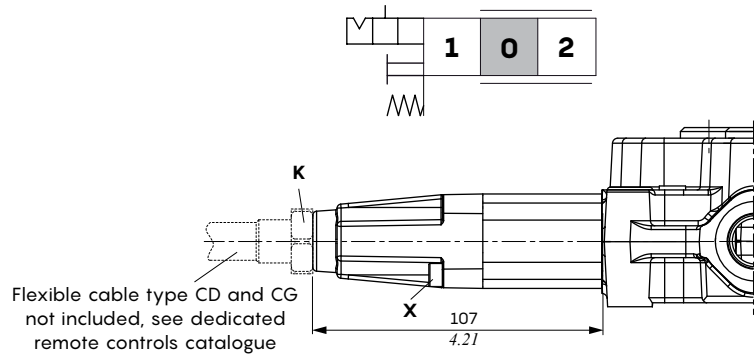
Type 9

Detent in position 1



Type 9TCL

As type 9, flexible cable control arrangement

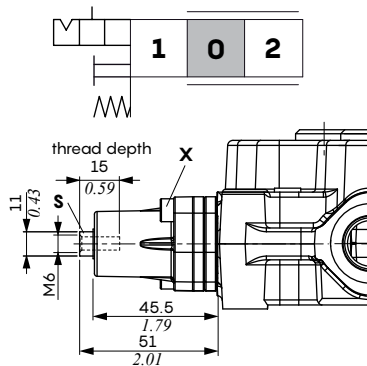
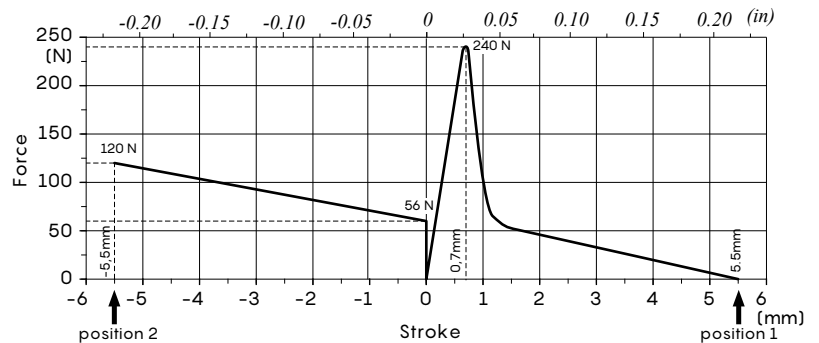


Technical features

Locking force (from 0 to 1) .. 240 N $\pm$ 30 N / 53.9 lbf $\pm$ 6.7 lbfRelease force (from 1 to 0) .. 150 N $\pm$ 20 N / 33.7 lbf $\pm$ 4.5 lbf

Type 9D

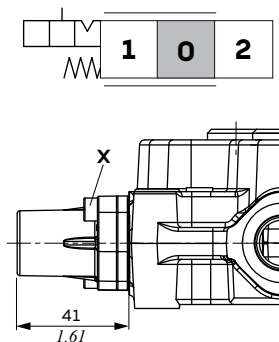
As type 9, M6 female threaded pin extension

Force-Stroke diagram
(9 - 9D - 9TCL)

3 positions, with detent, spring return in neutral position

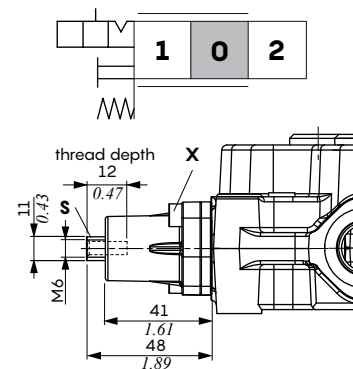
Type 10

Detent in position 2



Type 10D

As type 10, M6 female threaded pin extension

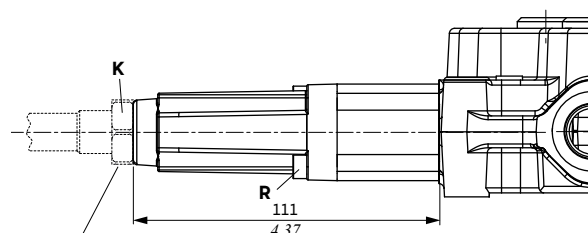
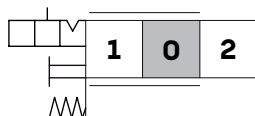


Technical features

Locking force (from 0 to 2) .. 240 N $\pm$ 30 N / 53.9 lbf $\pm$ 6.7 lbfRelease force (from 2 to 0) .. 150 N $\pm$ 20 N / 33.7 lbf $\pm$ 4.5 lbf

Type 10TCL

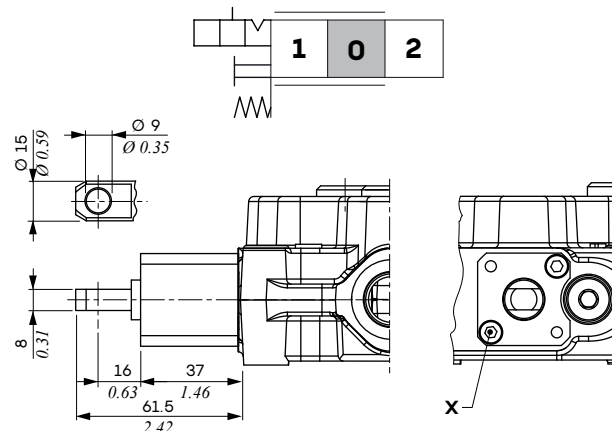
As type 10, flexible cable control arrangement



Flexible cable type CD and CG not included, see dedicated remote controls catalogue

Type 10TL

As type 10, double control arrangement



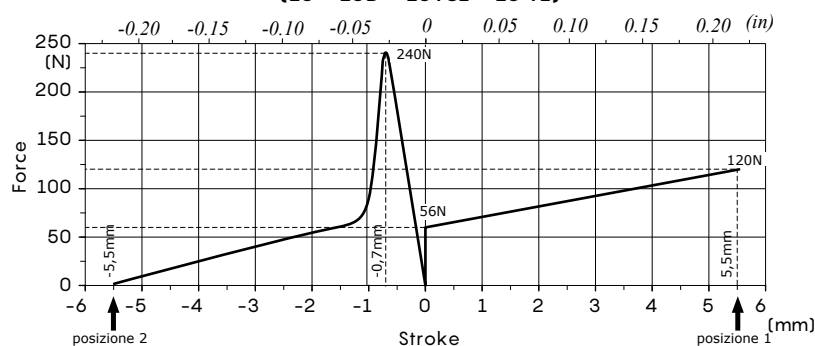
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

K= wrench 24

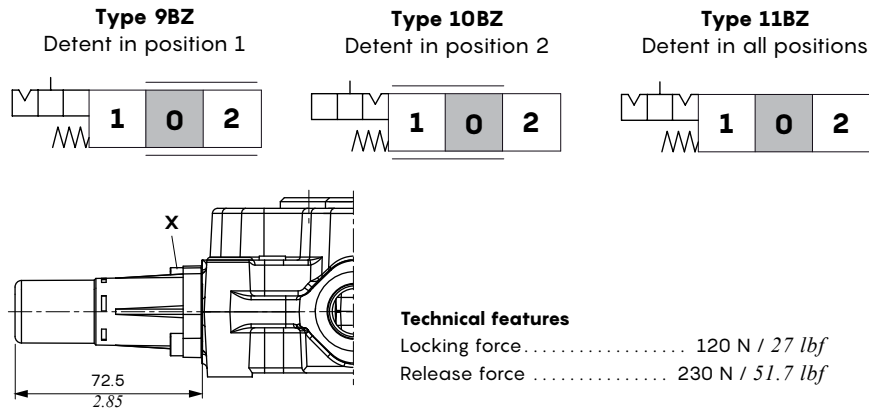
S= allen wrench 9-9.8 Nm (7.2 lbf)

R= allen wrench 4-7.5 Nm (5.51 lbf)

Force-Stroke diagram
(10 - 10D - 10TCL - 10 TL)

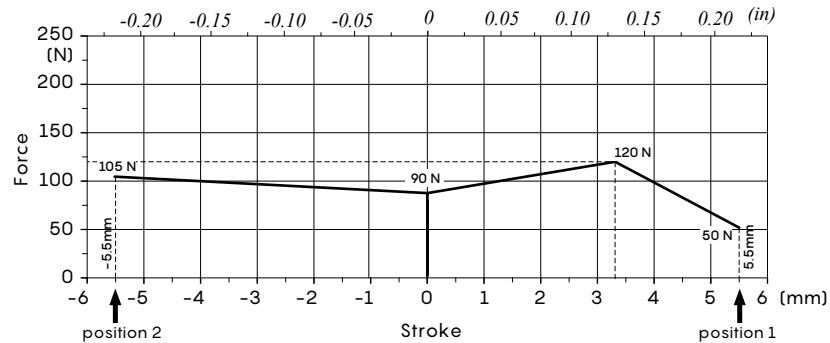
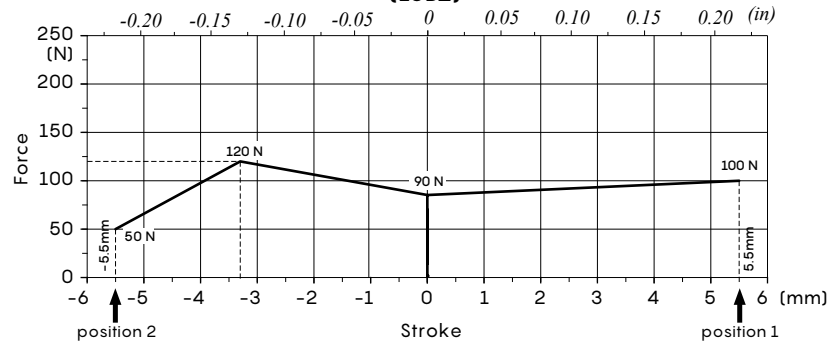
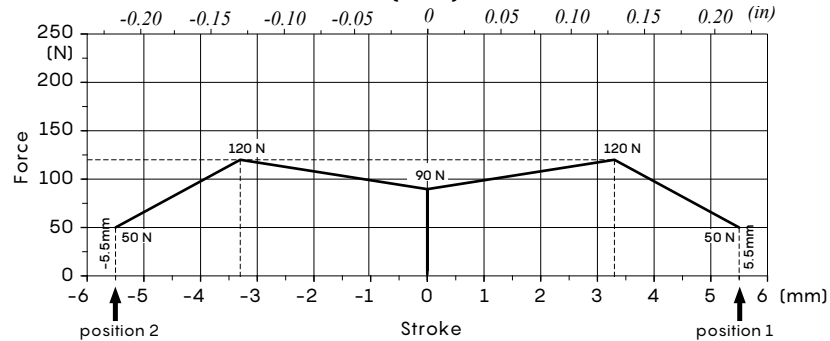
A side controls

3 positions, with detent, spring return in neutral position



Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

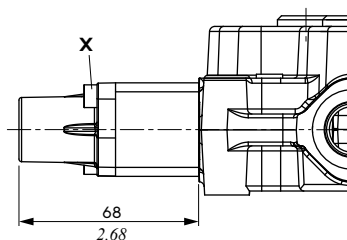
Force-Stroke diagram
(9BZ)Force-Stroke diagram
(10BZ)Force-Stroke diagram
(11BZ)

A side controls

3 positions, with detent, spring return in neutral position

Type 11B

Detent in positions 1 and 2

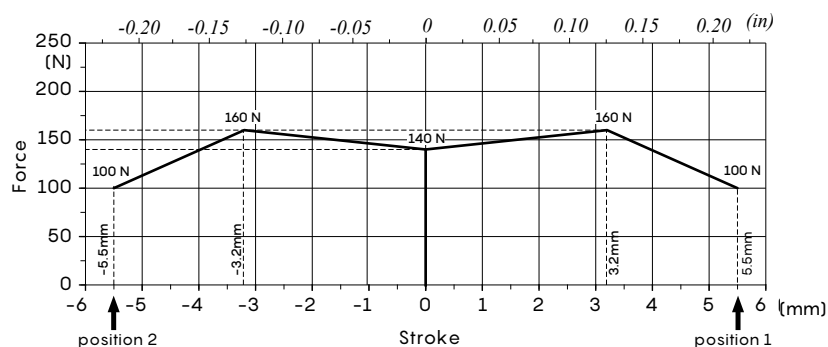


Wrenches and tightening torques

X = allen wrench 4–6.6 Nm (4.9 lbf)

Technical features

Locking and release force 120 N / 27 lbf

Force-Stroke diagram
(11B)

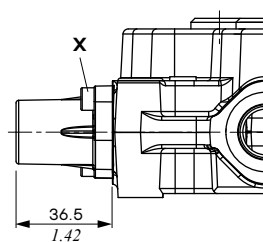
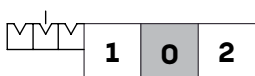
3 positions, with detent

Type 11

Detent in all positions

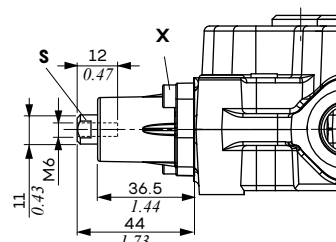
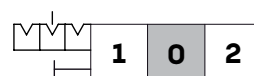
Type 11WPO

As type 11, water proof type



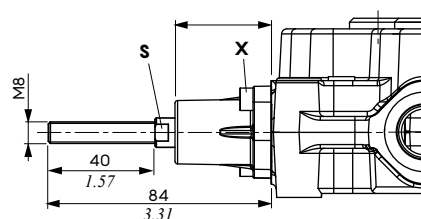
Type 11D

As type 11, M6 female threaded pin extension



Type 11D2

As type 11, M8 male threaded pin extension



Wrenches and tightening torques

X = allen wrench 4–6.6 Nm (4.9 lbf)

S = allen wrench 9–9.8 Nm (7.2 lbf)

Technical features

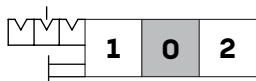
Locking and release force: 120 N / 27 lbf

A side controls

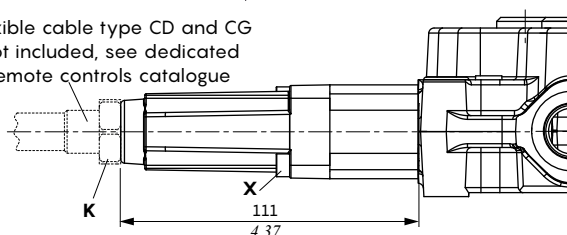
3 positions, with detent

Type 11TCL

As type 11 flexible cable control arrangement



Flexible cable type CD and CG not included, see dedicated remote controls catalogue



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

K= wrench 24

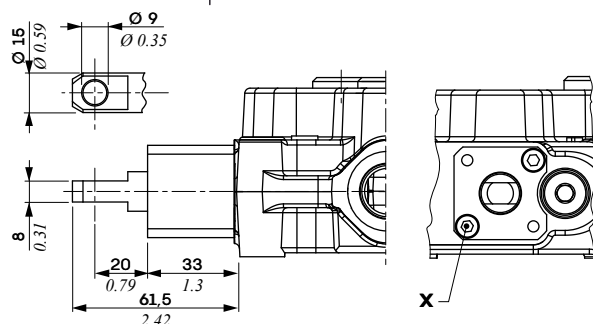
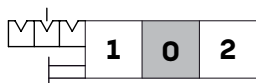
Y= allen wrench 4-30 Nm (22.13 lbf)

Technical features

Locking and release force 120 N / 27 lbf

Type 11TL

As type 11, double control arrangement

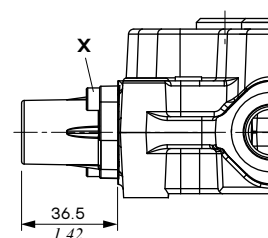


Technical features

Locking and release force 120 N / 27 lbf

Type 12

Detent in positions 1 and 2

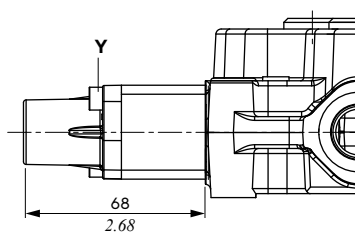
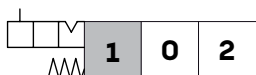


Technical features

Locking and release force 120 N / 27 lbf

Type 21

Detent in position 2 and spring return in position 1



Technical features

Locking and release force 300 N / 67.4 lbf

A side controls

2 positions, with detent

Type 15

Positions 1-0, detent
in both positions

Type 15WPO

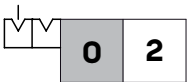
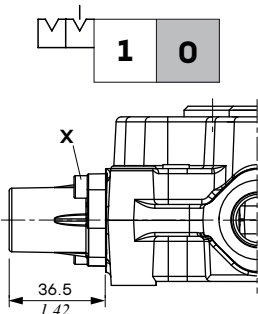
As type 15,
water proof type

Type 16

Positions 2-0, detent
in both positions

Type 16WPO

As type 16,
water proof type



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

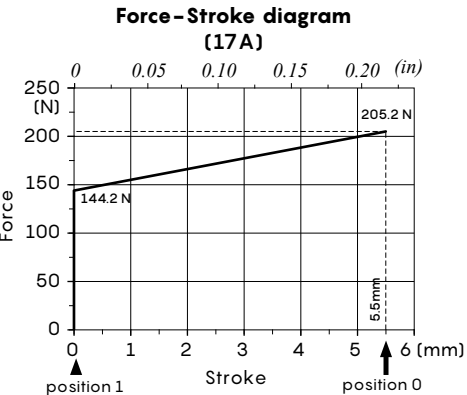
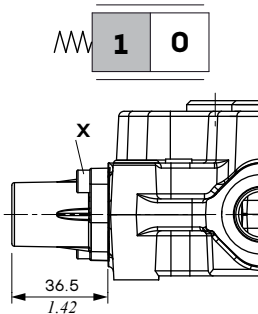
Technical features

Locking and release force 120 N / 27 lbf

2 positions, spring return

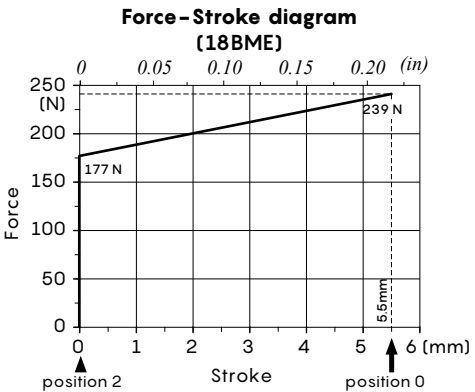
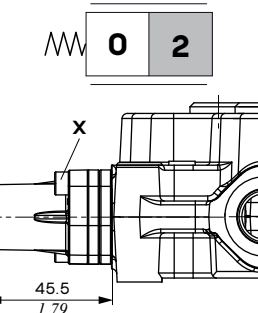
Type 17A

Positions 1-0, spring return in position 1



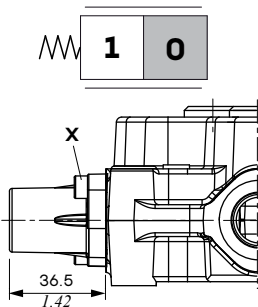
Type 18BME

Positions 2-0, spring return in position 2



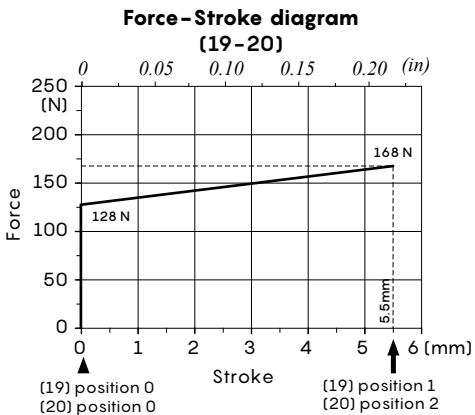
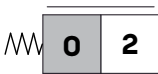
Type 19

Positions 1-0, spring return
in position 0



Type 20

Positions 2-0, spring return
in position 0



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

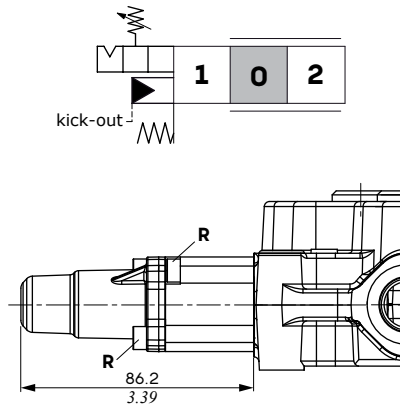
A side controls

With pressure kick-off

NOTE: Not for use with body kit for series circuit.

Type 9A

3 positions, detent in position 1, kick-out to neutral position, it requires spool type 1(21A-9A)



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

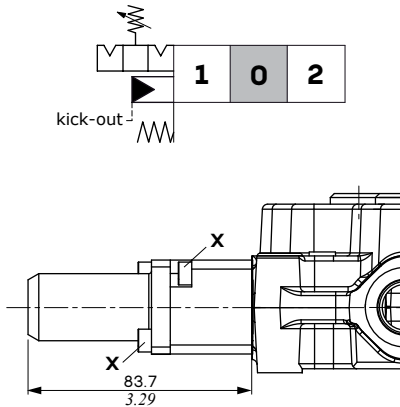
R= allen wrench 4-7.5 Nm (5.51 lbf)

Technical features

Release pressure from 20 to 80 bar - from 290 to 1160 psi
(standard setting 63 bar - 914 psi)

Type 11A

3 positions, detent in positions 1 and 2, kick-out to neutral position, it requires spool type 1(11A)

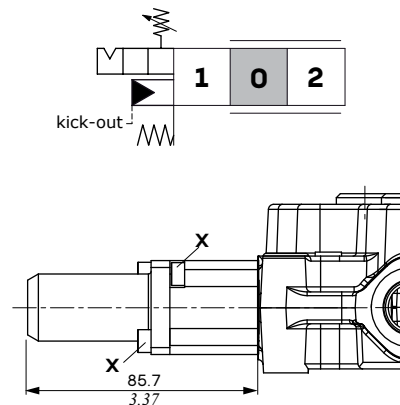


Technical features

Release pressure from 20 to 80 bar - from 290 to 1160 psi
(standard setting 63 bar - 914 psi)

Type 21A

3 positions, detent in position 1, kick-out to position 2, it requires spool type 1(21A-9A)



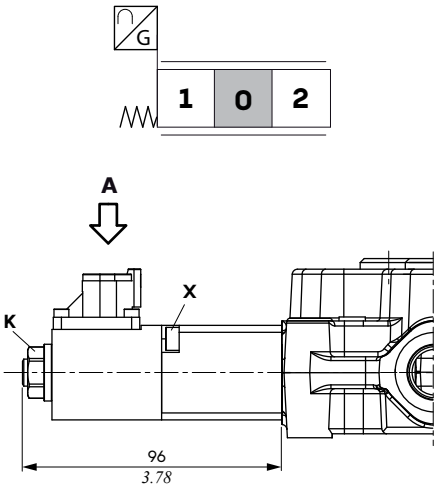
Technical features

Release pressure from 40 to 100 bar - from 580 to 1450 psi
(standard setting 63 bar - 914 psi)

Spool positioning control, electric signal

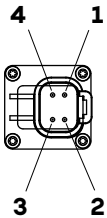
Tipo 8SPSL

As type 8, Hall effect sensor



Wrenches and tightening torques
X= allen wrench 4-6.6 Nm (4.9 lbf)
K= wrench 17-9.8 Nm (7.2 lbf)

view connector from A



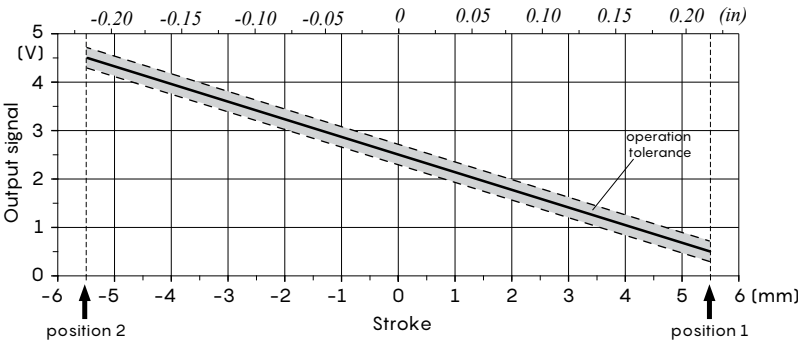
Pin-out DEUTSCH DT04-4P	
pin	signal
1	VCC
2	-
3	GND
4	out A

Technical features

Voltage supply 5 VDC
Current absorption..... <10 mA (no load)
Mechanical life 3x10⁶
Connector type Deutsch DT04-4P
Weather protection IP67 / IP69K
Working temperature..... da -40°C a +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
Mechanical vibrations, shock, bumps IEC 68-2-6/27/29
EMC ISO 13766 / ISO 14982

Deutsch DT06-4S mating connector, code 5CON140072

Output Voltage-spool stroke diagram

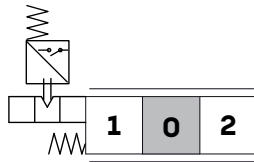


A side controls

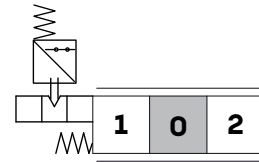
Spool control with microswitch

Type 8MG3(NO)

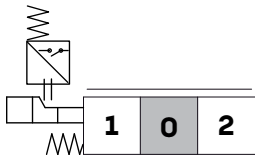
As type 8 with microswitch in positions 1 and 2, NO (normally opened) contact

**Type 8MG3(NC)**

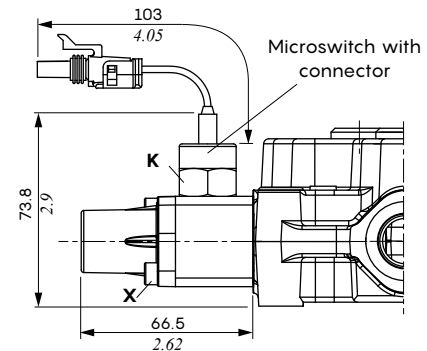
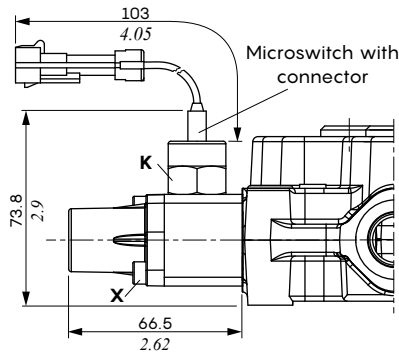
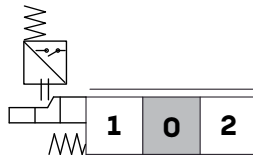
As type 8 with microswitch in positions 1 and 2, NC (normally closed) contact

**Type 8MG1(NO)**

As type 8 with microswitch in position 1, NO contact

**Type 8MG2(NO)**

As type 8 with microswitch in position 2, NO contact

**Wrenches and tightening torques**

X = allen wrench 4-6.6 Nm (4.9 lbf)

K = wrench 22-42 Nm (31 lbf)

Q = wrench 22-24 Nm (17.7 lbf)

Microswitches technical features

Mechanical life 5x10⁵ operations

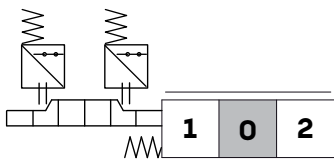
Electrical life (resistive load) ... 10⁶ operations - 7 A / 13.5 VDC

5x10⁴ operations - 10 A / 12 VDC

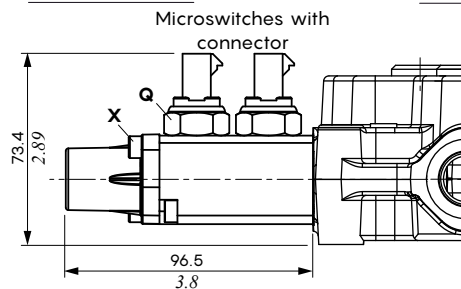
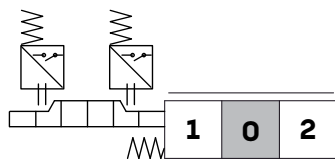
5x10⁴ operations - 3 A / 28 VDC

Type 8MG19\MG29(NC\NC)

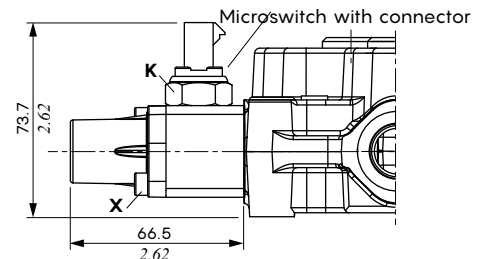
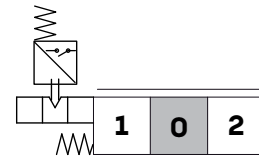
As type 8 with 2 microswitches (NC normally closed)

**Type 8MG19\MG29(NO\NO)MC**

As type 8 with 2 microswitches (NO normally opened), spring type C

**Type 8MG39(NO)**

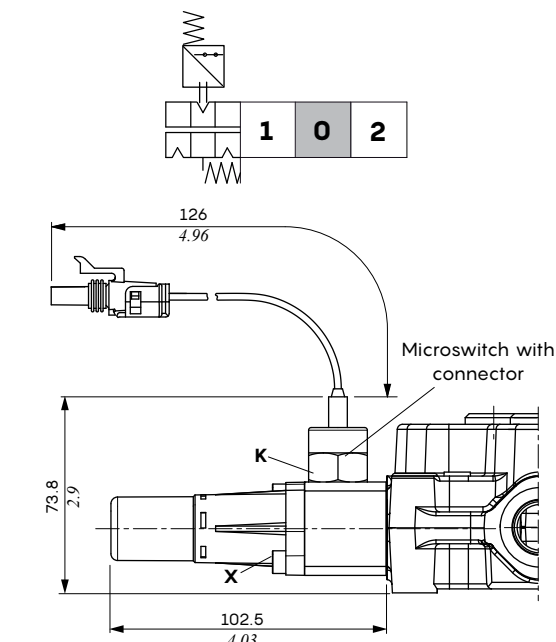
As type 8MG3(NO) with integrated connector (NO normally opened)



Spool control with microswitch

Type 11BMG3(NC)

As type 11B with microswitch in positions 1 and 2, NC (normally closed) contact



Wrenches and tightening torques

X = allen wrench 4–6.6 Nm (4.9 lbf)

K = wrench 22–24 Nm (17.7 lbf)

Control features

Locking force 120 N / 27 lbf

Release force 230 N / 52 lbf

Microswitches technical features

Mechanical life 5×10^5 operations

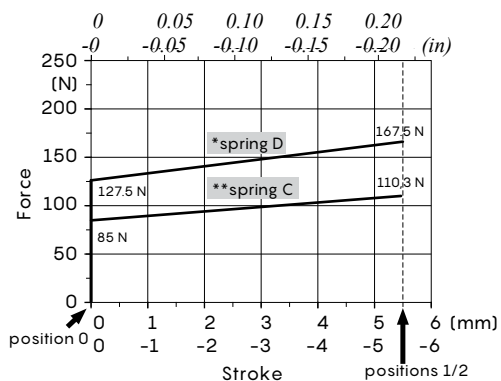
Electrical life (resistive load) ... 10^5 operations – 7 A / 13.5 VDC

5×10^4 operations – 10 A / 12 VDC

5×10^4 operations – 3 A / 28 VDC

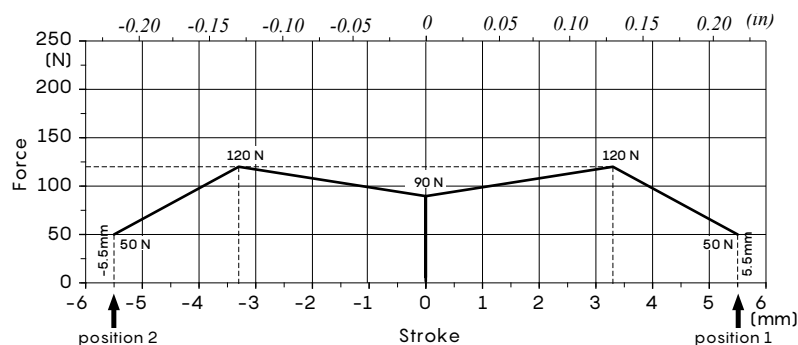
Force–Stroke diagram

[8MG1–8MG2–8MG3–8MG19\29(NC\NC)–8MG39*]
[8MG19\29(NO\NO)MC**]



Force–Stroke diagram

[11BMG3(NC)]



Controls

(microswitch operations)

Circuit	8MG3		
	position 1	position 2	position 1, 2
(NO)	5V08105670	5V08105680	5V08105660
(NC)	-	-	5V08105662

Circuit	8MG19/29	8MG39	11BZMG3
	position 1, 2	position 1, 2	position 1, 2
(NO)	5V08105679	5V08105669	-
(NC)	5V08105678	-	5V11205601

Connector codes

For control type	Microswitch with connector	Mating connector (not included)
8MG3(NC)	4MIC744	5CON005
8MG3(NO)		
8MG1(NO)	4MIC734	5CON001
8MG2(NO)		
8MG39(NO)	4MIC733	5CON001
8MG19/29(NC\NC)	4MIC743	5CON140047
8MG19/29(NO\NO)MC	4MIC733	5CON140047
11BZMG3(NC)	4MIC744	5CON005

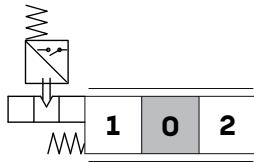
A side controls

Spool control kit with prearranged centralized microswitch

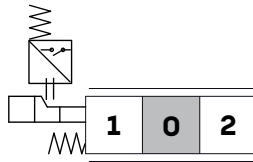
Complete controls can only be ordered with the IP51 microswitch.

Alternatively, controls can be assembled by ordering the control kit, KM assembly kit, and type of microswitch separately.

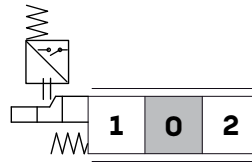
Type 8MS3
Switch in positions 1 and 2



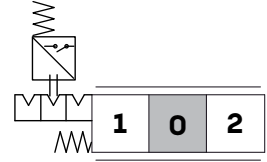
Type 8MS1
Switch in position 1



Type 8MS2
Switch in position 2



Type 11MS3
As 8MS3 with detent

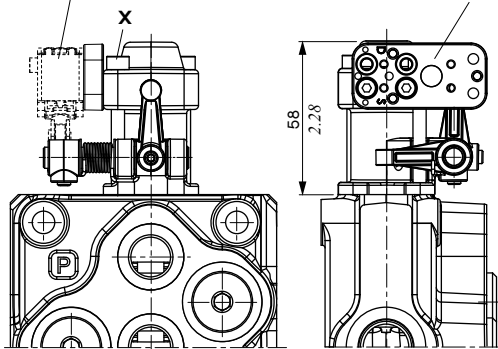


microswitch code:

IP 51 - 5MIC100

IP 67 - 5MIC200

bracket for MIC100
microswitch



Assembly controls (IP51)				
nr. sections	8MS1	8MS2	8MS3	11MS3
1	5V08105510	5V08105520	5V08105500	5V11105500
2	5VMS005227	-	5VMS005200	5VMS005209
3	5VMS005303	-	5VMS005300	-
4	-	-	5VMS005400	-
5	-	-	5VMS005500	-
6	-	-	5VMS005600	-

Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

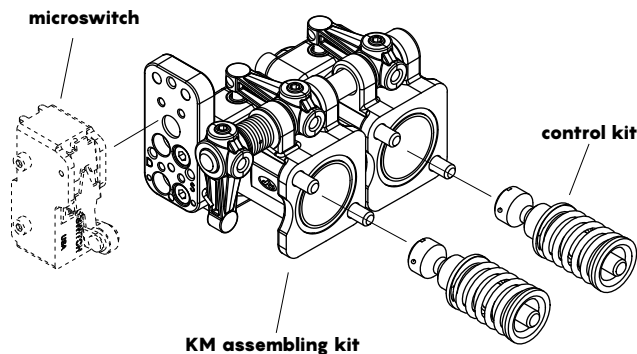
Control kit

(it need KM assembling kit)

8MS1	8MS2	8MS3	11MS3	8MS1MC(*)	8MS2CR(**)
5V08105551	5V08105557	5V08105553	5V11105553	5V08205551	5V08105552

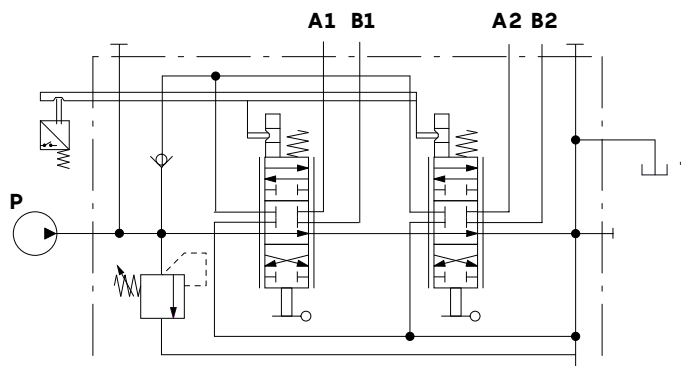
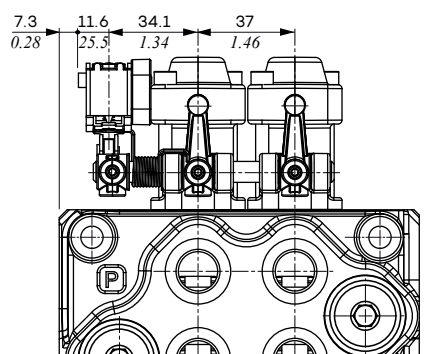
Notes - The order code for the control kit applies to each individual section.

(*) As 8MS1 with soft spring "type C" (**) As 8MS2 with short stroke.



KM assembling kit				
nr. sections	for microswitch IP51		for microswitch IP67	
	type	code	type	code
1	KM1S51	5KM1S5102	KM1S67	5KM1S6702
2	KM2S51	5KM2S5102	KM2S67	5KM2S6702
3	KM3S51	5KM3S5102	KM3S67	5KM3S6702
4	KM4S51	5KM4S5102	KM4S67	5KM4S6702
5	KM5S51	5KM5S5102	KM5S67	5KM5S6702
6	KM6S51	5KM5S510	KM6S67	5KM5S6702
7	KM7S51	5KM7S5102	KM7S67	5KM7S6702

Spool control kit with prearranged centralized microswitch



Example: SD5/2-P(JG3-120)/18MS3L/18MS3L/AET - **KM 2 S 51** - SAE

assembling kit

nr. sections

51 = with fixing bracket for microswitch M51 (IP51)

67 = with fixing bracket for microswitch M67 (IP67)

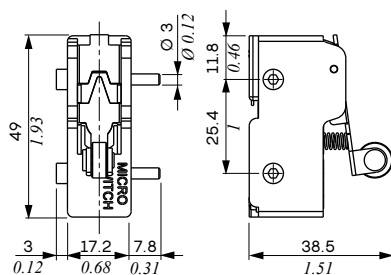
S = bracket placed on left

D = bracket placed on right

Microswitches for 8MS kit

To order separately. Complete with rubber cover and mounting screws.

