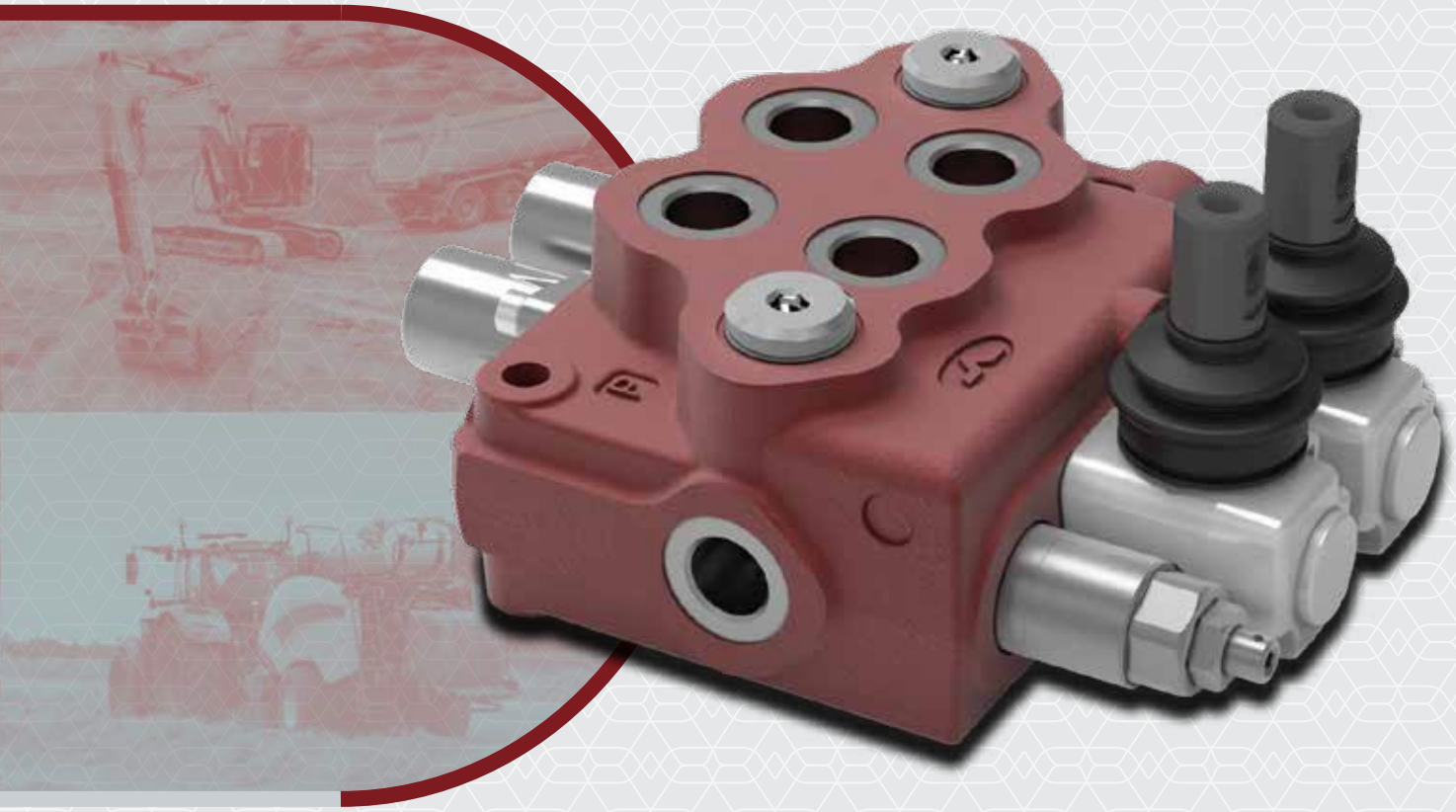
walvoil

MOTION BY PEOPLE

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 idraulic 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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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

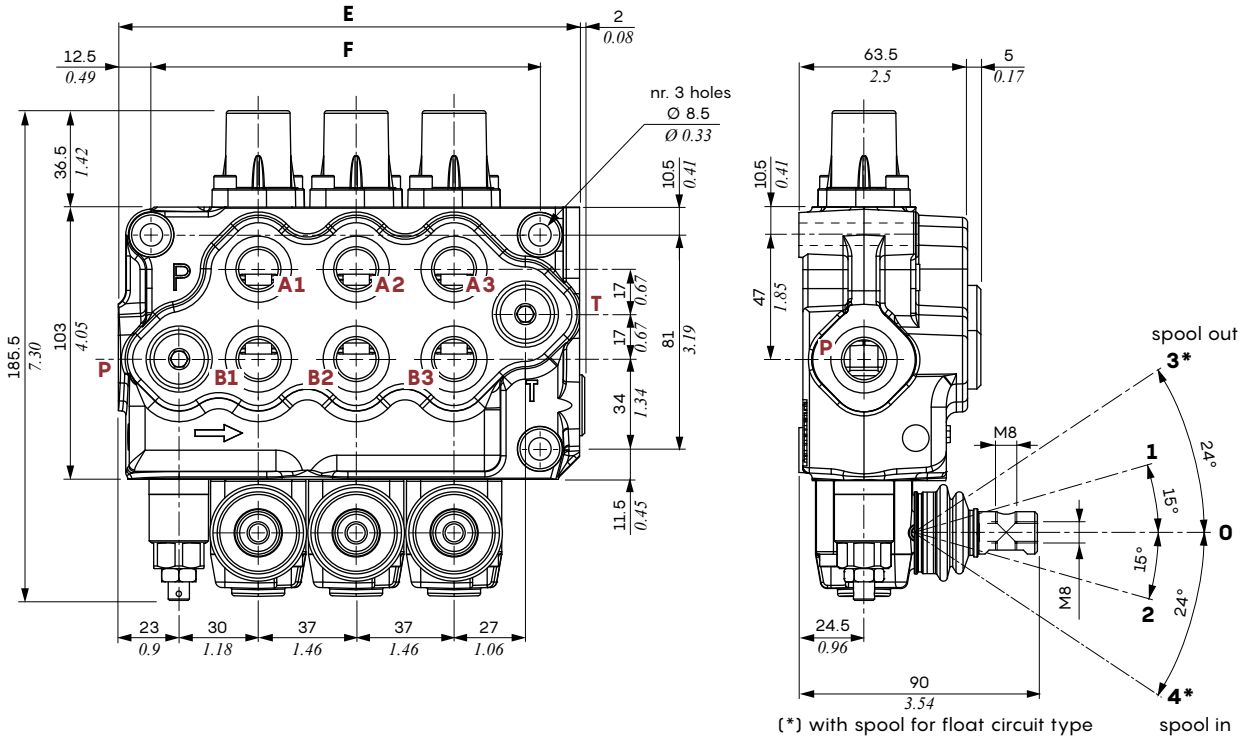
REFERENCE STANDARD					
		BSP	**UN-UNF**	**METRIC**	**NPTF**
THREAD ACCORDING TO		ISO 228/1	ISO 263	ISO 262	ANSI B1.20.3
		BS 2779	ANSI B1.1 unified		
CAVITY DIMENSION ACCORDING TO	ISO	1179-1	11926-1	9974-1	
	SAE		J1926-1	J2244	J476a
	DIN	3852-2 shape X or Y		3852-1 shape X or Y	

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 G 1/2*	3/4-16 (SAE 8)	M18x1.5 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



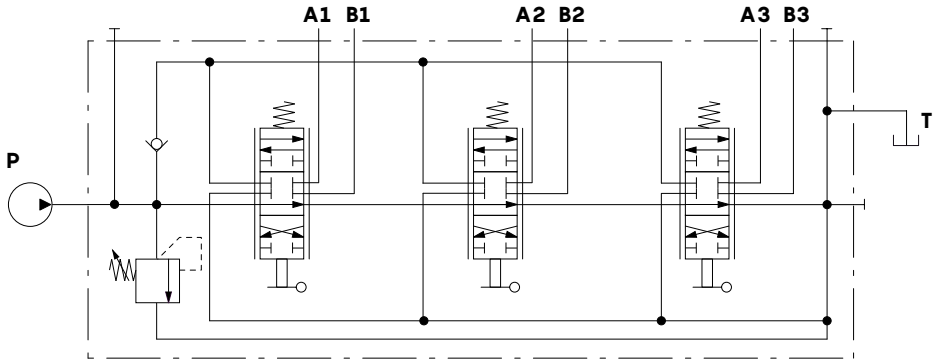
type circuit		E		F	
parallel	**tandem**	mm	*in*	mm	*in*
SD5/1-P	-	100.5	*3.96*	73	*2.87*
SD5/2-P	**SD5/2-SP**	137.5	*5.41*	110	*4.33*
SD5/3-P	**SD5/3-SP**	174.5	*6.87*	147	*5.79*
SD5/4-P	**SD5/4-SP**	211.5	*8.33*	184	*7.27*
SD5/5-P	**SD5/5-SP**	248.5	*9.78*	221	*8.7*
SD5/6-P	**SD5/6-SP**	285.5	*11.24*	258	*10.16*
SD5/7-P	**SD5/7-SP**	322.5	*12.7*	295	*11.61*

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

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

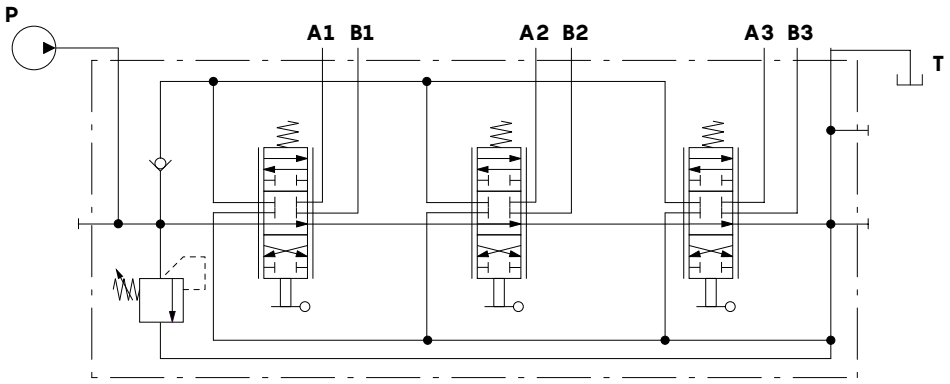
Hydraulic circuit

Parallel circuit execution (standard configuration)