Type for IP51 code: 5MIC100

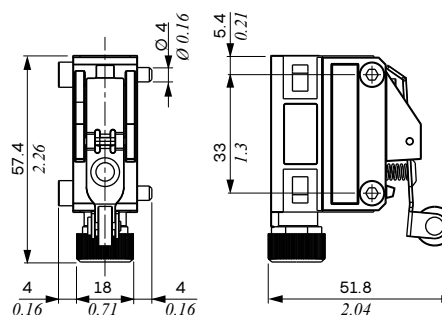


Technical features

Max current/Voltage 15A / 125-250 VAC
 Weather protection IP51
 Working temperature range da - 25°C a +80°C
 (from -13°F to 176°F)
 Mechanical life min. 10⁶ operations

Type for IP67 code: 5MIC200

Dedicated bracket is needed for the assembly. Code: 3FLA225055



Technical features

Max current/Voltage 5A / 250 VAC
 Weather protection IP67
 Working temperature range da - 10°C a +80°C
 (from 14°F to 176°F)
 Mechanical life min. 2x10⁶ operations

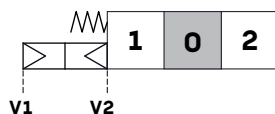
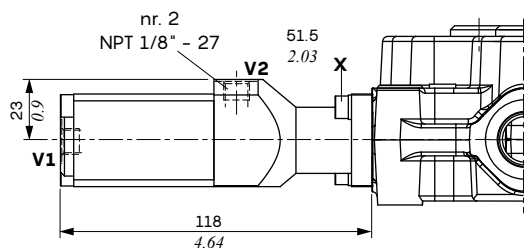
A side controls

Pneumatic controls

Type 8P

Pneumatic ON/OFF with spring return in neutral position

Wrenches and tightening torques
X= allen wrench 4-6.6 Nm (4.9 lbf^t)

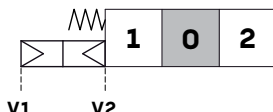
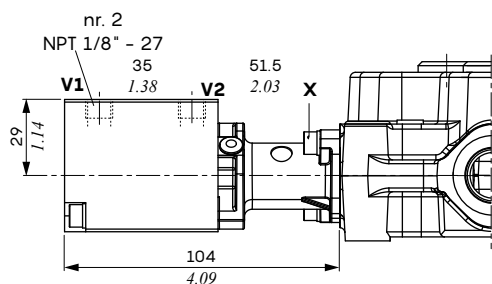


Technical features

Pilot pressure..... min. 5.5 bar / (80 psi)
max. 10 bar / (145 psi)

Type 8PNB

As type 8P, waterproof

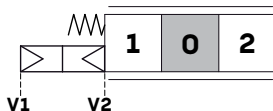
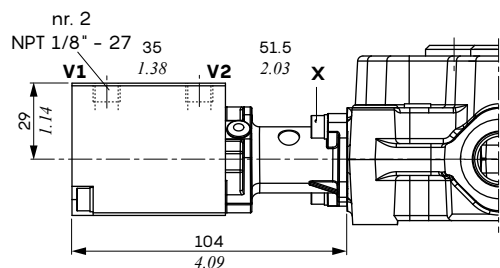


Technical features

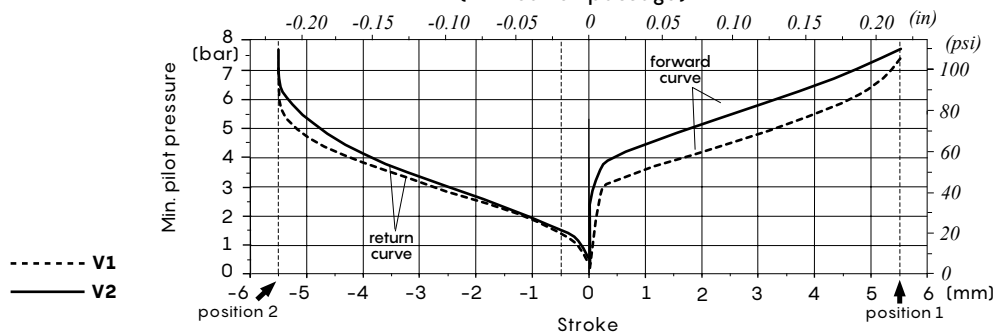
Pilot pressure..... min. 6 bar / (87 psi)
max. 15 bar / (217 psi)

Type 8PNBZ

Proportional pneumatic control



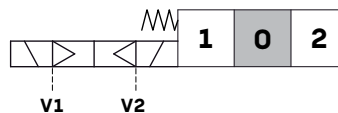
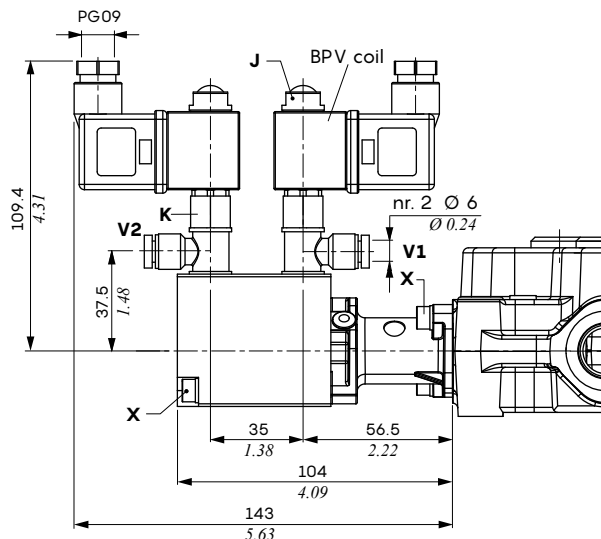
8PNBZ Pilot-Stroke diagram
(without oil passage)



Electropneumatic controls

Type 8EPNB3

ON/OFF electropneumatic control, 12 VDC / 24VDC



Technical features

Nominal voltage.....	12/24 VDC
Power absorption.....	8 W @ 12VDC
	9.1W @ 24VDC
Weather temperature.....	from - 20°C to 60°C @ 12VDC
	(from - 4°F to 140°F) @ 12VDC
	from - 30°C to 105°C @ 24VDC
	(from - 22°F to 221°F) @ 12VDC
Pilot pressure.....	min. 6 bar / (87 psi)
	max. 15 bar / (217 psi)

Note - For BPV coils and connectors see page 114

Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

K= wrench 15-6.6 Nm (4.9 lbf)

J= wrench 13-1.5 Nm (1.1 lbf)

A side controls

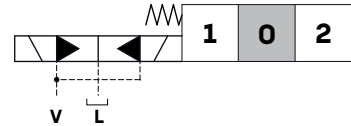
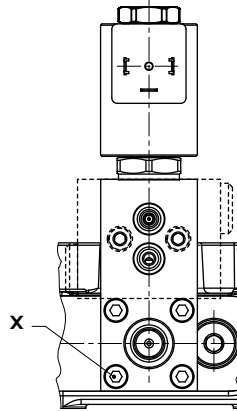
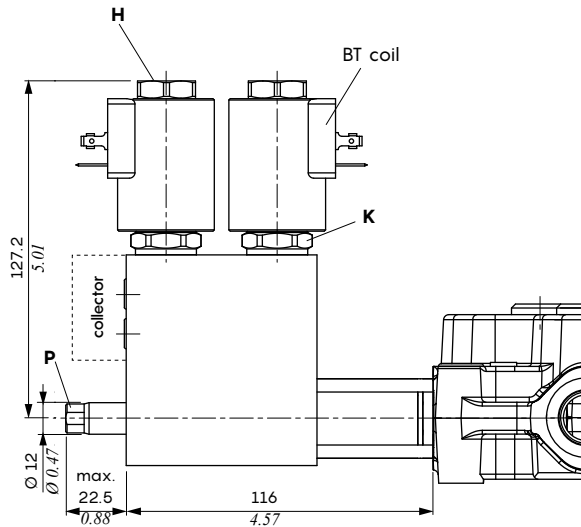
Electrohydraulic controls

Type 8ED3

ON/OFF with spring return in neutral position, 12VDC / 24VDC.

Type 8ED3(NFC)

without coils and restrictor

**Wrenches and tightening torques**

X= allen wrench 4-6.6 Nm (4.9 lbf)

K= wrench 24-30 Nm (22.1 lbf)

H= wrench 22-6.6 Nm (4.9 lbf)

P= wrench 10

Technical features

Nominal voltage..... 12/24 VDC

Power absorption..... 21 W

Weather temperature..... from - 30°C to 60°C
(from - 22°F to 140°F)

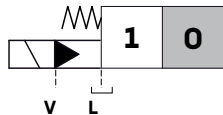
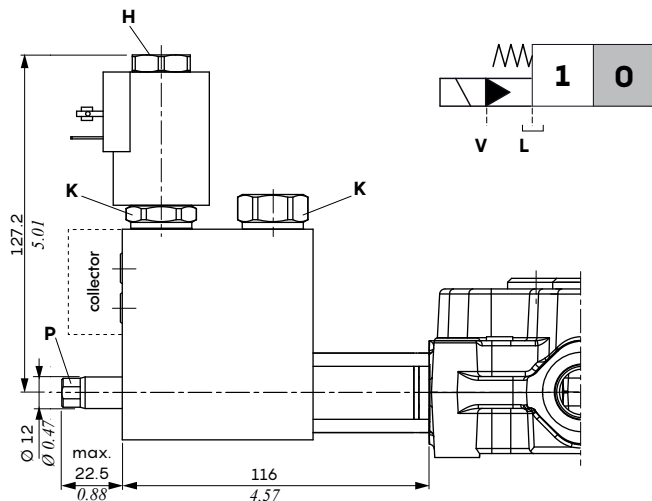
Pilot pressure..... min. 10 bar / (145 psi)
max. 50 bar / (725 psi)

Max. backpressure..... min. 25 bar / (360 psi)

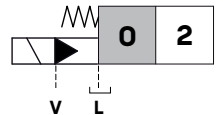
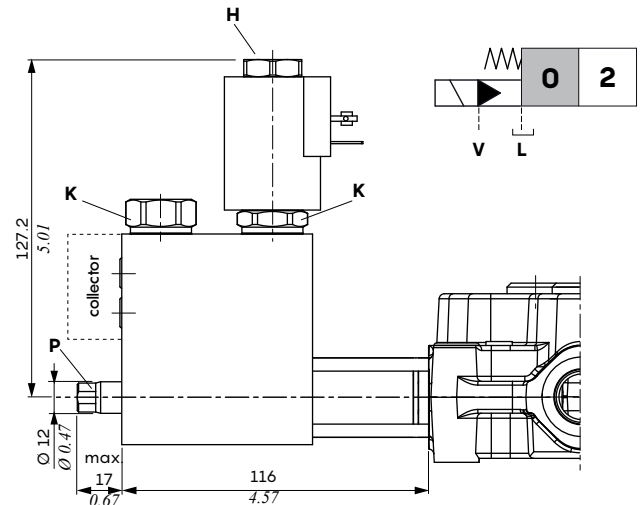
Note - For BT coils and connectors see page 116

Type 19ED1

ON/OFF, 2 positions (1 and 0), spring return in position 0

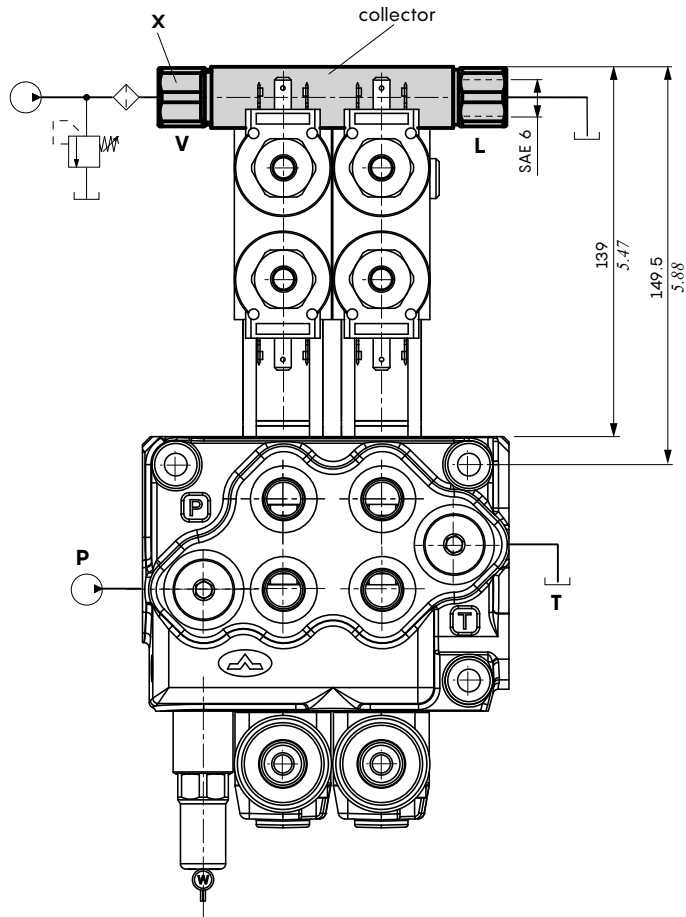
**Type 20ED2**

ON/OFF, 2 positions (2 and 0), spring return in position 0



Electrohydraulic controls

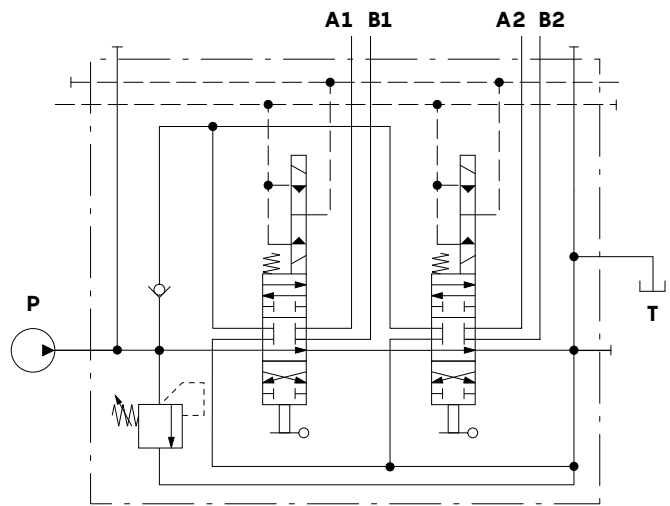
kit for external pilot and drain



Collector kit		
type	code ^(*)	description
KE1S0-SAE	5KE1S00070	kit for 1 section
KE2S0-SAE	5KE2S00270	kit for 2 section
KE3S0-SAE	5KE3S00270	kit for 3 section
KE4S0-SAE	5KE4S00270	kit for 4 section
KE5S0-SAE	5KE5S00270	kit for 5 section
KE6S0-SAE	5KE6S00270	kit for 6 section
KE7S0-SAE	5KE7S00270	kit for 7 section

(*) codes are referred to UN-UNF thread

Wrenches and tightening torques
X= allen wrench 6-24 Nm (17.7 lbf)



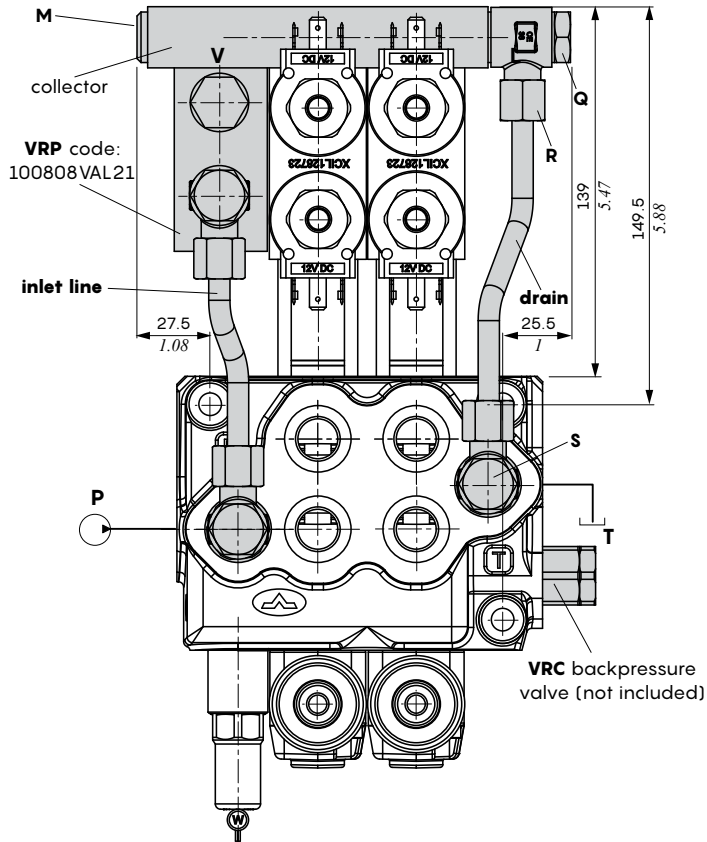
Description example:
SD5/2-P(KH4-200)/18ED3L/18ED3L/AET-SAE-KE2S0-24VDC

A side controls

Electrohydraulic controls

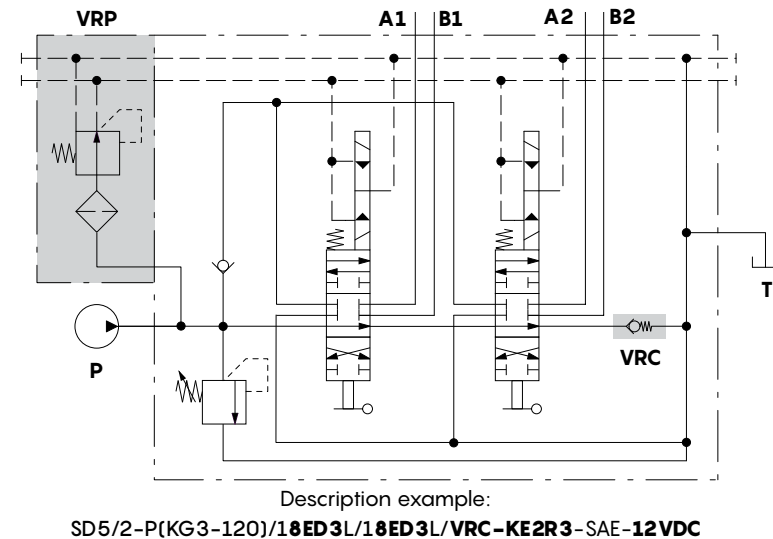
Collector kit with pilot and drain lines

The kit is made of collector, VRP pressure reducing valve and pipes.



Wrenches and tightening torques

X= wrench 22-42 Nm (31 lbf)
 Y= wrench 22-24 Nm (17.7 lbf)
 M= allen wrench 6-24 Nm (17.7 lbf)
 Q= wrench 19-24 Nm (17.7 lbf)
 R= wrench 17
 S= wrench 22-24 Nm (17.7 lbf)



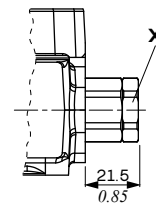
Collector kit		
type	code(*)	description
KE1R3-SAE	5KE1R30270	kit for 1 section
KE2R3-SAE	5KE2R30270	kit for 2 section
KE3R3-SAE	5KE3R30270	kit for 3 section
KE4R3-SAE	5KE4R30270	kit for 4 section
KE5R3-SAE	5KE5R30270	kit for 5 section
KE6R3-SAE	5KE6R30270	kit for 6 section
KE7R3-SAE	5KE7R30270	kit for 7 section

(*) codes are referred to UN-UNF thread

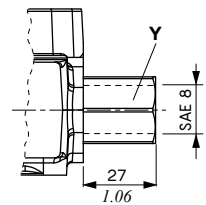
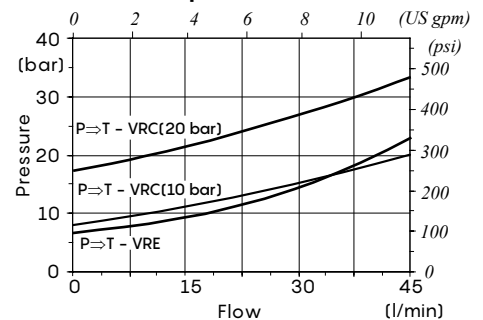
Backpressure valves		
type	code	backpressure
VRC(10bar)	X003600010	10 bar (145 psi)
VRC(20bar)	X003600020	20 bar (290 psi)
VRE*	XGIU522506	8 bar (116 psi) with carry-over

(*) codes are referred to UN-UNF thread

Valve type VRC



Valve type VRE

Pressure drop
(backpressure valves)

A side controls

Short stroke (CR) spool control kits for spool type 4

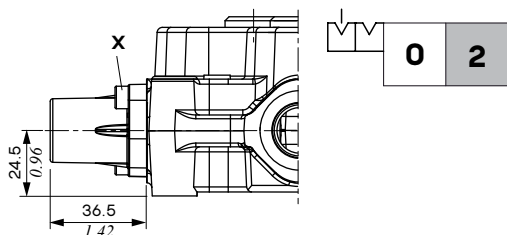
2 positions

Type 16CR

Positions 2-0, detent in both positions

Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

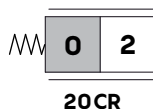
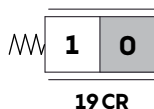
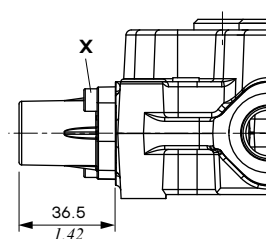
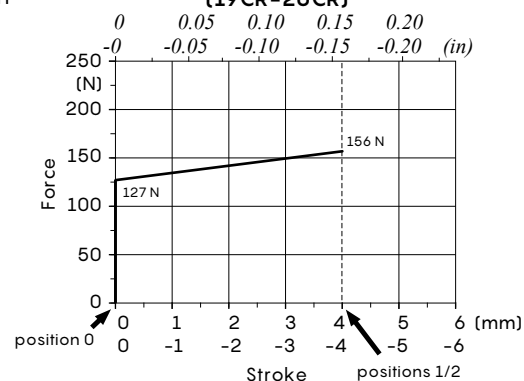


Type 19CR

Positions 1-0, spring return in neutral position

Type 20CR

Positions 2-0, spring return in neutral position

Force-Stroke diagram
(19CR-20CR)

3 positions

Type 8CR

3 positions, spring return in neutral position

Type 17CR

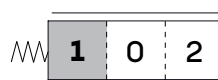
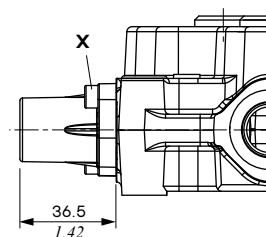
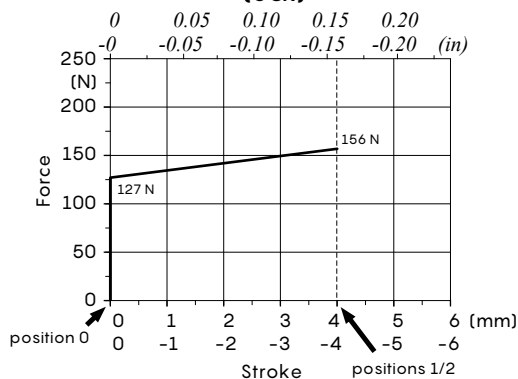
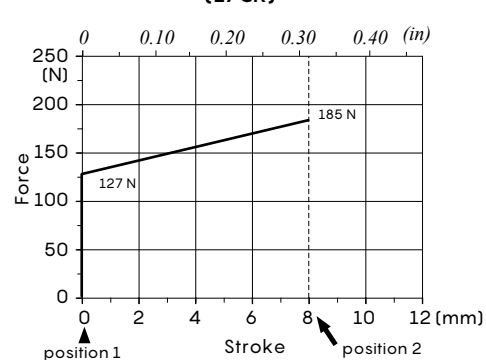
Spring return in position 1, free neutral position

Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

Tipo 8CRWPO

As type 8CR, water proof type

Force-Stroke diagram
(8CR)Force-Stroke diagram
(17CR)

A side controls

Short stroke (CR) spool control kits for spool type 4

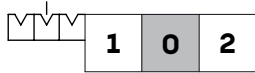
3 positions

Type 11CR

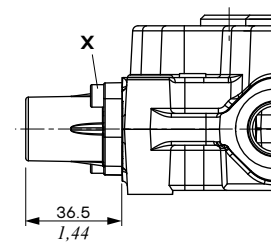
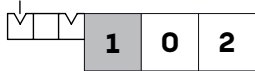
Detent in both positions

Type 11CRWPO

As type 11CR, water proof type



Type 12CR

Detent in positions
1 and 2

Technical features

Locking and release force 120 N / 27 lbf

Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

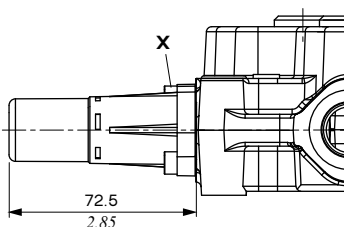
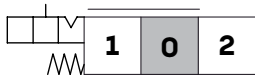
K= wrench 24-30 Nm (22.1 lbf)

H= 6.6 Nm (4.9 lbf)

Type 9BZCR

3 positions, detent in position 1 and
spring return in neutral position

Type 10BZCR

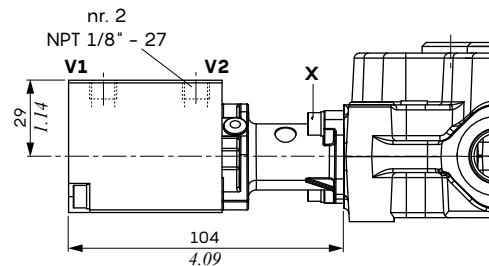
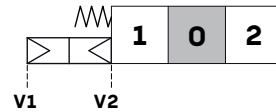
3 positions, detent in position 2 and
spring return in neutral position

Technical features

Locking force 120 N / 27 lbf

Release force 230 N / 52 lbf

Type 8PNBCR

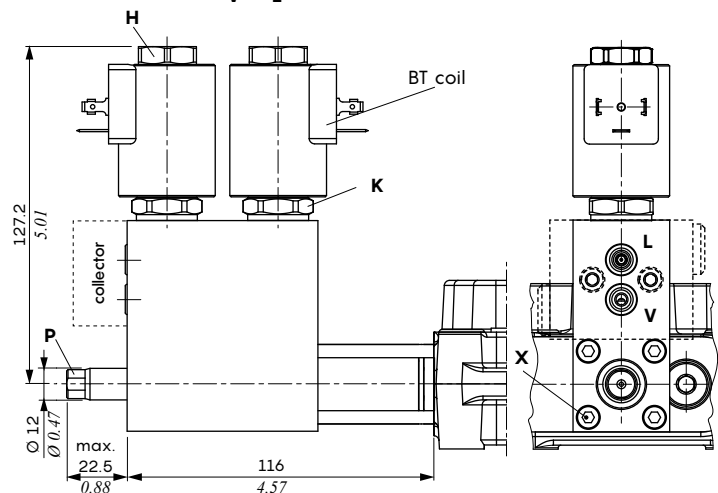
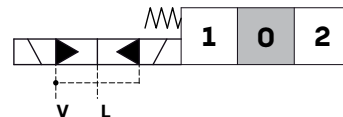
ON/OFF pneumatic control with spring
return in neutral position, waterproof

Technical features

Pilot pressure min. 6 bar / (87 psi)

max. 15 bar / (217 psi)

Type 8ED3CR

ON/OFF electrohydraulic control with
spring return in neutral position

Technical features

Nominal voltage 12/24 VDC

Power absorption 21 W

Weather temperature from - 30°C to 60°C
(from - 22°F to 140°F)Pilot pressure min. 10 bar / (145 psi)
max. 50 bar / (725 psi)

Max. backpressure min. 25 bar / (360 psi)

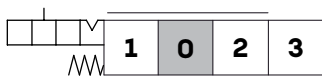
Note - For BT coils and connectors see page 116

For collectors see pages 45-46.

For floating circuit

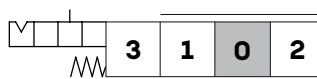
Type 13NZ (spool in)

4 positions, detent in position 3, spring return in neutral position, **for spools type 5DY and 5WY**



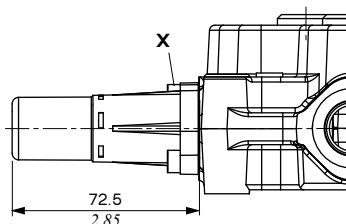
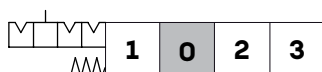
Type 13QN (spool out)

4 positions, detent in position 3, spring return in neutral position, **for spool type 5PY**



Type 14NZ (spool in)

4 positions, detent in positions 1, 2 and 3, spring return in neutral position, **for spools type 5DY and 5WY**



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

13 NZ technical features

Locking force..... 280 N / 63 lbf

Release force 300 N / 68 lbf

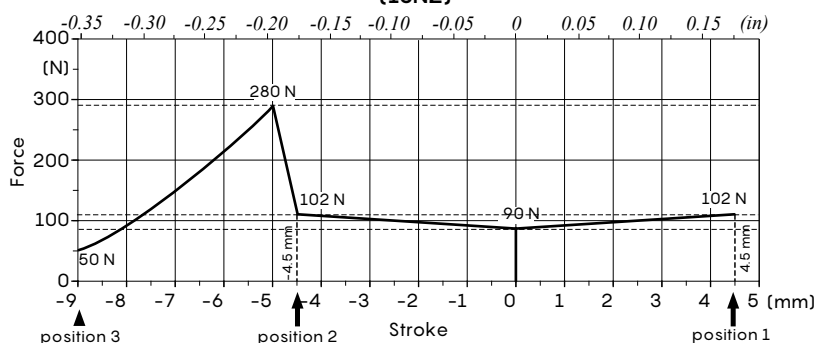
13QN technical features

Locking force..... 360 N / 81 lbf

Release force 390 N / 88 lbf

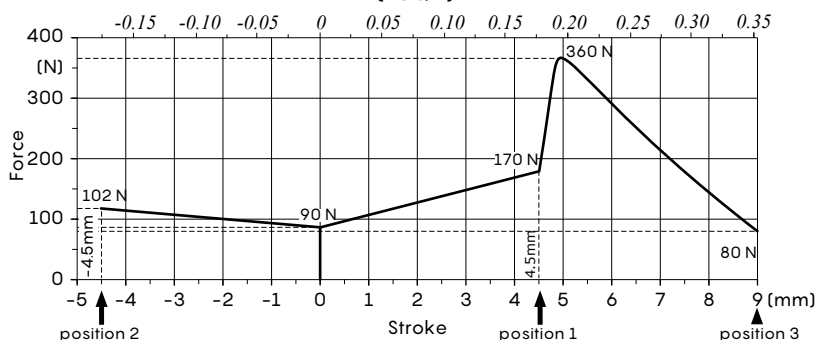
Force-Stroke diagram

(13NZ)



Force-Stroke diagram

(13QN)

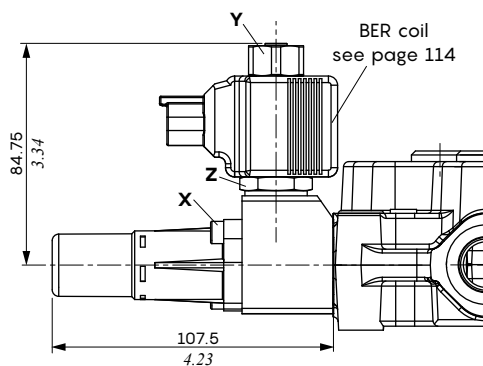
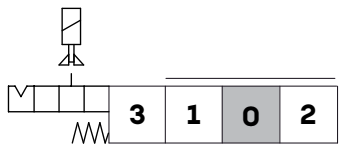


A side controls

For floating circuit

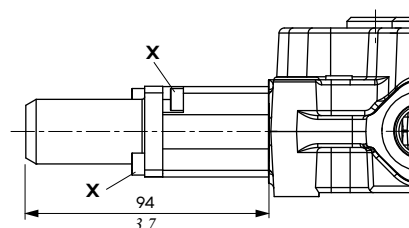
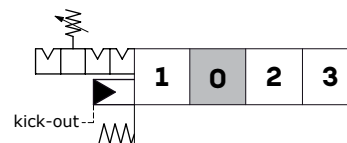
Type 13QNK4

4 positions, detent in position 3, spring return in neutral position with solenoid spool lock in neutral, **for spool type 5PY**



Type 14A

4 positions, detent in positions 1, 2 and 3, spring kick-out in neutral position, **for spool type 5(14A)**



Technical features

Release pressure . . . from 20 to 200 bar - from 290 to 2900 psi

Technical features

Nominal voltage 12 VDC
Power absorption 19.2 W
Weather temperature from - 30°C to 50°C
(from - 22°F to 122°F)

Note - For BER coils and connectors see page 114

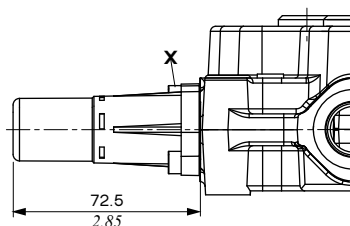
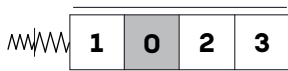
Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)
Y = wrench 21-6.6 Nm (4.9 lbf)
Z = wrench 24-9.8 Nm (7.2 lbf)

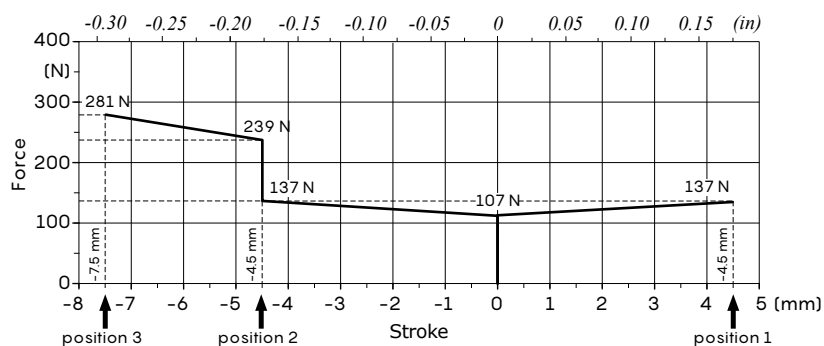
For regenerative circuit

Type 13FZ

4 positions, spring return in neutral position, **for spool type 8(13FZ)**



Force-Stroke diagram (13FZ)



Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

A side controls

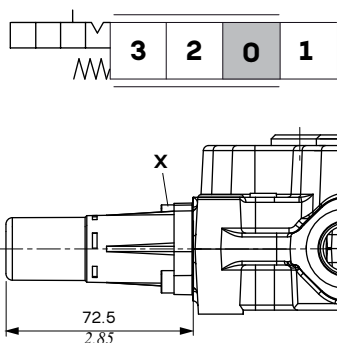
For regenerative circuit

Type 13FZ1

4 positions, detent in position 1, spring return in neutral position, **for spool type 8(13FZ)**

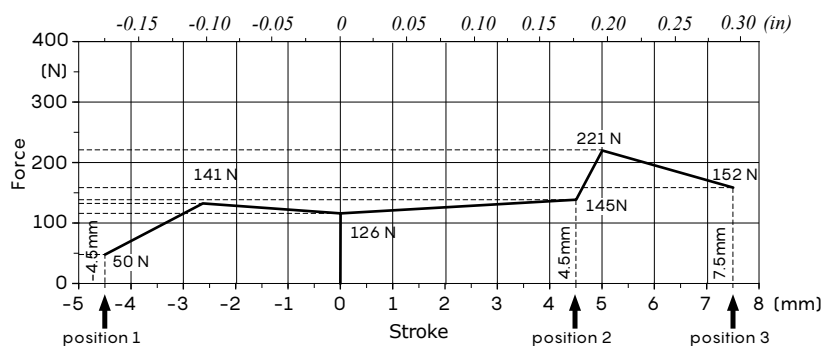
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)



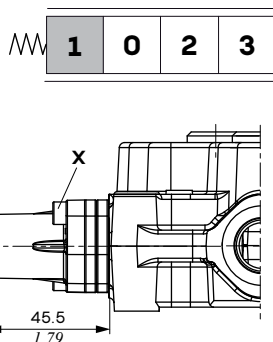
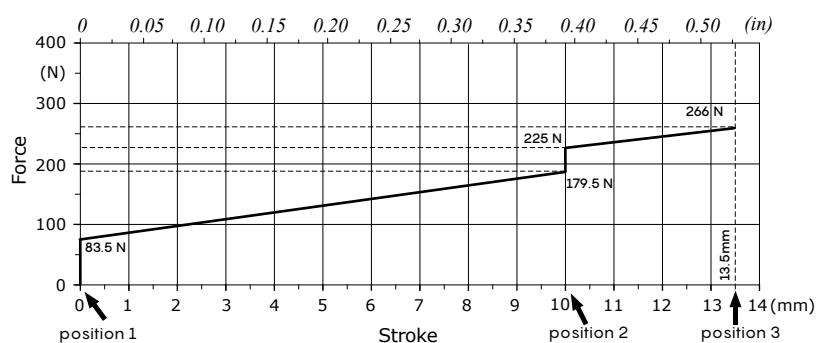
Technical features

Locking and release force (pos.1): ... 170 N / 38 lbf

Force-Stroke diagram
(13FZ1)

Type 17F

4 positions, spring return in position 1, **for spool type 8(17F)**

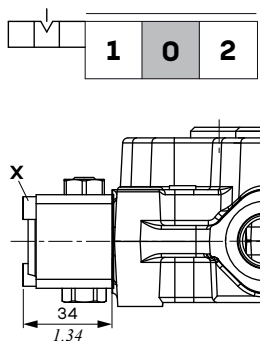
Force-Stroke diagram
(17F)

Rotary spool control kit configuration

The rotary spool control kit needs dedicated spools, see page 18 and page 59 for complete control kit.

Type R

Control kit for rotary spool configuration

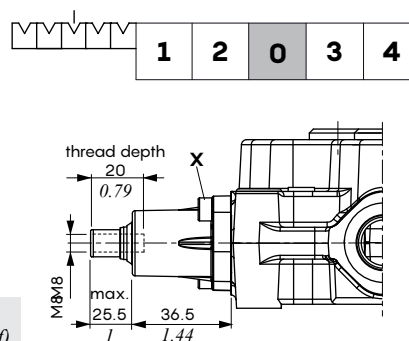


5 positions manually operated configuration

The control with 5 positions manually operated needs dedicated spools, see page 19.

Type 11D5

Control detent in all positions for 5 positions control configuration



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

B side controls

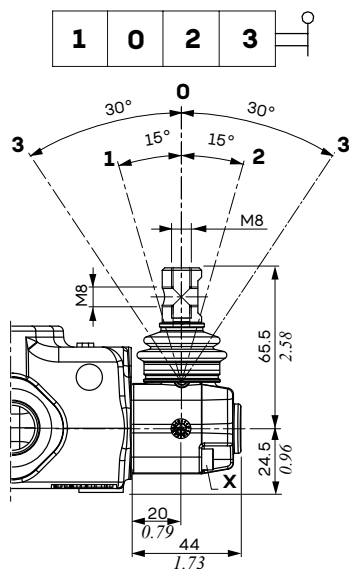
Aluminium lever kits

Type L

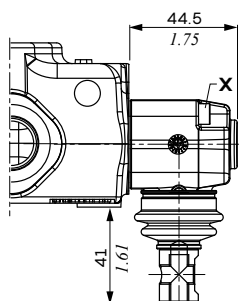
Standard lever kit

Type LW

As type L, with rust preventer treatment

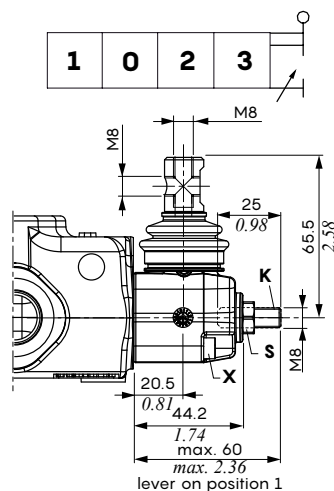


Execution L180



Type LSGF1

As type LSG, with stroke adjustment

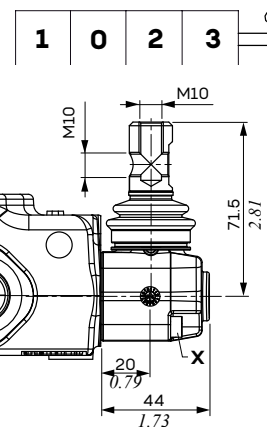


Type LM10

Lever kit with M10 thread

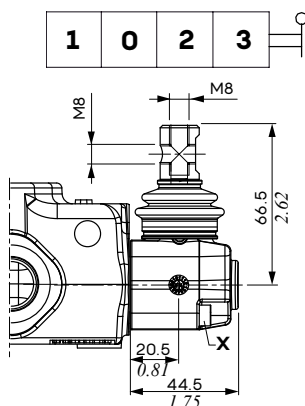
Type LWM10

As type LW, with rust preventer treatment



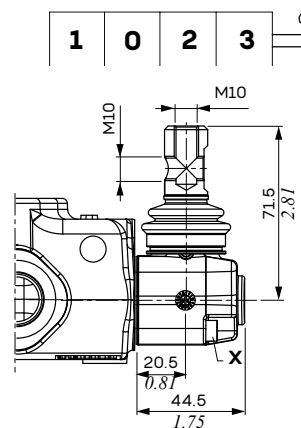
Type LSG

As type L, waterproof



Type LMSGM10

As type LM10 waterproof



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

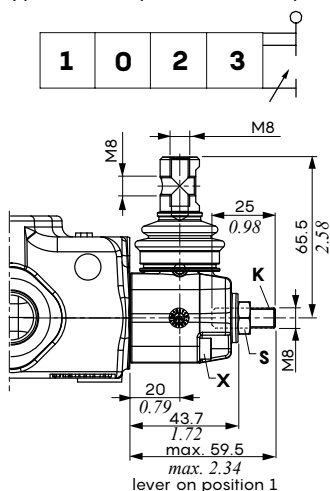
S= wrench 13-24 Nm (17.7 lbf)

K= allen wrench 4

Aluminium lever kits

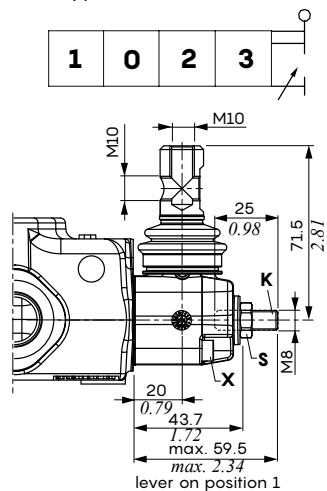
Type LF1

As type L with spool stroke adjustment



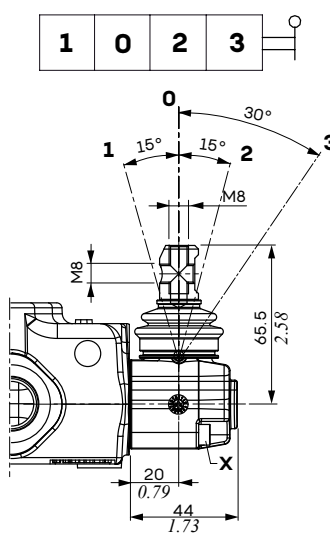
Type LF1M10

As type LF1 with M10 thread



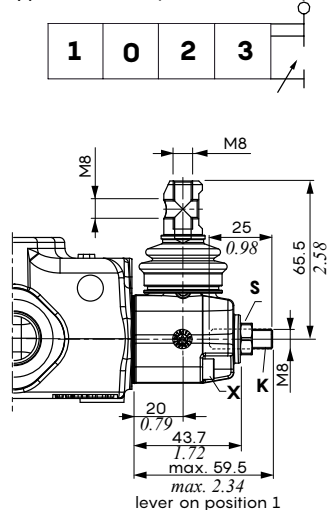
Type L1

With dull lever for P valves



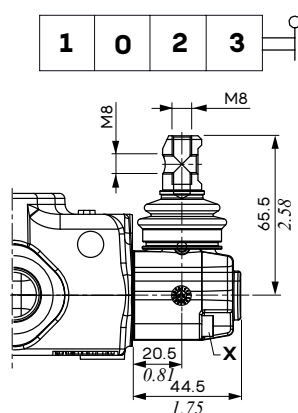
Type L1F1

As type L1, with spool stroke adjustment



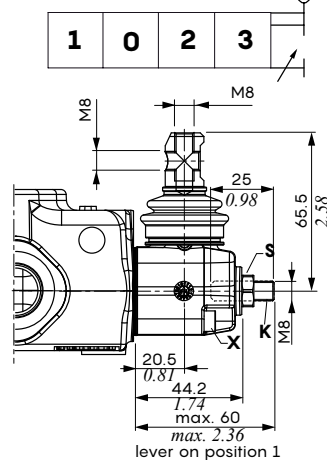
Type LSG1

As type L1 waterproof



Type LSG1F1

As type L1F1 waterproof



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

S= wrench 13-24 Nm (17.7 lbf)

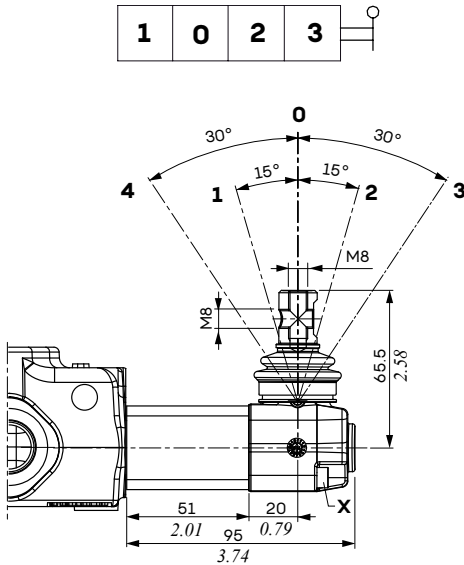
K= allen wrench 4

B side controls

Aluminium lever kits

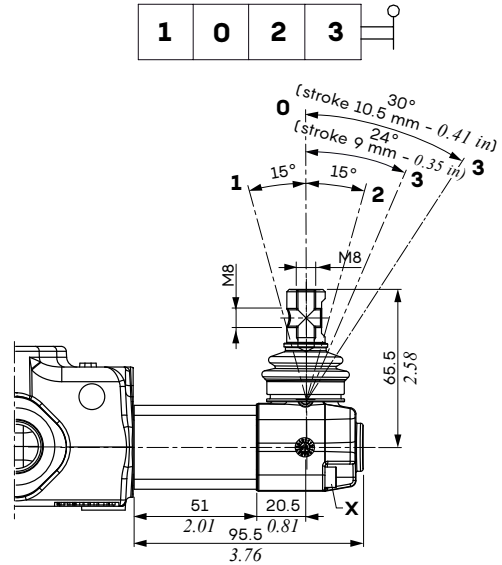
Type L9

As type L with spool extension



Type LSG9

As type L9 waterproof



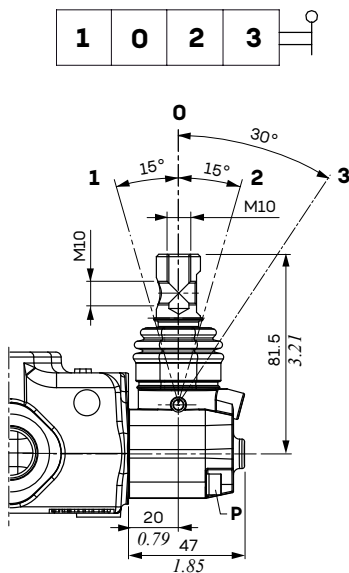
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Cast iron lever kits

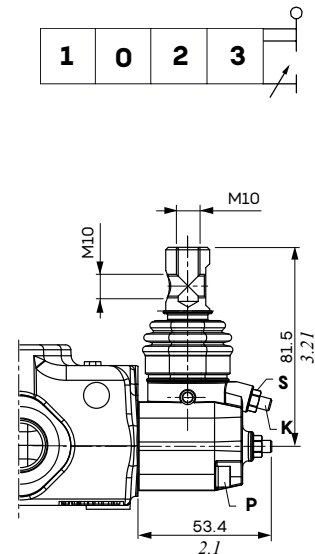
Type LG

Standard lever kit



Type LFG

Standard lever kit, with spool stroke adjustment



Wrenches and tightening torques

P= allen wrench 4-10 Nm (7.3 lbf)

S= wrench 8-6.6 Nm (4.9 lbf)

K= allen wrench 2.5

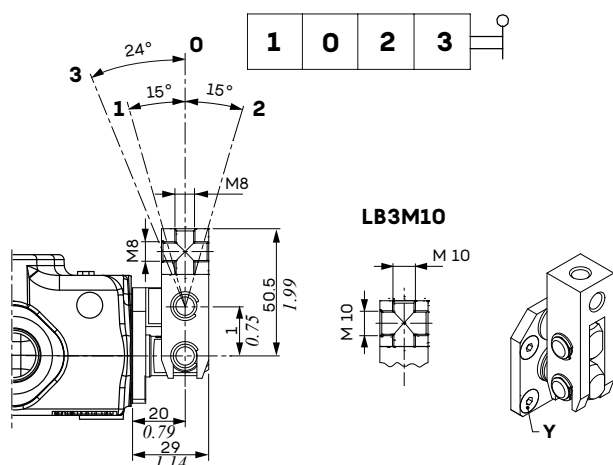
Steel lever kits

Type LB3

Steel lever kit with upper pivot

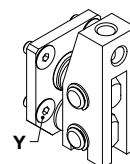
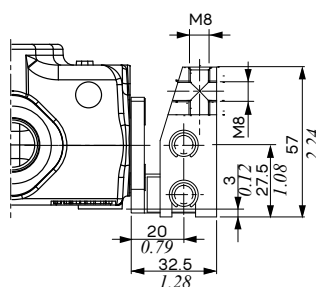
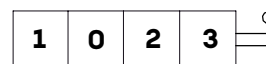
Type LB3M10

As type LB3 with M10 thread



Type LB1

Steel lever kit with lower pivot



Wrenches and tightening torques

Y = allen wrench 3-6.6 Nm (4.9 lbf)

Aluminium lever kits with detent

Type LEB

Detent in neutral position
with safety lever box

Type LSGB5

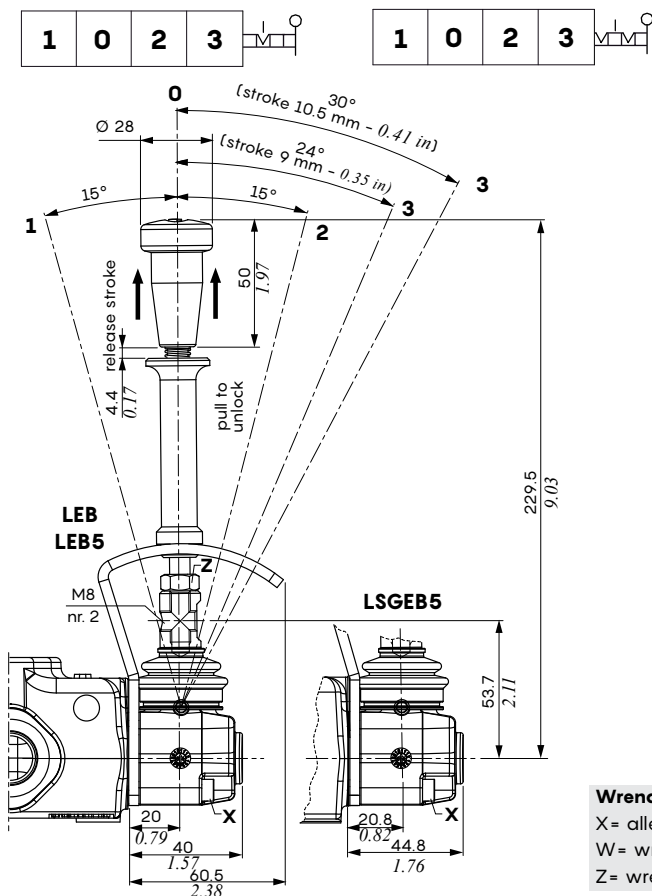
As type LEB waterproof

Type LEB5

Detent in positions
1 and 2 with
safety lever box

Type LE

Detent in neutral position

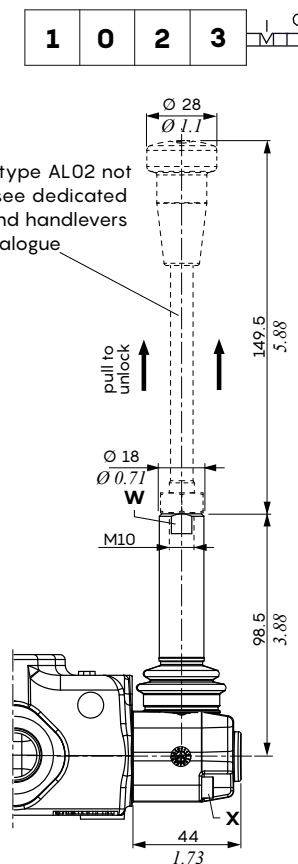


Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

W = wrench 16

Z = wrench 13-24 Nm (17.7 lbf)

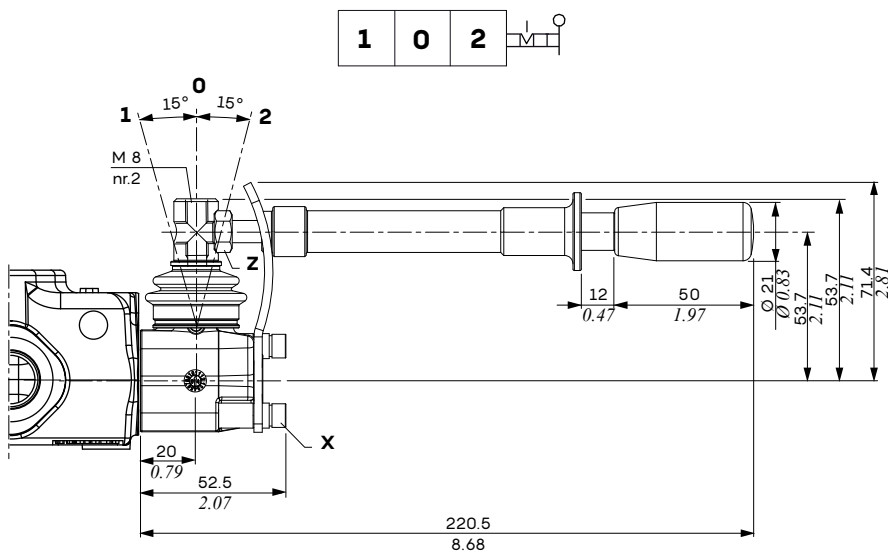
Handlever type AL02 not
included, see dedicated
handles and handlevers
catalogue

B side controls

Aluminium lever kits with detent

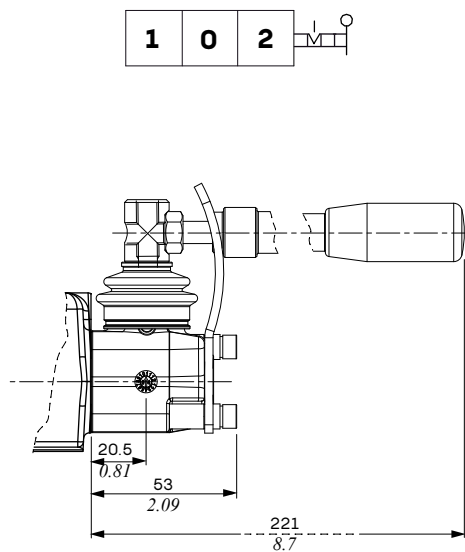
Type LUP

As type LEB with horizontal safety lever box



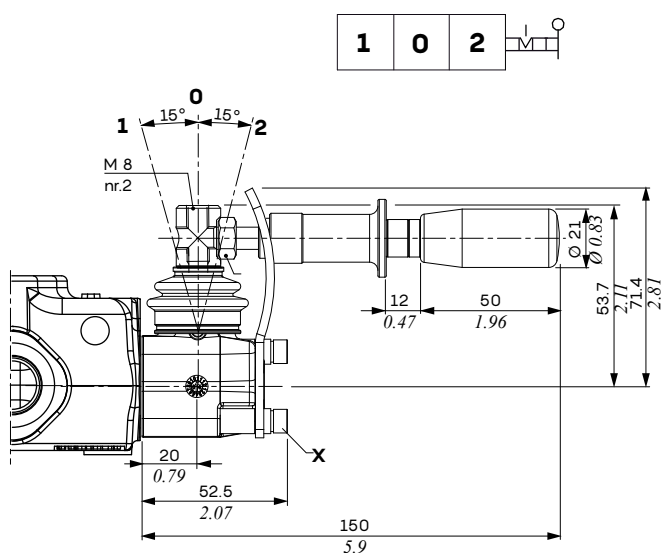
Type LSGUP

As type LUP, waterproof



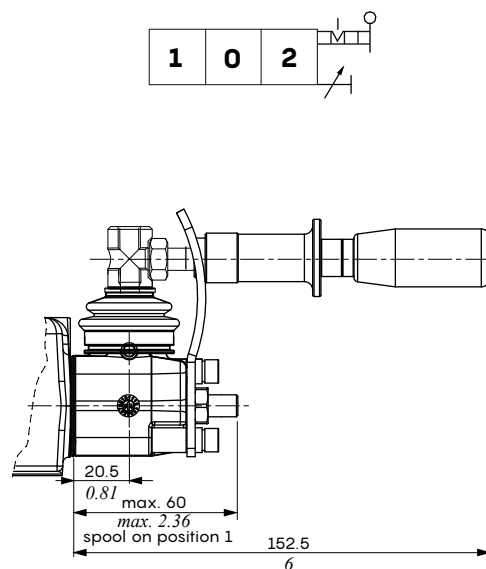
Type LUP(R150)

As type LUP with short handlever



Type LSGUP(R150)F1

As type LUP(R150), waterproof with spool stroke limiter on port A



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Z= wrench 13-24 Nm (17.7 lbf)

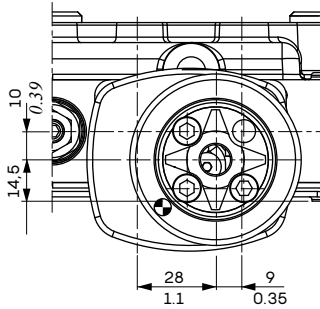
Joystick for 2 section operation

Type LCN1

Mechanical joystick, pivot placed down on the left, with nylon bearing

Type LCA1

Mechanical joystick, pivot placed down on the left, with bronze bearing

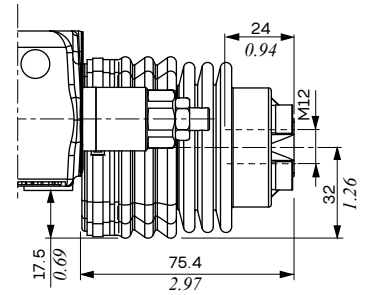
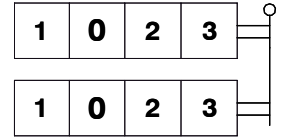
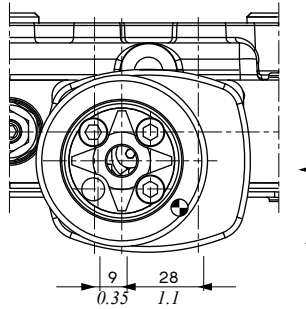


Type LCN2

Mechanical joystick, pivot placed down on the right, with nylon bearing

Type LCA2

Mechanical joystick, pivot placed down on the right, with bronze bearing

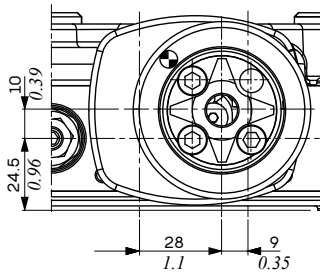


Type LCN3

Mechanical joystick, pivot placed above to the left, with nylon bearing

Type LCA3

Mechanical joystick, pivot placed above to the left, with bronze bearing

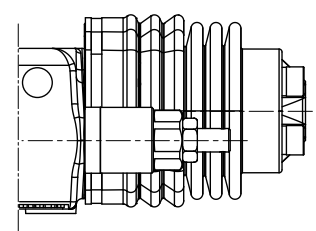
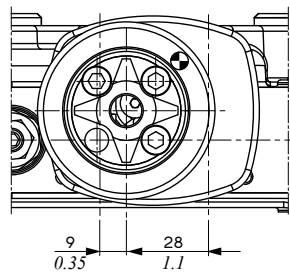


Type LCN4

Mechanical joystick, pivot placed above to the right, with nylon bearing

Type LCA4

Mechanical joystick, pivot placed above to the right, with bronze bearing



Wrenches and tightening torques

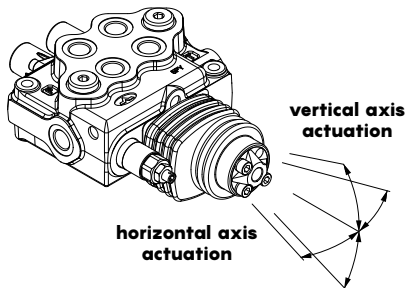
P= allen wrench 5-15 Nm

Q= wrench 13-24 Nm

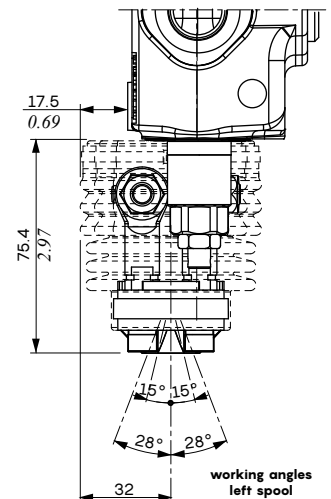
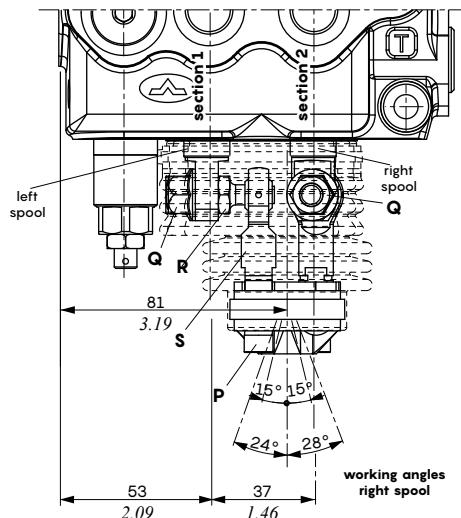
R= wrench 13

S= wrench 9.4

Configuration example LCN1-4



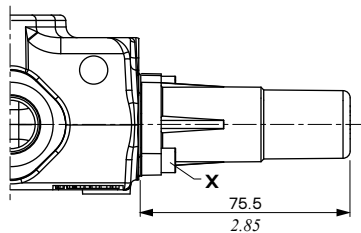
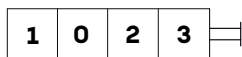
Working angles			
	right spool		left spool
angle	15°		15°
stroke	+ 5.5 mm	- 5.5 mm	+ 5.5 mm - 5.5 mm
	0.22 in	- 0.22 in	0.22 in - 0.22 in
angle	24°	28°	28°
stroke	+ 9 mm	- 10.5 mm	+ 9 mm - 9 mm
	0.35 in	- 0.41 in	0.35 in - 0.35 in



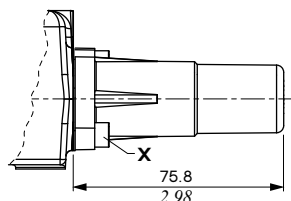
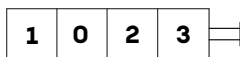
B side controls

Other devices

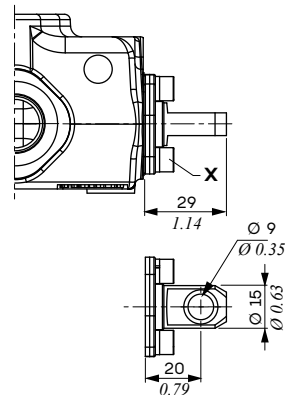
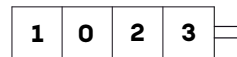
Type SLCZ
With endcap



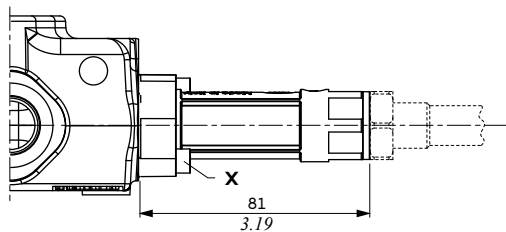
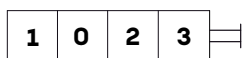
Type SLCZWP
As type SLCZ, waterproof



Type SLP
Dust proof plate

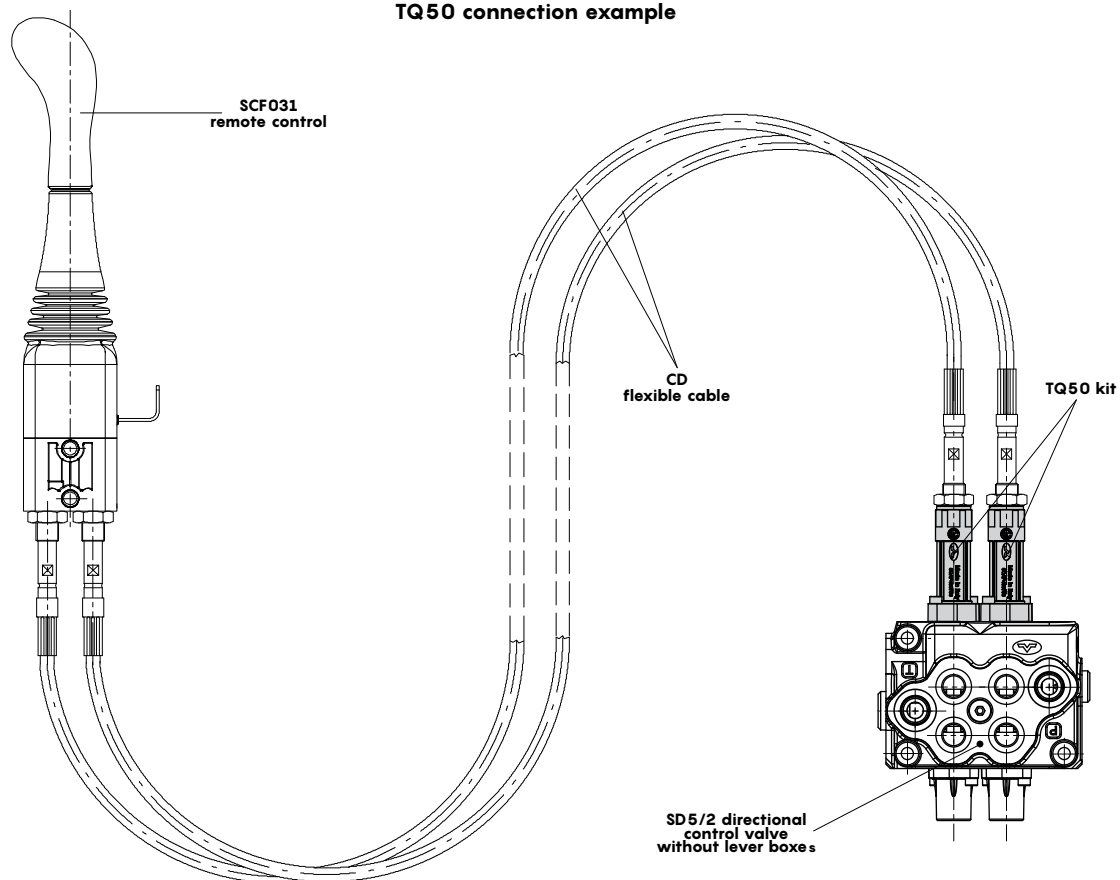


Type TQ50
Cable connection



Wrenches and tightening torques
X= allen wrench 4-6.6 Nm (4.9 lbf ft)

TQ50 connection example

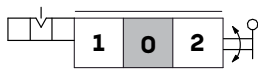


For rotary spool control kit configuration

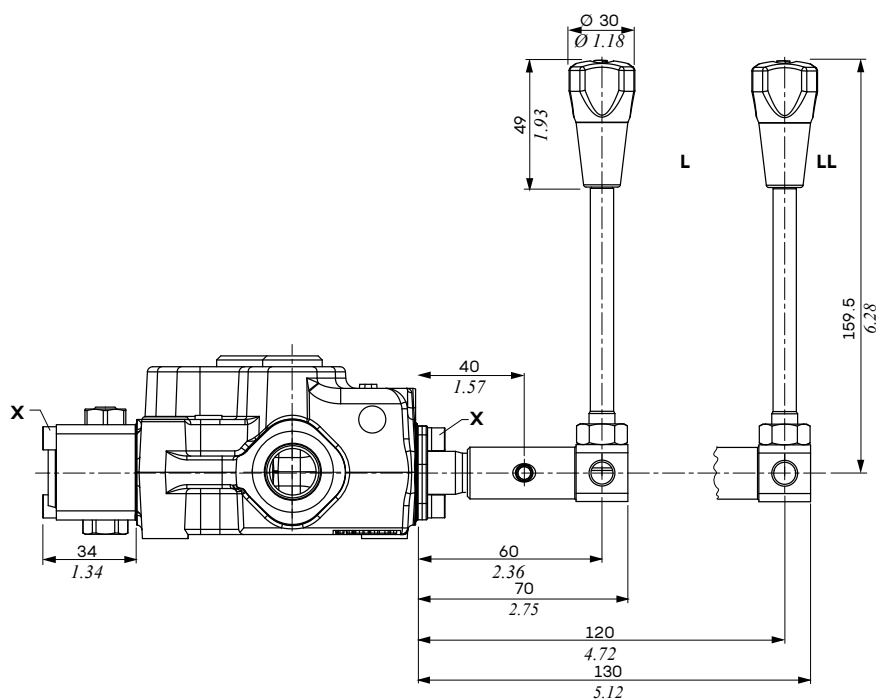
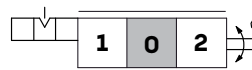
Rotary spool controls requires dedicated spools, see page 18.

Type L

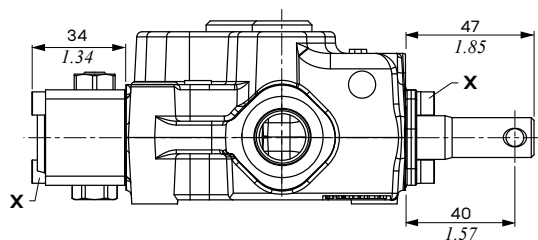
Control kit for rotary spool configuration

**Type LL**

Long control kit for rotary spool configuration

**Type SLP**

Configuration with dust proof plate

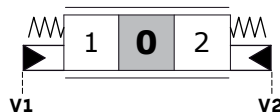
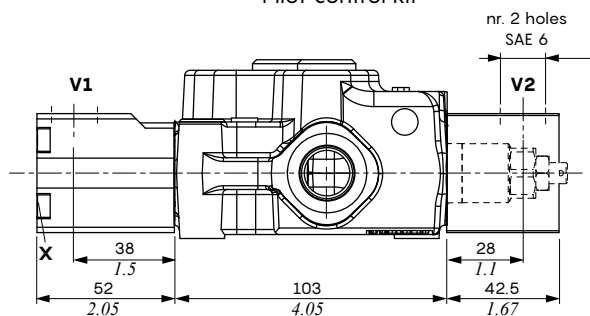


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm (4.9 lbf)

Complete controls

Proportional hydraulic control

Type 8IM
Pilot control kit



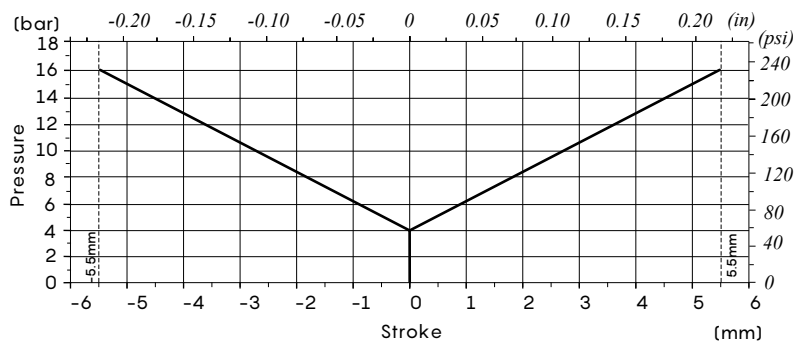
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

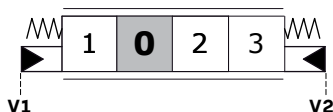
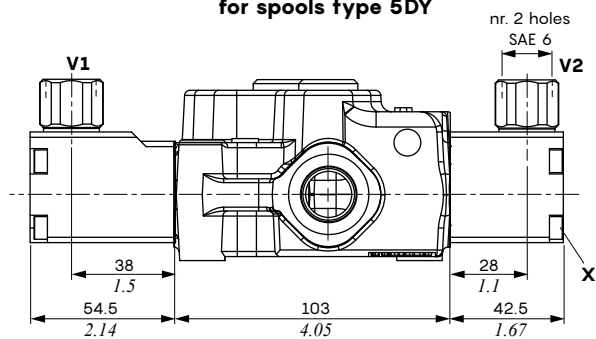
Technical features

Pilot pressure: max. 50 bar / 725 psi

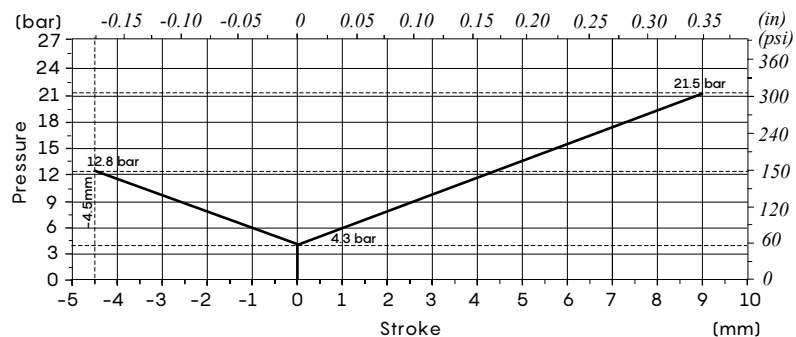
Pilot pressure-Stroke diagram



Type 13IM
Pilot control kit for floating circuit
for spools type 5DY



Pilot pressure-Stroke diagram



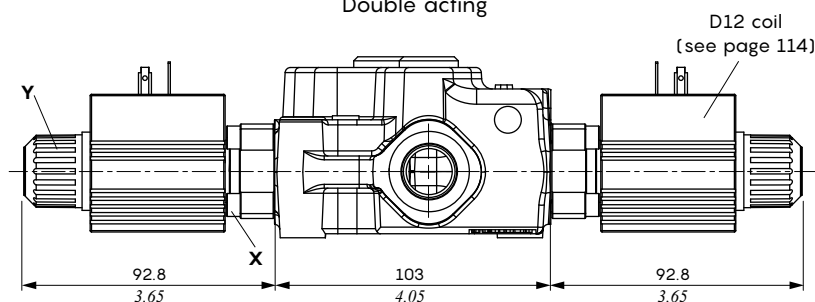
Technical features

Pilot pressure: max. 100 bar / 1450 psi

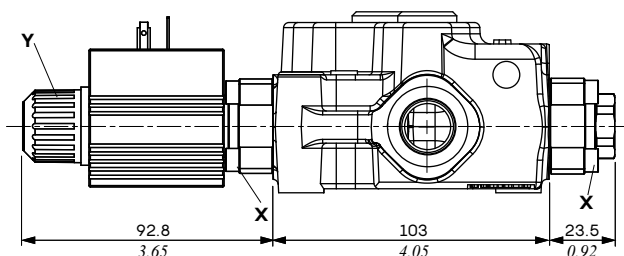
Note - 13IM control requires dedicated spool type 5DY.

ON/OFF direct solenoid control kits

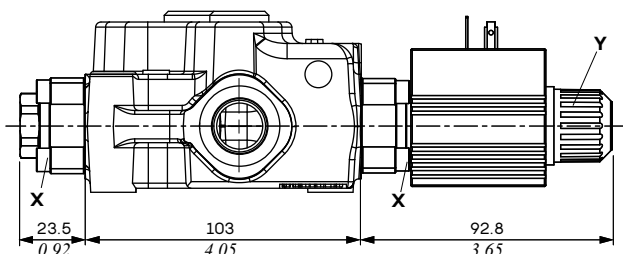
Type 8ES3
Double acting



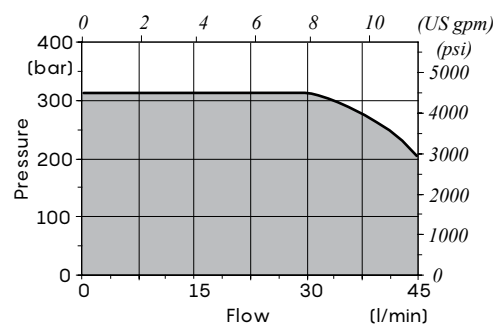
Type 8ES1
Single acting in A



Type 8ES2
Single acting in B



Operating condition diagram

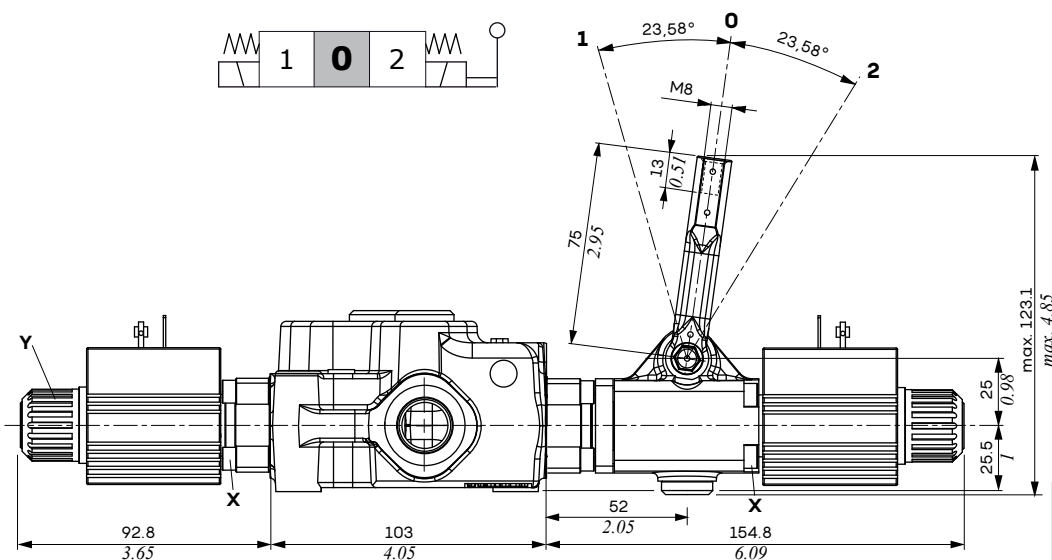
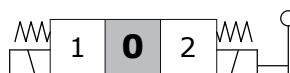


Technical features

Nominal voltage..... 12/24 VDC
Power absorption..... 36 W
Weather temperature..... from 60°C to 115°C
(from 140°F to 239°F)

Note - For D12 coils and connectors see page 114

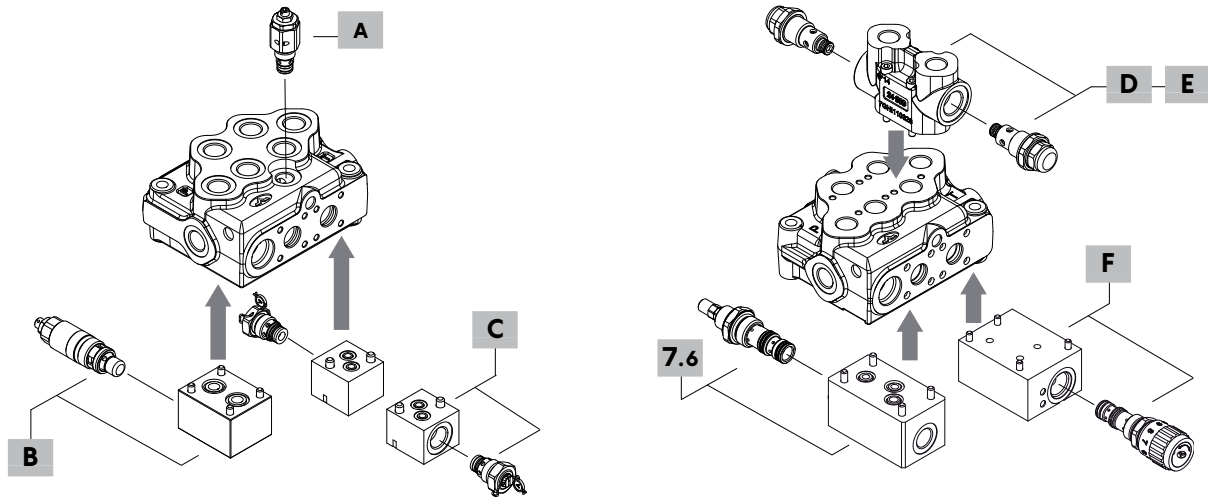
Type 8ES3LHE
Double acting with manual override for emergency only



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)
Y= 6.6 Nm (4.9 lbf)

Auxiliary valves



- A:** VS relief service valve
B: VSC flange mounted relief service valve
C: VP, VU and VC flange mounted relief service valve
D: Pantishock cross return valve
E: BP, BPS pilot operated check valves
F: VD, VB flow control valves

Description examples

Valve setting (bar)
SD5/2-P(KG3-120)/18L/ VS(G3-100) /18L
 A

Valve setting (bar)
SD5/3-SP2(JNG3-200)/18L/ VSC(KG3-180) /18L/18L/AET
 B

Valve setting (bar)
SD5/3-P(JNG3-120)/ VD11 /18L/18IM/18ES3. P3(G3-100) /AET-ELNW(NO)-.....- 12VDC
 F C

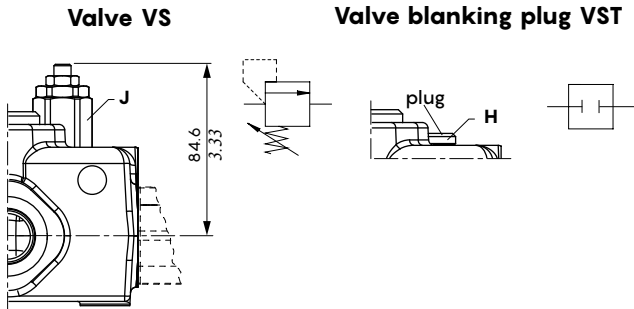
Valve setting (bar)
SD5/2-P(JG3-100)/28L. BP1 /28L. P3(D3-100) /AET
 E D

Auxiliary valves

Type VS relief service valve

It's suggested for flow up to 25 l/min - 6.6 US gpm, and it's mounted on parallel body to limitate the pressure, a lower value than main relief valve (min. gap 20 bar - 290 psi), on downstream section.
It requires additional SD5 body machining. Please contact our Sales Dpt for the machining of the body and more information.

Adjustment type **G**= with screw
H= set and locked
Spring type
Valve setting (bar)
Description example: SD5/2-P(KG3-120)/18L/ **VS(G3-100)** /18L/AET-PSA-SAE
relief service valve



Ordering codes

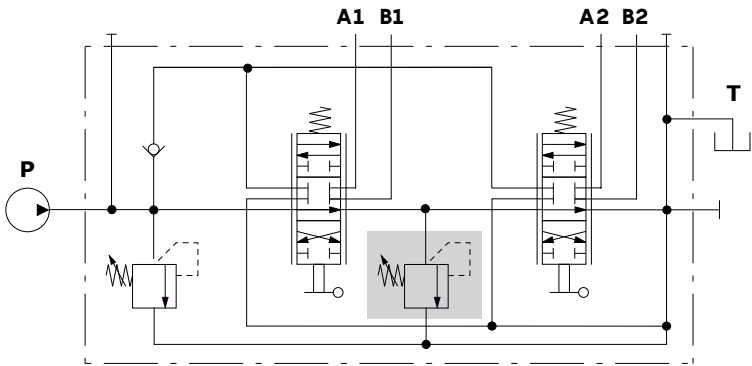
All valves indicated require additional body machining. (*)

TYPE	CODE	DESCRIPTION
Relief service valve		
VS(G3-100)	3XCAR505113	Setting range from 40 to 200 bar (from 580 to 2900 psi), standard setting 100 bar (1450 psi)
VST	5TAP419300	Valve blanking plug

Note - (*) Please contact our Sales Dpt for more information.

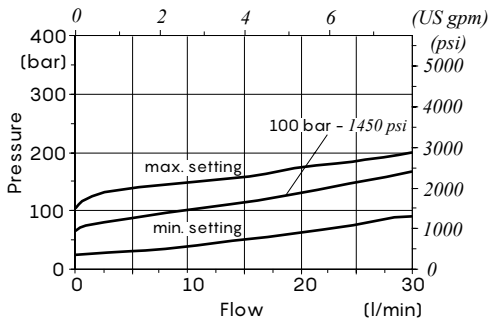
Wrenches and tightening torques
J= wrench 19-24 Nm (17.7 lbf)
H= allen wrench 6-24 Nm (17.7 lbf)

Hydraulic circuit with VS valve



Description example:
SD5/2-P(KG3-120)/18L/**VS(G3-100)**/18L/AET-PSA-SAE

Setting range



Auxiliary valves

Type VSC-VSB flange mounted relief service valve

The valves requires additional SD5 body machining. The VSC and VSB valve block is supplied fitted to the body. Please contact our Sales Dpt for more information.

Ordering codes

TYPE	CODE	DESCRIPTION
-	5CO2420000	Mounting block kit
Flange mounted relief service valve		
VMD5(KG1-30)	5KIT105121	Range from 20 to 50 bar (from 290 to 725 psi), standard setting 30 bar (435 psi)
VMD5 (KG2-80)	5KIT105122	Range from 40 to 100 bar (from 580 to 1450 psi), standard setting 80 bar (1160 psi)
VMD5 (KG3-120)	5KIT105123	Range from 80 to 200 bar (from 1160 to 2900 psi), standard setting 120 bar (1740 psi)
VMD5 (KG4-220)	5KIT105124	Range from 180 to 315 bar (from 2610 to 4560 psi), standard setting 220 bar (3190 psi) SV
XTAP623282		Valve blanking plug

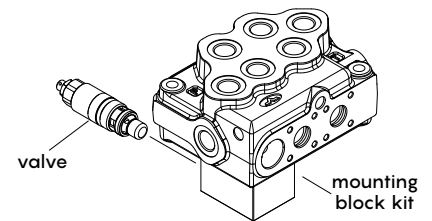
Notes - For performance data see K valves on page 21.