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

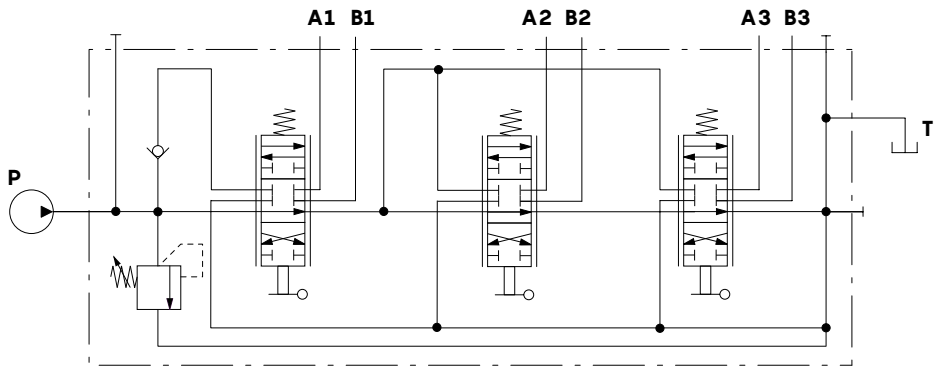
Parallel circuit execution (configuration with upper inlet and outlet)



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

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.



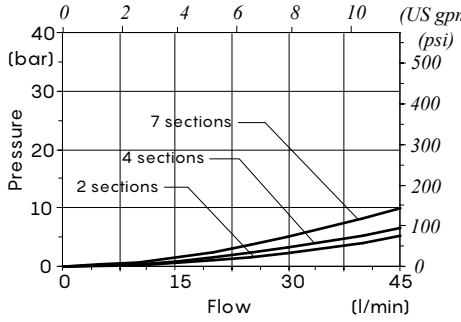
Description example:
SD5/3-**SP2**(KG3—120)/18L/18L/18L/**AET**

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

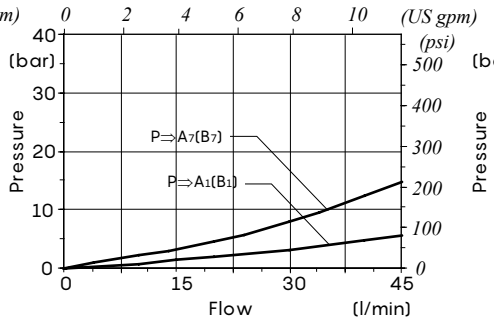
Performance data

Parallel circuit execution

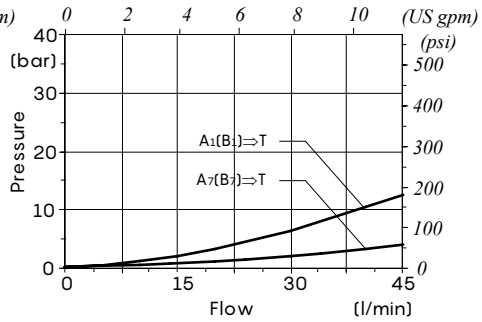
P⇒T pressure drops



P⇒A(B) pressure drops
7 sections valve

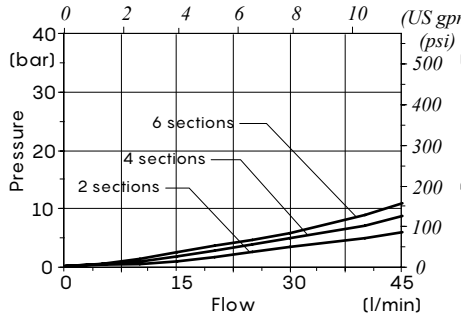


A(B)⇒T pressure drops
7 sections valve

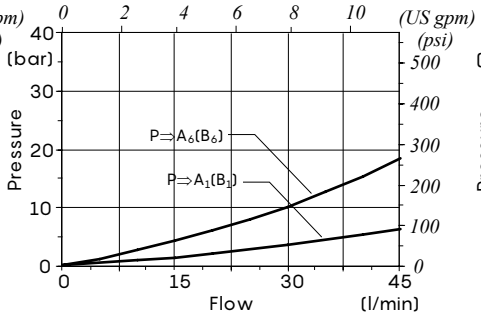


Tandem circuit execution

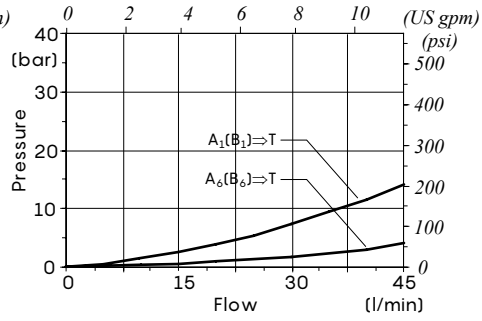
P⇒T pressure drops



P⇒A(B) pressure drops
6 sections valve

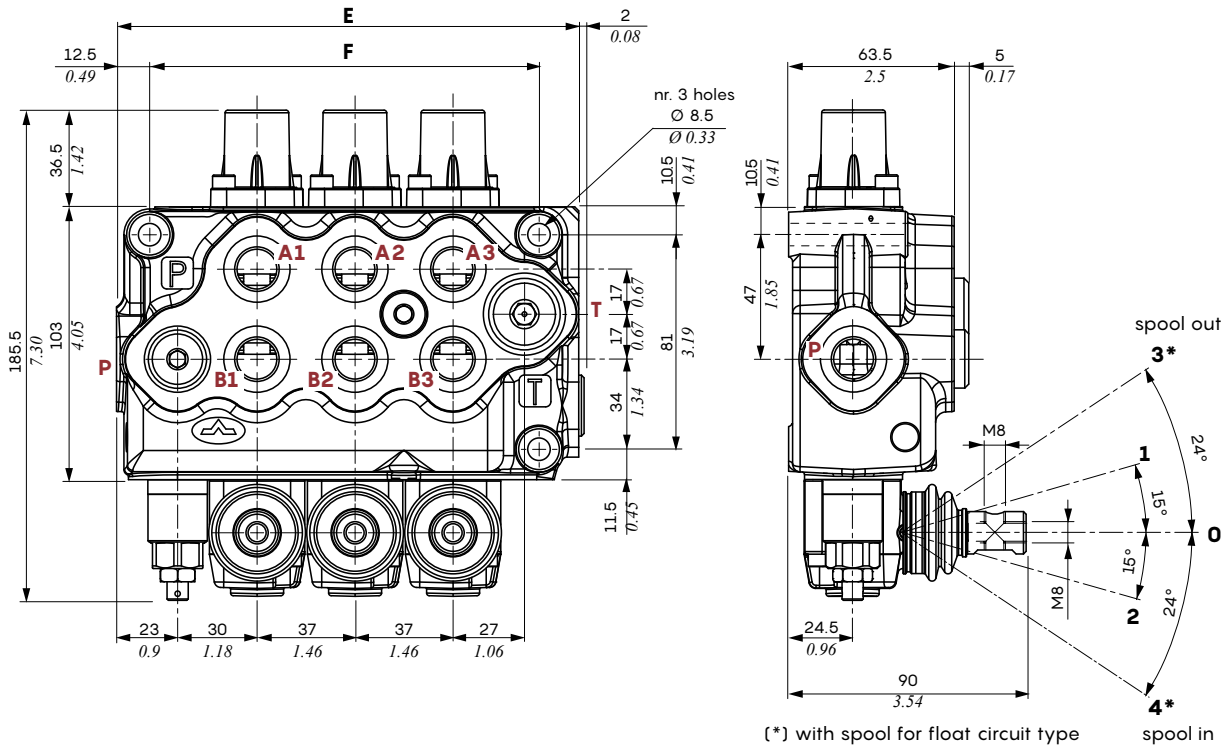


A(B)⇒T pressure drops
6 sections valve



Series (SD5-S) circuit execution

Dimensional data

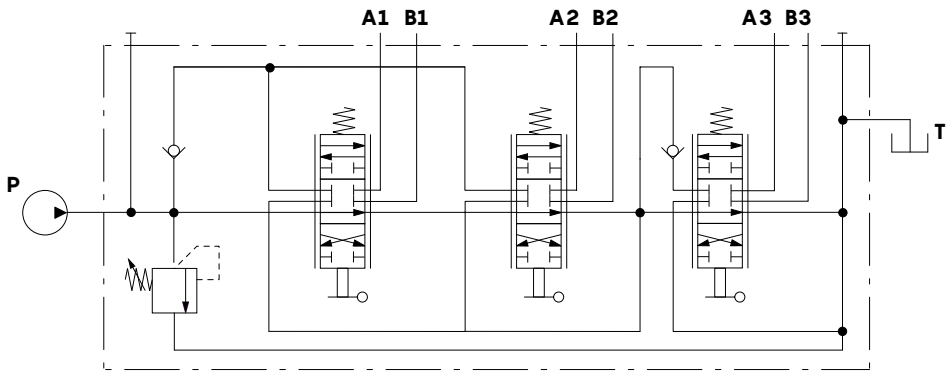


type	E		F	
	mm	*in*	mm	*in*
SD5/2-S	137.5	*5.41*	110	*4.33*
SD5/3-S	174.5	*6.87*	147	*5.79*
SD5/4-S	211.5	*8.33*	184	*7.27*
SD5/5-S	248.5	*9.78*	221	*8.7*
SD5/6-S	285.5	*11.24*	258	*10.16*
SD5/7-S	322.5	*12.7*	295	*11.61*

Note - Drawings and dimensions are referred to a **BSP** 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.

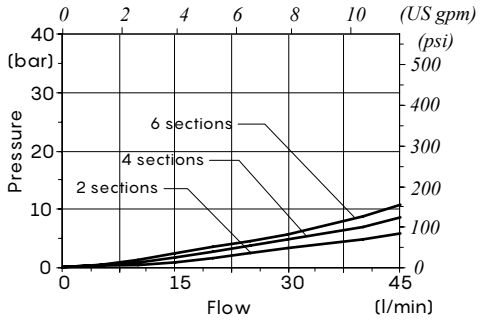


Description example:
SD5/3-**S1**(KG3—120)/18L/18L/18L

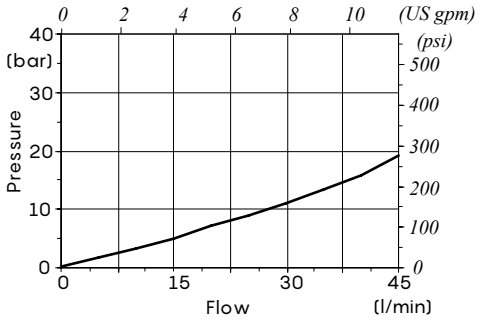
Series circuit execution SD5-S

Performance data

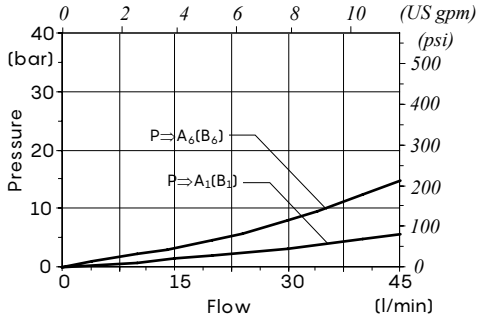
P⇒T pressure drops



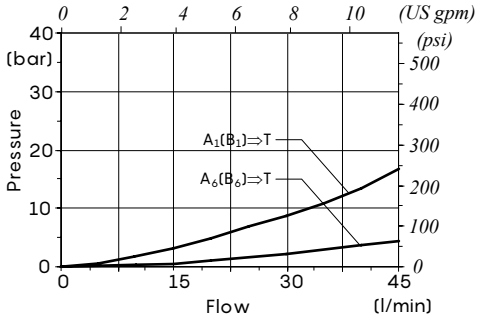
Pressure drops
Between port A(B) before series connection and port A(B) after



P⇒A(B) pressure drops
6 sections valve



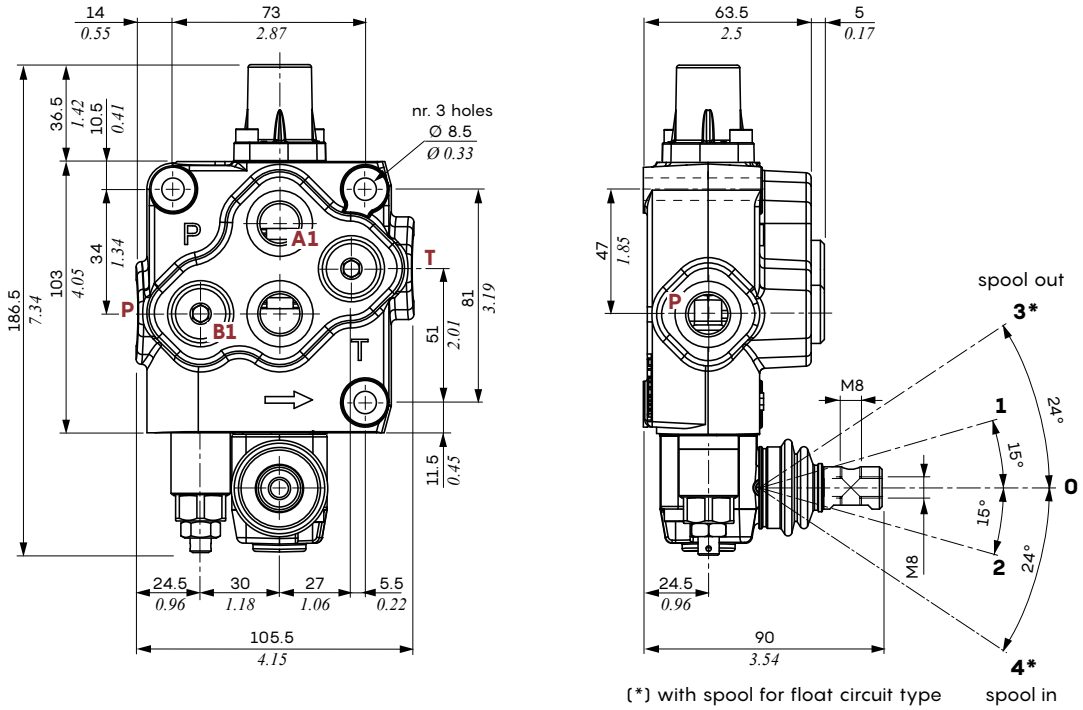
A(B)⇒T pressure drops
6 sections valve



Single section monoblock valve (SD5/1-N)

Dimensional data

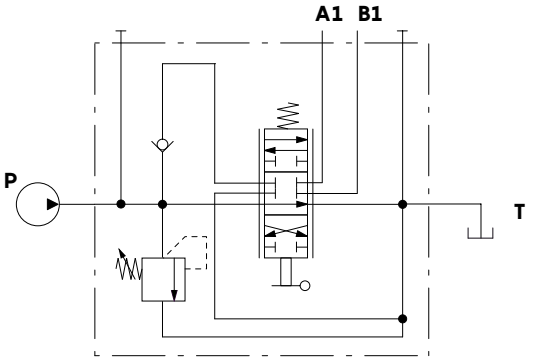
Execution with one working section. It can be used in hydraulic circuit where carry-over doesn't required. For controls, spool positioning and valves, refer to directional valve with parallel circuit.



(*) with spool for float circuit type spool in

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

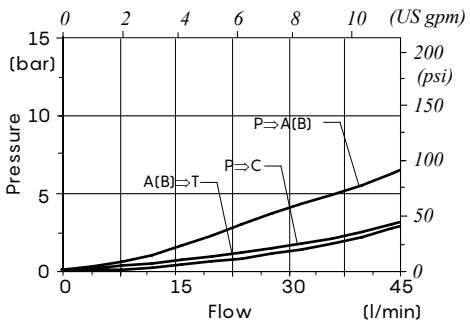
Hydraulic circuit



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

Performance data

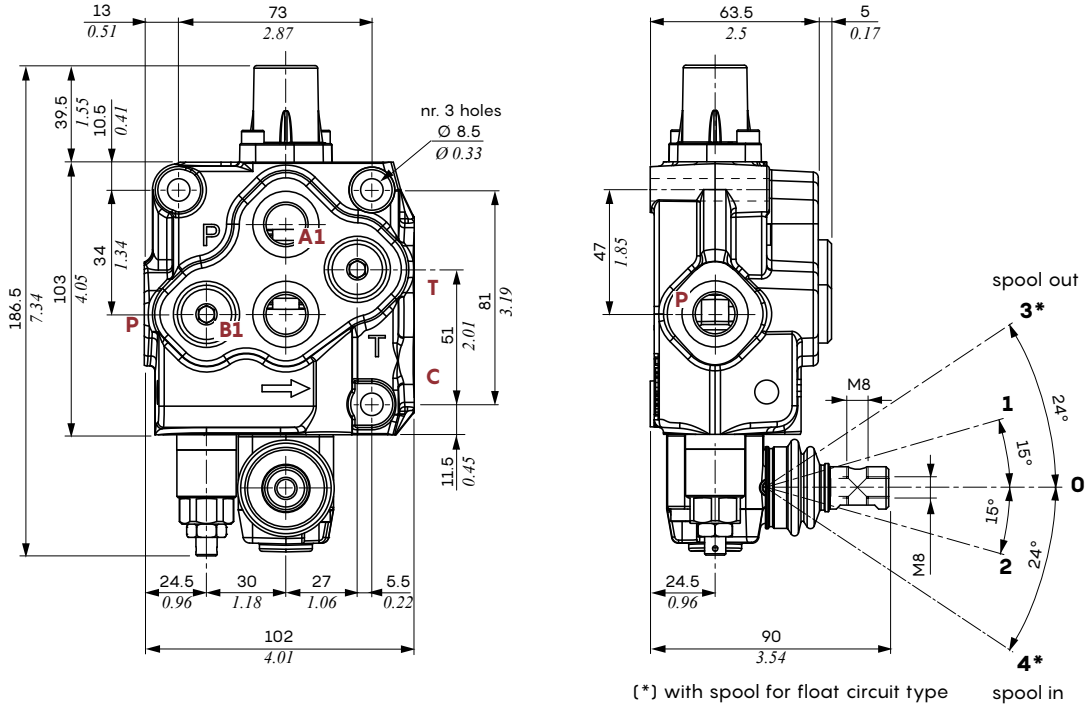
Pressure drops



Single section monoblock valve (SD5/1-D)

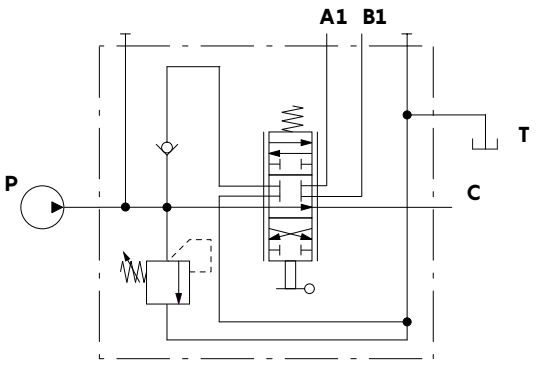
Dimensional data

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 **BSP** threading configuration.