Type VSC

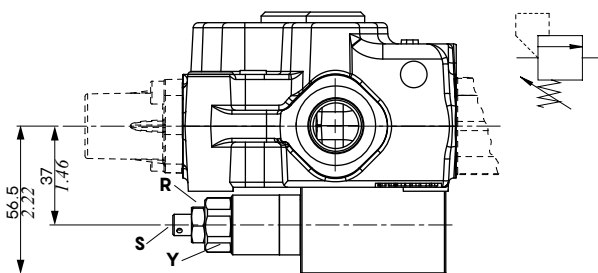
VSC valve is mounted on parallel body on the opposite side of working ports, the function to limit the pressure, at lower value than main relief valve (min. gap 20 bar / 290 psi) on downstream sections.

Adjustment type **G**= with screw
H= set and locked Spring type Valve setting (bar)

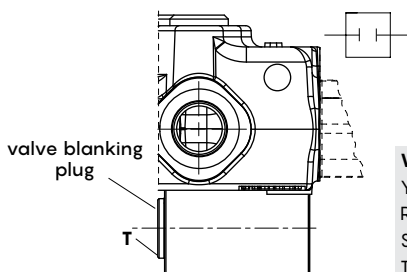
Description example: SD5/2-P(JG3-120)/18L/ **VSC(KG3-100)** /18L/AET
flange mounted relief service valve



VSC valve



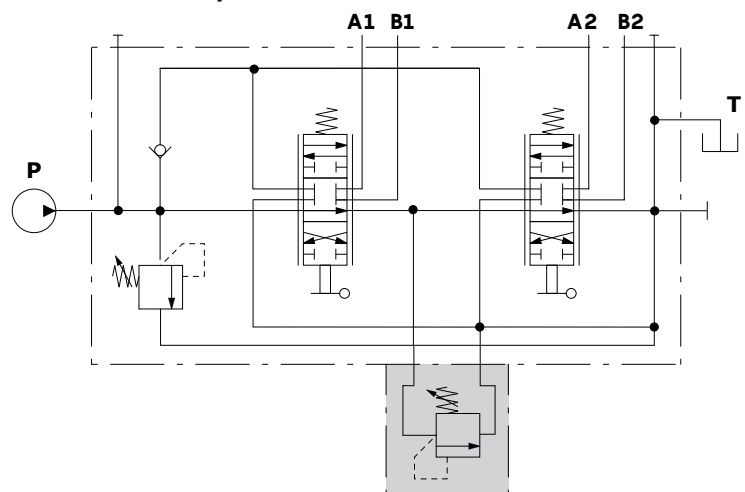
SV valve blanking plug



Wrenches and tightening torques

Y= wrench 19-24 Nm (17.7 lbf)
R= wrench 13-24 Nm (17.7 lbf)
S= allen wrench 4
T= wrench 10-24 Nm (17.7 lbf)

Hydraulic circuit with VSC valve



Description example:

SD5/2-P(JG3-120)/18L/**VSC(KG3-100)**/18L/AET-SAE

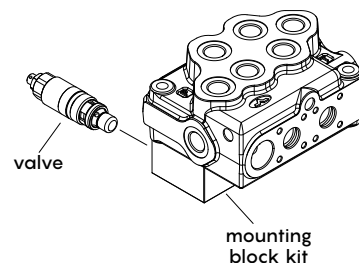
Type VSB

VSB valve is mounted on the opposite side of working ports in correspondence of series-parallel connection, the function to limit the pressure, at lower value than main relief valve (min. gap 20 bar / 290 psi) on downstream sections.

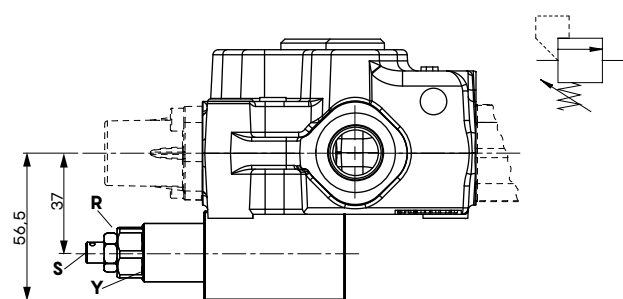
Adjustment type **G**= with screw Spring type
H= set and locked Valve setting (bar)

Description example: SD5/2-SP1(JG3-120)/18L/ **VSB(KG3-100)** /18L/AET

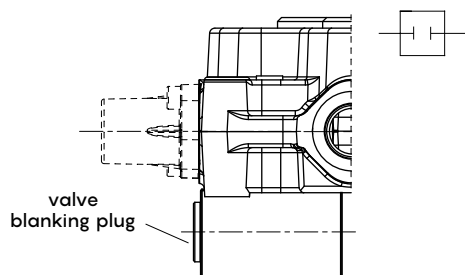
flange mounted relief service valve



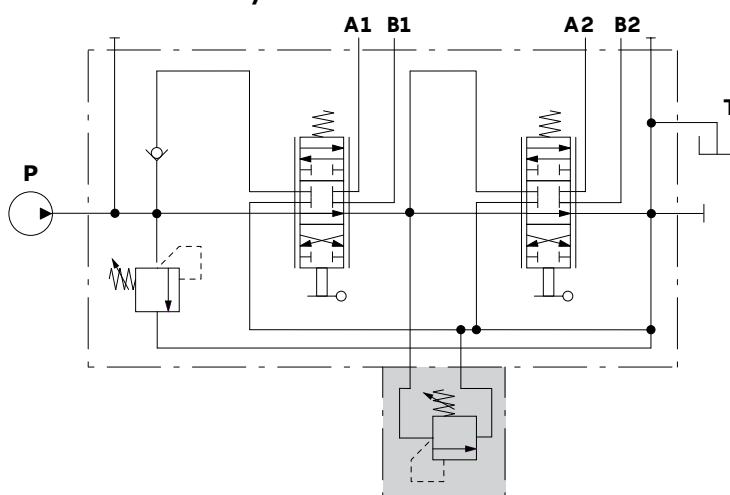
VSB valve



SV valve blanking plug



Hydraulic circuit with VSB



Description example:

SD5/2-SP1(JG3-120)/18L/ **VSB(KG3-100)** /18L/AET-SAE

Wrenches and tightening torques

Y= wrench 19-24 Nm (17.7 lbf)

R= wrench 13-24 Nm (17.7 lbf)

S= allen wrench 4

T= wrench 10-24 Nm (17.7 lbf)

Auxiliary valves

Type VP-VU-VC flange mounted service valves

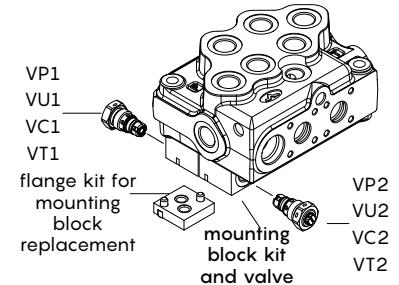
They are antishock (VP), antishock and anticavitation (VU) and anticavitation (VC) service valves, flange mounted on the opposite side of working ports connected in parallel with A and B ports.

They require additional machining on the SD5 body. The valve block is supplied fitted to the body. Please contact our Sales Dpt for the machining of the body and information.

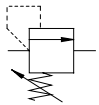
Adjustment type **G** = with screw
H = set and locked Spring type Valve setting (bar)

Description example: SD5/2-P(JNG4-220)/18L/18L **VP3(G3-120)** /AET

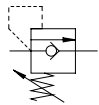
VP1-VU1-VC1: service valves on port A
VP2-VU2-VC2: service valves on port B
VP3-VU3-VC3: service valves on ports A and B
VT: valve blanking plug



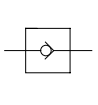
Type VP
antishock



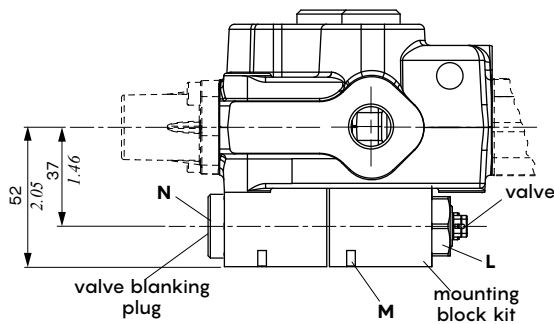
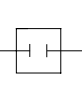
Type VU
antishock and
anticavitation



Type VC
anticavitation



Type SV
valve
blanking plug



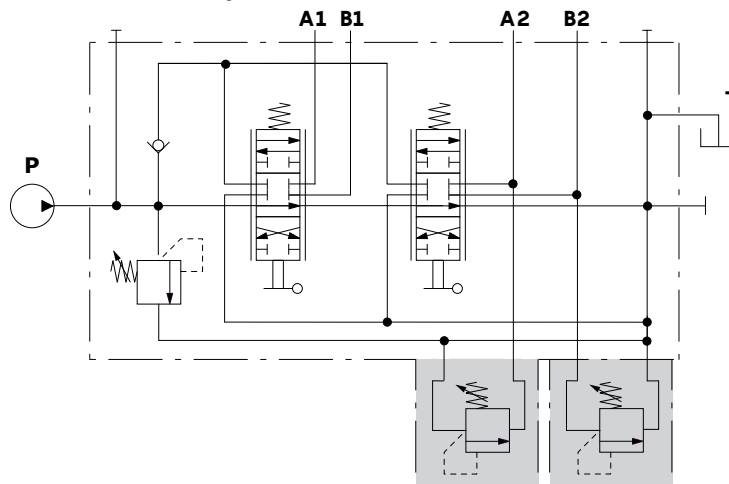
Wrenches and tightening torques

L = wrench 22-42 Nm (31 lbf)
M = allen wrench 5-9.8 Nm (7.2 lbf)
N = allen wrench 8-24 Nm (17.7 lbf)

Ordering codes

TYPE	CODE	DESCRIPTION
V	5CO2820010	Mounting block kit for VP, VU and VC valves
SV	XTAP524280	Valve blanking plug
VF	5FLA336036	Flange kit for mounting block replacement
Antishock valves (VP)		
P(G2)	5KIT206112	Range from 60 to 125 bar (from 870 to 1810 psi), standard setting 80 bar (1160 psi)
P(G3)	5KIT206113	Range from 80 to 200 bar (from 1160 to 2900 psi), standard setting 120 bar (1740 psi)
P(G4)	5KIT206114	Range from 160 to 315 bar (from 2320 to 4560 psi), standard setting 200 bar (2900 psi)
Antishock and anticavitation valves (VU)		
U(G2)	5KIT305112	Range from 40 to 80 bar (from 580 to 1160 psi), standard setting 60 bar (870 psi)
U(G3)	5KIT305113	Range from 63 to 200 bar (from 910 to 2900 psi), standard setting 100 bar (1450 psi)
Anticavitation valves (VC)		
C	5KIT406110	Anticavitation valve

Hydraulic circuit with VP valve



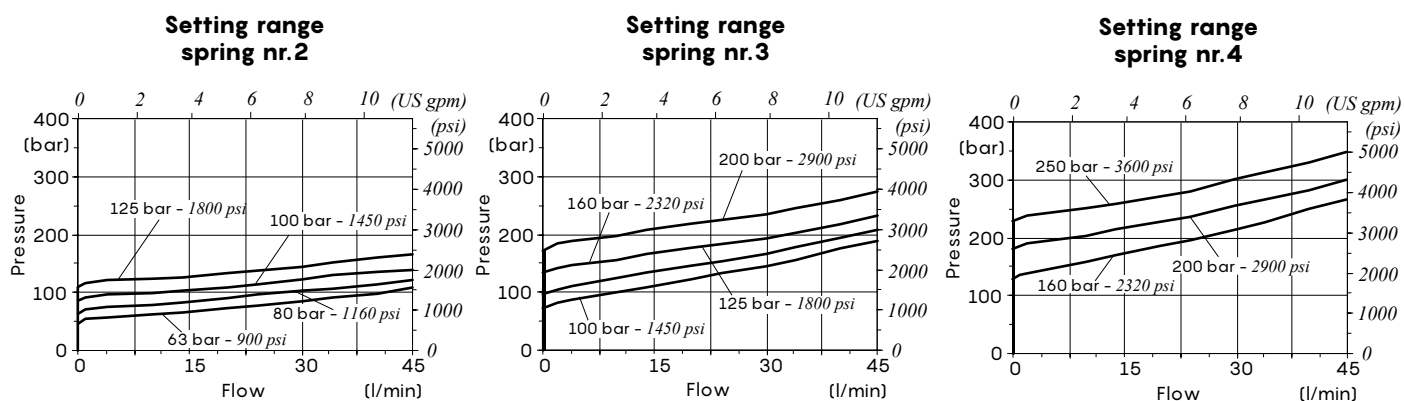
Description example:

SD5/2-P(JNG4-220)/18L/18L **VP3(G3-120)** /AET-SAE

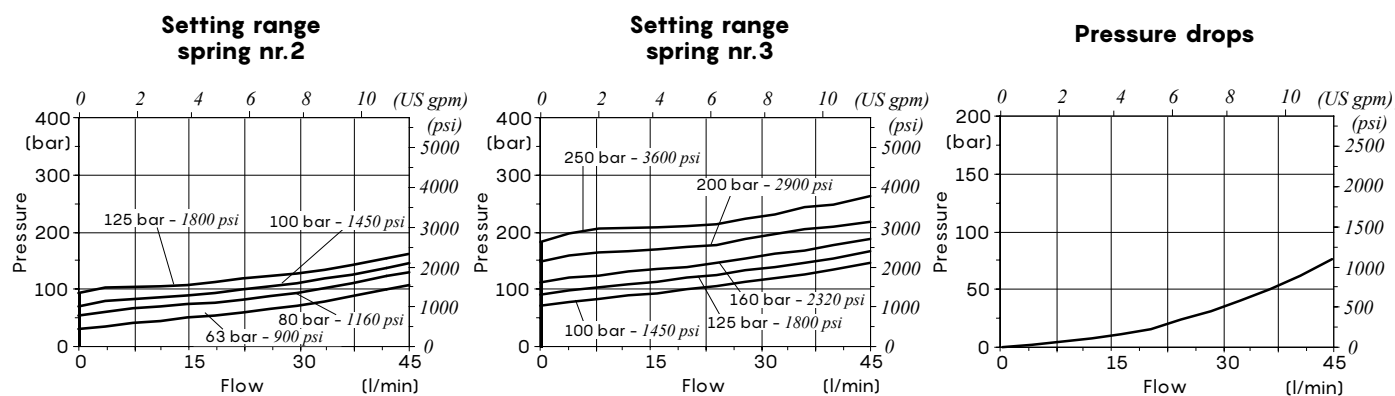
Auxiliary valves

Type VP-VU-VC flange mounted service valves

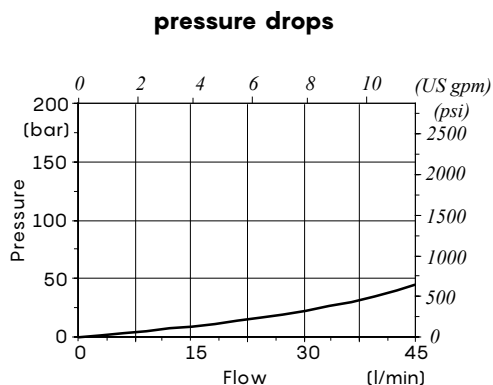
Type VP antishock valve performance data



Type VU antishock and anticavitation valve performance data



Type VC anticavitation valve performance data



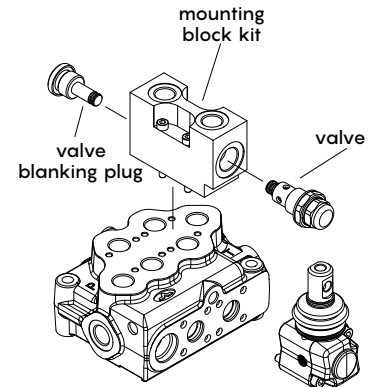
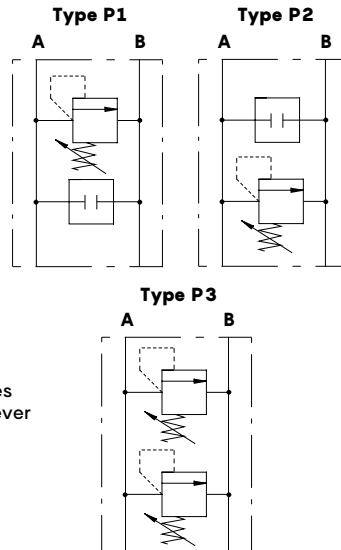
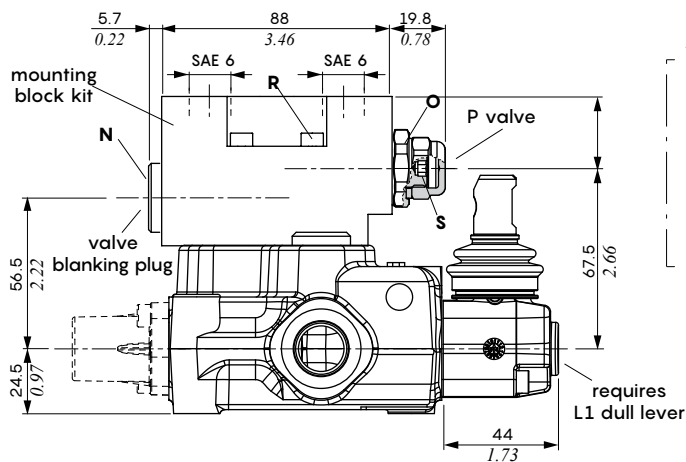
Auxiliary valves

Type P antishock cross return valve

Cast iron block with antishock valves for lever kit **L1**, **LSG1**, **L1F1** and **LSG1F1**. They require special machining on the SD5 body. Please contact our Sales Dpt for the machining of the body and information.

Taratura valvola (bar)

Esempio descrizione: SD5/1-P(KG4-200)/18**L1.P2(G4-200)**/AET



Wrenches and tightening torques

N= allen wrench 8-24 Nm (17.7 lbf)

O= wrench 27-42 Nm (31 lbf)

P= allen wrench 4-9.8 Nm (7.2 lbf)

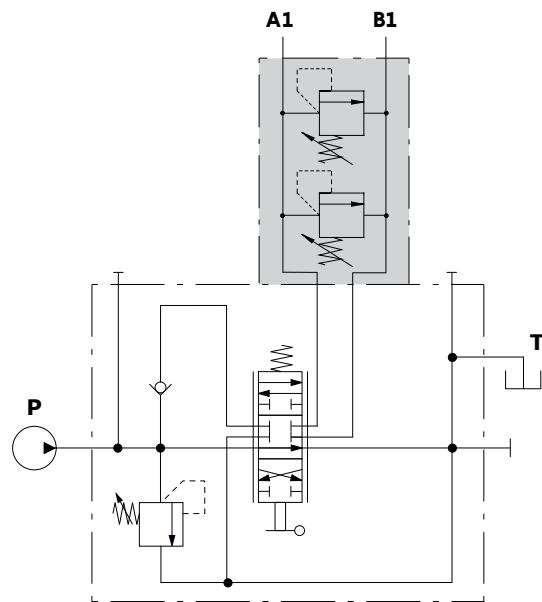
S= wrench 5

Ordering codes

TYPE	CODE	DESCRIPTION
Complete P valve block (cross return type; it requires L1, LSG1 and LSGF1 dedicated lever kit)		
P1(D3)	602001007 ⁽¹⁾	Block with valve on port A
P2(D3)	602001007 ⁽¹⁾	Block with valve on port B
P3(D3)	602001101 ⁽¹⁾	Block with valve on ports A and B
Mounting block		
-	5CO2720700 ⁽¹⁾	Mounting block kit
Single P valves		
P(G2)	5CAR211112	Range from 50 to 100 bar (from 725 to 1450 psi), standard setting 60 bar (870 psi)
P(G3)	5CAR211113	Range from 80 to 220 bar (from 1160 to 3190 psi), standard setting 100 bar (1450 psi)
P(G4)	5CAR211114	Range from 100 to 315 bar (from 1450 to 4560 psi), standard setting 200 bar (2900 psi)
P1-P2	XTAP526430	Valve blanking plug

Note - (1) Codes are referred to **UN-UNF** threads

Hydraulic circuit with P valve

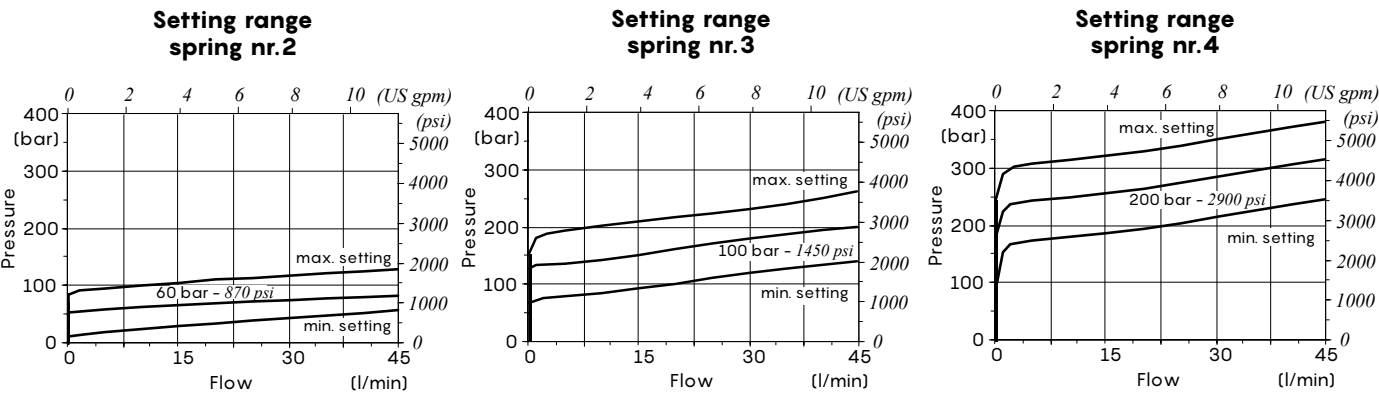


Description example:

SD5/1-P(KG4-200)/18**L1.P3(G4-200)**/AET-SAE

Type P antishock cross return valve

Performance data



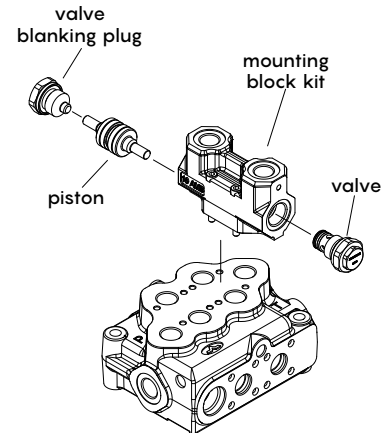
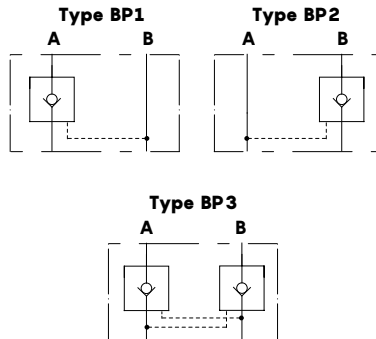
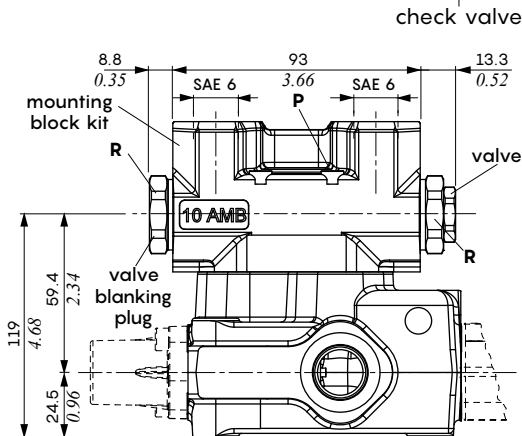
Auxiliary valves

Type BP-BPS pilot operated check valves

They require additional machining on the SD5 body. Please contact our Sales Dpt for the machining of the body and information.

BP direct type

Description example: SD5/2-P(SV)/18L.**BP2**/18LSG/AET



Wrenches and tightening torques

R= wrench 27-42 Nm (31 lbf)

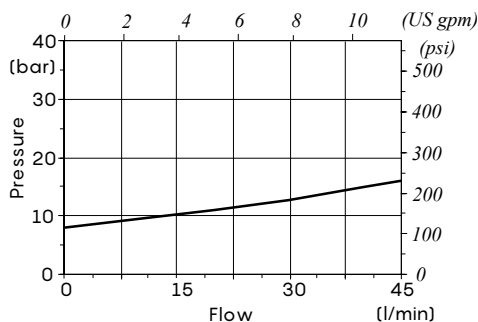
P= allen wrench 4-9.8 Nm (7.2 lbf)

Ordering codes

TYPE	CODE	DESCRIPTION
Complete BP-BPS valve block, direct type ⁽¹⁾		
BP1	602002020	Block with valve on port A
BP2	602002021	Block with valve on port B
BP3	602002101	Block with valve on ports A and B
Mounting block		
-	5CO2620700 ⁽¹⁾	Mounting block kit
Piston		
-	3PIS216450	Piston
Single BP-BPS valves		
VBP	XCAR605112	VBP cartridge direct type
VBPS	XCAR605210	VBPS cartridge type with pre-opening
BP1-BP2	XTAP627300	Valve blanking plug

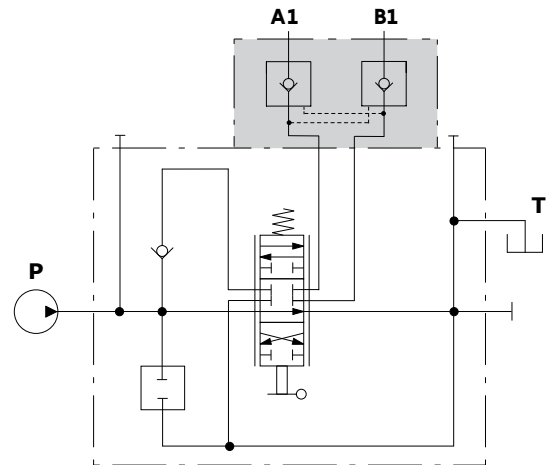
Note - (1) Codes are referred to UN-UNF threads

BP valve pressure drops



Type	Pilot ratio With pre-opening	Main
BP	-	1:5.3

Hydraulic circuit with BP valve



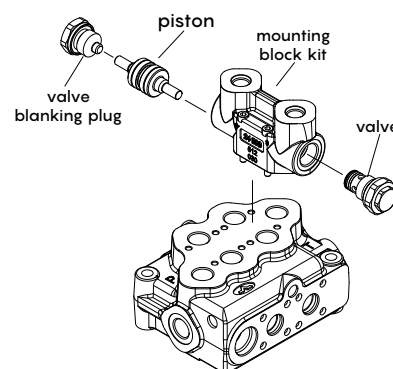
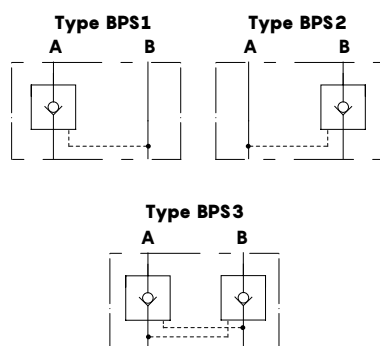
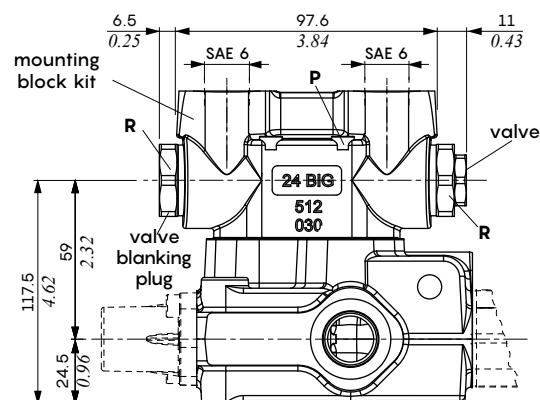
Description example:
SD5/1-P(SV)/18L.**BP3**/AET-SAE

Type BP-BPS pilot operated check valves

BPS with pre-opening type

Description example: SD5/2-S1(KG3-130)/18L/1CS8L.BPS2-PSL

check valve



Wrenches and tightening torques

R= wrench 27-42 Nm (31 lbf)

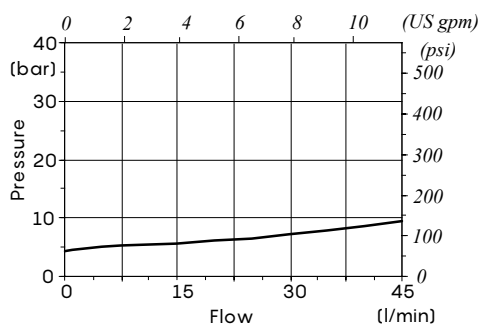
P= allen wrench 4-9.8 Nm (7.2 lbf)

Ordering codes

TYPE	CODE	DESCRIPTION
With pre-opening ⁽¹⁾		
BPS1	602003005	Block with valve on port A
BPS2	602003006	Block with valve on port B
BPS3	602003105	Block with valve on ports A and B
Mounting block		
-	5CO2620700 ⁽¹⁾	Mounting block kit
Piston		
-	3PIS216450	Piston
Single BP-BPS valves		
VBP	XCAR605112	VBP cartridge direct type
VBPS	XCAR605210	VBPS cartridge type with pre-opening
BP1-BP2	XTAP627300	Valve blanking plug

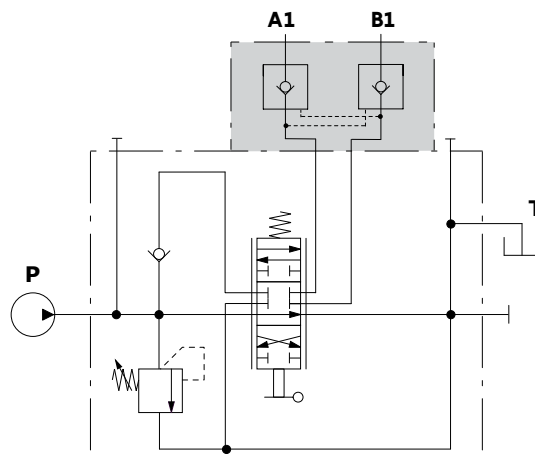
Note - (1) Codes are referred to UN-UNF threads

BPS valve pressure drops



Type	Pilot ratio	
	With pre-opening	Main
BPS	1:16	1:3.2

Hydraulic circuit with BPS valve

Description example:
SD5/1-P(KG3-120)/18L.BPS3/AET-SAE

Auxiliary valves

Flow control valves

Valve type VD1

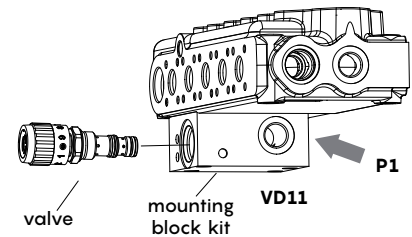
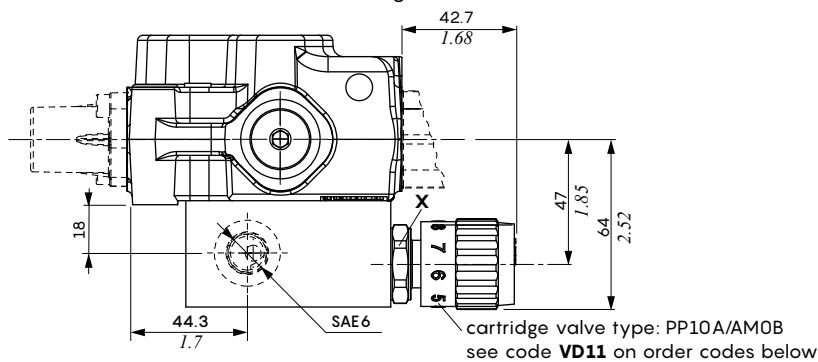
Block with pressure compensated 3-way flow regulator valve, to be flange mounted on body with parallel circuit. The cavity is oriented toward lever side. The flow is regulated on every working section while the exceeding flow goes to tank: max regulated flow 30 l/min (7.9 USgpm) with inlet on port 1. They requires additional machining on the SD5 body. The valve block is supplied fitted to the body. Please contact our Sales Dpt for the machining of the body and information.

Description example: SD5/3-P(JNG3-120)/**VD12**/18L/18L/18L/AET

VD11 valve: continuous fine regulation
VD12 valve: one turn with detent handknob regulated

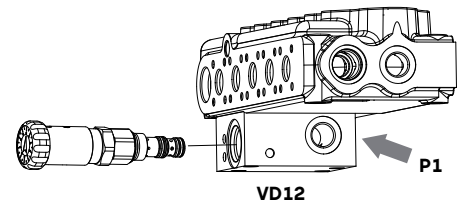
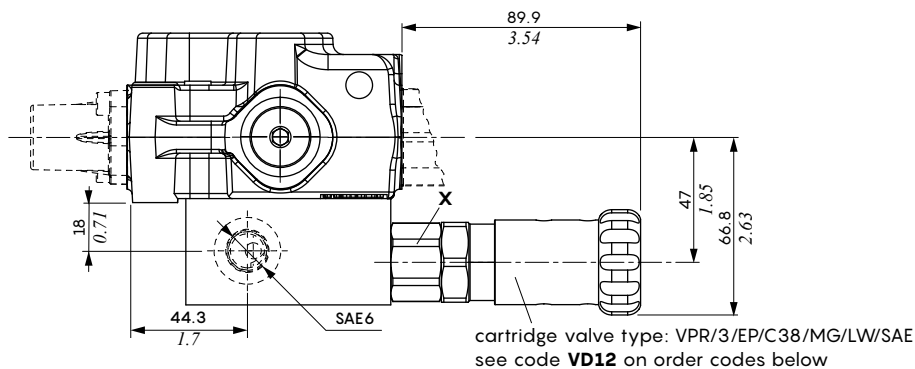
Type VD11

continuous fine regulation



Type VD12

one turn with detent handknob regulated



Wrenches and tightening torques

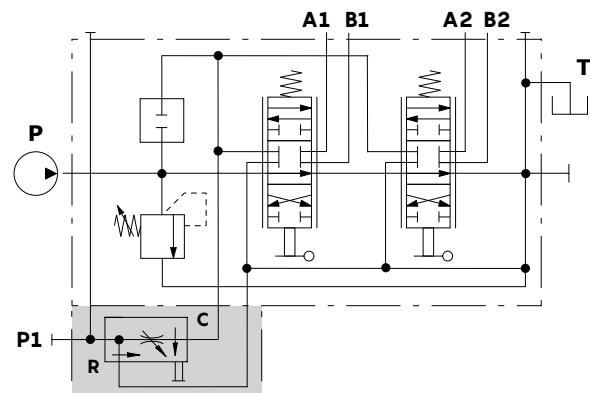
X= wrench 27-50 Nm (36.9 lbf)

Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VD1 type		
-	5CO63602202 ⁽¹⁾	Mounting block kit
VD1 valves		
VD11	OPP10002000	Fine regulation from 3 to 20 l/min (from 0.79 to 5.28 US gpm)
VD12	1636020211	One turn with detent (n. 10 notches)

Note - ⁽¹⁾ Codes are referred to UN-UNF threads

Hydraulic circuit with VD11 valve



Description example:
SD5/2-P(JNG120)/**VD11**/18L/18L/AET-SAE

Flow control valves

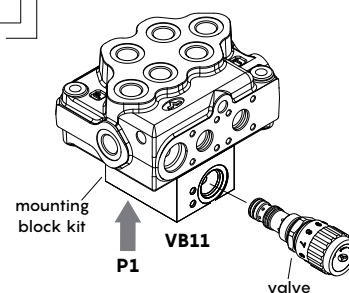
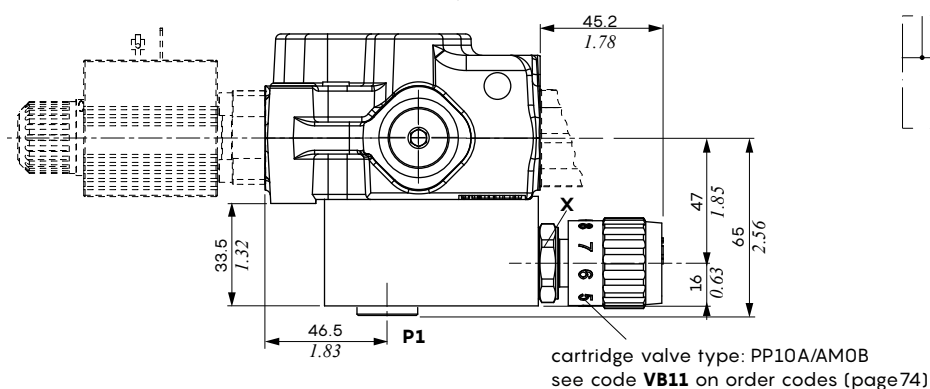
Valve type VB1

Block with pressure compensated 3-way flow regulator valve, to be flange mounted on body with tandem circuit. The flow is regulated on the first section while the exceeding flow is available for down stream sections. First and second working. When the first spool is not operated, all inlet flow is available for down stream sections (max. 45 l/min - 12 USgpm). The valve block is supplied fitted to the body. It needs a dedicated body with additional machining: for information please contact our Sales Dpt.

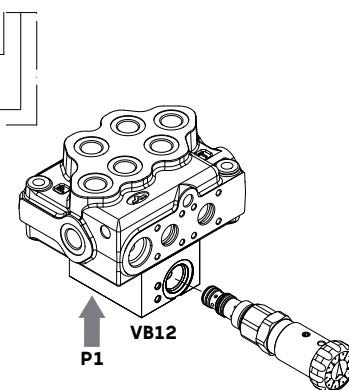
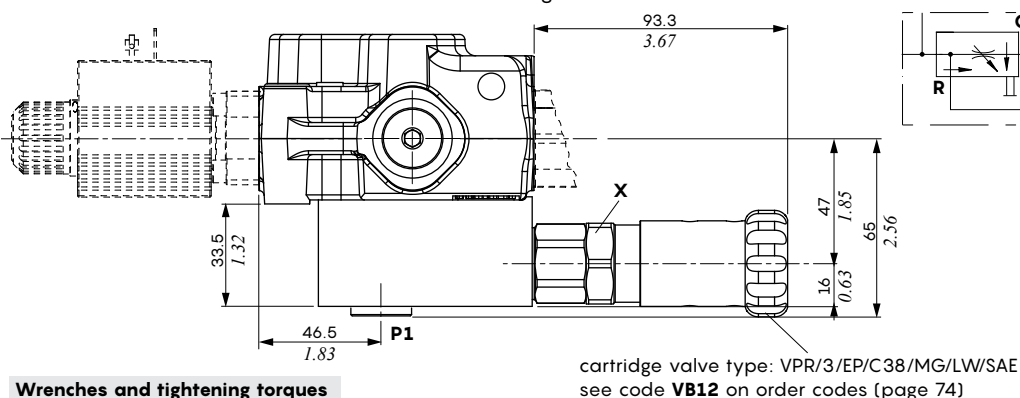
Description example: SD5/4-SP(JNG3-150)/28ES1/**VB16**/28ES3/28ES3/28ES3/18ES3/AET

- VB11** valve: continuous fine regulation
- VB12** valve: one turn with detent handknob regulated
- VB13** valve: electroproportional operated
- VB15** valve: screw regulation with blind nut

VB11 type
continuous fine regulation



VB12 type
one turn with detent handknob regulated



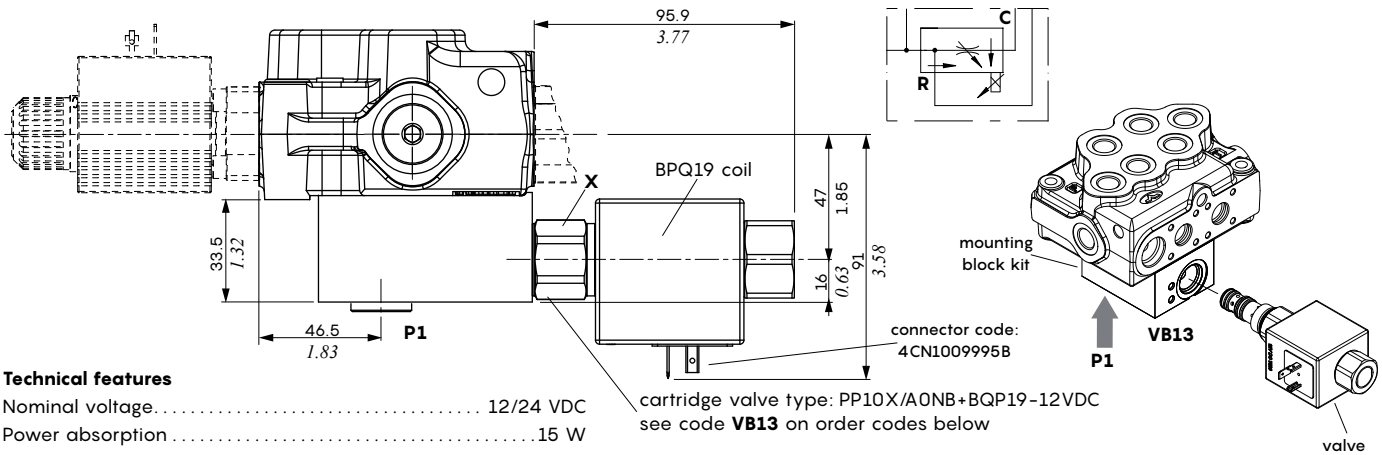
Wrenches and tightening torques

X= wrench 27-50 Nm (36.9 lbf)

Auxiliary valves

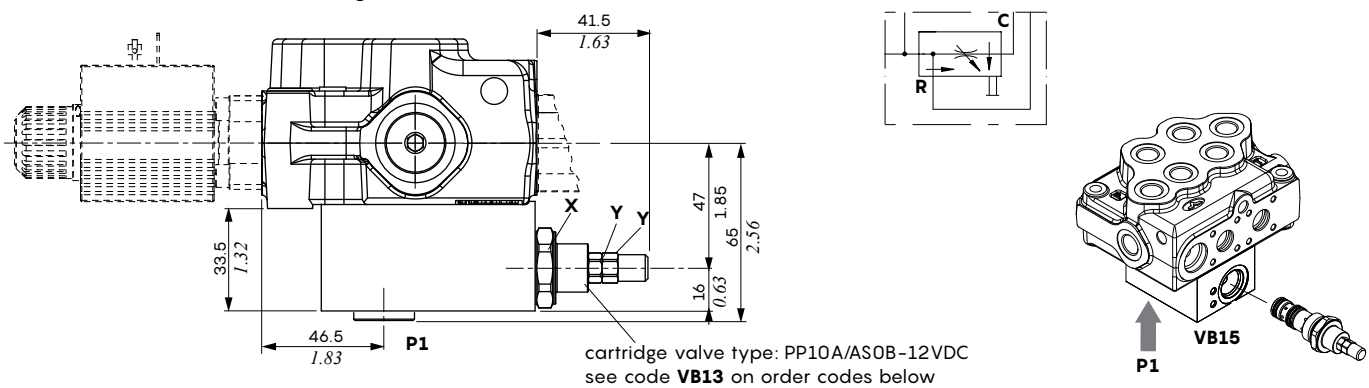
Flow control valves

Valve type VB1

VB13 type
 electroproportional operated
**Technical features**

Nominal voltage 12/24 VDC
 Power absorption 15 W
 Weather temperature from -40°C to 100°C
 (from -40°F to 212°F)

Note - For **BQP19** coils and connectors see page 116

VB15 type
 screw regulation with blind nut
**Wrenches and tightening torques**

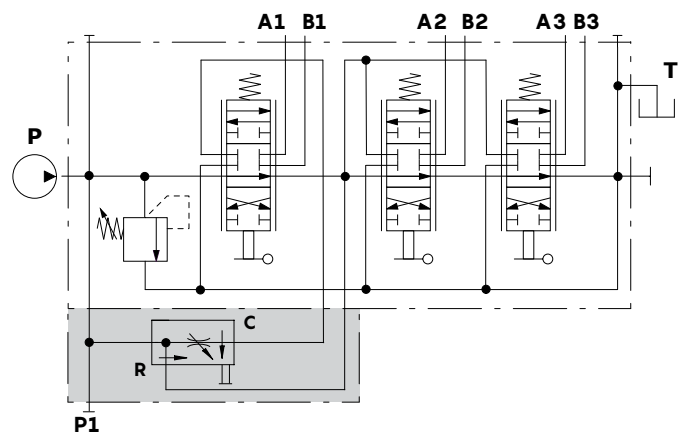
X= wrench 27-50 Nm (36.9 lbf)

Y= wrench 10-6.6 Nm (4.87 lbf)

Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VB1 type		
-	5CO63602206 (1)	Mounting block kit
VB1 valves		
VB11	OPP10002000	Fine regulation from 3 to 20 l/min (from 0.79 to 5.28 US gpm)
VB12	1636020211	One turn with detent (n. 10 notches)
VB13	OPP10002037	Electroproportional operated
VB15	OPP10002005	Screw regulation with blind nut
Coil (see page 116)		
BPQ19	4SL5000126A	Type BPQ19, 12VDC, conn. ISO4400

Note - (1) Codes are referred to **UN-UNF** threads

Hydraulic circuit with VB11 valve

Description example:

SD5/3-SP2(JNG120)/**VB11**/18L/18L/AET-SAE

Flow control valves

Valve type VD2

Block with pressure compensated 3-way flow regulator valve, to be flange only on the first section mounted on body with parallel circuit and cavity oriented toward cap side. The flow is regulated for working sections, while the exceeding flow goes to tank. The block body is prearranged with inlet port (P1). Using P1 it is possible to have regulated flow up to 28 l/min (7.4 USgpm); using standard port, the regulated flow is 20 l/min (5.28USgpm). The valve block is supplied fitted to the body. It needs a dedicated body with additional machining; for information please contact our Sales Dpt.