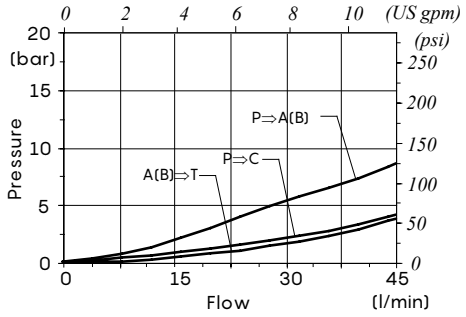
Hydraulic circuit



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

Performance data

Pressure drops

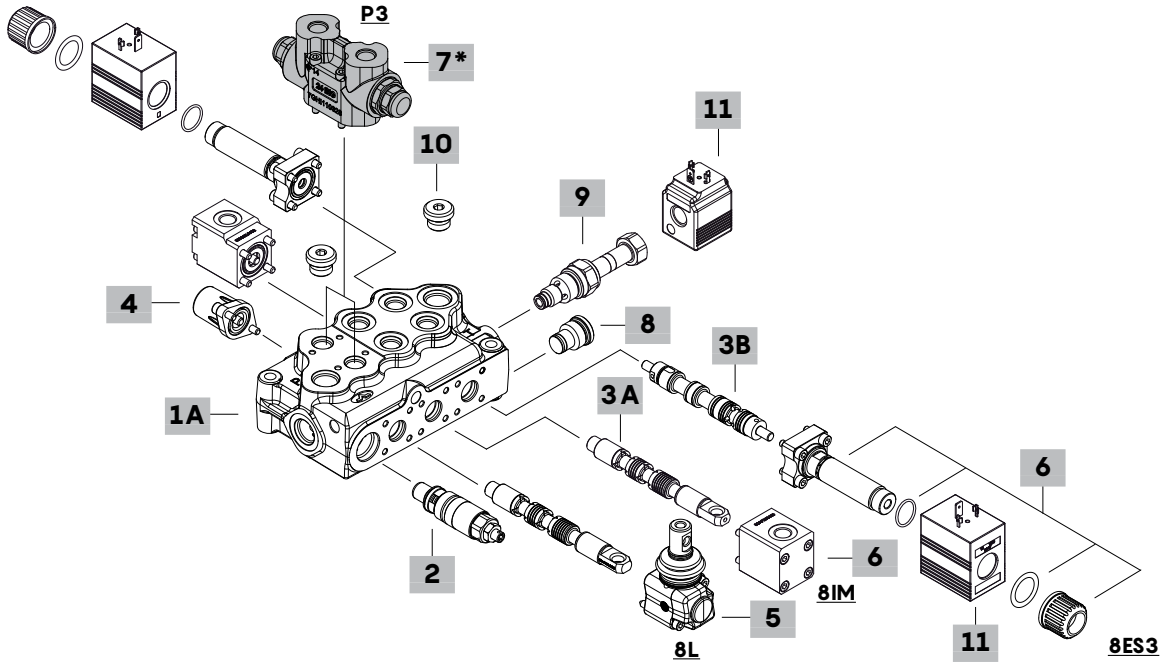


Ordering codes

nr. of sections | Valve setting (bar) | Valve setting (bar) | Ports thread

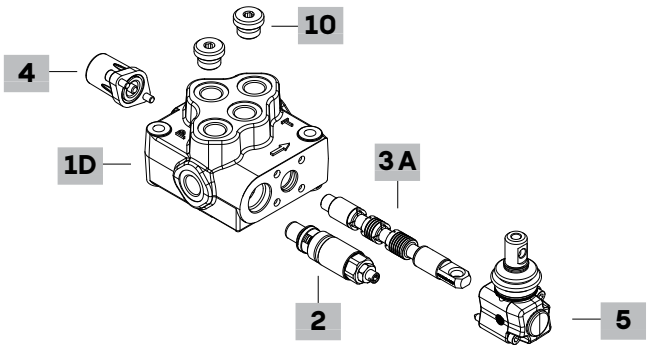
SD5/3-P (JG3-120) / VD11 / 1 8 L / 1 8IM/ 1 8ES3 . P3(G3-100) / AET-ELNW(NO) - ..... - 12VDC - <CVN>

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



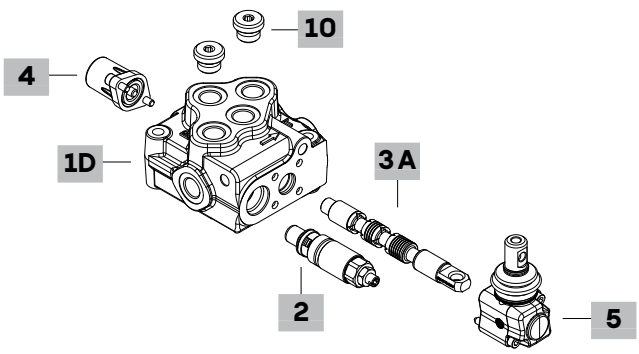
SD5/1-N (KG3-120) / 1 8 L - ..... - <CVN>

1 2 3 4 5 10



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

1 2 3 4 5 10



Notes - (*) For all auxiliary valves see dedicated pages from 62 to 77. All valves requires special machining on the SD5 body.
(**) 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	5KC1193000	1 section
SD5/2-P	5KC1223000	2 sections
SD5/3-P	5KC1243000	3 sections
SD5/4-P	5KC1273000	4 sections
SD5/5-P	5KC1313000	5 sections
SD5/6-P	5KC1353000	6 sections
SD5/7-P	5KC13E3000	7 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/1-P-IM-ES	5KC1193100	1 section
SD5/2-P-IM-ES	5KC1223100	2 sections
SD5/3-P-IM-ES	5KC1243100	3 sections
SD5/4-P-IM-ES	5KC1273100	4 sections
SD5/5-P-IM-ES	5KC1313100	5 sections
SD5/6-P-IM-ES	5KC1353100	6 sections
SD5/7-P-IM-ES	5KC13E3100	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	5KC1183000	2 sections
SD5/3-SP2	5KC12G3000	3 sections
SD5/4-SP3	5KC1293000	4 sections
SD5/5-SP4	5KC1333000	5 sections
SD5/6-SP5	5KC1373000	6 sections
SD5/7-SP6	5KC13F3000	7 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/2-SP1-IM-ES	5KC1183000A	2 sections
SD5/3-SP2-IM-ES	5KC12G3000A	3 sections
SD5/4-SP3-IM-ES	5KC1293000A	4 sections
SD5/5-SP4-IM-ES	5KC1333000A	5 sections
SD5/6-SP5-IM-ES	5KC1373000A	6 sections
SD5/7-SP6-IM-ES	5KC13F3000A	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	5KC1153040	2 sections
SD5/3-S1	5KC1253003	3 sections
SD5/4-S1	5KC1283003	4 sections
SD5/5-S1	5KC1324033	5 sections
SD5/6-S1	5KC1363003	6 sections
For proportional hydraulic and ON/OFF electric controls		
SD5/2-S1-IM-ES	5KC1153040A	2 sections
SD5/3-S1-IM-ES	5KC1253103	3 sections
SD5/4-S1-IM-ES	5KC1283100	4 sections
SD5/5-S1-IM-ES	5KC1324100	5 sections
SD5/6-S1-IM-ES	5KC1363003A	6 sections

1D Body kit for single section execution (1)

TIPO	CODE	DESCRIPTION
SD5/1-N	5KC1203040 (1)	Without "carry-over", for mechanical control
SD5/1-N-IM-ES	5KC1203100 (1)	As SD5/1-N for proportional hydraulic and ON/OFF controls
SD5/1-D	5KC1213000 (1)	As SD5/1-N with "carry-over"
SD5/1-D-IM-ES	5KC1213100	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 22

Spools 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
1CEXX	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 **BSP** 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
2CEXX	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 (4th 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 (4th 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 (4th pos.), spool out (lever to push),**it requires A side controls type 13FZ and 13FZ1 and addictional 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 **BSP** 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 micoswitch 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 **BSP** threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

4 A side controls page 27

TYPE	CODE	DESCRIPTION
For floating circuit		
13QNK4	5V13405022	As type13QN 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	For LCN1 or LCN4 configuration with nylon bearing
LCN2-3	5CLO305101	For LCN2 or LCN3 configuration with nylon bearing
LCA1-4	5CLO305055	For LCA1 or LCA4 configuration with bronze bearing
LCA2-3	5CLO305056	For LCA2 or LCA3 configuration 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 **BSP** 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	5IDR205021	Pilot control kit
13IM	5IDR205330	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-G3/8	3XGIU522460[1]	G3/8 carry-over sleeve
AE2-G3/8	5GIU524330[1]	As previous short type
AE-G1/2	3XGIU527490[1]	G1/2 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
3XTAP722160	G3/8 plug
3XTAP727180	G1/2 plug

11 Coils page 116

For complete available coil list and connectors 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**

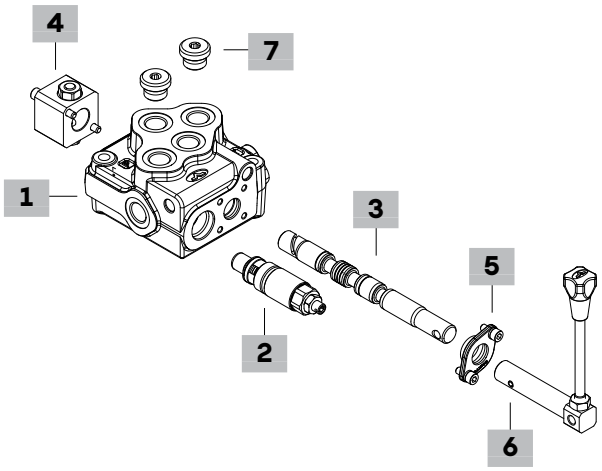
Notes - (1) Codes are referred to **BSP** threads - (2) Please contact our Sales Dpt for more information.