Description example: SD5/3-P(JNG3-150)/**VD25**/18ES3/18ES3/18ES3/AET

VD21 valve: PP10A/AM0B

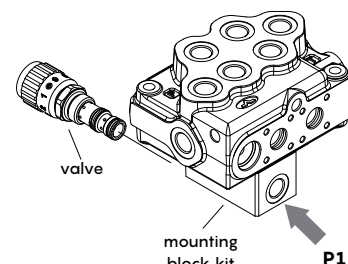
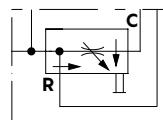
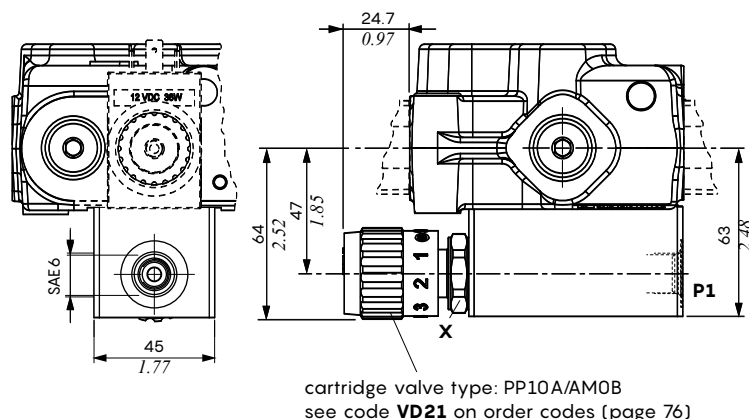
VD22 valve: VPR/3/EP/C38/MG/LW/SAE

VD23 valve: PP10X/A0NB+BQP19-12VDC

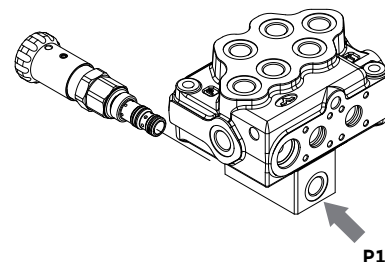
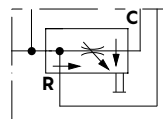
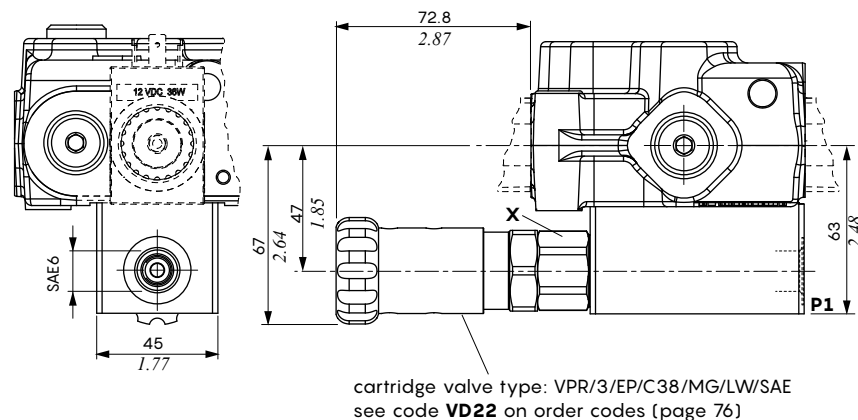
VD25 valve: PP10A/AS0B-12VDC

VD21 type

continuous fine regulation

**VD22 type**

one turn with detent handknob regulated

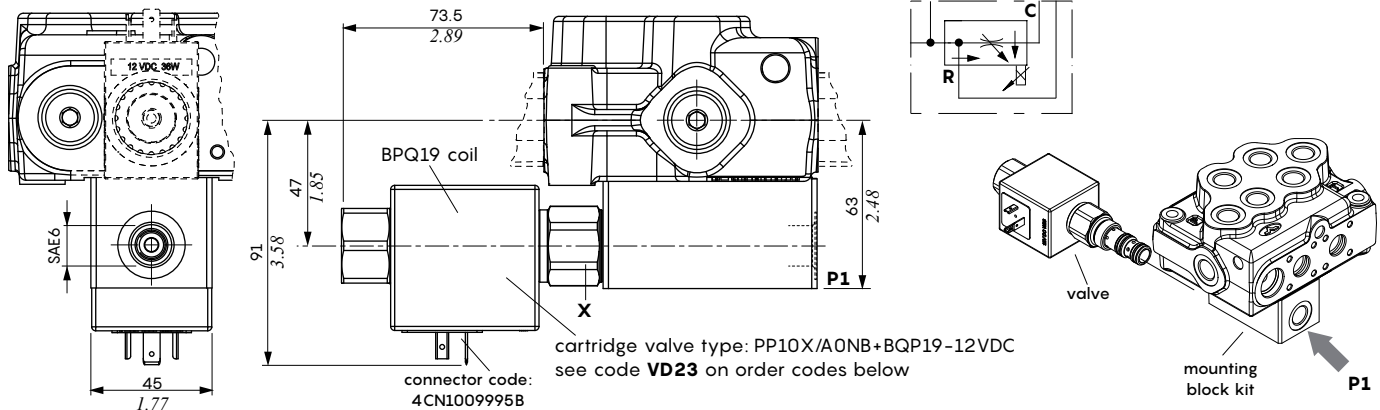
**Wrenches and tightening torques**

X = wrench 27-50 Nm (36.9 lbf)

Auxiliary valves

Flow control valves

Valve type VD2

VD23 type
 electroproportional operated


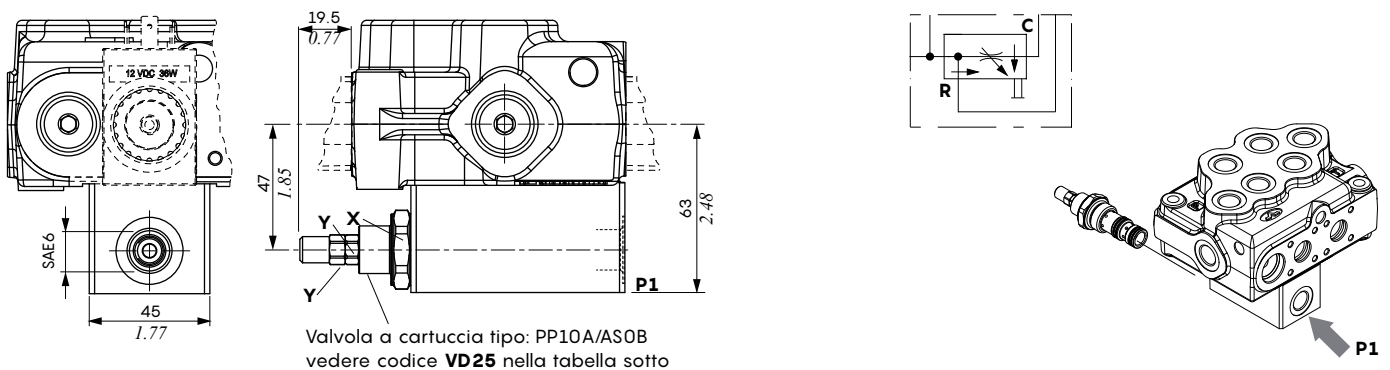
Technical features

Nominal voltage 12/24 VDC
 Power absorption 15 W
 Weather temperature from -40°C to 100°C
 (from -40°F to 212°F)

Note - For **BPQ19** coils and connectors see page 116

Wrenches and tightening torques

X= wrench 27-50 Nm (36.9 lbf)
 Y= wrench 10-6.6 Nm (4.87 lbf)

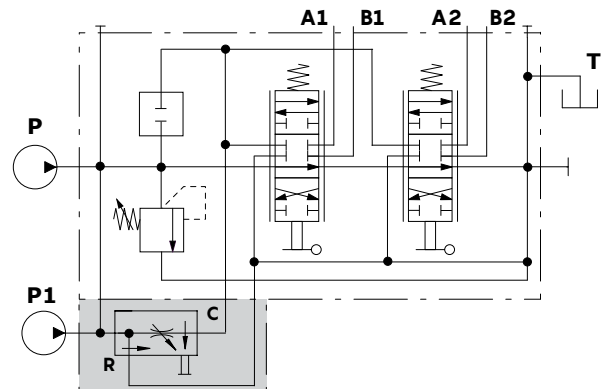
VD25 type
 screw regulation with blind nut


Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VD2 type		
-	5CO63602207 (1)	Mounting block kit
VD2 valves		
VD21	OPP10002000	Fine regulation from 3 to 20 l/min (from 0.79 to 5.28 US gpm)
VD22	1636020211	One turn with detent (n. 10 notches)
VD23	OPP10002037	Electroproportional operated
VD25	OPP10002005	Screw regulation with blind nut
Coil (see page 116)		
BPQ19	4SL5000126A	Tipo BPQ19, 12VDC, conn. ISO4400

Note - (1) Codes are referred to **BSP** threads

Hydraulic circuit with VD23 valve

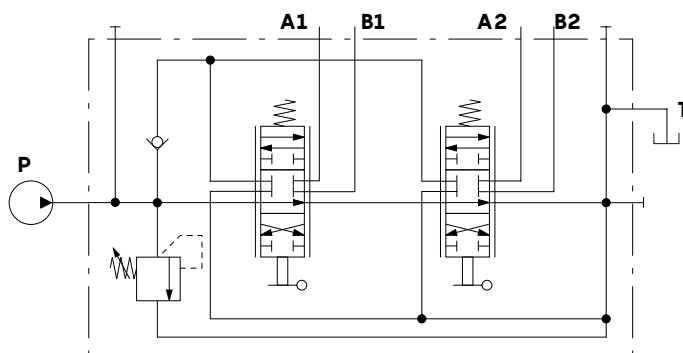
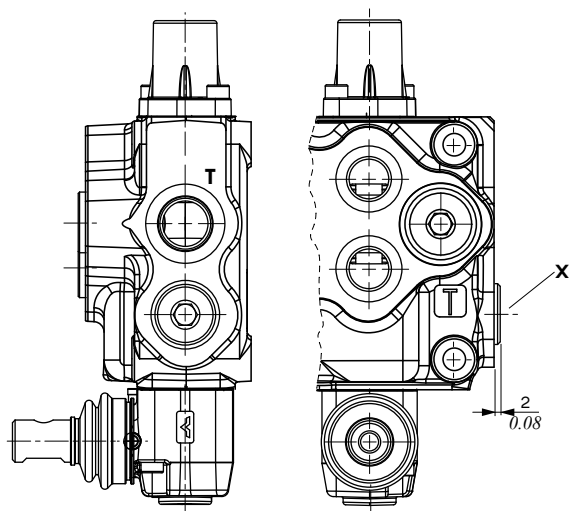


Description example:

SD5/2-P(JNG120)/**VD23**/18L/18L/AET-SAE

Outlet port options

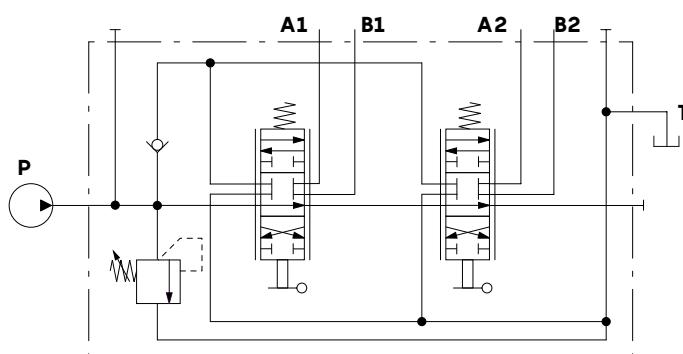
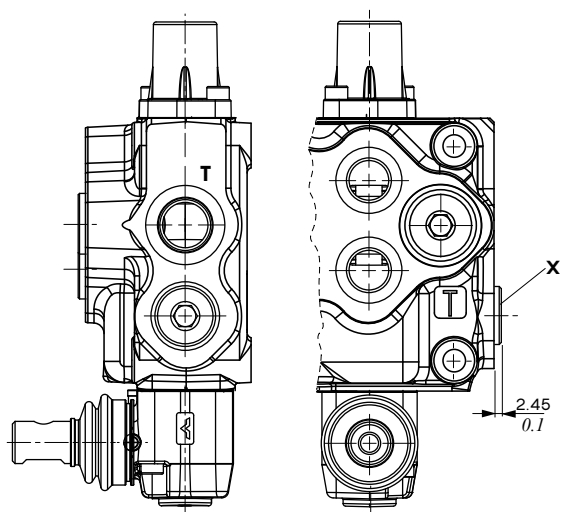
It's possible to have open center, closed center and carry-over. Are available unloader valves with special bodies: for information please contact our Sales Dpt.

AET: open center

Description example:
SD5/3-P(JG3-120)/18L/18L/AET-SAE
(see page 6 for other AET examples)

Wrenches and tightening torques

X= allen wrench 8-24 Nm (17.7 lbf)

AEK: closed center

Description example:
SD5/3-P(JG3-120)/18L/18L/AEK-SAE

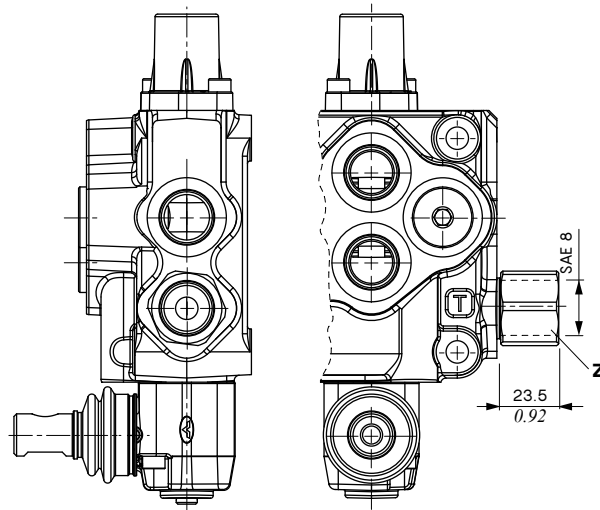
Wrenches and tightening torques

X= allen wrench 8-24 Nm (17.7 lbf)

Outlet port options

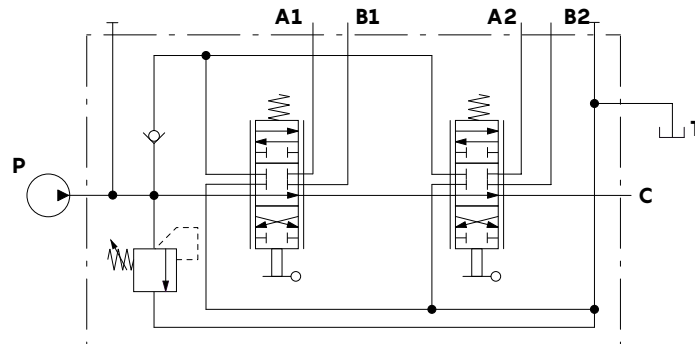
AE: with carry-over

AE-SAE8



Wrenches and tightening torques

Z = wrench 27–24 Nm (17.7 lbf)



Description example:

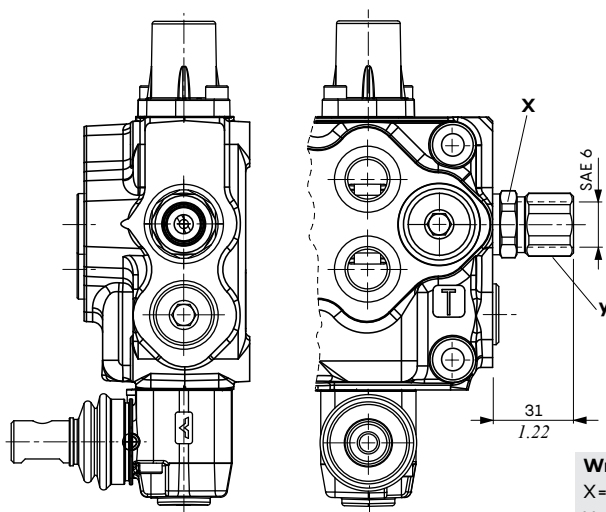
SD5/2-P(JNG3—120)/18L/18L/AE-SAE8

Unloader valves (with hydraulic pilot type L)

Dimensions

Type L configuration

Unloader valve with hydraulic pilot



Wrenches and tightening torques

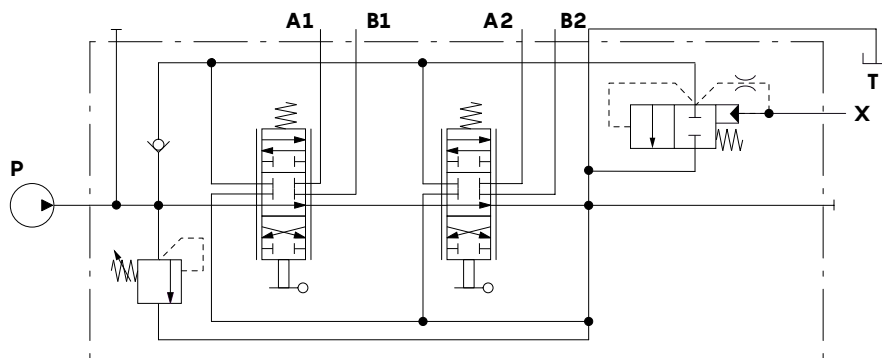
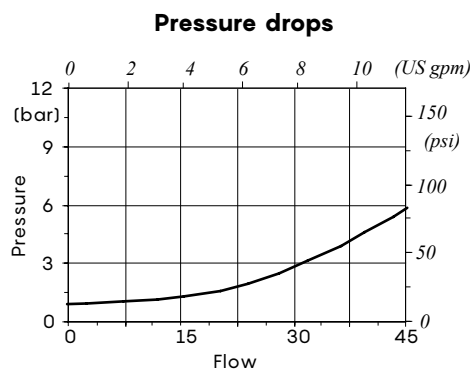
X = wrench 24–42 Nm (31 lbf)

Y = wrench 22–24 Nm (17.7 lbf)

Technical features

Internal leakage: from 4 to 18 cm³/min at 100 bar
 from 0.24 to 1.1 in³/min at 1450 psi

Performance data and hydraulic circuit



Description example:

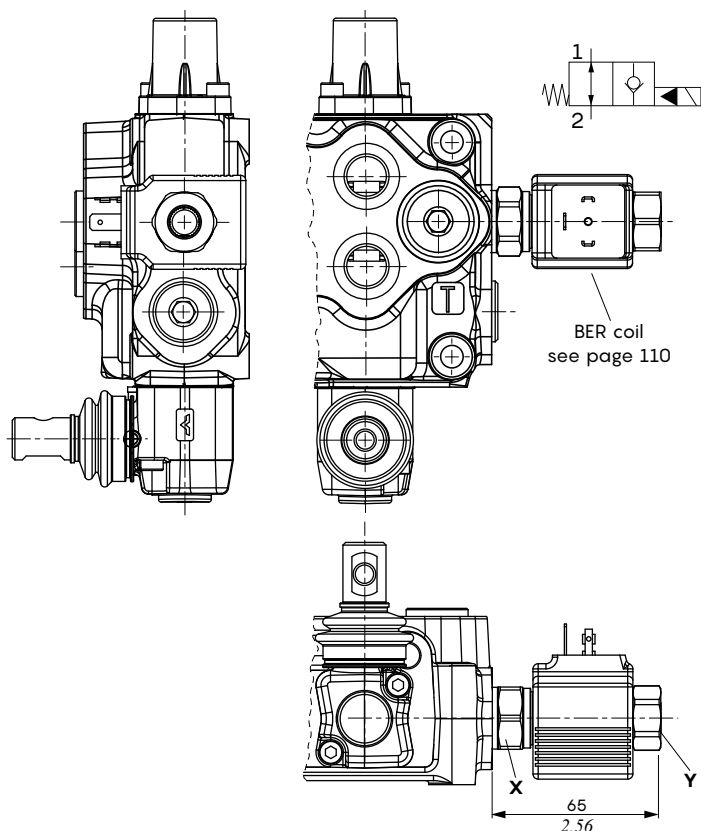
SD5/3-P(JNG3—120)/18L/18L/AET-L-SAE

Unloader valves

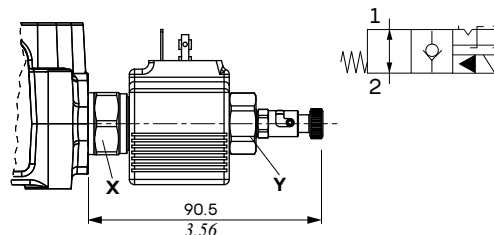
With solenoid pilot unloader valves

ELNW(NO)

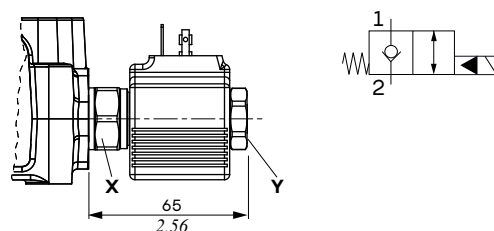
Without manual emergency, NO circuit

**ELTW (NO)**

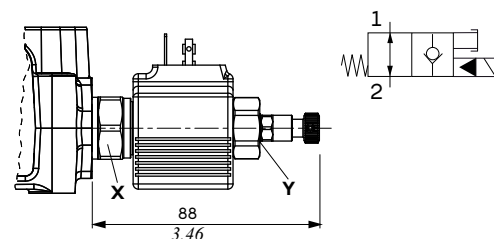
With "push&twist" manual emergency, NO circuit

**ELNW(NC)**

Without manual emergency, NC circuit

**ELPW (NO)**

With push-button manual emergency, NO circuit

**Technical features**

Max. flow: 45 l/min / 12 USgpm

Max. pressure: 315 bar / 4600psi

Internal leakage: max. 3 cm³/min at 100 bar
..... max. 4.6 in³/min at 1450 psi

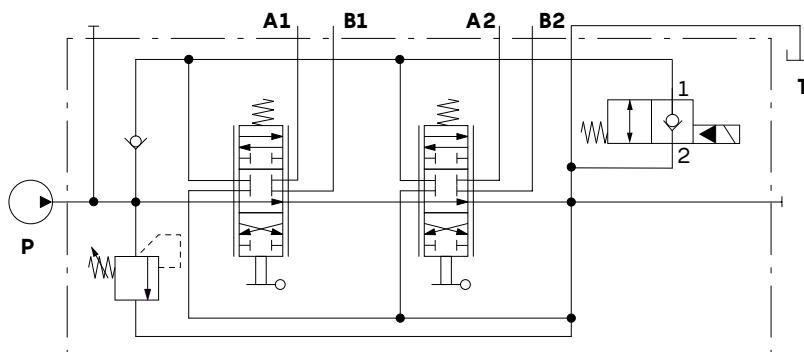
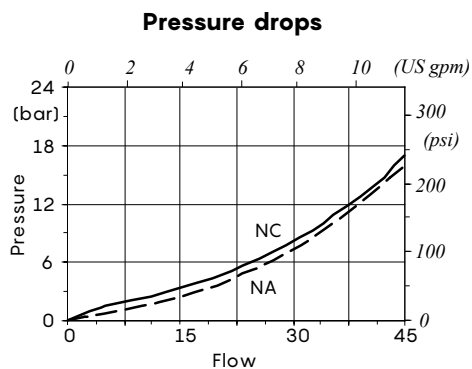
Nominal voltage: 12/24 VDC

Power absorption 19.2 W

Weather temperature from - 30°C to 50°C
(from - 22°F to 122°F)Note - For **BER** coils and connectors see page 114**Wrenches and tightening torques**

X= wrench 24-42 Nm (31 lbf)

Y= max. 6.6 Nm (4.9 lbf)



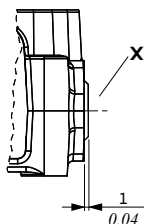
Description example:

SD5/3-P(JNG3-120)/18L/18L/AET-ELNW-SAE

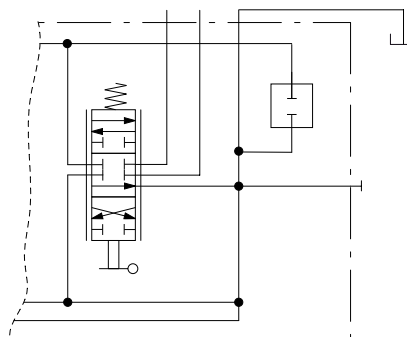
Unloader valves (valve blanking plug: AET-LT)

Dimensions and hydraulic circuit

LT
Valve blanking plug

**Wrenches and tightening torques**

X = Allen wrench 6–24 Nm (17.7 lbf)

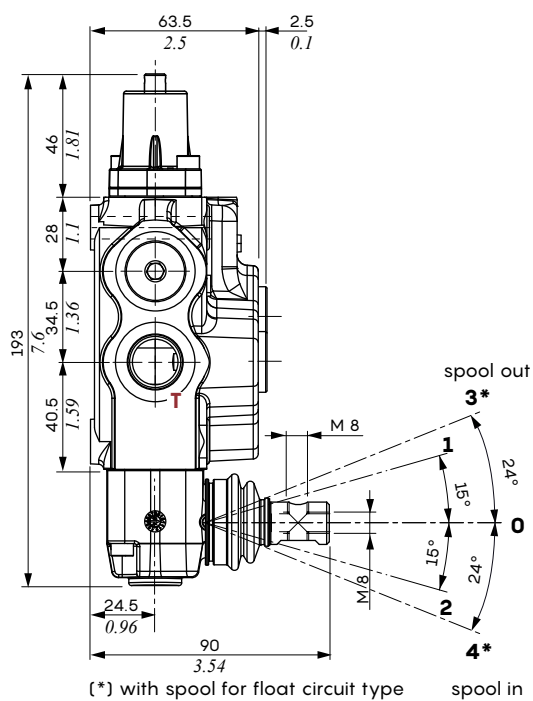
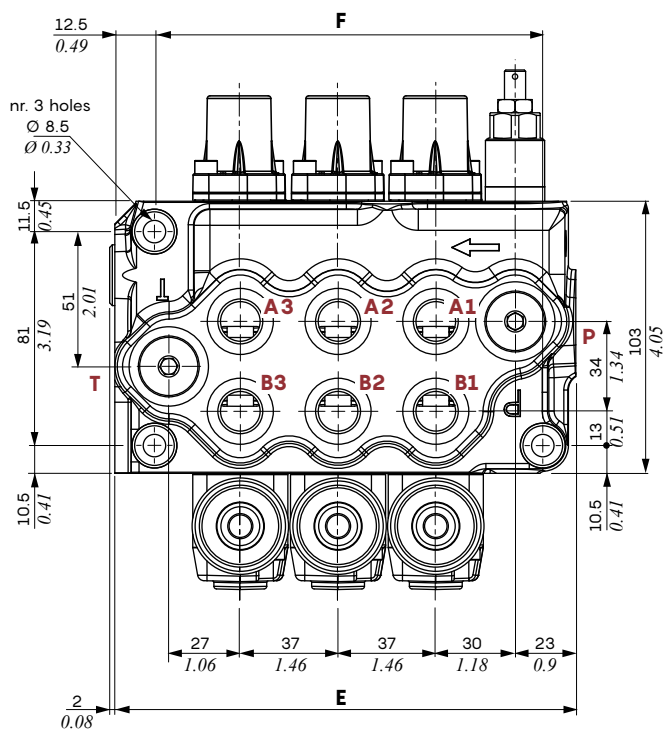


Description example:

SD5/3-P(JG3—120)/18L/18L/AET-LT-SAE

Parallel (SD5-P) and tandem (SD5-SP) circuit execution

Dimensional data



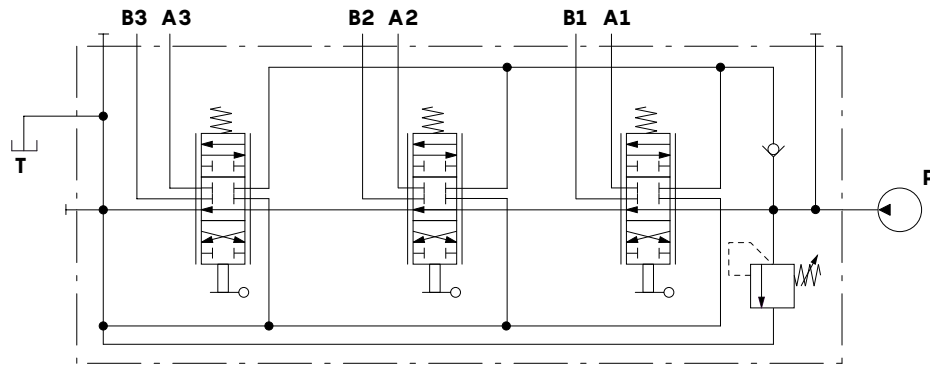
type circuit		E		F	
parallel	tandem	mm	in	mm	in
SD 5/1-P	-	100.5	3.96	73	2.87
SD 5/2-P	SD 5/2-SP	137.5	5.41	110	4.33
SD 5/3-P	SD 5/3-SP	174.5	6.87	147	5.79
SD 5/4-P	SD 5/4-SP	211.5	8.33	184	7.27
SD 5/5-P	SD 5/5-SP	248.5	9.78	221	8.7
SD 5/6-P	SD 5/6-SP	285.5	11.24	258	10.16
SD 5/7-P	SD 5/7-SP	322.5	12.7	295	11.61

Notes: Drawings and dimensions are referred to a UN-UNF threading configuration. For performances see page 7.

Parallel (SD5-P) and tandem (SD5-SP) circuit execution

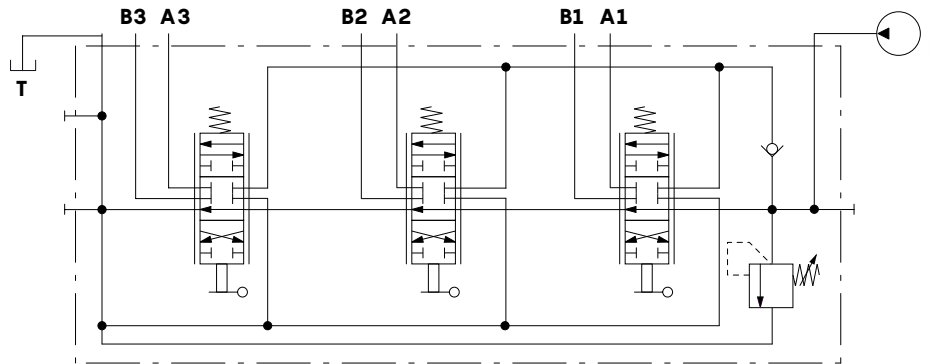
Hydraulic circuit

Parallel circuit execution (standard configuration)



Description example:
SD5/3-P(KG3—120)/ED-18L/ED-18L/ED-18L/AET-SAE

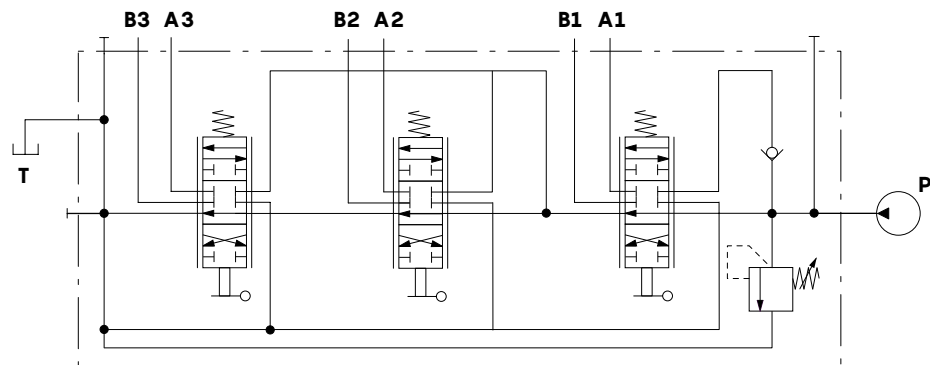
Parallel circuit execution (configuration with upper inlet and outlet)



Description example:
SD5/3-P(KG3—120)/ED-18L/ED-18L/ED-18L/AET-PSA-SAE

Tandem circuit execution

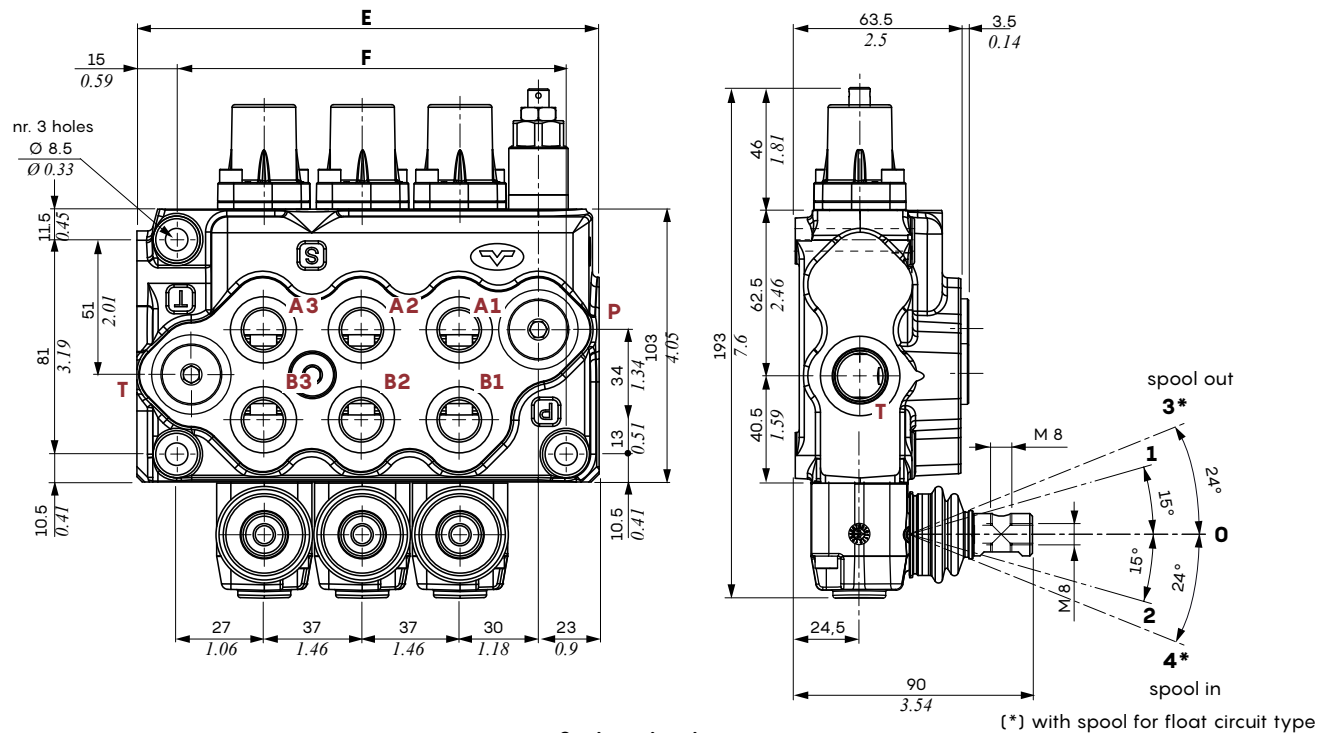
The description of SD5 valve with tandem circuit is marked with letters "SP" and one figure which indicate the downstream sections for tandem connection.



Description example:
SD5/3-SP2(KG3—120)/ED-18L/ED-18L/ED-18L/AET-SAE

Series (SD5-S) circuit execution

Dimensional data



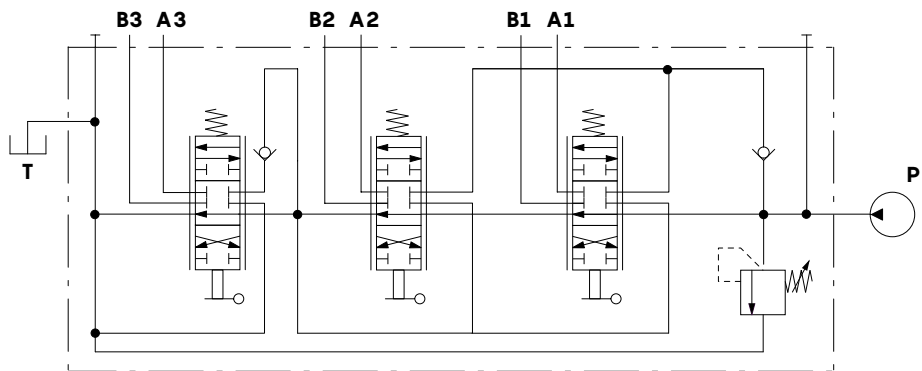
Series circuit

type	E		F	
	mm	in	mm	in
SD5/2-S	137.5	5.41	110	4.33
SD5/3-S	174.5	6.87	147	5.79
SD5/4-S	211.5	8.33	184	7.27
SD5/5-S	248.5	9.78	221	8.7
SD5/6-S	285.5	11.24	258	10.16
SD5/7-S	322.5	12.7	295	11.61

Notes: Drawings and dimensions are referred to a UN-UNF threading configuration. For performances see page 9.

Hydraulic circuit

The description of SD5 valve with series circuit is marked with letters "S" and one figure which indicate the downstream sections for tandem connection.