Ordering codes

Rotary spool control kit configuration

SD5/1-P (KG3-120) / 1 R LL - <CVN>

1 2 3 4 5 6



1 Body kit(1)

TYPE	CODE	DESCRIPTION
SD5/1-P	5KC1193000	1 section

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 Lever

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

7 Port plugs(1)

CODE	DESCRIPTION
3XTAP722160	G3/8 plug
3XTAP727180	G1/2 plug

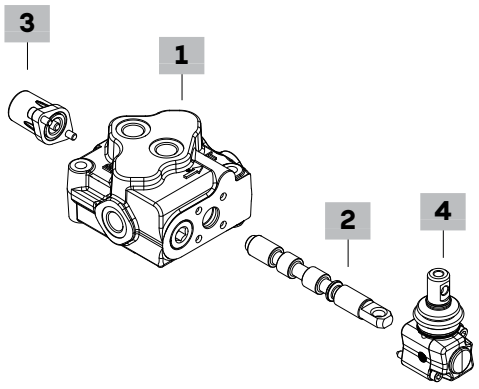
Notes - (1) Codes are referred to **BSP** threads

Ordering codes

5 positions manually operated configuration

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

1 2 3 4 1



1 Body kit(1)

TYPE: **SD5/1-D(SV)/BSP/9L-PSL-SVR** CODE: 5KC1213900S

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 **BSP** threads

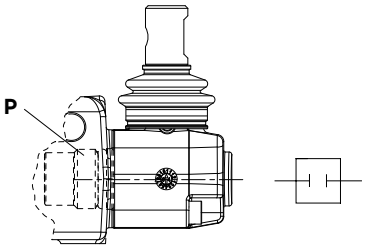
Main pressure relief valves

Dimensions and hydraulic circuit

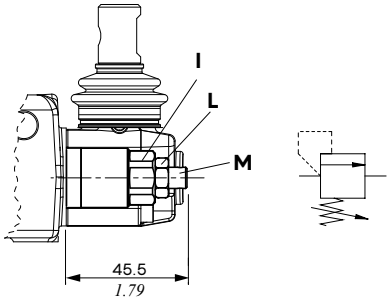
Description example: **K G 1 - 30**

- type: directly controlled = **K**; zero-leak directly controlled = **JN**
- spring type
- configuration: **G** = with screw; **V** = with handweel; **H** = set and locked; **ZT** = fix setting with plastic cap
- valve setting (bar)

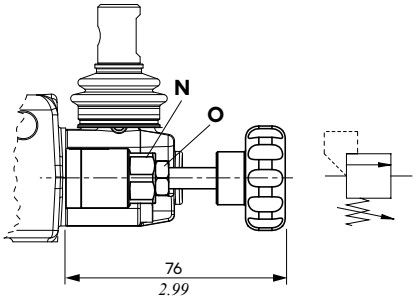
Relief valve blanking plug



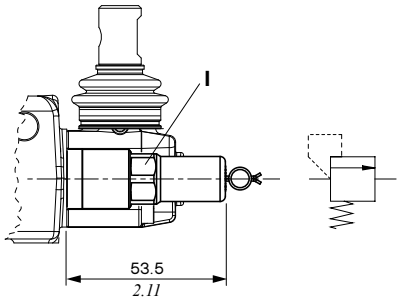
Type G configuration
with screw



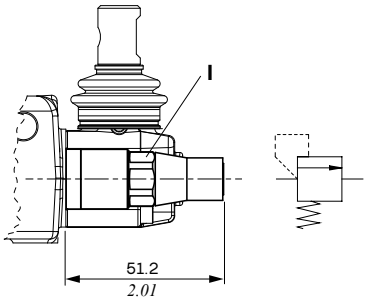
Type V configuration
with handweel



Type H configuration
set and locked



Type ZT configuration
fix setting with plastic cap



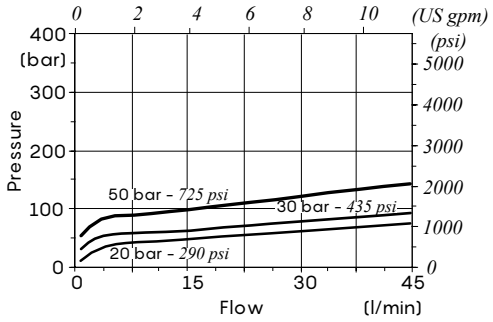
Wrenches and tightening torques
P = allen wrench 10 - 42 Nm *(31 lbft)*
I = wrench 19 - 42 Nm *(31 lbft)*
L = wrench 13 - 24 Nm *(17.7 lbft)*
M = allen wrench 4
N = wrench 19- 50 Nm *(36,9 lbft)*
O = wrench 13 - 30 Nm *(22.1 lbft)*

Main pressure relief valves

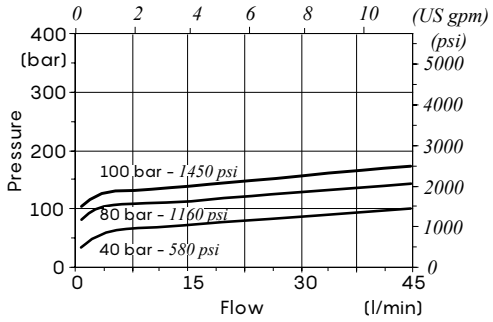
Performance data

Type K valve

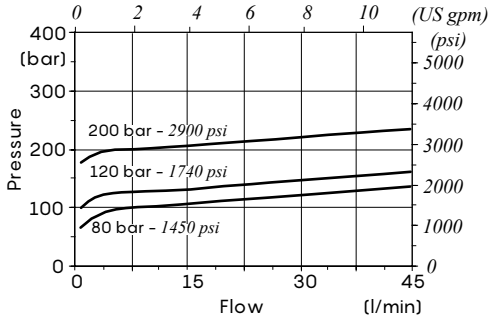
Setting range spring nr.1



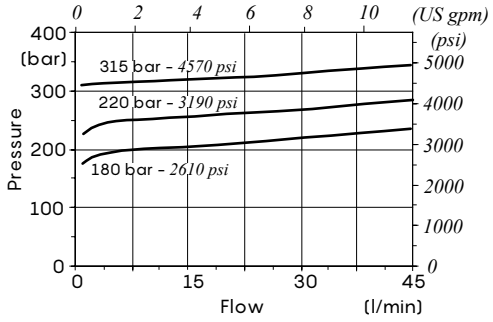
Setting range spring nr.2



Setting range spring nr.3

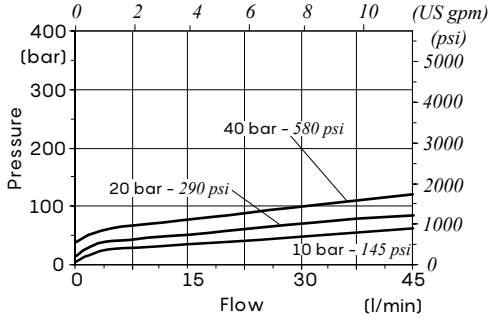


Setting range spring nr.4

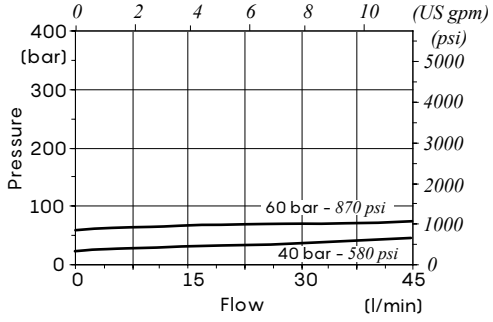


Type JN valve

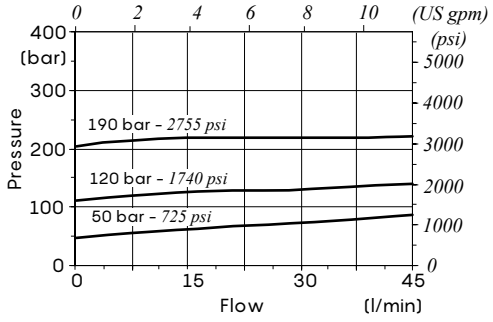
Setting range spring nr.1



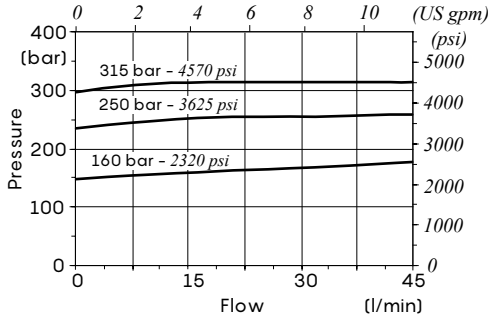
Setting range spring nr.2



Setting range spring nr.3



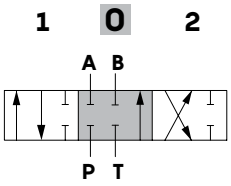
Setting range spring nr.4



Spools

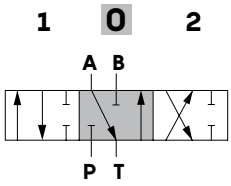
Double acting

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



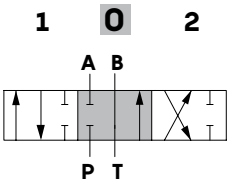
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*
for 1ES and 1(ES3LHC)
nominal position 1: + 3.4 mm *(+0.134 in)*
nominal position 2: - 3.4 mm *(-0.134 in)*

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)*

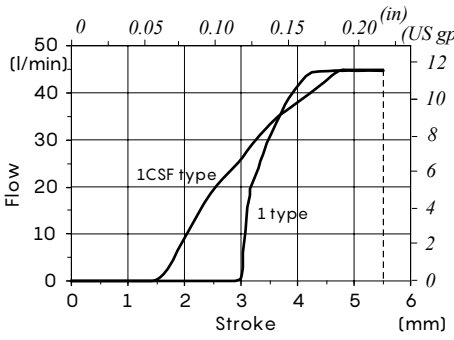
Spool types 1B (1BCEX)
3 positions, with B connect to tank in neutral position



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

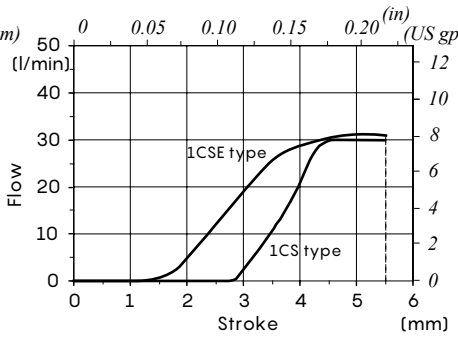
Spool metering types 1-1CSF

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



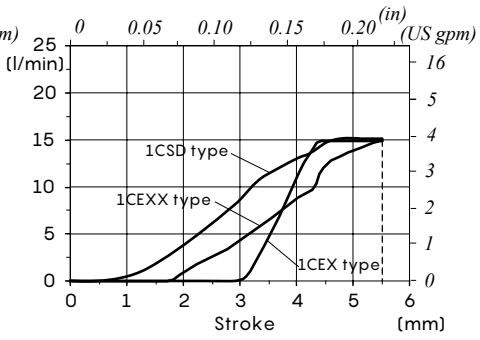
Spool metering types 1CS-1CSE

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

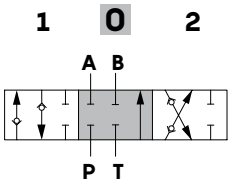


Spool metering types 1CSD-1CEX-1CEXX

P⇒A(B)⇒B(A)⇒T
Q_{in} = 15 l/min / *(3.96 US gpm)*
$P_{(on\ ports)}$ = 100 bar / *(1450 psi)*

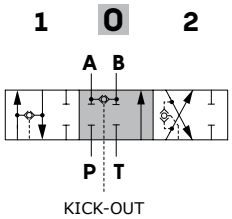


Spool type 1 CSVR
3 positions, A and B closed in neutral position, with load check valve



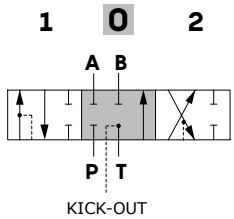
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*

Spool type 1A (11A)
3 positions, with A and B closed in neutral position, **for pressure kick-out**



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**

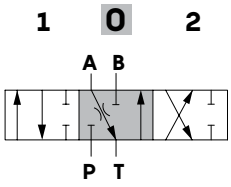


Stroke
position 1: + 5.2 mm *(+0.205 in)*
position 2: - 5.2 mm *(-0.205 in)*

Spools

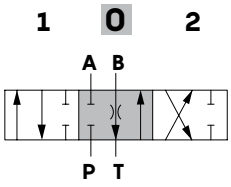
Double acting

Spool type 1AHCEX
3 positions, with A partially connect to tank in neutral position



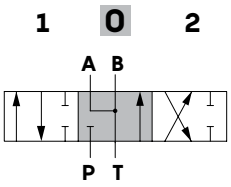
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*

Spool type 1BHCEX
3 positions, with B partially connect to tank in neutral position



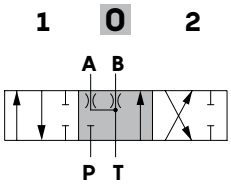
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*

Spool types 2 (2CSE-2R-2CEX-2CEXX-2ES-2(ES3LHE))
3 positions, with A and B connect to tank in neutral position



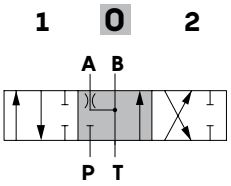
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*
for 1AES, 2ES and 2(ES3LHC)
nominal position 1: + 3.4 mm *(+0.134 in)*
nominal position 2: - 3.4 mm *(-0.134 in)*

Spool types 2HCEX (2HCSE-2HES)
3 positions, with A and B partially connect to tank in neutral position



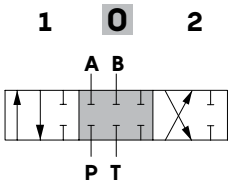
Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*
for 2HES
position 1: + 3.4 mm *(+0.134 in)*
position 2: - 3.4 mm *(-0.134 in)*

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)*

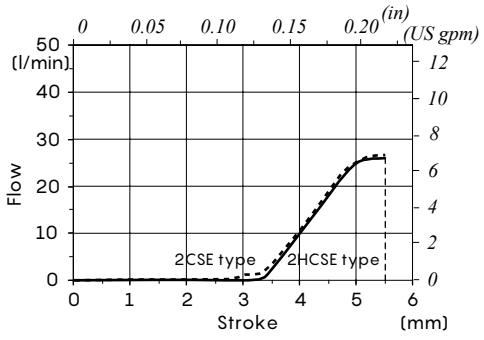
Spool type 6
3 positions, with closed center



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

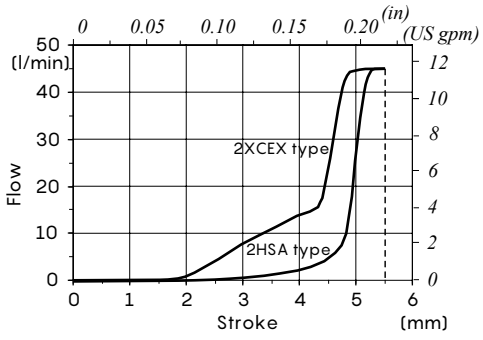
Spool metering types 2CSE-2HCSE

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

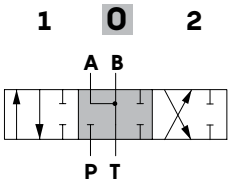


Spool metering types 2H(CEX)-2HSA

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



Spool type 7
3 positions, closed center with A and B connect to tank in neutral position

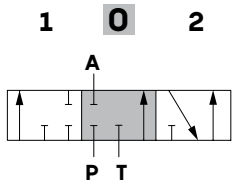


Stroke
position 1: + 5.5 mm *(+0.216 in)*
position 2: - 5.5 mm *(-0.216 in)*

Spools

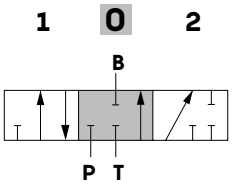
Single acting

Spool type 3 (3ES-3[ES3LHC])
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)*

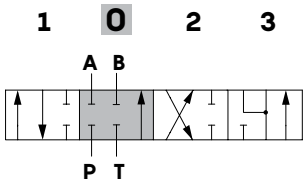
Spool type 4
3 positions, single acting in B



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

Double acting for float circuit type

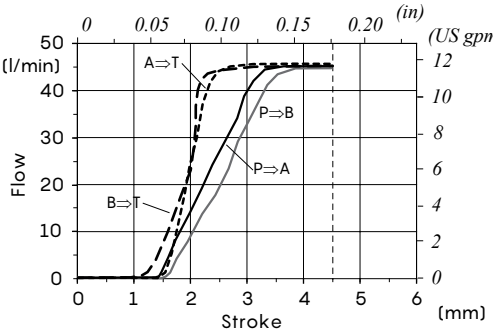
Spool type 5DY
4 positions, floating in position 3 (4th position), spool in



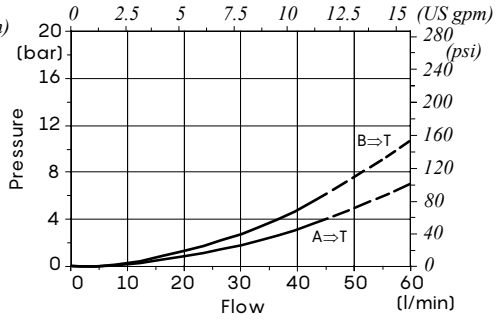
Stroke
position 1: + 4.5 mm *(+0.177 in)*
position 2: - 4.5 mm *(-0.177 in)*
position 3: - 9 mm *(-0.354 in)*

Spool metering type 5DY

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

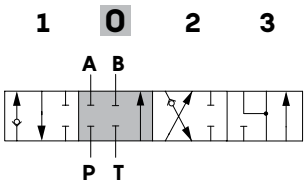


Pressure drop in position 3



SdC2449_cursori5PY-5WY 5DY come da vecchio catalogo

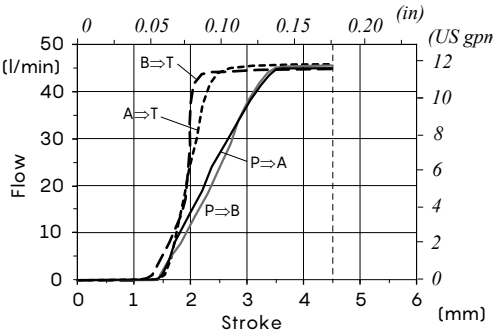
Spool type 5WY
4 positions, floating in position 3 (4th position), spool in, with check valve on A



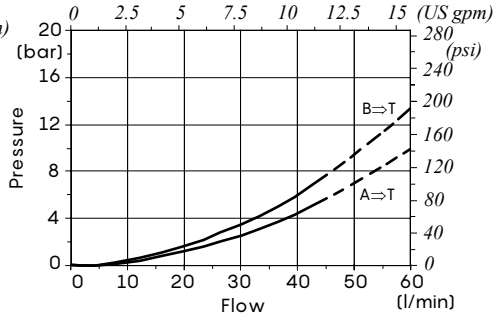
Stroke
position 1: + 4.5 mm *(+0.177 in)*
position 2: - 4.5 mm *(-0.177 in)*
position 3: - 9 mm *(-0.354 in)*