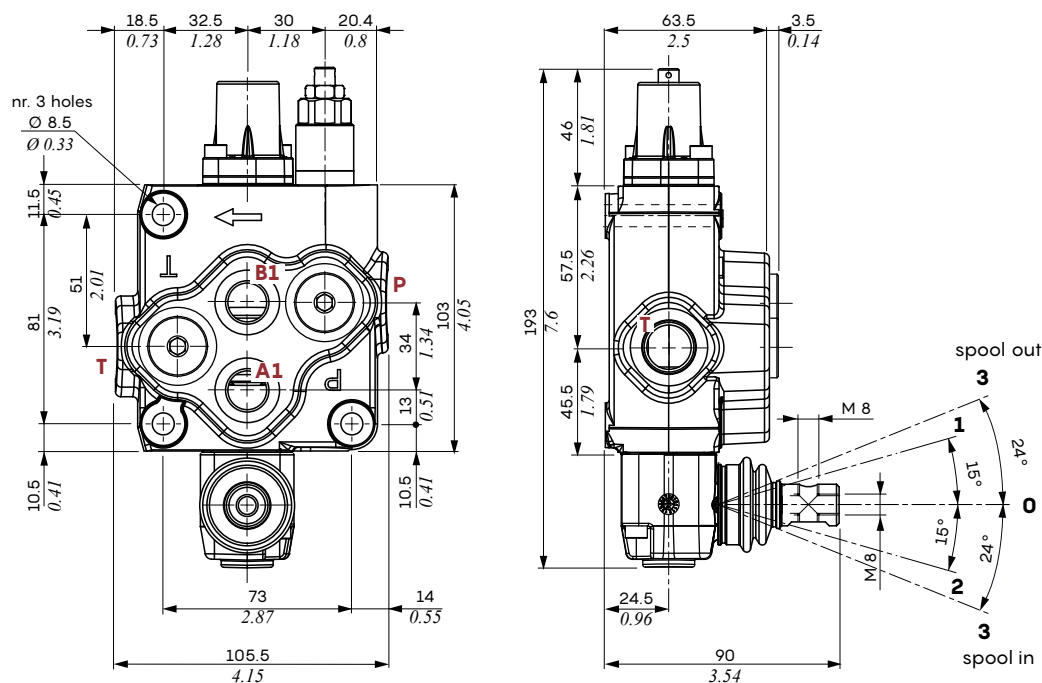
Description example:

SD5/3-S1(KG3-120)/ED-18L/ED-18L/ED-18L-SAE

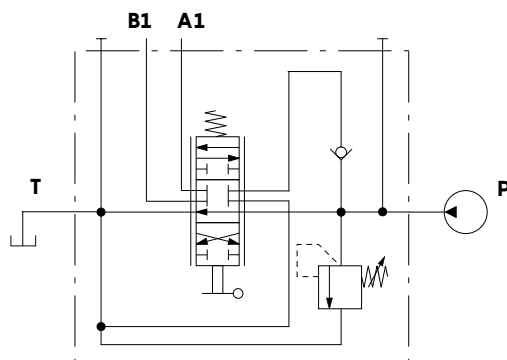
Single section monoblock valve (SD5/1-N)

Dimensional data

Execution with one working section. It can be used in hydraulic circuit where carry-over doesn't required. For controls, spool positioning and valves, refer to directional valve with parallel circuit.

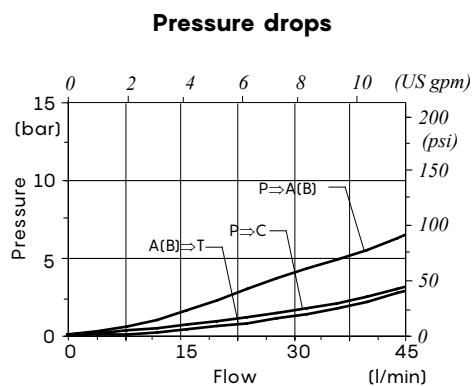


Hydraulic circuit



Description example:
SD5/1-N(KG3-120)/ED-18L-SAE

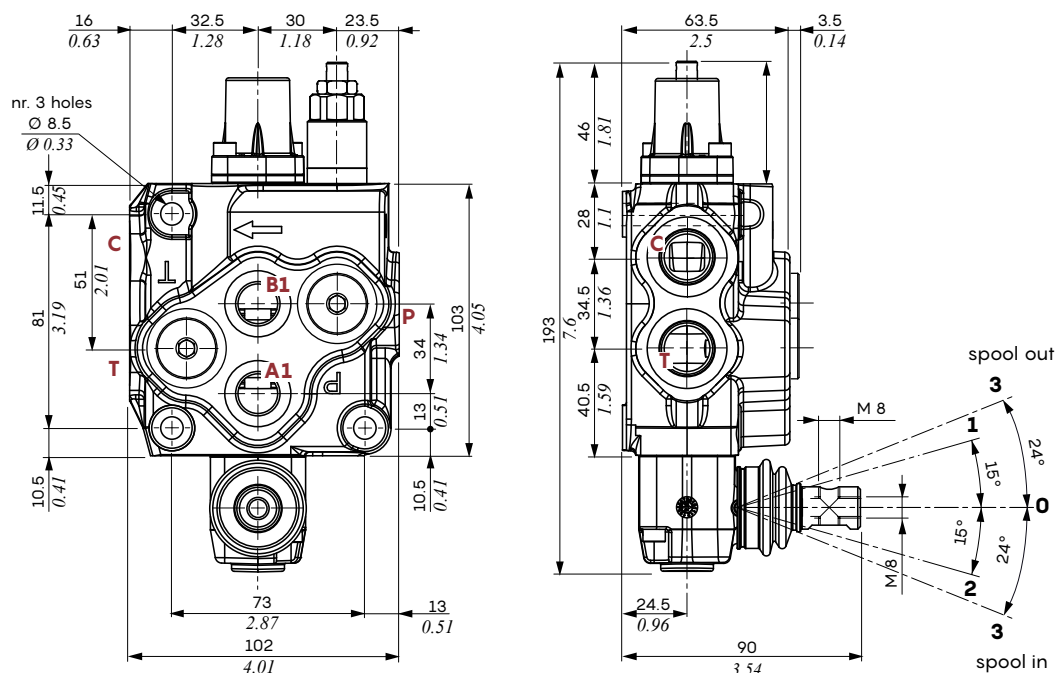
Performance



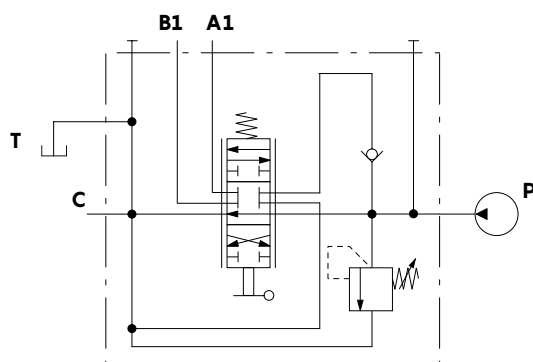
Single section monoblock valve (SD5/1-D)

Dimensional data

Execution with one working section. It can be used in hydraulic circuit where carry-over is required. For controls, spool positioning and valves, refer to directional valve with parallel circuit.

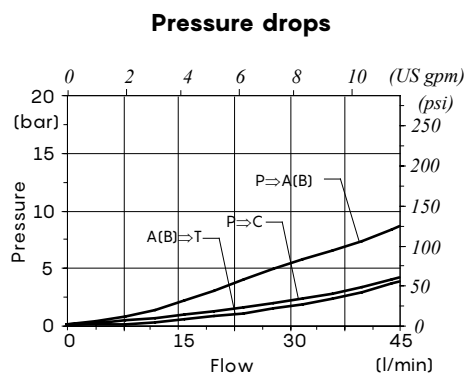


Hydraulic circuit



Description example:
SD5/1-D(KG3-120)/ED-18L-SAE

Performance

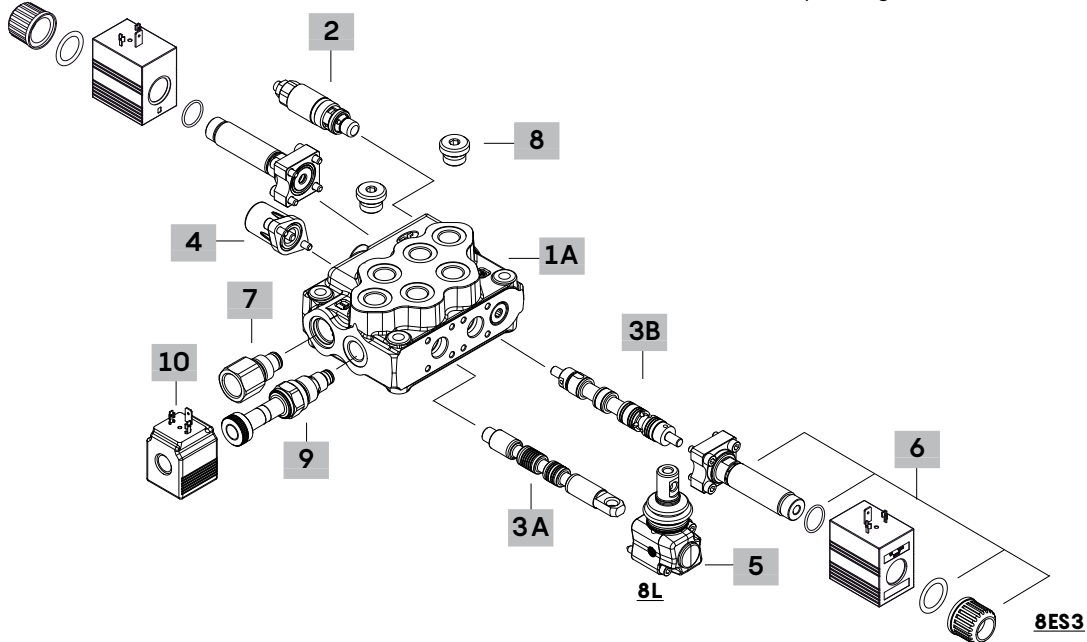


Ordering codes

nr. of sections Valve setting (bar) Ports thread

SD5/2-P (JNG3-120) / ED **1 8 L / ED** **1 8ES L / AET - SAE - <CVN>**

1A **2** right inlet **3A 4 5** **3B 6 5 7** **8** Optional painting *

**1A Body kit for parallel circuit execution ⁽¹⁾**Available body kit for mixed pilot controls ⁽²⁾

TYPE	CODE	DESCRIPTION
Mechanical controls		
SD5/1-P	5KC1197000	1 section
SD5/2-P	5KC1227000	2 sections
SD5/3-P	5KC1247000	3 sections
SD5/4-P	5KC1277000	4 sections
SD5/5-P	5KC1317000	5 sections
SD5/6-P	5KC1357000	6 sections
SD5/7-P	5KC13E7000	7 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/1-P-IM-ES	5KC1197100	1 section
SD5/2-P-IM-ES	5KC1227100	2 sections
SD5/3-P-IM-ES	5KC1247100	3 sections
SD5/4-P-IM-ES	5KC1277100	4 sections
SD5/5-P-IM-ES	5KC1317100	5 sections
SD5/6-P-IM-ES	5KC1357100	6 sections
SD5/7-P-IM-ES	5KC13E7100	7 sections

Mechanical controls**For proportional hydraulic and ON/OFF electric controls****1B Body kit for tandem circuit execution ⁽¹⁾**The letter "SP" and one figure indicate the downstream sections for tandem connection ⁽²⁾

TYPE	CODE	DESCRIPTION
For mechanical controls		
SD5/2-SP1	5KC1187000	2 sections
SD5/3-SP2	5KC1267000	3 sections
SD5/4-SP3	5KC1297000	4 sections
SD5/5-SP4	5KC1337000	5 sections
SD5/6-SP5	5KC1377000	6 sections
SD5/7-SP6	5KC13F7000	7 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/2-SP1-IM-ES	5KC1187000A	2 sections
SD5/3-SP2-IM-ES	5KC1267000A	3 sections

For mechanical controls**For proportional hydraulic and ON/OFF electric controls****1B Body kit for tandem circuit execution (continue) ⁽¹⁾**

TYPE	CODE	DESCRIPTION
For proportional hydraulic and ON/OFF electric controls (continue)		
SD5/4-SP3-IM-ES	5KC1297000A	4 sections
SD5/5-SP4-IM-ES	5KC1337000A	5 sections
SD5/6-SP5-IM-ES	5KC1377002A	6 sections
SD5/7-SP6-IM-ES	5KC13F7000A	7 sections

For proportional hydraulic and ON/OFF electric controls (continue)**1C Body kit for series circuit execution ^{(1) (3)}**The letter "S" and one figure indicate the downstream sections for series connection ⁽²⁾

TYPE	CODE	DESCRIPTION
For mechanical controls		
SD5/2-S1	5KC1157040	2 sections
SD5/3-S1	5KC1257000	3 sections
SD5/4-S1	5KC1287000	4 sections
SD5/5-S1	5KC1327003	5 sections
SD5/6-S1	5KC1367000	6 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/2-S1-IM-ES	5KC1157040A	2 sections
SD5/3-S1-IM-ES	5KC1257000A	3 sections
SD5/4-S1-IM-ES	5KC1287000A	4 sections
SD5/5-S1-IM-ES	5KC1327003A	5 sections
SD5/6-S1-IM-ES	5KC1367000A	6 sections

For mechanical controls**For proportional hydraulic and ON/OFF electric controls****1D Body kit for single section execution**

TYPE	CODE	DESCRIPTION
SD5/1-N	5KC1207040 ⁽¹⁾	Without "carry-over", for mechanical control
SD5/1-N-IM-ES	5KC1207140 ⁽¹⁾	As SD5/1-N for proportional hydraulic and ON/OFF controls
SD5/1-D	5KC1217000	As SD5/1-N with "carry-over"
SD5/1-D-IM-ES	5KC1217100	As SD5/1-N-IM-ES with "carry-over"

Notes - (1) Codes are referred to **BSP** threads - (2) Please contact our Sales Dpt for more information

(*) SD5 valve can be supplied with one coat of black paint (CVN configuration). For different colour please contact our Sales Dpt.

Ordering codes

2 Main pressure relief valves page 20

Standard setting is referred to 10 l/min (26 US gpm).

SV	XTAP623282	Tappo sostituzione valvola
TYPE	CODE	DESCRIPTION
VMD5 type K (directly controlled)		
(KG1-30)	5KIT105121	Range from 20 to 50 bar (from 290 to 725 psi), standard setting 30 bar (435 psi)
(KG2-80)	5KIT105122	Range from 40 to 100 bar (from 580 to 1450 psi), standard setting 80 bar (1160 psi)
(KG3-120)	5KIT105123	Range from 80 to 200 bar (from 1160 to 2900 psi), standard setting 120 bar (1740 psi)
(KG4-220)	5KIT105124	Range from 180 to 315 bar (from 2610 to 4570 psi), standard setting 220 bar (3190 psi)
VMD5 type J (Zero-leak directly controlled)		
(JNG1-20)	5KIT105500	Range from 10 to 40 bar (from 145 to 580 psi), standard setting 20 bar (290 psi)
(JNG2-60)	5KIT105512	Range from 40 to 60 bar (from 580 to 870 psi), standard setting 60 bar (870 psi)
(JNG3-120)	5KIT105513	Range from 50 to 190 bar (from 725 to 2755 psi), standard setting 120 bar (1740 psi)
(JNG4-250)	5KIT105514	Range from 160 to 315 bar (from 2320 to 4570 psi), standard setting 250 bar (3625 psi)

3A Spools for mechanical and hydraulic controls page 91

TYPE	CODE	DESCRIPTION
Double acting type, 3 positions		
ED-1	3CU1210730	A and B closed in neutral position
ED-1B	3CU1222700	B connect to tank in neutral position
ED-2	3CU1225730	A and B connect to tank in neutral position
Single acting type, 3 positions		
ED-3	3CU1231700	Single acting in A, it requires port plug on B and (CR) control kits
ED-4	3CU1235700	Single acting in B, it requires port plug on A
Float circuit type ⁽²⁾		
ED-5(14A)	3CU1242430	Double acting, floating in pos.3 (4 th pos.), spool in (lever to pull), pressure kick-out, it requires 14A control kit and additional body machining ⁽²⁾
Float circuit type ⁽²⁾		
ED-5PY	3CU1245700	Double acting, 4 positions, floating in pos. 3 (4 th pos.), spool out (lever to push), it requires 13QN/S4 control kit and additional body machining ⁽²⁾
Regenerative circuit type		
ED-8F	3CU1261700	Double acting, 3 positions, regenerative in position 1

3B Spools for ON/OFF direct solenoid control kit pag. 22

For ON/OFF direct solenoid control kit see pages 22-24 and please contact our Sales Dpt for more information.

TYPE	CODE	DESCRIPTION
ON/OFF direct solenoid control kit		
1ES	3CU1210011	Double acting, 3 positions, A and B closed in neutral position
1AES	3CU1221026	Double acting, 3 positions with A to tank in neutral position
2ES	3CU1225011	Double acting, 3 positions with A and B to tank in neutral position
2HES	3CU1225227	Double acting, 3 positions with A and B partially connect to tank in neutral position
3ES	3CU1231011	3 positions, single acting in A, it requires plug on B
ON/OFF direct solenoid control kit with lever		
1(ES3LHE)	3CU1210014	Double acting, 3 positions, A and B closed in neutral position
2(ES3LHE)	3CU1225013	Double acting, 3 positions with A and B to tank in neutral position
3(ES3LHE)	3CU1231036	3 positions, single acting in A, it requires plug on B

4 A side controls pag. 93

TYPE	CODE	DESCRIPTION
7	5V07104000	Free control
3 positions, spring return		
8	5V08104000	Spring return in neutral position
8WPO	5V08104001	Water proof type
8F2	5V08104101	Spool stroke limiter in B
8D	5V08104200	M6 female threaded pin extension
8D2	5V08104220	M8 male threaded pin extension
17	5V17104000	Spring return in position 1
17ME	5V17304000	As previous, spring type E
18ME	5V18404100	Spring return in position 2
3 positions, with detent		
9	5V09104010	Detent in position 1
9C	5V09204001	As previous, rigid spring type D
9BZ	5V09204010	As type 9, zama execution
10	5V10104010	Detent in position 2
10C	5V09204001	As previous, rigid spring type D
10BZ	5V10204010	As type 10, zama execution
11	5V11104000	Detent in all positions
11WPO	5V11104005	As previous water proof type
11B	5V11204000	Detent in positions 1 and 2
11BZ	5V11204010	As type 11, zama execution
11BZD	5V11204200	As previous with M6 female threaded pin extension
12	5V12104000	Detent in positions 1 and 2
21	5V21104003	Spring return in position 1, detent in position 2
2 positions, spring return		
17A	5V17104050	Positions 1-0, spring return in position 1
18BME	5V18404000	Positions 2-0, spring return in position 2
19	5V19104000	Positions 1-0, spring return in position 0
20	5V19104000	Positions 2-0, spring return in position 0

Notes - (1) Codes are referred to **UN-UNF** threads - (2) Please contact our Sales Dpt for more information

Ordering codes

4 A side controls (continue) page 93

TYPE	CODE	DESCRIPTION
2 positions, with detent		
15	5V15104000	Positions 1-0, detent in both positions
15WPO	5V15104001	As type 15, water proof type
16	5V16104000	Positions 2-0, detent in both positions
Spool control with microswitch		
11BMG3(NC)	5V11204601	As type 11B with microswitch in positions 1 and 2
8MG1(NO)	5V08104670	As type 8 with microswitch in position 1, NO contact
8MG2(NO)	5V08104680	As type 8 with microswitch in position 2, NO contact
8MG3(NO)	5V08104660	As type 8 with microswitch in positions 1 and 2, NO contact
Pneumatic controls		
8P-NPT	5V08104701	ON/OFF type with spring return in neutral position
8PNB-NPT	5V08104718	As previous, waterproof
Electrohydraulic controls		
Manifold kit and backpressure valve are required, see page 100		
8ED3	5V08104350	Type ON/OFF, spring return in neutral position 12VDC
	5V08104351	As previous, 24VDC
For complete available coil list and connectors see page 116		
4th position float kit (spool in)		
13QN/S4	5V13404020	With detent in position 3, it requires spool ED-5PY
14A	5V14505000	Detent in positions 1,2 and 3, kick-out to neutral, it requires spool ED-5(14A)
Short stroke (CR) spool control kits for spool type ED-3		
8CR	5V08104022	3 positions, spring return in neutral position
8CRWPO	5V08104023	As type 8CR, waterproof
9BCR	5V09204022	3 positions, detent in position 1 and spring return in neutral position, Zama execution
10BCR	5V09204022	3 positions, detent in position 2 and spring return in neutral position, Zama execution
11CR	5V11105023	Detent in 3 positions
11CRWPO	5V11104023	As type 11CR, waterproof
11BCR	5V11204022	As type 11, Zama execution

5 B side controls

TYPE	CODE	DESCRIPTION
L	5LEV105000	Standard lever kit

For other controls see page 16 and please contact our Sales Dpt for more information.

6 Complete controls page 59

For complete controls see pages 59-61 and please contact our Sales Dpt for more information.

TYPE	CODE	DESCRIPTION
Proportional hydraulic pilot control kit⁽¹⁾		
8IM	5IDR205071	Pilot control kit
13IM	5IDR205730	Pilot control kit for floating circuit

ON/OFF direct solenoid control kits

8ES3	5CAN08025	Double acting
8ES1	5CAN08024	Single acting in A
8ES2	5CAN08024	Single acting in B
8ES3LHE	5CAN08092	Double acting with manual override for emergency only

7 Outlet port option page 104

TYPE	CODE	DESCRIPTION
AE-SAE8	3XGIU527470 ⁽¹⁾	G3/8 carry-over sleeve
AEK	3XTAP522282	Closed center plug
AET	XTAP623170	Open center plug

8 Port plugs

Omitted if it is BSP thread. For description with side or upper inlet and outlet (**PSA**) configuration see page 84.

CODE	DESCRIPTION
3XTAP722160 ⁽¹⁾	G3/8 plug
3XTAP727180 ⁽¹⁾	G1/2 plug

9 Unloader valves page 79

For dimensions, hydraulic circuit and performance data see page 80.

TYPE	CODE	DESCRIPTION
L	XCAR405300	With hydraulic pilot unloader valve
ELNW(NO)	0EFW0132002	Solenoid valve without manual emergency, NO circuit
ELTW(NO)	0EFW0132000	Solenoid valve with "push&twist" manual emergency, NO circuit
ELPW(NO)	0EFW0132001	Solenoid valve with push-button manual emergency, NO circuit
ELNW(NC)	0EFW0132003	Solenoid valve without manual emergency, NC circuit
AET-LT	XTAP523370	Valve blanking plug

10 Coils page 116

For a complete list of available coils and connectors see page 116.

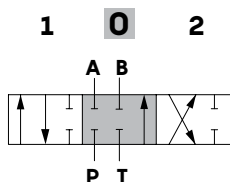
TYPE	CODE	DESCRIPTION
12VDC-BER	4SLE001200A	Type BER, 12VDC, ISO4400 connector, for unloader valve
12VDC-D12	4SOL412012	Type D12, 12VDC, ISO4400 connector, for ON/OFF direct solenoid control kits
12VDC-BT	4SL3000120	Type BT, 12VDC, ISO4400 connector, for electrohydraulic ON/OFF spool control kit

Notes - (1) Codes are referred to **UN-UNF** threads

Double acting

Spool type ED-1

3 positions, A and B closed in neutral position

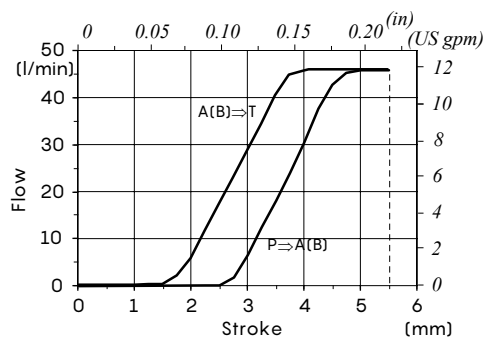


Stroke

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

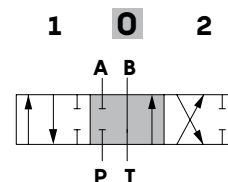
Spool metering type 1-ED

$P \Rightarrow A(B) / A(B) \Rightarrow T$
 $Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (1450 \text{ psi})$



Spool types ED-1B

3 positions, with B connect to tank in neutral position

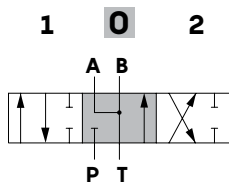


Stroke

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool type ED-2

3 positions, with A and B connect to tank in neutral position

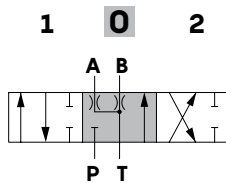


Stroke

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spool type ED-2H

3 positions, with A and B partially connect to tank in neutral position



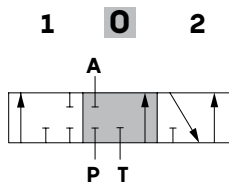
Stroke

position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Single acting

Spool type ED-3

3 positions, single acting in A

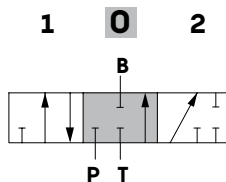


Stroke

position 1: + 4 mm (+0.157 in)
position 2: - 4 mm (-0.157 in)

Spool type ED-4

3 positions, single acting in B



Stroke

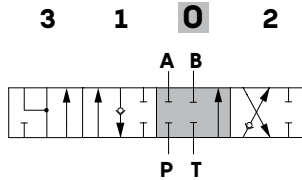
position 1: + 5.5 mm (+0.216 in)
position 2: - 5.5 mm (-0.216 in)

Spools

Double acting for float circuit type

Spool type ED-5PY

4 positions, floating in position 3
(4th position), spool out, with check
valve on B

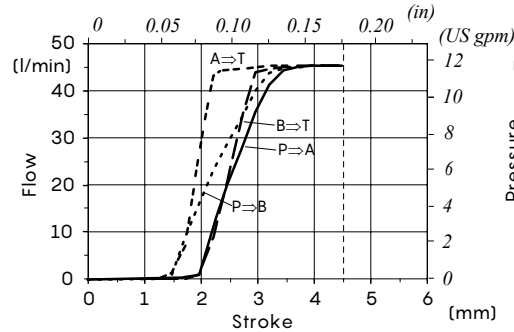
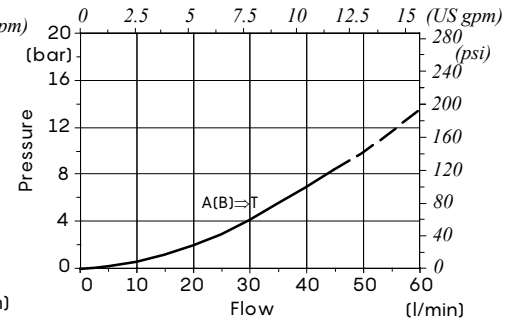


Stroke

position 1: + 4.5 mm (+0.177 in)
position 2: - 4.5 mm (-0.177 in)
position 3: + 9 mm (+0.354 in)

Spool metering type 5PY

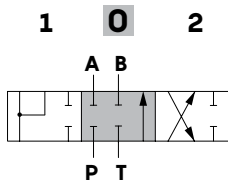
$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$

Pressure drop in position 3
(last section)

Regenerative circuit type

Spool type ED-8F

3 positions, regenerative in position 1

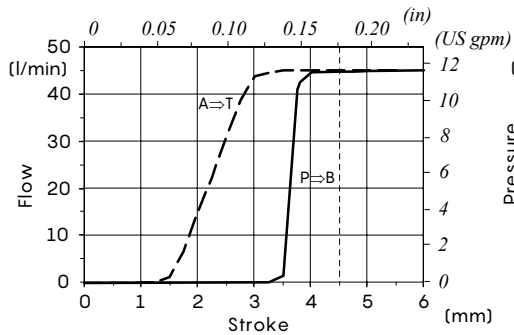


Stroke

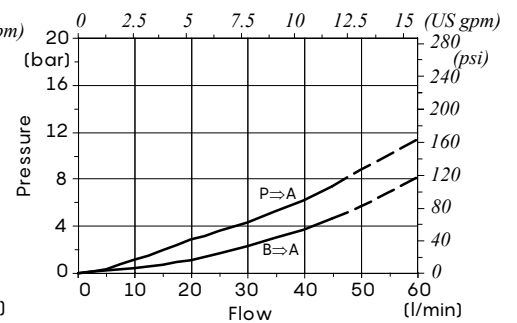
position 1: + 5.5 (+0.216 in)
position 2: - 5.5 (-0.216 in)

Spool metering type 8F

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$
 $P_{(on ports)} = 100 \text{ bar} / (145 \text{ psi})$

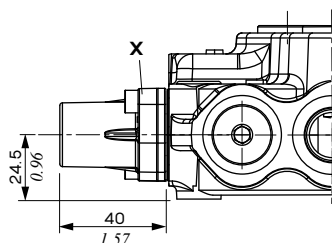
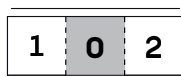


Pressure drop in position 1



Free control

Type 7



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

3 positions, spring return in neutral position

control kit	Ordering code with		
	C type spring	D type spring	E type spring
8	5V08204000	5V08104000	5V08404000
8WPO	/	5V08104001	/

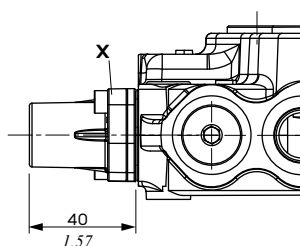
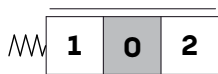
Note: bold code represent standard version

Type 8

(standard D spring)

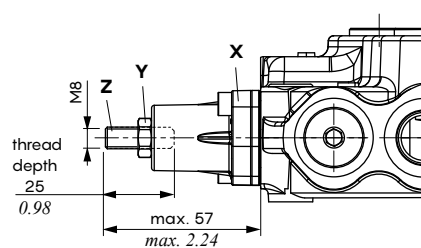
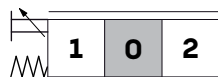
Type 8WPO

Water proof type



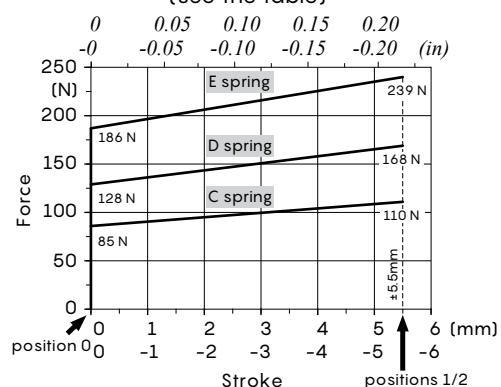
Type 8F2

Spool stroke limiter on port B



Force-Stroke diagram

(see the table)



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Y= wrench 13-24 Nm (17.7 lbf)

Z= allen wrench 4

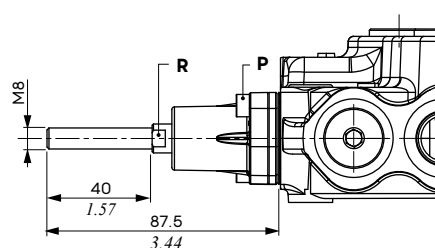
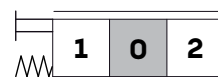
S= allen wrench 9-9.8 Nm (7.2 lbf)

R= wrench 9 - 10 Nm (7.4 lbf)

P= allen wrench 4-7.5 Nm (5.5 lbf)

Type 8D2

As type 8, M8 male threaded pin extension

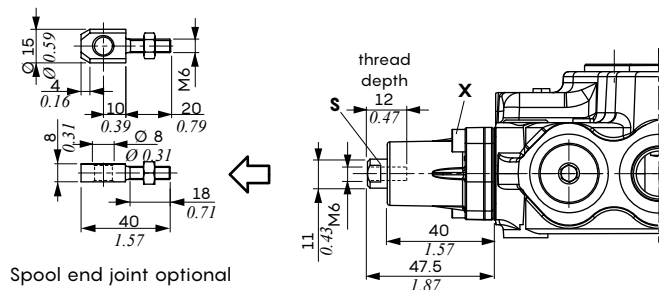
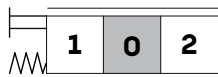


A side controls

3 positions, spring return in neutral position

Type 8D

As type 8, M6 female threaded pin extension



Spool end joint optional
dimensions
code: XPER315400

Wrenches and tightening torques

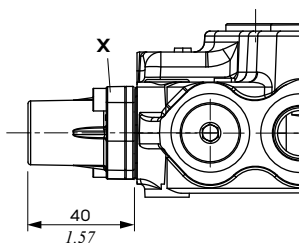
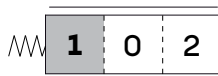
X= allen wrench 4-6.6 Nm (4.9 lbf)

S= wrench 9-9.8 Nm (7.2 lbf)

3 positions, spring return to position 1 or 2

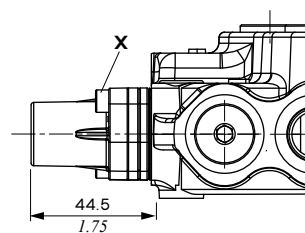
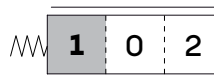
Type 17

Spring return in position 1



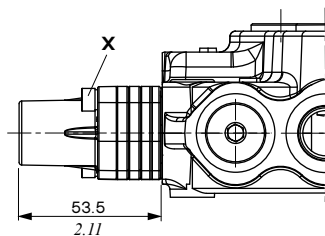
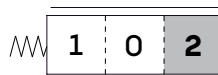
Type 17ME

Spring return in position 1, spring type E



Type 18ME

Spring return in position 2, spring type E



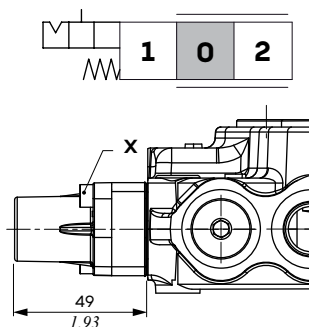
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

3 positions, with detent, spring return in neutral position

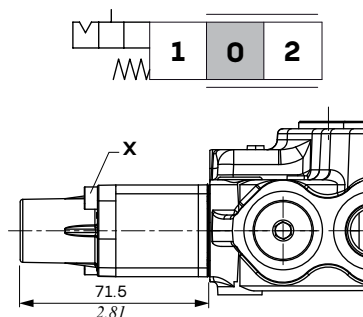
Type 9

Detent in position 1



Type 9C

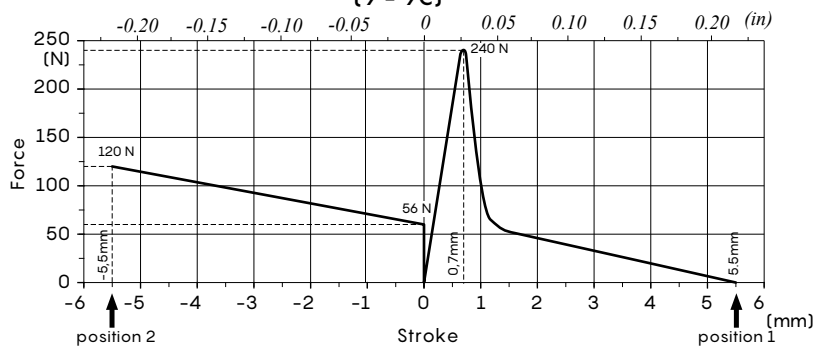
Detent in position 1 with rigid spring type D



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

S= allen wrench 8-9.8 Nm (7.2 lbf)

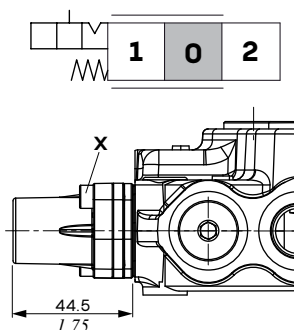
Force-Stroke diagram
(9 - 9C)

Technical features

Locking force (from 0 to 1) . . . 240 N $\pm$ 30 N / 53.9 lbf $\pm$ 6.7 lbfRelease force (from 1 to 0) . . . 150 N $\pm$ 20 N / 33.7 lbf $\pm$ 4.5 lbf

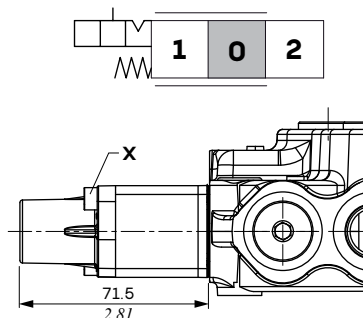
Type 10

Detent in position 2



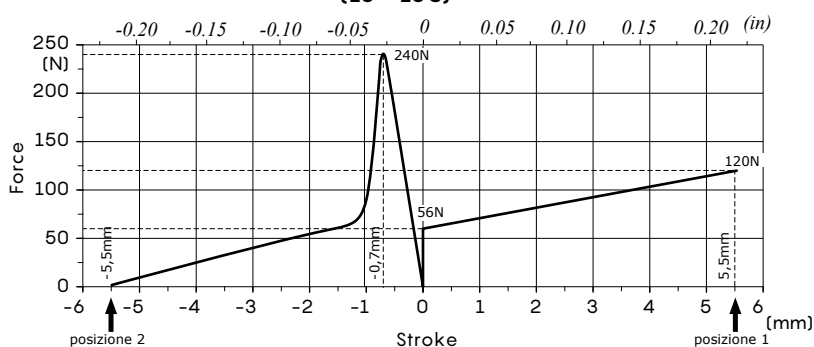
Type 10C

Detent in position 2, rigid spring type D



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Force-Stroke diagram
(10 - 10C)

Technical features

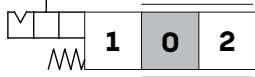
Locking force (from 0 to 2) . . . 240 N $\pm$ 30 N / 53.9 lbf $\pm$ 6.7 lbfRelease force (from 2 to 0) . . . 150 N $\pm$ 20 N / 33.7 lbf $\pm$ 4.5 lbf

A side controls

3 positions, with detent, spring return in neutral position

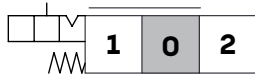
Type 9BZ

Detent in position 1



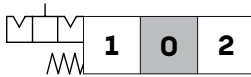
Type 10BZ

Detent in position 2



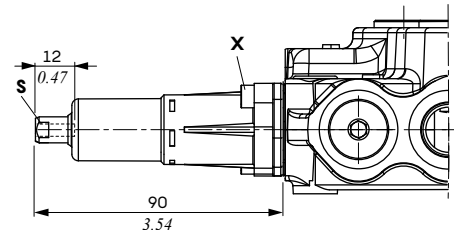
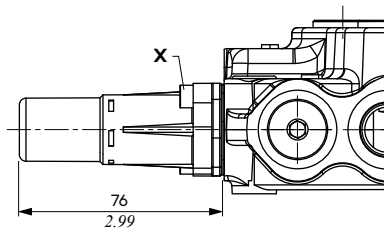
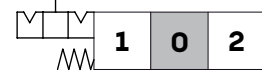
Type 11BZ

Detent in position 1 and 2



Type 11BZD

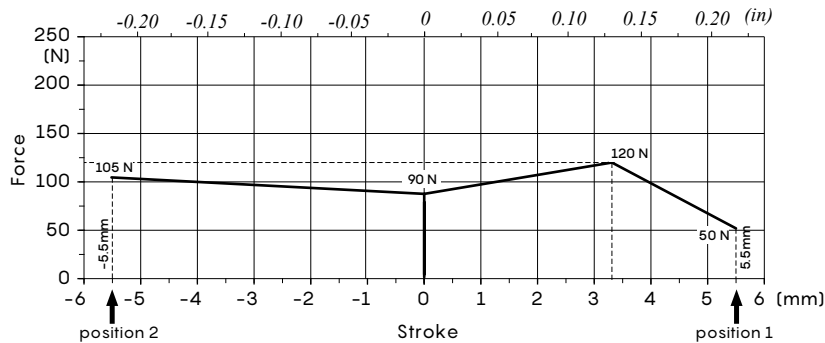
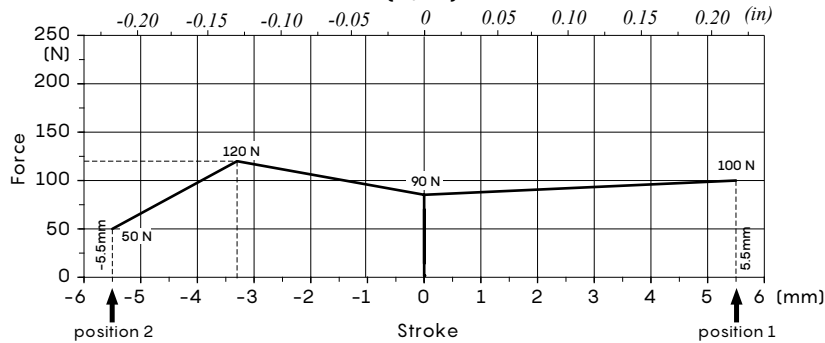
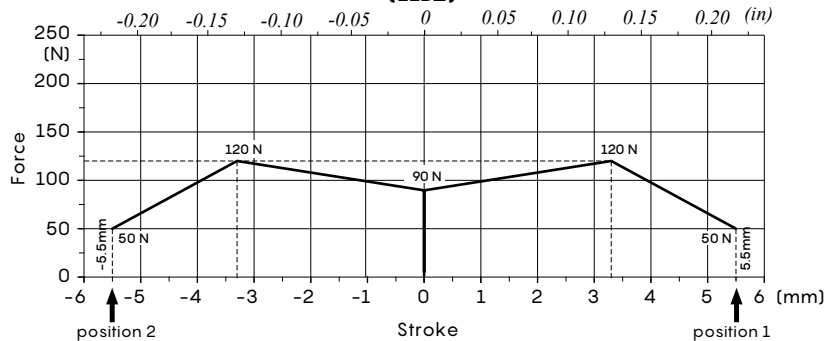
As 11BZ, M6 female threaded pin extension



Wrenches and tightening torques

X = allen wrench 4-6.6 Nm (4.9 lbf)

S = wrench 8-9.8 Nm (7.2 lbf)

Force-Stroke diagram
(9BZ)Force-Stroke diagram
(10BZ)Force-Stroke diagram
(11BZ)

Technical features

Locking force.: 120 N / 27 lbf

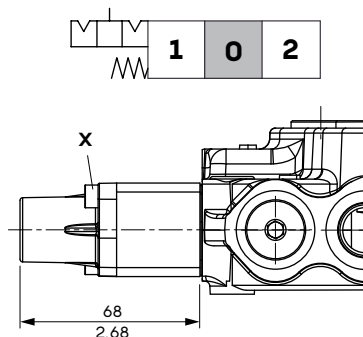
Release force.: 230 N / 51.7 lbf

A side controls

3 positions, with detent, spring return in neutral position

Tipo 11B

Aggancio nelle posizioni 1 e 2

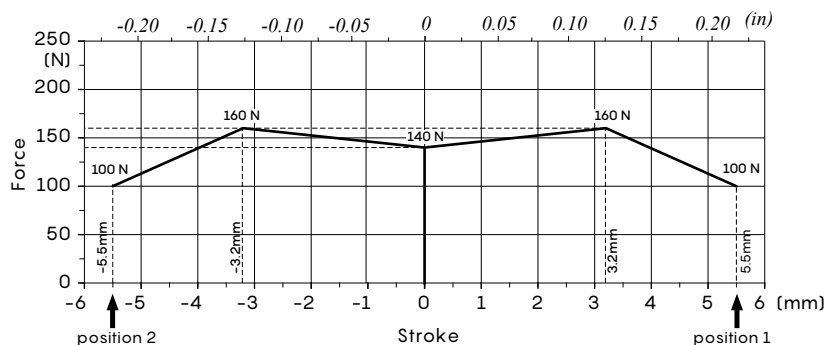


Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Technical features

Locking and release force: 120 N / 27 lbf

Force-Stroke diagram
(11B)