Spool metering type 5WY

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



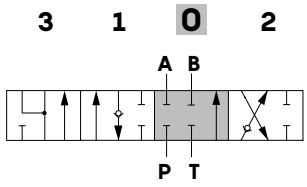
Pressure drop in position 3



Double acting for float circuit type

Spool type 5PY

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

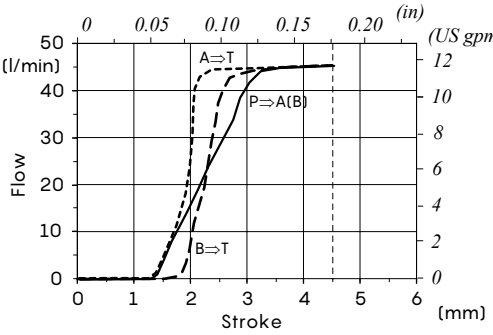


Stroke

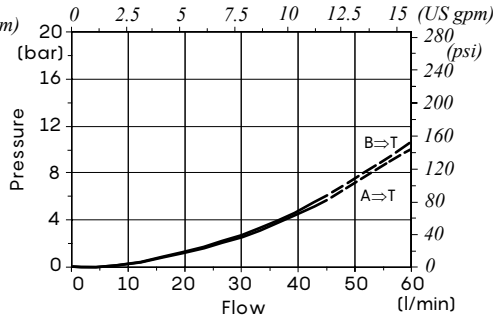
position 3: + 9 mm *(+0.354 in)*
position 1: + 4.5 mm *(+0.177 in)*
position 2: - 4.5 mm *(-0.177 in)*

Spool metering type 5PY

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

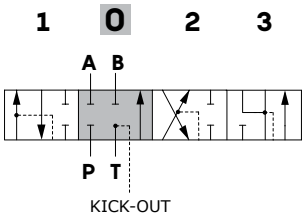


Pressure drop in position 3



Spool type 5(14A)

4 positions, floating in position 3 (4th position), spool in, **for pressure kick-out**

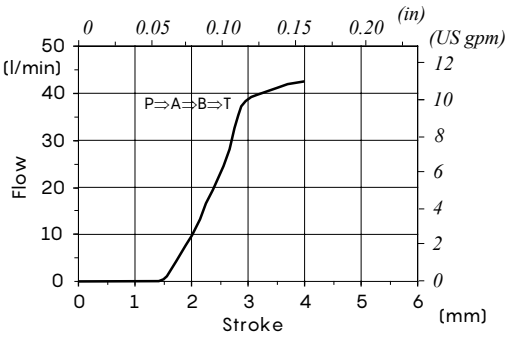


Stroke

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

Spool metering type 5(14A)

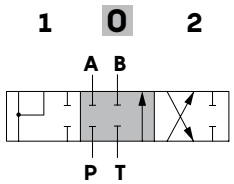
Q_{in} = 45 l/min / *(11.89 US gpm)*
$P_{(on\ ports)}$ = 100 bar / *(145 psi)*



Regenerative circuit type

Spool type 8F

3 positions, regenerative in position 1

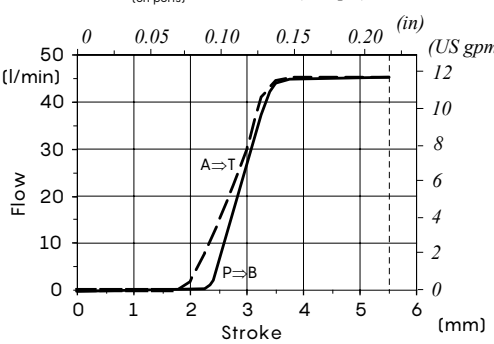


Stroke

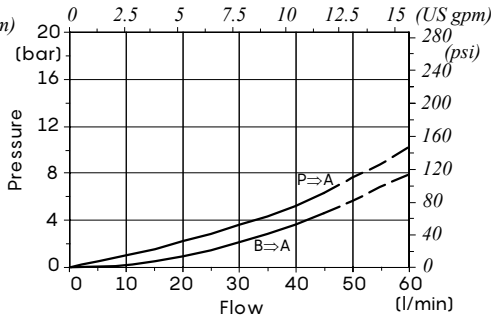
position 1: + 5.5 *(+0.216 in)*
position 2: - 5.5 *(-0.216 in)*

Spool metering type 8F

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



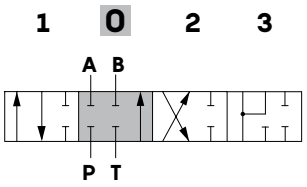
Pressure drop in position 1



Spools

Regenerative circuit type

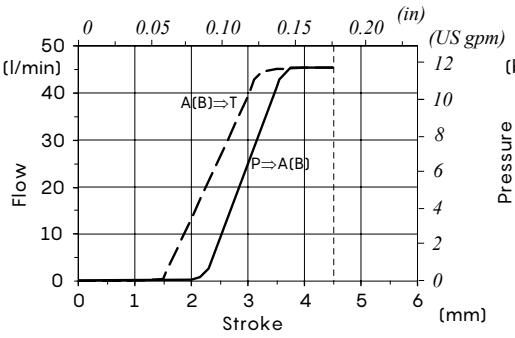
Spool type 8(13FZ)
4 positions, regenerative in position 3, spool in, **it requires 13FZ and 13FZ1 control kits**



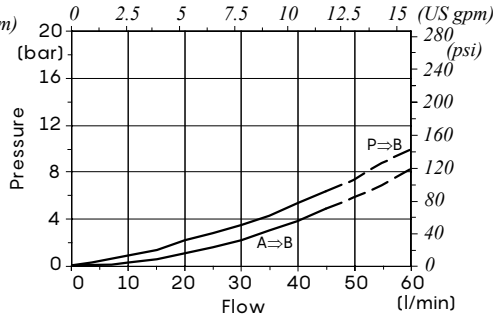
Stroke
position 1: + 4.5 mm *(+0.177 in)*
position 2: - 4.5 mm *(-0.177 in)*
position 3: - 7.5 mm *(-0.295 in)*

Spool metering type 8(13FZ)

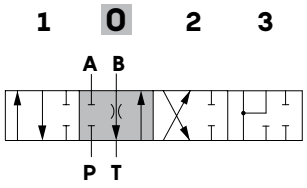
Q_{in} = 45 l/min / *(11.89 US gpm)*
$P_{(on\ ports)}$ = 100 bar / *(145 psi)*



Pressure drop in position 3

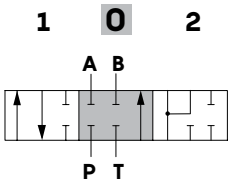


Spool type 8(17F)
4 positions, regenerative in position 3, with B partially connect to tank in neutral position, **it requires 17FZ control kits**



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

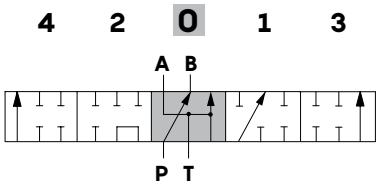
Spool type 8P
3 positions, regenerative in position 2



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

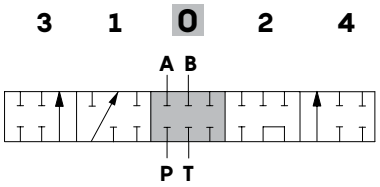
Double acting, 5 positions

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

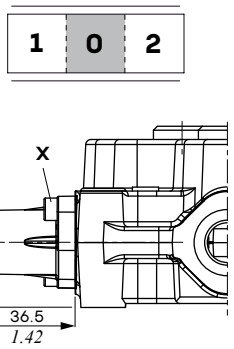


Stroke
position 3: + 8 mm *(+0.315 in)*
position 1: + 4 mm *(-0.157 in)*
position 2: - 4 mm *(-0.157 in)*
position 4: - 8 mm *(-0.315 in)*

A side controls

Free control

Type 7



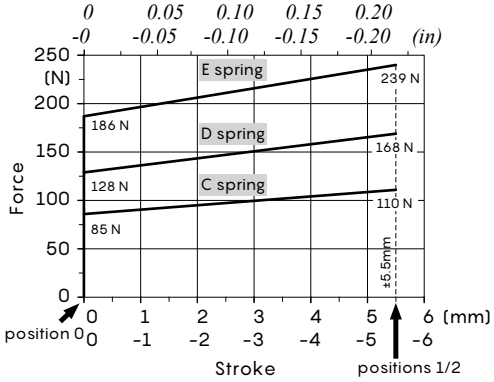
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbf)*

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

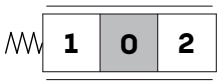
Force-Stroke diagram
(see the table)

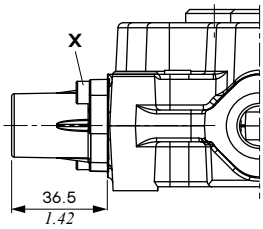


Type 6
Not pre-assembled kit

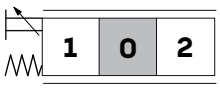
Type 8
With pre-assembled kit
(standard D spring)