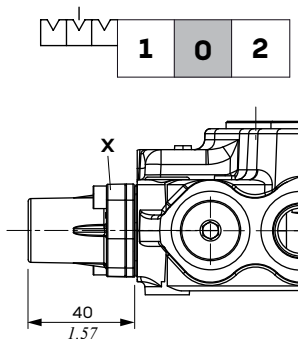
3 positions, with detent

Type 11

Detent in all positions

Type 11WPO

As type 11, water proof type

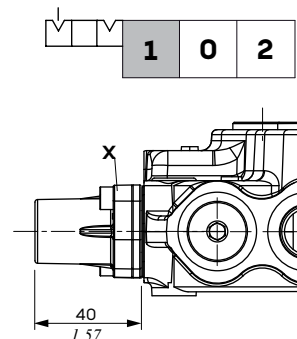


Technical features

Locking and release force: 120 N / 27 lbf

Type 12

Detent in positions 1 and 2

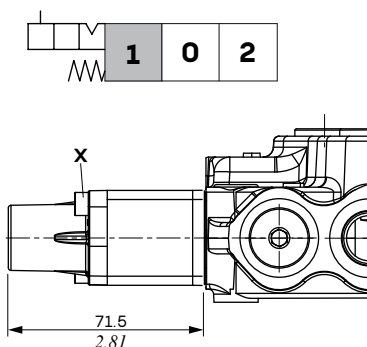


Operating features

Locking and release force: 100 N / 22.5 lbf

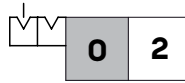
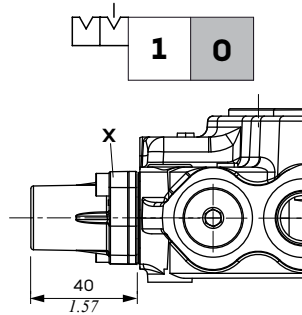
Type 21

Detent in position 2 and spring return in position 1



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

A side controls**2 positions, with detent****Type 15**Positions 1-0, detent
in both positions**Type 15WPO**As type 15,
water proof type**Type 16**Positions 2-0, detent
in both positions**Type 16WPO**As type 16,
water proof type**Wrenches and tightening torques**

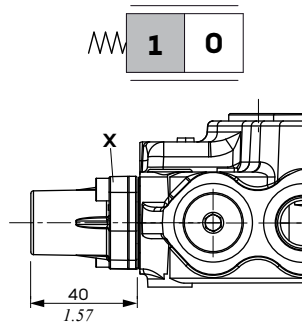
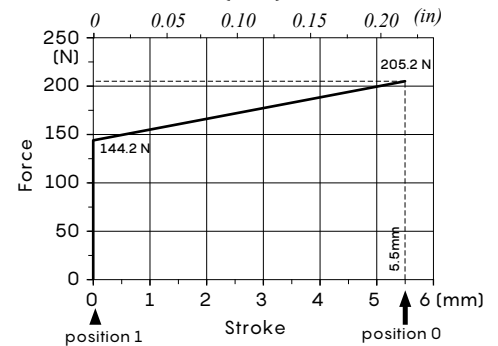
X= allen wrench 4-6.6 Nm (4.9 lbf)

Technical features

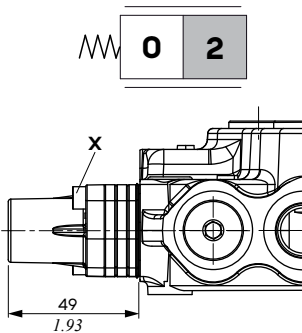
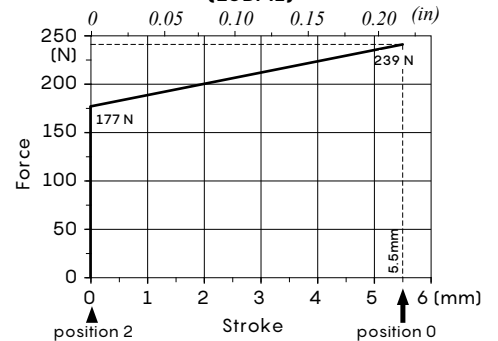
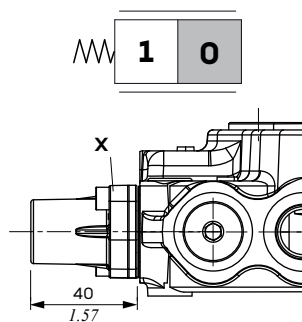
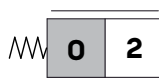
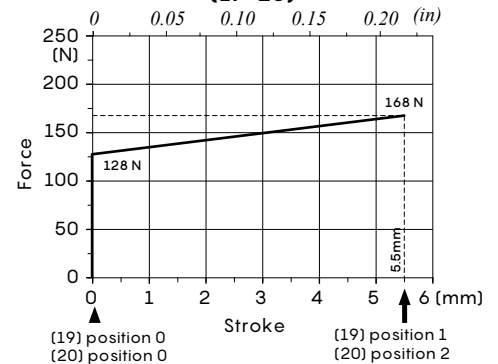
Locking and release force: 120 N / 27 lbf

2 positions, spring return**Type 17A**

Positions 1-0, spring return in position 1

**Force-Stroke diagram
(17A)****Type 18BME**

Positions 2-0, spring return in position 2

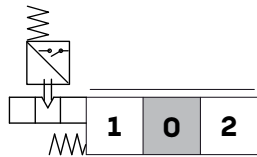
**Force-Stroke diagram
(18BME)****Type 19**Positions 1-0, spring return
in position 0**Type 20**Positions 2-0, spring return
in position 0**Force-Stroke diagram
(19-20)****Wrenches and tightening torques**

X= allen wrench 4-6.6 Nm (4.9 lbf)

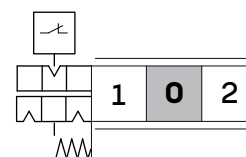
With microswitch

Type 8MG3(NO)

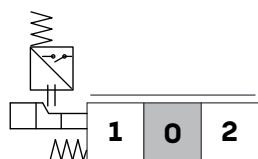
As type 8 with microswitch in positions 1 and 2,
NO (normally opened) contact

**Type 11BMG3(NC)**

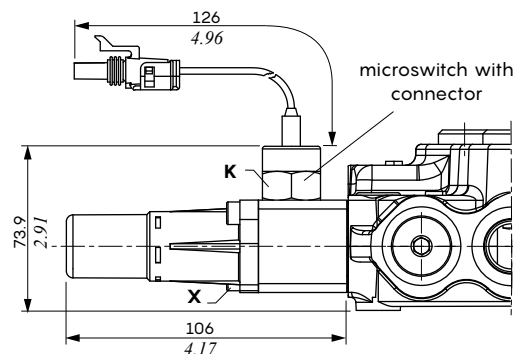
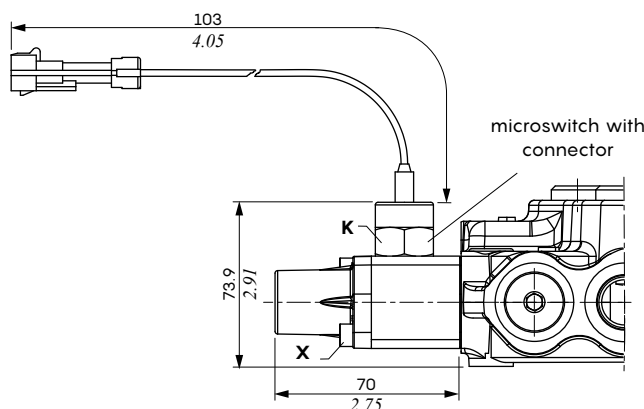
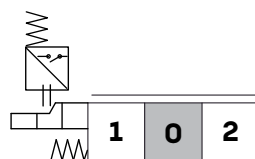
As type 11B with microswitch in position 1
and 2

**Type 8MG1(NO)**

As type 8 with microswitch
in position 1, NO contact

**Type 8MG2(NO)**

As type 8 with microswitch
in position 2, NO contact

**Wrenches and tightening torques**

X = allen wrench 4-6.6 Nm (4.9 lbf)

K = wrench 22-42 Nm (31 lbf)

Technical features

Locking force: 120 N / 27 lbf

Release force: 230 N / 51.7 lbf

Microswitches technical features

Mechanical life 5x10⁵ operations

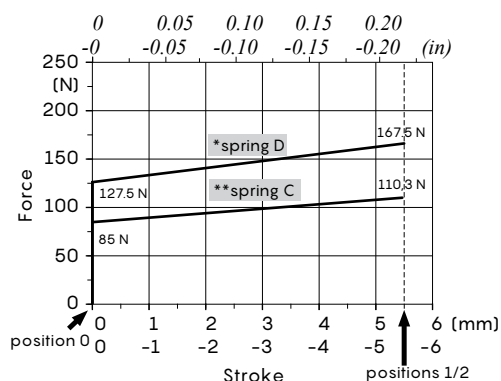
Electrical life (resistive load) 10⁵ operations - 7 A / 13.5 VDC

5x10⁴ operations - 10 A / 12 VDC

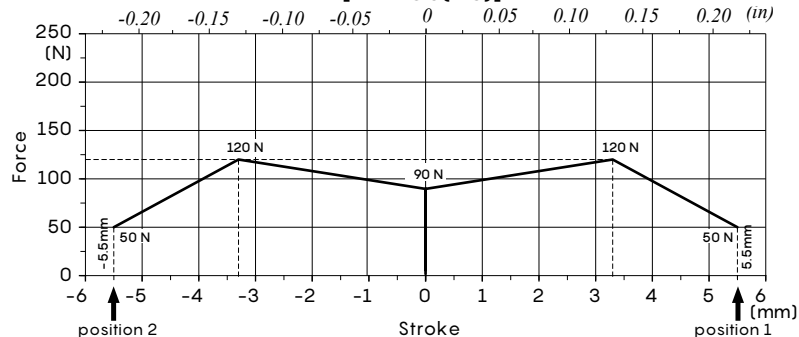
5x10⁴ operations - 3 A / 28 VDC

Force-Stroke diagram

(8MG1-8MG2-8MG3)

**Force-Stroke diagram**

[11BMG3(NC)]

**Comandi completi**

(microswitch)

Circuit	8MG1 position 1	8MG2 position 2	8MG3 positions 1, 2	11BZMG3 positions 1, 2
(NO)	5V08104670	5V08104680	5V08106660	-
(NC)	-	-	-	5V11204601

Microswitches

For control type	Microswitch with connector	Mating connector (not included)
8MG3(NO)		
8MG1(NO)	4MIC734	5CON001
8MG2(NO)		
11BZMG3(NC)	4MIC744	5CON005

A side controls

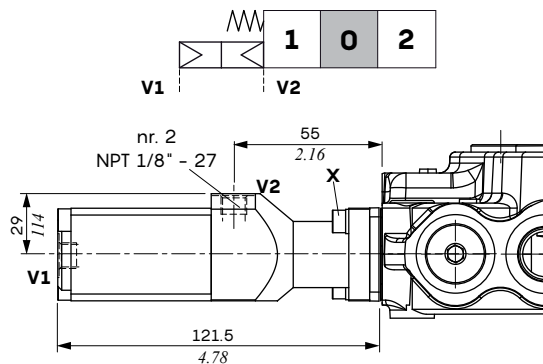
Pneumatic control

Type 8P

Pneumatic ON/OFF with spring return in neutral position.

Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

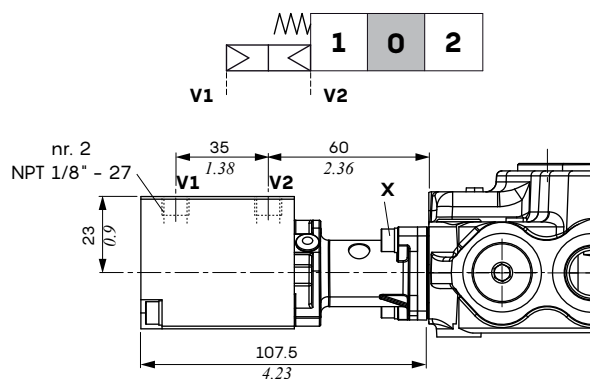


Technical features

Pilot pressure.: min. 5.5 bar / (80 psi)
max. 10 bar / (145 psi)

Type 8PNB

As type 8P, waterproof



Electrohydraulic controls

Type 8ED3

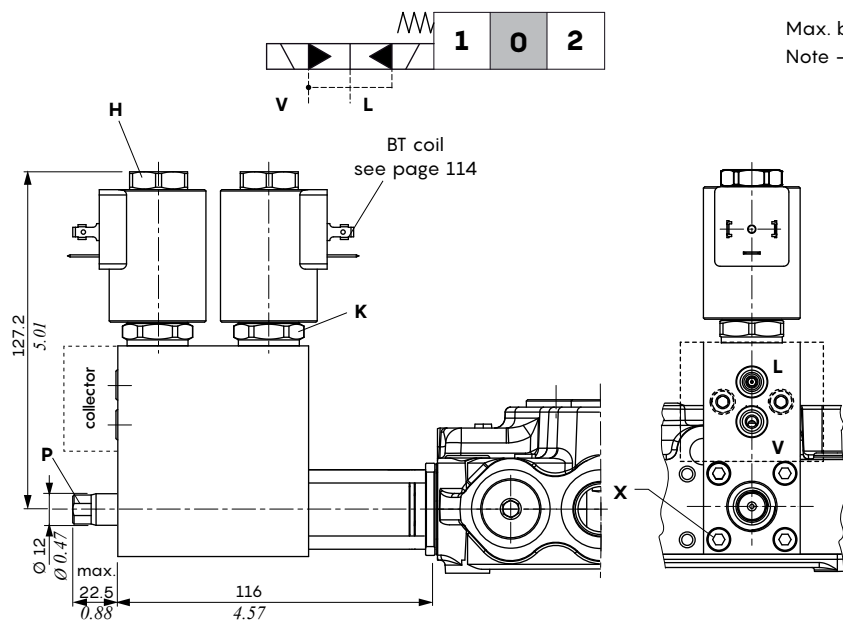
ON/OFF with spring return in neutral position, 12 VDC / 24 VDC

Technical features

Pilot pressure.: min. 10 bar / (145 psi)
max. 50 bar / (725 psi)

Max. bscpressure.on drain L: min. 25 bar / (360 psi)

Note - for BT coils and connectors see page 114.



Wrenches and tightening torques

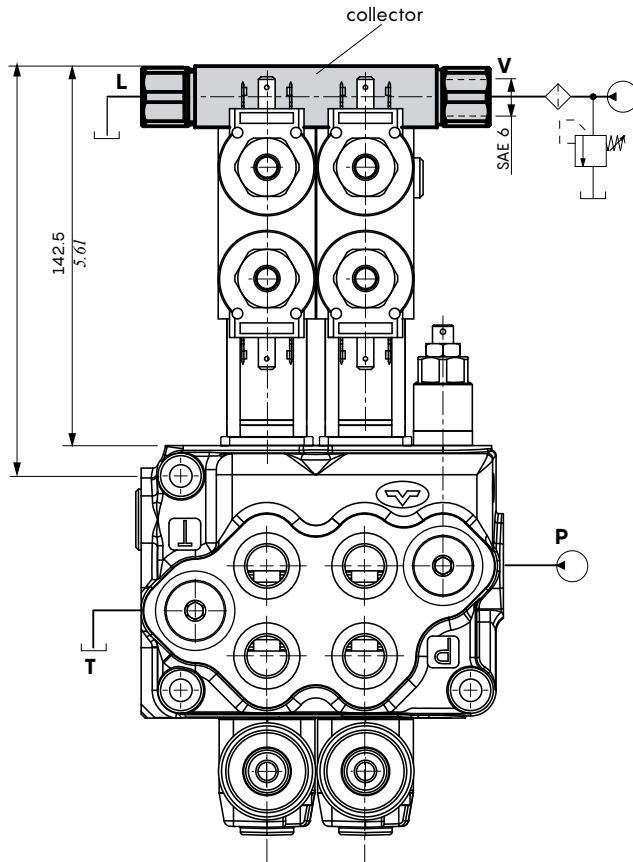
X= allen wrench 4-6.6 Nm (4.9 lbf)

K= wrench 24-30 Nm (22.1 lbf)

H= wrench 22-6.6 Nm (4.9 lbf)

Electrohydraulic controls

Collector kit for external pilot and drain

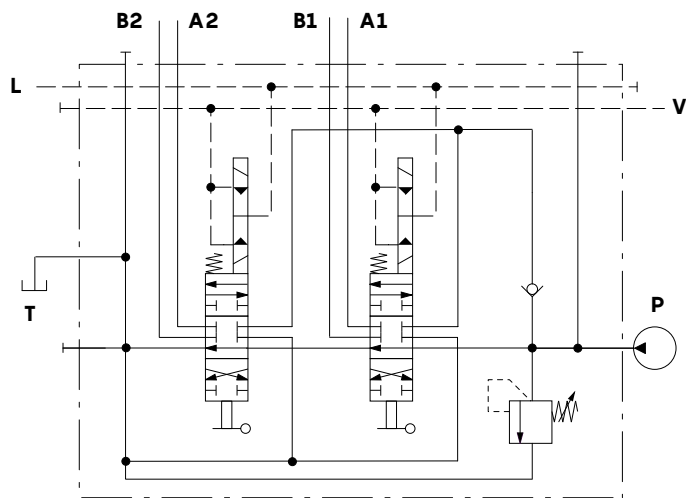


Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Collector kit		
type	code (*)	description
KE1S0-SAE	5KE1S00070	kit for 1 section
KE2S0-SAE	5KE2S00270	kit for 2 section
KE3S0-SAE	5KE3S00270	kit for 3 section
KE4S0-SAE	5KE4S00270	kit for 4 section
KE5S0-SAE	5KE5S00270	kit for 5 section
KE6S0-SAE	5KE6S00270	kit for 6 section
KE7S0-SAE	5KE7S00270	kit for 7 section

(*) codes are referred to UN-UNF thread



Description example:

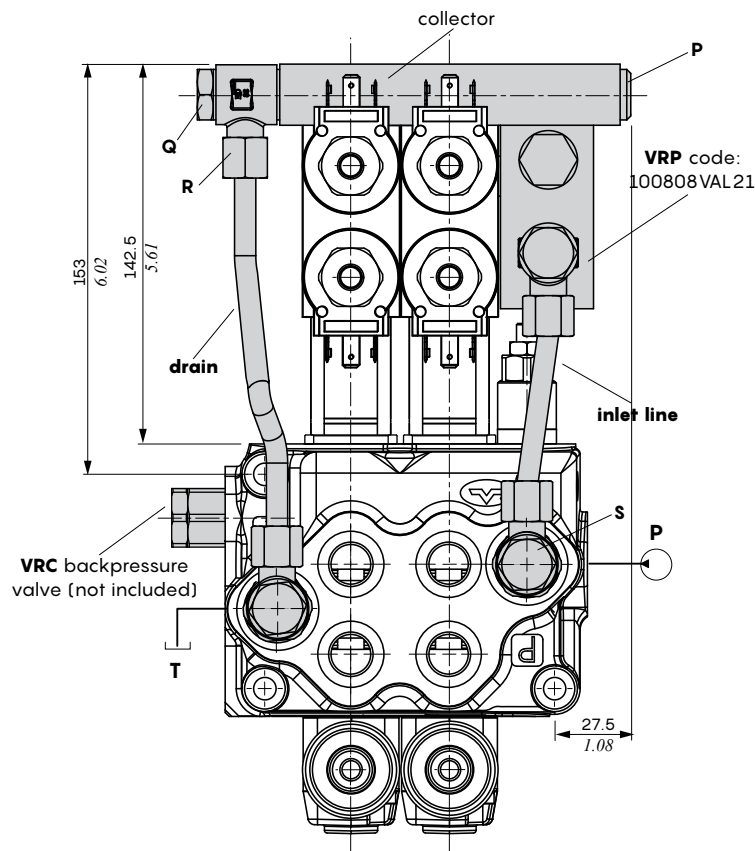
SD5/2-P(JG3-120)/ED-18ED3L/18ED3L/AET-SAE-KE2S0-24VDC

A side controls

Electrohydraulic controls

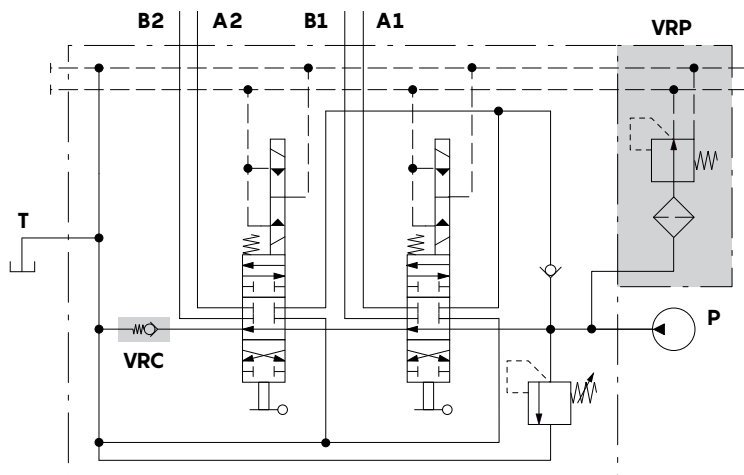
Collector kit for external pilot and drain

The kit is made of collector, VRP pressure reducing valve and pipes.



Wrenches and tightening torques

X= wrench 22-42 Nm (31 lbf)
 Y= wrench 22-24 Nm (17.7 lbf)
 P= allen wrench 6-24 Nm (17.7 lbf)
 Q= wrench 19-24 Nm (17.7 lbf)
 R= wrench 17
 S= wrench 22-24 Nm (17.7 lbf)



Description example:

SD5/2-P(KG3-120)/18ED3L/18ED3L/VRC-SAE-KE2R3-12VDC-SAE

Collector kit

type	code(*)	description
KE1R3-SAE	5KE1R30270	kit for 1 section
KE2R3-SAE	5KE2R30270	kit for 2 section
KE3R3-SAE	5KE3R30270	kit for 3 section
KE4R3-SAE	5KE4R30270	kit for 4 section
KE5R3-SAE	5KE5R30270	kit for 5 section
KE6R3-SAE	5KE6R30270	kit for 6 section
KE7R3-SAE	5KE7R30270	kit for 7 section

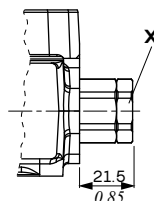
(*) codes are referred to UN-UNF thread

Backpressure valves

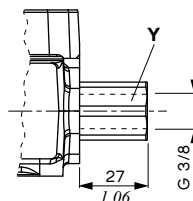
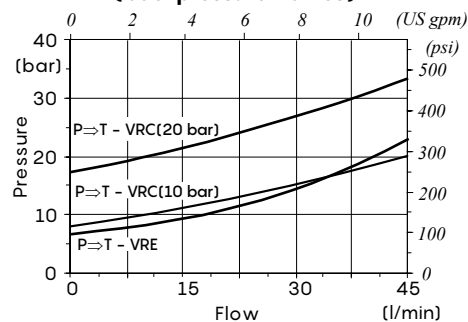
type	code	backpressure
VRC(10bar)	X003600010	10 bar (145 psi)
VRC(20bar)	X003600020	20 bar (290 psi)
VRE*	XGIU522506	with carry-over

(*) codes are referred to UN-UNF thread

Valve type VRC



Valve type VRE

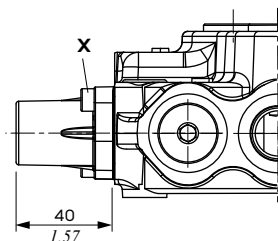
Pressure drop
(backpressure valves)

A side controls

Short stroke (CR) spool control kits for spool type ED-3

Type 8CR3 positions, spring return
in neutral position**Type 8CRWPO**

Waterproof type

**Type 11CR**

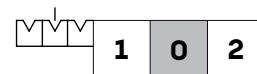
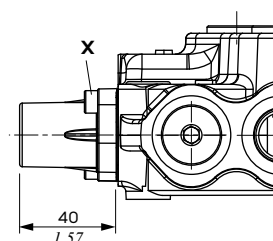
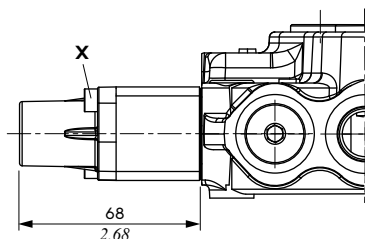
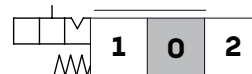
Detent in 3 positions

Type 11CRWPO

As type 11CR, waterproof

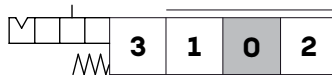
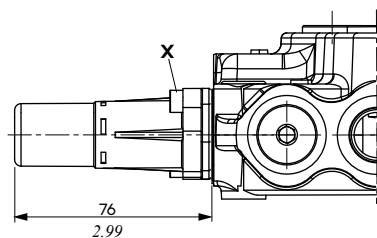
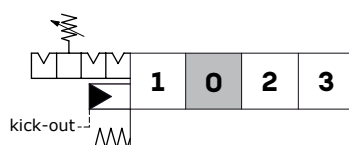
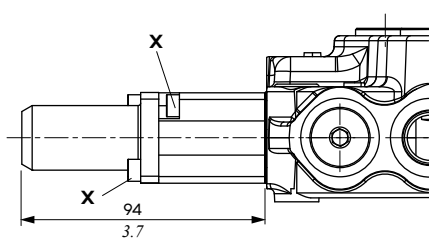
Type 11CRBCR

As type 11CR, zama execution

**Type 9BCR**3 positions, detent in position 1, spring return
in neutral position, zama execution**Type 10BCR**3 positions, detent in position 2, spring return
in neutral position, zama execution**Wrenches and tightening torques**

X= allen wrench 4-6.6 Nm (4.9 lbf)

For floating circuit

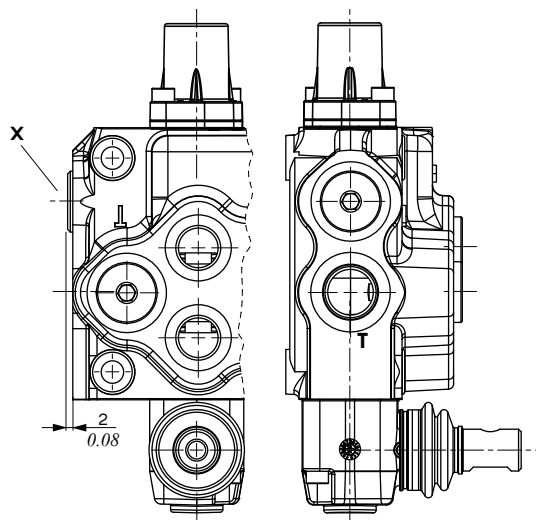
Type 13QN4 positions, detent in position 3, spring return
in neutral position, for spools type ED-5PY**Type 14A**4 positions, detent in positions 1, 2 and 3, spring kick-out in
neutral position, for spool type ED-5(14A)**Wrenches and tightening torques**

X= allen wrench 4-6.6 Nm (4.9 lbf)

Outlet port options

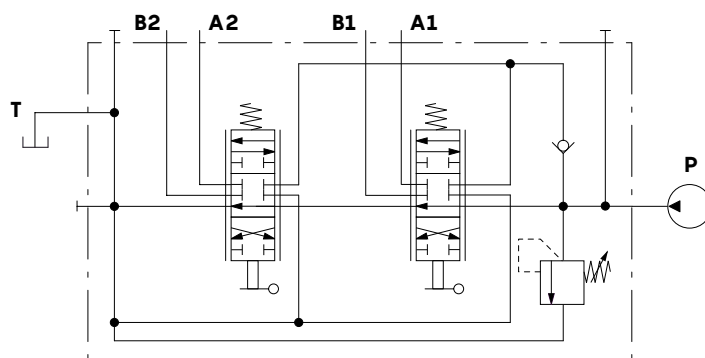
It's possible to have open center, closed center and carry-over. Are available unloader valves with special bodies: for information please contact our Sales Dpt.

Type AET: open center



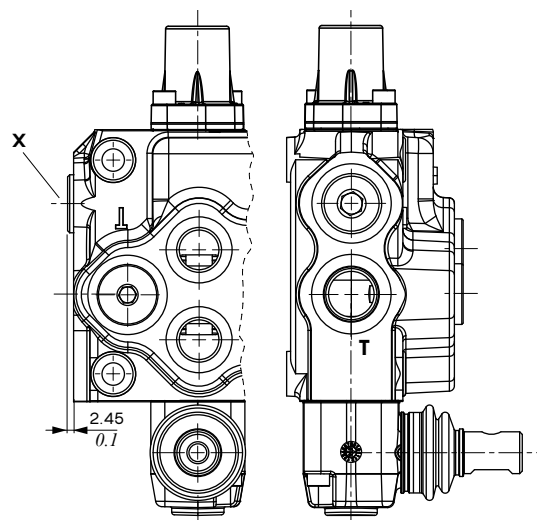
Wrenches and tightening torques

X= allen wrench 8-24 Nm (17.7 lbf)



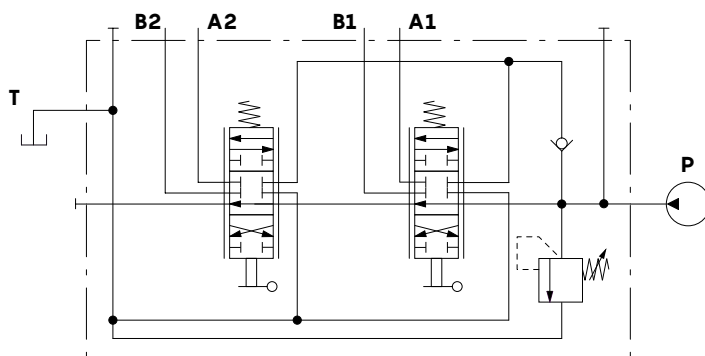
Description example:
SD5/2-P(JG3-120)/ED-18L/ED-18L/**AET**-SAE
(For other examples, see page 6)

Type AEK: closed center



Wrenches and tightening torques

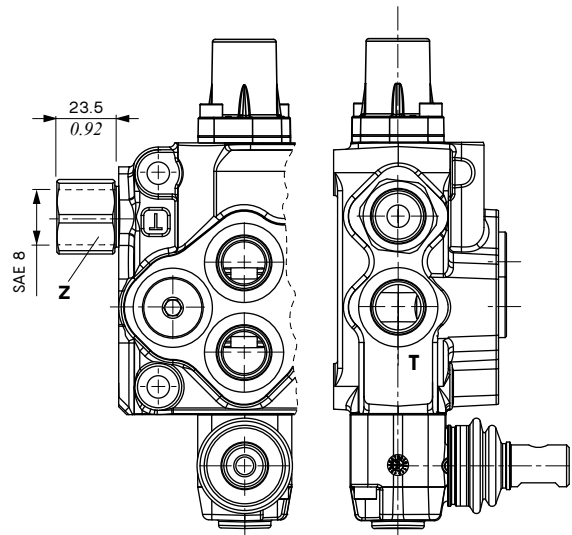
X= allen wrench 8-24 Nm (17.7 lbf)



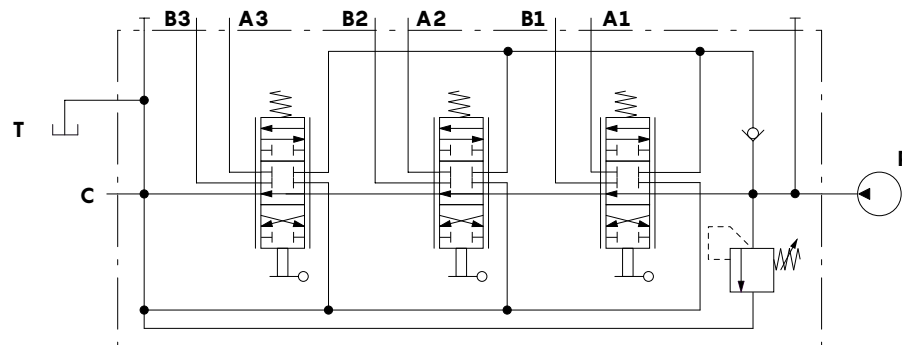
Description example:
SD5/2-P(JG3-120)/ED-18L/ED-18L/**AEK**-SAE

Type AE: with carry-over

Type AE-SAE8



Wrenches and tightening torques
 Z = wrench 27–24 Nm (17.7 lbf)



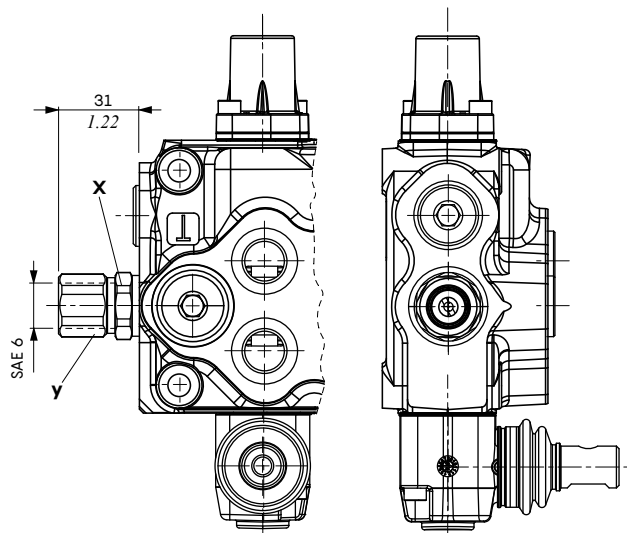
Description example:

SD5/3-P(KG3–120)/ED–18L/ED–18L/ED–18L/ED–18L/AE-SAE

Unloader valves (with hydraulic pilot type L)

Dimensions

Type L configuration
Unloader valve with hydraulic pilot

**Wrenches and tightening torques**

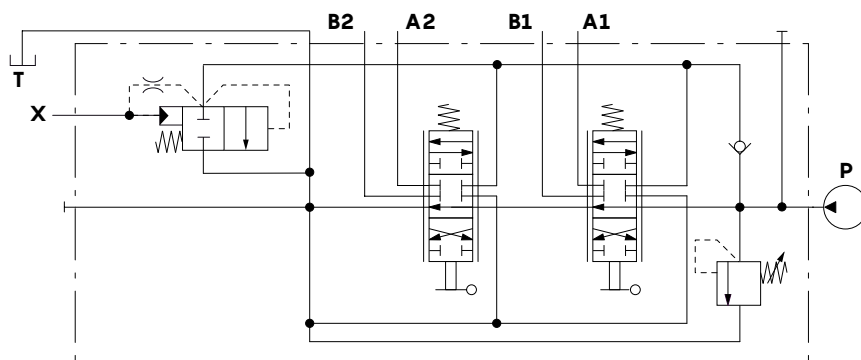
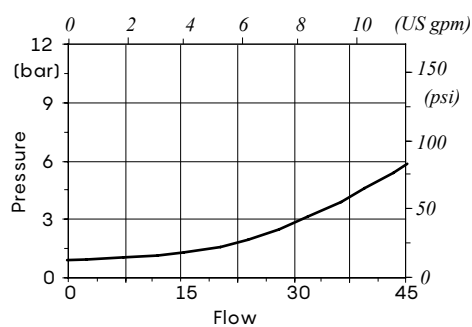
X = wrench 24-42 Nm (31 lbf)

Y = wrench 22-24 Nm (17.7 lbf)

Technical features

Internal leakage: . . . from 4 to 18 cm³/min at 100 bar
from 0.24 to 1.1 in³/min at 1450 psi

Performance data and hydraulic circuit

Pressure drops

Description example:

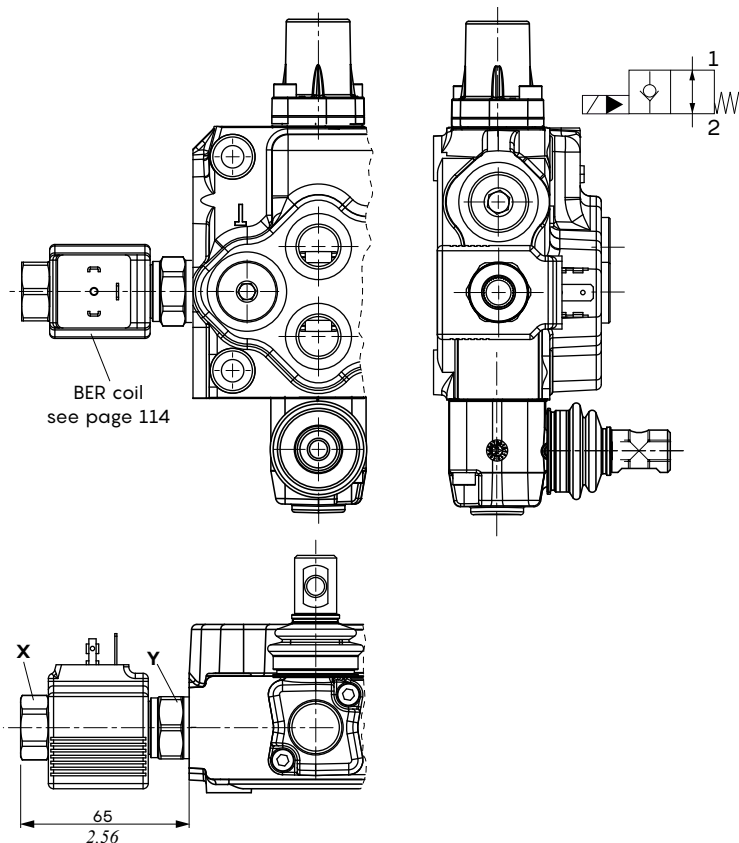
SD5/3-P(JG3-120)/ED-18L/ED-18L/AET-L-SAE

Unloader valves (with solenoid pilot type)

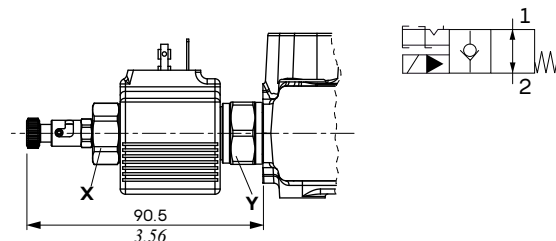
Dimensions

ELNW(NO)

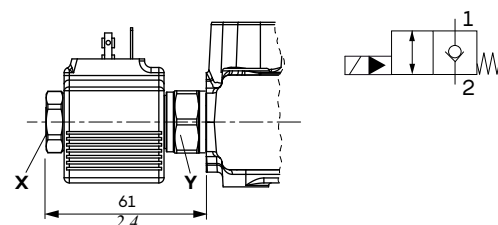
Without manual emergency, NO circuit

**ELTW (NO)**

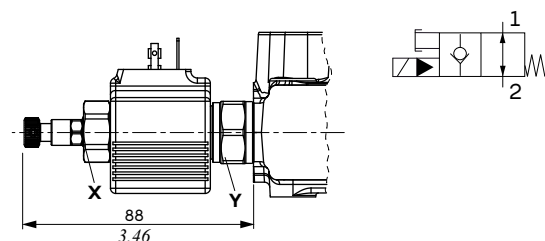
With "push&twist" manual emergency, NO circuit

**ELNW(NC)**

Without manual emergency, NC circuit

**ELPW (NO)**

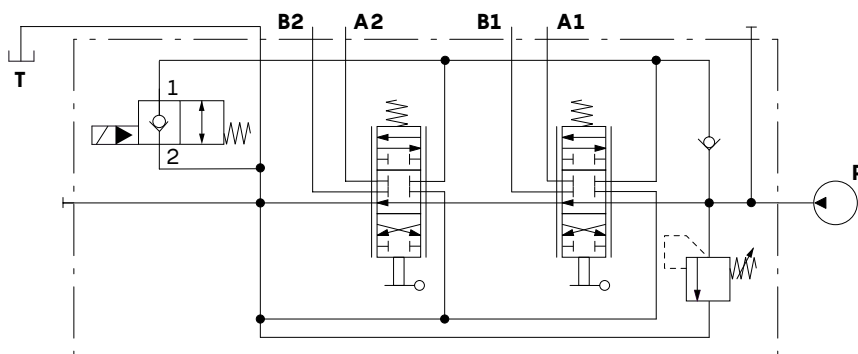
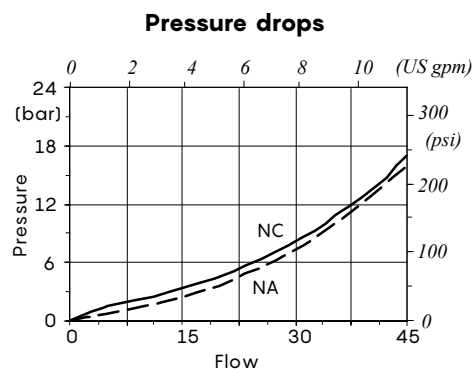
With push-button manual emergency, NO circuit

**Technical features**

Max. flow: 45 l/min (12 USgpm)
 Max. pressure: 315 bar (4600psi)
 Internal leakage: ... max. 3 cm³/min at 100 bar (max. 4.6 in³/min at 1450 psi)
 Nominal voltage: 12/24 VDC
 Power absorption 19.2 W
 Weather temperature from - 30°C to 50°C (from - 22°F to 122°F)
 Note - For **BER** coils and connectors see page 116

Wrenches and tightening torques

X= wrench 24-42 Nm (31 lbf)
 Y= max. 6.6 Nm (4.9 lbf)

Performance data and hydraulic circuit

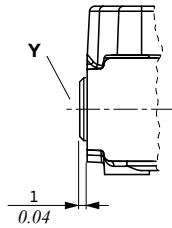
Description example:

SD5/2-P(JG3-120)/ED-18L/ED-18L/AET-ELNW-SAE

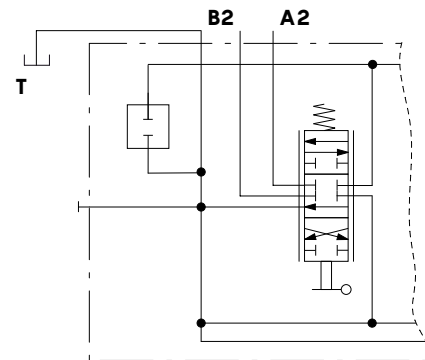
VUnloader valves (valve blanking plug)

Dimensiona and hydraulic circuit

LT
Tappo sostituzione valvola



Wrenches and tightening torques
X= Allen wrench 6-24 Nm (17.7 lbf)



Description example:

SD5/3-P(JG3-120)/ED-18L/ED-18L/AET-LT-SAE

Working conditions

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

Nominal flow rating		45 l/min	12 US gpm
Max. pressure	parallel or tandem circuit	315 bar	4600 psi
Back pressure (max.) on outlet T port		25 bar	362.5 psi
Standard internal leakage A(B)→T	Δp = 100 bar - 1450 psi with fluid and valve at 40°C - 46 cSt	3 cm ³ /min	0.18 in ³ /min
Fluid		Mineral oil	
Fluid temperature range	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 300 mm ² /s	from 15 to 300 cst
	minimum	12 mm ² /s	12 cSt
	maximum	400 mm ² /s	400 cSt
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 electric devices	from -20°C to 60°C	from -4°F to 140°F

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

Standard threads

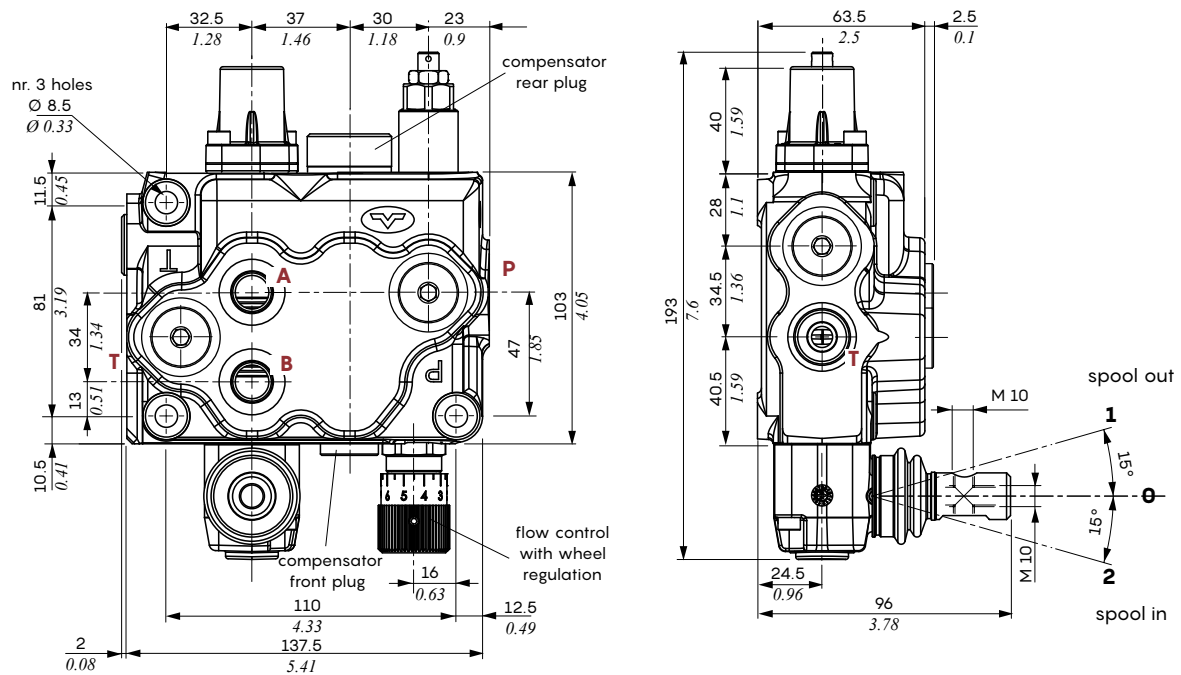
REFERENCE STANDARD						
		BSP		UN-UNF	METRIC	NPTF
THREAD		ISO 228/1		ISO 263		
ACCORDING TO		BS 2779		ANSI B1.1 unified	ISO 262	ANSI B1.20.3
CAVITY	ISO	1179-1		11926-1	9974-1	
DIMENSION	SAE			J1926-1	J2244	J476a
ACCORDING TO	DIN	3852-2 shape X or Y			3852-1 shape X or Y	

PORTS THREADING				
		BSP	UN-UNF	METRIC
P inlet and C carry-over		G 3/8	3/4-16 (SAE 8)	M18x1.5
A and B ports		G 3/8	9/16-18 (SAE 6)	M18x1.5
T outlet		G 3/8	3/4-16 (SAE 8)	M18x1.5
Controls		G 1/4	9/16-18 (SAE 6)	G 1/4

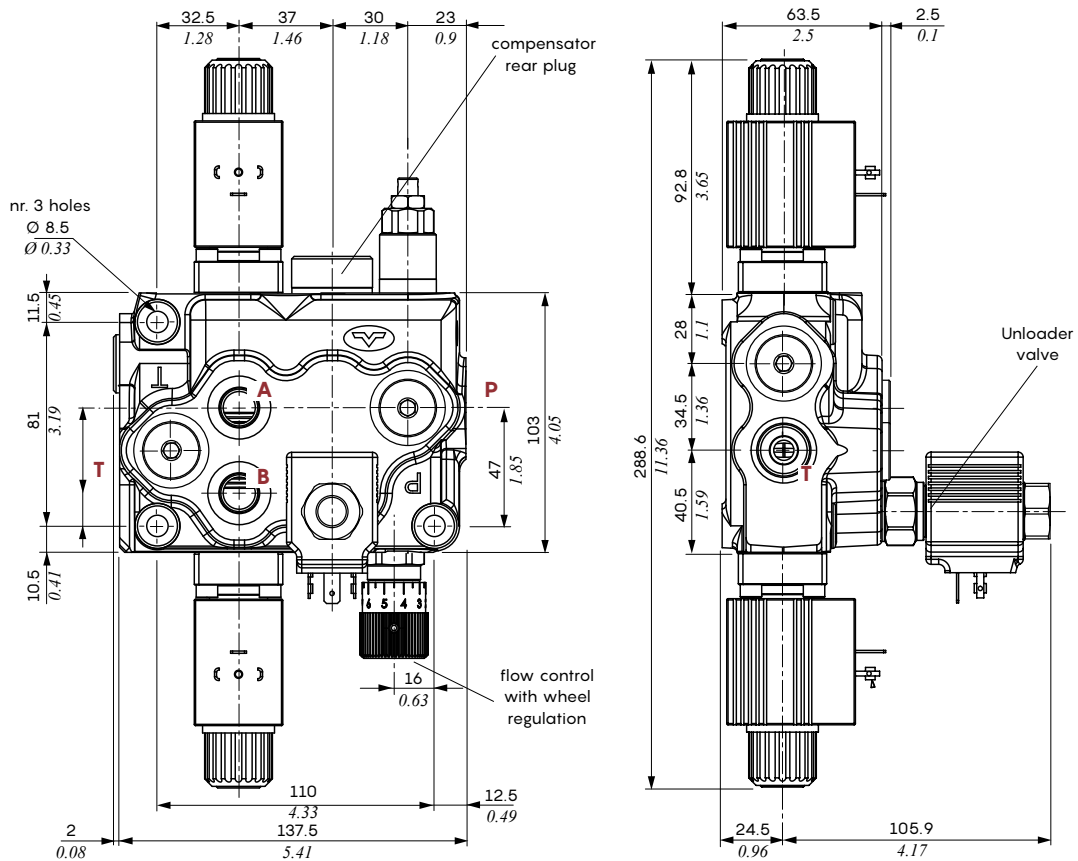
Parallel circuit execution

Dimensional data

Configuration with lever kit



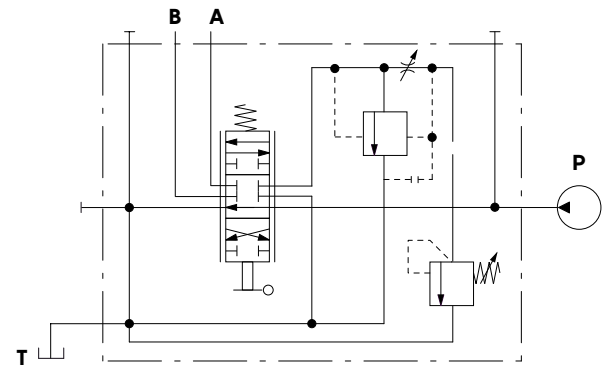
Configuration with on/off solenoid control kit



Parallel (SDM105) circuit execution

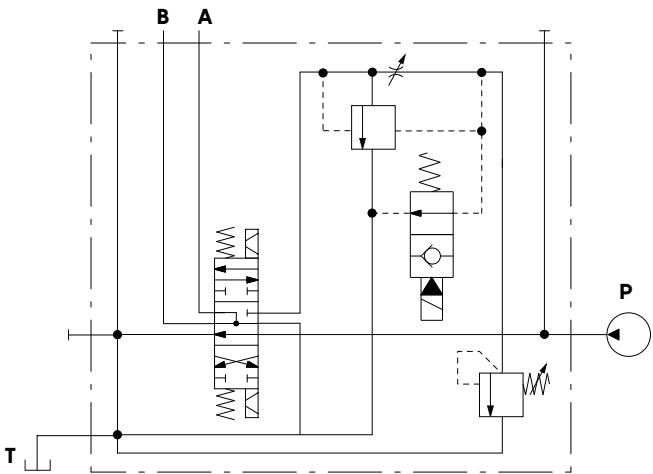
Hydraulic circuit

Configuration with lever kit



Description example:
SDM105/1-P(JG3-120)M/18L/AET-SAE

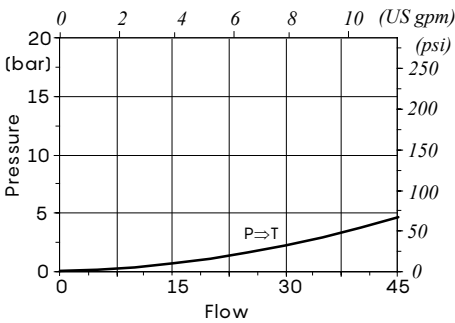
Configuration with ON/OFF solenoid control kit



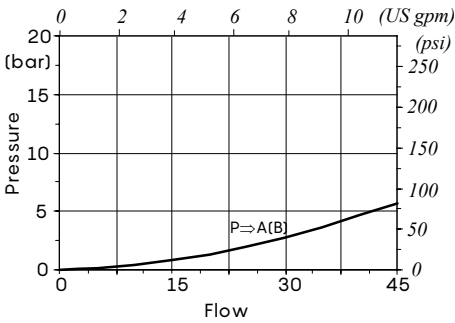
Description example:
SDM105/1-P(JG3-120)M/18ES3/AET-SAE

Performance

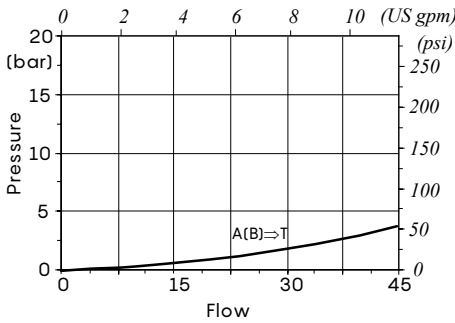
P⇒T pressure drops



P⇒A(B) pressure drops
6 sections valve



A(B)⇒T pressure drops
6 sections valve

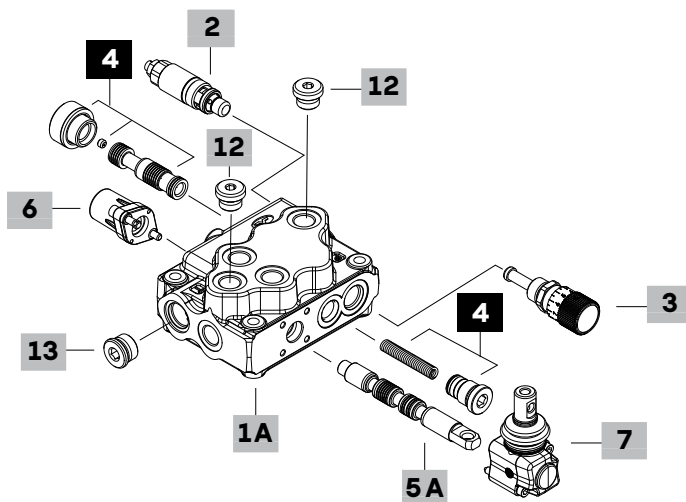


Ordering codes

Valve setting (bar)

SDM105/1-P (JNG3-120) M / 1 8 L / AET - SAE - - <CVN>

1A **2** **3** **5A** **6** **7** **13** **12** Optional painting *

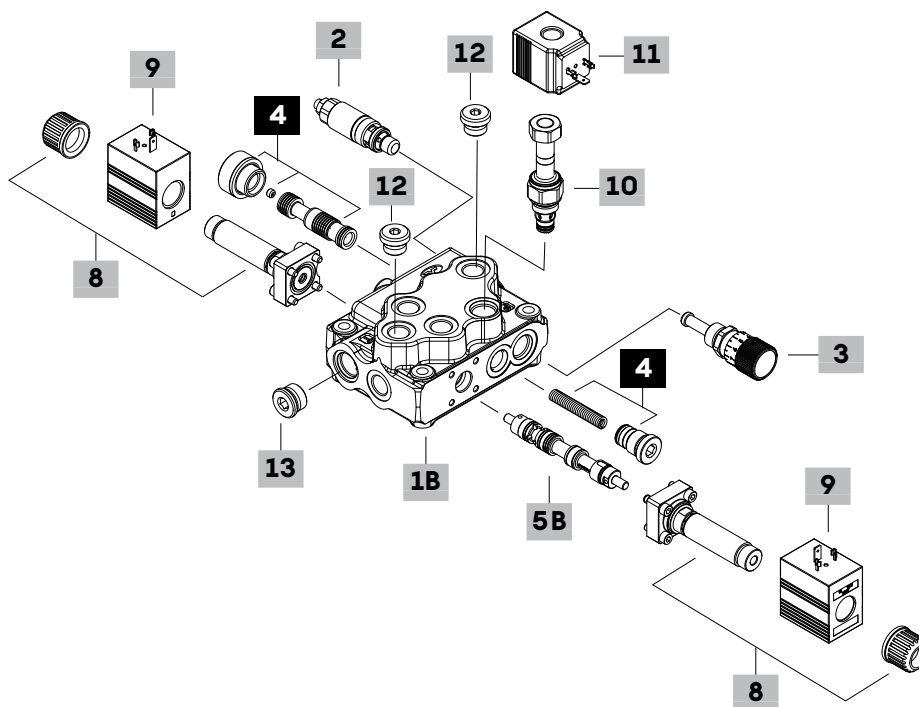


Valve setting (bar)

SDM105/1-P (JNG3-120) M . ELN(NO) / 1 8ES3 / AET - SAE - 24VDC - <CVN>

1B **2** **3** **10** **5B** **8** **13** **9** **12** Optional painting *

11



Notes - (*) SD5 valve can be supplied with one coat of black paint (CVN configuration). For different colour please contact our Sales Dpt.

Ordering codes

1A Body kit ⁽¹⁾

TYPE	CODE	DESCRIPTION
SDM105/1	5KC5017001	Parallel, 1 section

1B Body kit for unloader valve ⁽¹⁾

TYPE	CODE	DESCRIPTION
SDM105/1/ELS(A1)	5KC5018005	Parallel, 1 section, predisposition for unloader valve
SDM105/1/SAE8 (PABT)/ELS(A1)-AE-NL-IM-ES	5KC5018005A	Parallel, 1 section, predisposition for unloader valve and solenoid controls

2 Main pressure relief valve page 20

TYPE	CODE	DESCRIPTION
VMD5 type J (Zero-leak directly controlled) (JNG3-120)	5KIT105513	Range from 50 to 190 bar (from 725 to 2755 psi), standard setting 120 bar (1740 psi)

3 Flow controls page 114

TYPE	CODE	DESCRIPTION
M	XCAR705211	Continuous fine wheel regulation
G	XCAR705202	Screw regulation with locking nut

4 Compensator kit

TYPE	CODE	DESCRIPTION
-	5CAS316066	Compensated spool kit

5A Spools page 114

TYPE	CODE	DESCRIPTION
Double acting type, 3 positions		
ED-1	3CU1210730	A and B closed in neutral position
ED-2	3CU1225730	A and B connect to tank in neutral position

5B Spools page 114

TYPE	CODE	DESCRIPTION
For ON/OFF direct solenoid control kit		
1ES	3CU1210011	Double acting, 3 positions, A and B closed in neutral position
2ES	3CU1225011	Double acting, 3 positions with A and B to tank in neutral position

6 A side controls ⁽²⁾ page 115

TYPE	CODE	DESCRIPTION
3 positions, spring return		
8	5V08104000	Spring return in neutral position

7 B side controls ⁽²⁾ page 115

TYPE	CODE	DESCRIPTION
LM10	5LEV205000	Standard lever kit, M10 thread
SLP	5COP105000	With plate (see page 58)

8 Complete controls page 115

TYPE	CODE	DESCRIPTION
ON/OFF direct solenoid control kits		
8ES3	5CAN08025	Double acting
8ES1	5CAN08024	Single acting in A
8ES2	5CAN08024	Single acting in B

9 Coils for complete controls

For complete available coil list and connectors see page 116

TYPE	CODE	DESCRIPTION
12VDC	4SOL412012	Type D12, 12VDC, ISO4400 connector

10 Unloader valve

TYPE	CODE	DESCRIPTION
ELN(NO)	0EC08002031	Solenoid valve without manual emergency, NO circuit
ELN(NC)	0EC08002032	Solenoid valve without manual emergency, NC circuit
LT	XTAP510320	Valve blanking plug

11 Coils for unloader valves

For complete available coil list and connectors see page 116

TYPE	CODE	DESCRIPTION
12VDC	4SLE001200A	Type BER, 12VDC, ISO4400 connector

12 Inlet and outlet selection ⁽¹⁾

TYPE	CODE	DESCRIPTION
PSL	3XTAP822150	Side ports: n.2 SAE8 plugs, standard configuration (omit in valve description)
PSA	3XTAP822150	Upper ports: n.2 SAE8 plugs

13 Outlet options

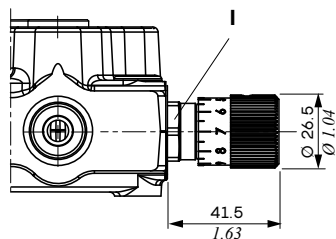
TYPE	CODE	DESCRIPTION
AET	XTAP623170	Open center plug

Notes - (1) Codes are referred to **UN-UNF** threads - (2) Please contact our Sales Dpt for more information.

Flow controls

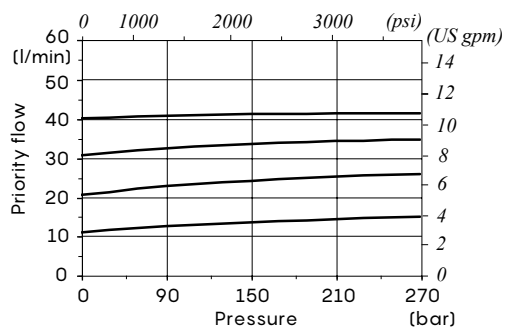
Type M

Continuous fine wheel regulation.



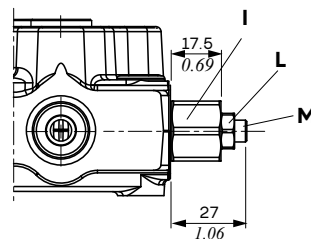
**Pressure-flow diagram
M and G flow controls**

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$



Type G

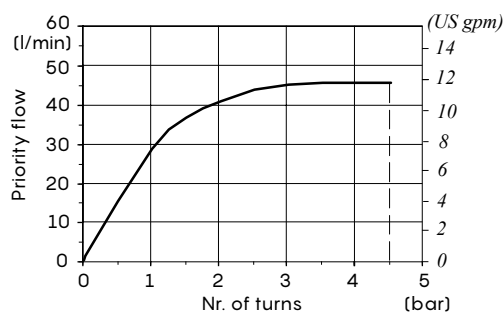
Screw regulation with locking nut.



**Flow regulation diagram
M and G flow controls**

$Q_{in} = 45 \text{ l/min} / (11.89 \text{ US gpm})$

$P = 100 \text{ bar} / (1450 \text{ psi})$



Wrenches and tightening torques

I = wrench 22 - 24 Nm (17.7 lbft)

L = wrench 13 - 24 Nm (17.7 lbft)

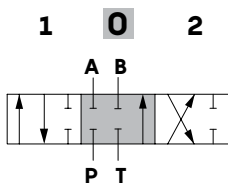
M = allen wrench 4

Spools

Double acting

Spool type 1 (ED1-1ES)

3 positions, A and B closed in neutral position



Stroke

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

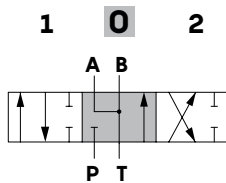
for 1ES

nominal position 1: + 3.4 mm (+0.134 in)

nominal position 2: - 3.4 mm (-0.134 in)

Spool type 2 (ED2-2ES)

3 positions, with A and B connect to tank in neutral position



Stroke

position 1: + 5.5 mm (+0.216 in)

position 2: - 5.5 mm (-0.216 in)

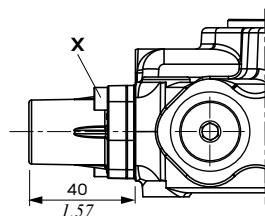
for 2ES

nominal position 1: + 3.4 mm (+0.134 in)

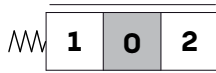
nominal position 2: - 3.4 mm (-0.134 in)

A side controls

3 positions, spring return in neutral position



Type 8

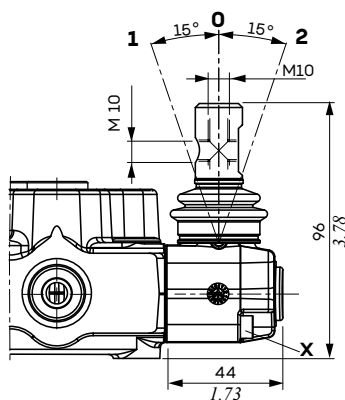


Wrenches and tightening torques

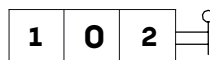
X= allen wrench 4-6.6 Nm (4.9 lbf)

B side controls

Lever kit



Type LM10



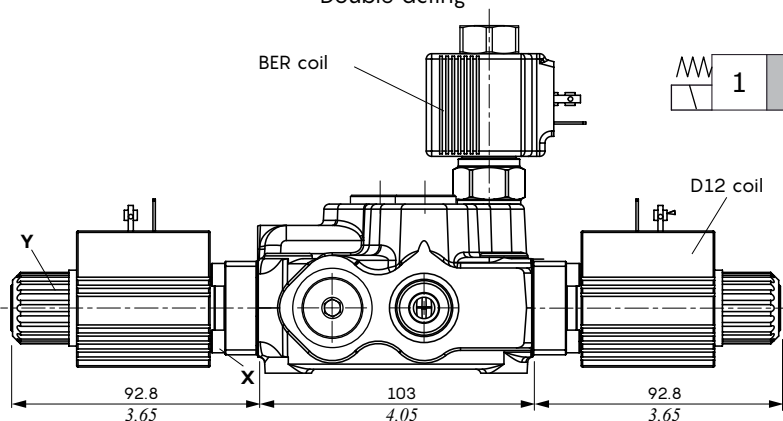
Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

Complete controls

ON/OFF direct solenoid control kits

Type 8ES3
Double acting



Wrenches and tightening torques

X= allen wrench 4-6.6 Nm (4.9 lbf)

$$Y = 6.6 \text{ Nm } (4.9 \text{ lbf})$$

Technical features

Nominal voltage.....12/24 VDC

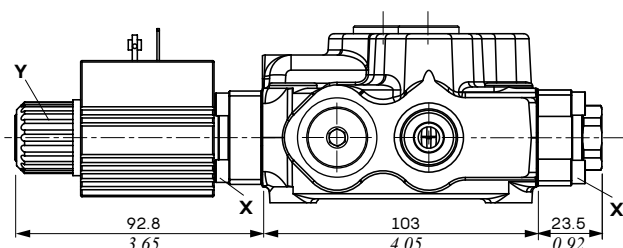
Power absorption 36 W

Weather temperature da 60°C a 115°C

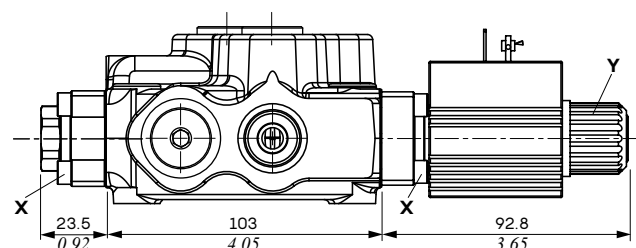
(from 140°F to 239°F)

Note - For coils and connectors see page 116

Type 8ES1
Single acting in A



Type 8ES2
Single acting in B



Coils

Types and ordering codes

Coil	Voltage	Connectors					
		ISO 4400	Deutsch DT	AMP JPT	Packard Weather-pack	Packard Metri-pack	Flying leads (without connector)
BER	10 VDC	4SLE001000A	-	-	-	-	-
	12 VDC	4SLE001200A	4SLE001201A ⁽⁵⁾	4SLE001203A ⁽⁵⁾	4SLE0011210A ⁽²⁾	4SLE001214A ⁽²⁾	4SLE001207A
		4SLE001217A ⁽³⁾	4SLE001202A ⁽⁶⁾	4SLE001211A ⁽³⁻⁵⁾	-	-	-
		-	4SLE001216B ⁽³⁻⁶⁾	-	-	-	-
	14 VDC	-	4SLE001400A ⁽⁶⁾	4SLE001403A ⁽³⁻⁵⁾	-	-	-
		-	4SLE001401A ⁽³⁻⁶⁾	-	-	-	-
		-	4SLE001402A ⁽³⁻⁵⁾	-	-	-	-
	24 VDC	4SLE002400A	4SLE002401A ⁽⁵⁾	4SLE002403A ⁽⁵⁾	-	-	4SLE002404A
		4SLE002408A ⁽³⁾	4SLE002407A ⁽³⁻⁵⁾	-	-	-	-
		4SLE002400A ⁽¹⁾	4SLE002402A ⁽⁶⁾	-	-	-	-
BT	28 VDC	-	4SLE002802A ⁽⁶⁾	4SLE002800A ⁽⁵⁾	-	-	-
	48 VDC	4SLE004800A	-	-	-	-	-
		4SLE004800A ⁽¹⁾	-	-	-	-	-
	110 VDC	4SLE011000A	-	-	-	-	-
		4SLE011000A ⁽¹⁾	-	-	-	-	-
	220 VDC	4SLE022000A	-	-	-	-	-
		4SLE022000A ⁽¹⁾	-	-	-	-	-
	10 VDC	4SL3000100	-	-	-	-	-
	12 VDC	4SL3000120	4SL3000130 ⁽⁶⁾	4SL3000122 ⁽⁵⁾	4SL3000124 ⁽²⁾	4SL3000127 ⁽²⁾	4SL300012C
		4SL3000126 ⁽⁴⁾	4SL3000134 ⁽³⁻⁶⁾	4SL3001200 ⁽³⁻⁵⁾	-	-	-
		-	4SL3000128 ⁽²⁾	-	-	-	-
BIN19	24 VDC	4SL3000240	4SL3000249 ⁽⁶⁾	4SL3000248 ⁽⁵⁾	-	-	4SL3000246
		4SL3030240 ⁽¹⁾	4SL30024C ⁽³⁻⁶⁾	-	-	-	-
	26 VDC	4SL3000260	-	-	-	-	-
		-	-	-	-	-	-
	48 VDC	4SL3000480	-	-	-	-	-
		4SL3030480 ⁽¹⁾	-	-	-	-	-
	110 VDC	4SL3001100	-	-	-	-	-
		4SL3031100 ⁽¹⁾	-	-	-	-	-
	220 VDC	4SL3002200	-	-	-	-	-
		4SL3032200 ⁽¹⁾	-	-	-	-	-
MP35	12 VDC	4SL6000121	-	-	-	-	-
	24 VDC	4SL6000240	-	-	-	-	-
BQP19	12 VDC	4SL4000120	-	-	-	-	4SL4000122
	24 VDC	4SL4000240	-	-	-	-	-
D12	10.5 VDC	4SOL412011	4SOL412111 ⁽²⁾	-	-	-	-
	12 VDC	4SOL412012	4SOL412013 ⁽⁶⁾	-	-	-	4SOL412017 ⁽³⁾
		4SOL412016 ⁽³⁾	4SOL412112 ⁽²⁾	-	-	-	-
		-	4SOL412015 ⁽³⁻⁶⁾	-	-	-	-
D12	24 VDC	-	4SOL412113 ⁽²⁻³⁾	-	-	-	-
		-	4SOL412025 ⁽⁶⁾	-	-	-	-
		4SOL412024	4SOL412124 ⁽²⁾	4SOL412224 ⁽²⁾	-	-	-
D12	24 VDC	-	4SOL412027 ⁽³⁻⁶⁾	-	-	-	-
		-	-	-	-	-	-

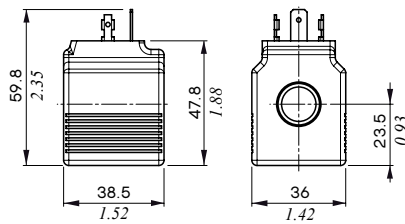
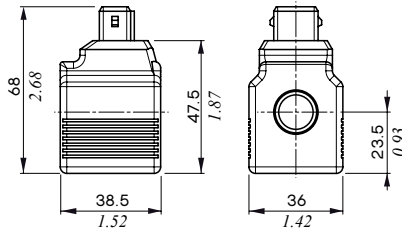
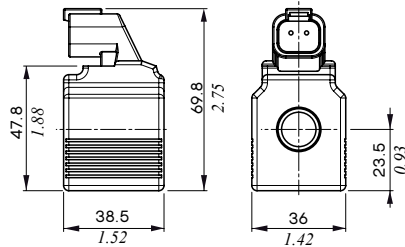
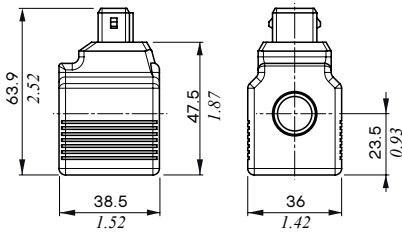
Connettori di accoppiamento

Standard	4CN1009995B	5CON140031	5CON003	5CON001	5CON017	-
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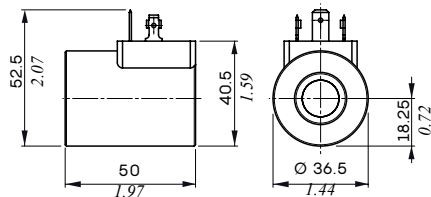
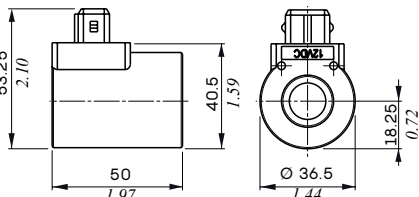
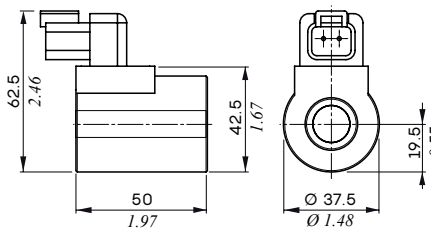
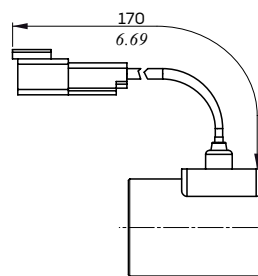
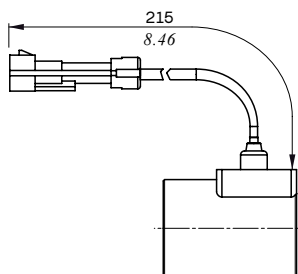
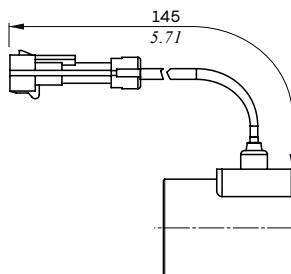
(for connector with rectifier see following table)

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

ISO 4400 mating connector with rectifier		
voltage	BER type	BT type
24 VDC	4CN1010240	-
48 VDC	4CN1010480	4CN3010480
110 VDC	4CN1011100	4CN3011100
220 VDC	4CN1012201	4CN3012200

BER type**ISO4400 connector****DEUTSCH DT04 connector**
(perpendicular type)**DEUTSCH DT04 connector**
(parallel type)**AMP JPT connector****Features**

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

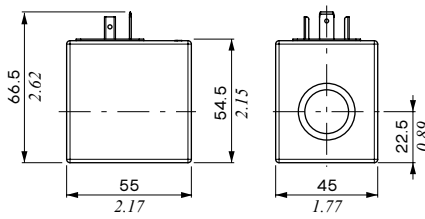
BT type**ISO4400 connector****AMP JPT connector****DEUTSCH DT04 connector****Flying leads with**
DEUTSCH DT04 connector**Flying leads with**
PACKARD WEATHER-PACK connector**Flying leads with**
PACKARD METRI-PACK connector**Features**

Nominal voltage tolerance	: ±10%
Power rating	: 21 W - 12/24/26 VDC
	: 20.3 W - 48 VDC
	: 17.3 W - 110 VDC
	: 17.7 W - 220 VDC
	: 19.9 W - 24 RAC
	: 20.7 W - 48 RAC
	: 20 W - 110 / 220 RAC
Max. operating current	: 1.77 A - 12 VDC
	: 0.89 A - 24VDC
	: 0.84 A - 26 VDC
	: 0.43 A - 48 VDC
	: 0.16 A - 110 VDC
	: 0.08 A - 220 VDC
	: 0.93 A - 24 RAC
	: 0.47 A - 48 RAC
	: 0.18 A - 110 RAC
	: 0.09 A - 220 RAC
Coil insulation	: Class F (155°C - 311°F)
Weather protection	: IP65 - ISO4400
	: IP69K - Deutsch DT
	: IP65 - AMP JPT
	: IP67 - Weatherpack
	: IP67 - Metri-pack
Insertion	: 100%

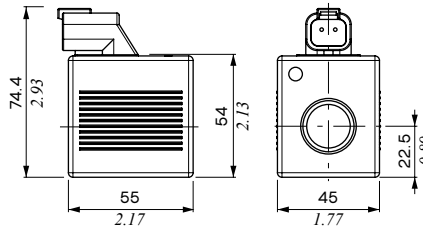
Coils

BQP19 type

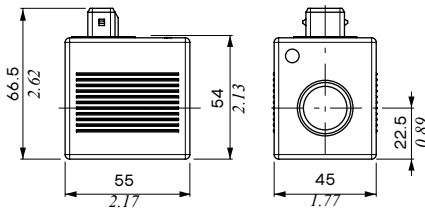
ISO4400 connector



DEUTSCH DT04 connector



AMP JPT connector

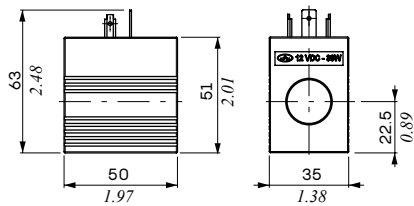


Features

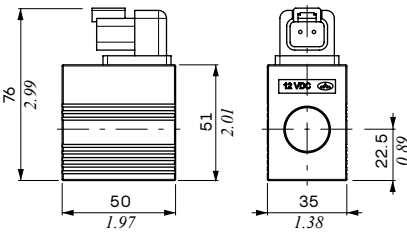
Nominal voltage tolerance	: ±10%
Power rating	: 15 W @ 12 VDC
	: 15 W @ 24 VDC
Max. operating current	: 1.25 A @ 12 VDC
	: 0.63 A @ 24 VDC
Coil insulation	: Class H
	: (180°C - 356°F)
Weather protection	: IP65 - ISO4400
	: IP69K - Deutsch DT
	: IP65 - AMP JPT
Insertion	: 100%

D12 type

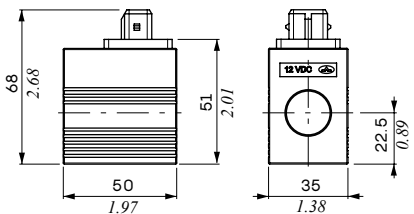
ISO4400 connector



DEUTSCH DT04 connector



AMP JPT connector

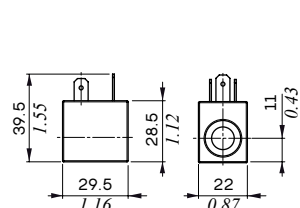


Features

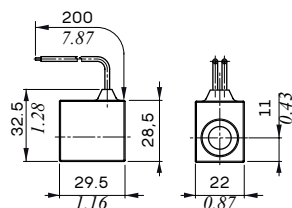
Nominal voltage tolerance	: ±10%
Power rating	: 36 W @
	: 10.5/12/24 VDC
Max. operating current	: 3.43 A @ 10.5 VDC
	: 3 A @ 12 VDC
	: 1.5 A @ 24VDC
Coil insulation	: Class H (180°C - 356°F)
Weather protection	: IP65 - ISO4400
	: IP69K - Deutsch DT
	: IP65 - AMP JPT
Insertion	: 100%

BPV type

ISO4400 connector



Flying leads



Features

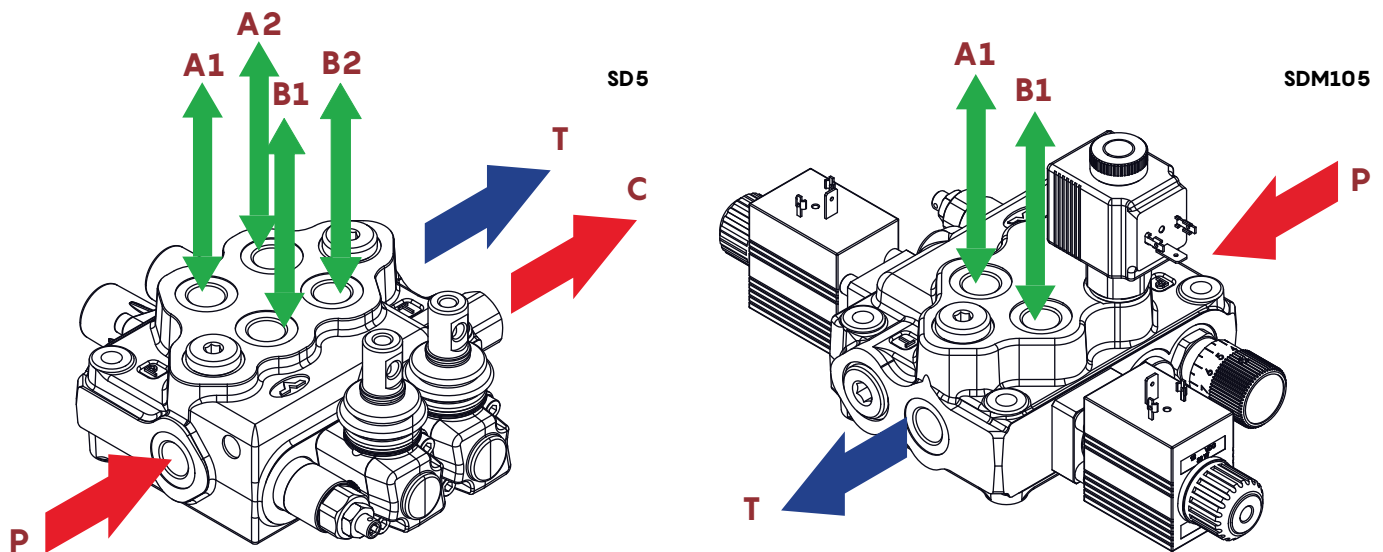
Nominal voltage tolerance	: ±10%
Power rating	: 8 W @ 12VDC
	: 9.1W @ 24 VDC
Max. operating current	: 0.67 A - 12 VDC
	: 0.37 A - 24VDC
Coil insulation	: Class H (180°C - 356°F)
Weather protection	: IP65 - ISO4400
Insertion	: 100%

Main rules

The SD5 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 body 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.



FITTINGS TIGHTENING TORQUE - Nm/lbft

THREAD TYPE	P and C ports	A and B ports	T port
BSP (ISO 228/1)	G 3/8	G 3/8	G 3/8 (G1/2*)
With O-Ring seal	35 / 25.8	35 / 25.8	35 / 25.8 (50 / 36.9*)
With copper washer	40 / 29.5	40 / 29.5	40 / 29.5 (50 / 36.9*)
With steel and rubber washer	30 / 22.1	30 / 22.1	30 / 22.1 (50 / 36.9*)
UN-UNF (ISO 11926/1)	3/4-16 UNF-2B (SAE 8)	9/16-18 UNF-2B (SAE 6)	3/4-16 UNF-2B (SAE 8)
With O-Ring seal	40 / 29.5	30 / 22.1	30 / 22.1
METRIC (ISO 262)	M18x1.5	M18x1.5	M18x1.5 (M22x1.5*)
With O-Ring seal	35 / 25.8	35 / 25.8	35 / 25.8 (50 / 36.9*)
With copper washer	40 / 29.5	40 / 29.5	40 / 29.5 (50 / 36.9*)
With steel and rubber washer	40 / 29.5	40 / 29.5	40 / 29.5 (50 / 36.9*)

Note: These torque are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.. (*) - only for series circuit.

- SD5 valve can be supplied with one coat of black paint **CVN** configuration

Description example: SD5/2-P(JG3-120)/18L/18L/AET-**<CVN>**

WALVOIL NEL MONDO | WALVOIL WORLDWIDE

WALVOIL S.P.A.

DIREZIONE E COORDINAMENTO INTERPUMP GROUP S.P.A.

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

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