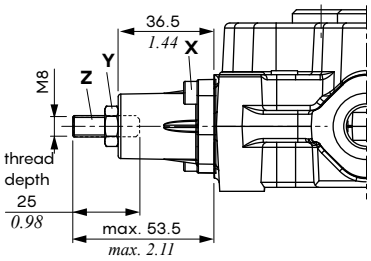
Type 8WPO
Water proof type



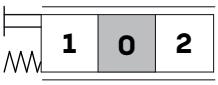


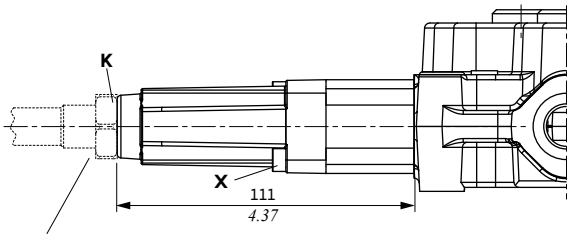
Type 8F2
Spool stroke limiter on port B





Type 8TCL
As type 8 flexible cable control arrangement





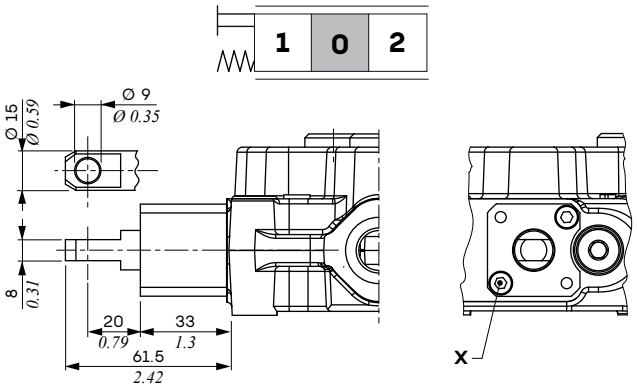
Flexible cable type CD
and CG not included, see
dedicated remote controls
catalogue

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

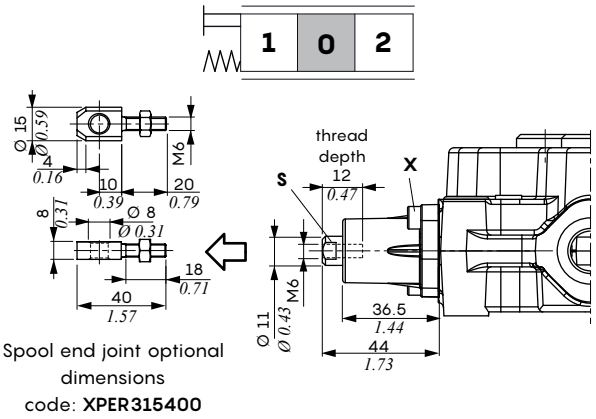
A side controls

3 positions, spring return in neutral position

Type 8TL
As type 8, double control arrangement

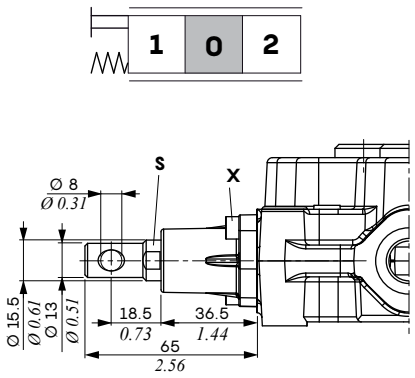


Type 8D
As type 8, M6 female threaded pin extension

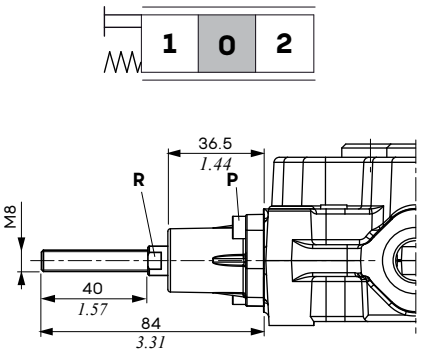


Spool end joint optional dimensions
code: **XPER315400**

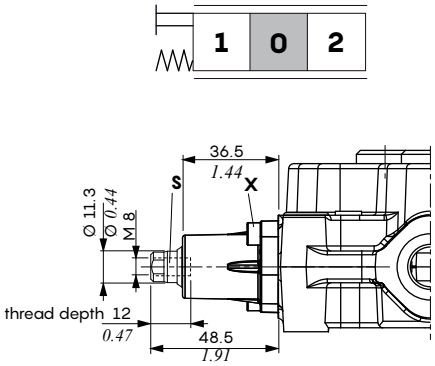
Type 8D1
As type 8, Ø 8 *(Ø 0.31)* hollow pin extension



Type 8D2
As type 8, M8 male threaded pin extension



Type 8D3
As type 8, M8 female threaded pin extension

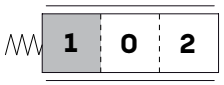


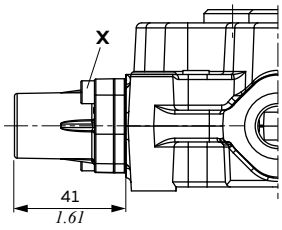
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
S= wrench 9-9.8 Nm *(7.2 lbtf)*
R= wrench 9 - 10 Nm *(7.4 lbtf)*
P= allen wrench 4-7.5 Nm *(5.5 lbtf)*

A side controls

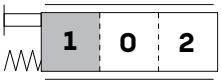
3 positions, spring return in position 1 or 2

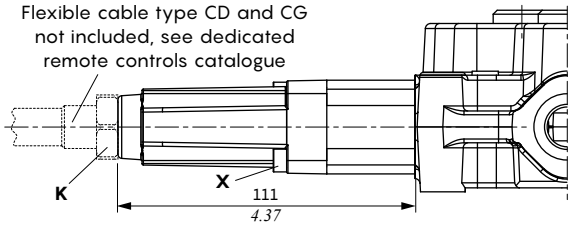
Type 17
Spring return in position 1





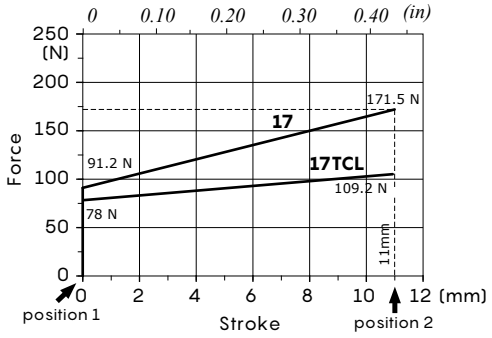
Type 17TCL
As type 17, flexible cable control arrangement



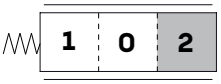


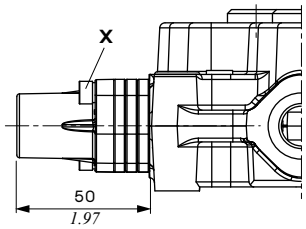
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 24
S= allen wrench 9-9.8 Nm *(7.2 lbtf)*
R= allen wrench 4-7.5 Nm *(5.51 lbtf)*

Force-Stroke diagram (17-17TCL)

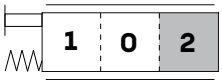


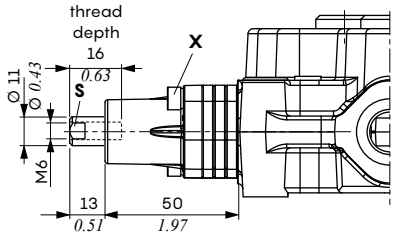
Type 18ME
Spring return in position 2



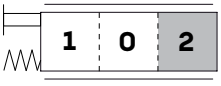


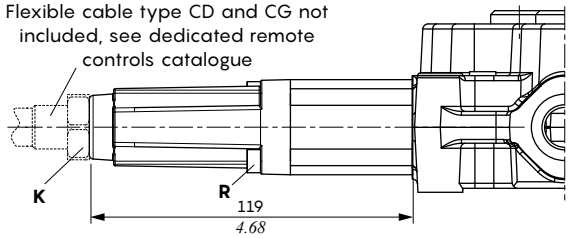
Type 18DB
As type 18ME, M6 female threaded pin extension



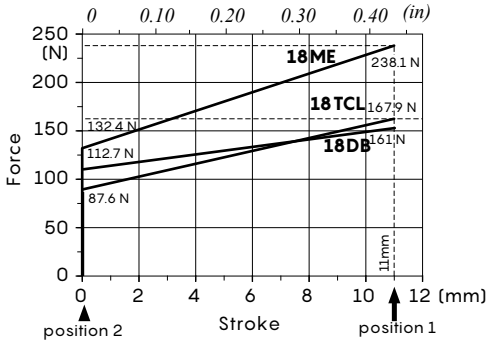


Type 18TCL
As type 18ME, flexible cable control arrangement





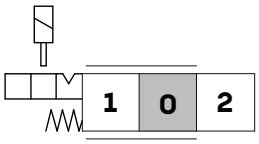
Force-Stroke diagram (18ME-18DB-18TCL)

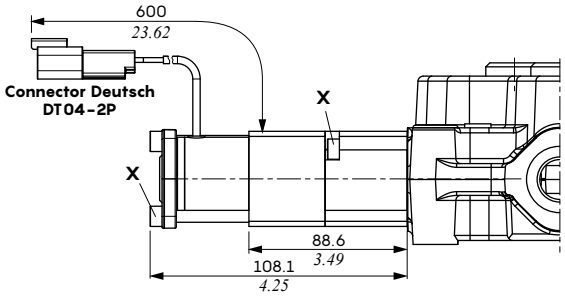


A side controls

3 positions, with detent, spring return in neutral position

Type 8RM2
Electromagnetic detent in position 2

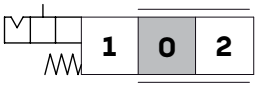


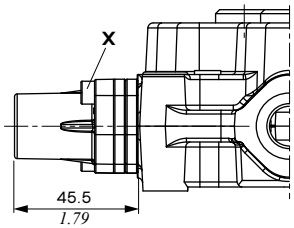


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbf)*
S= allen wrench 9-9.8 Nm *(7.2 lbf)*
K= wrench 24

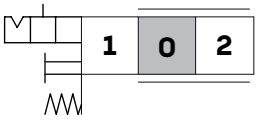
Technical features
Nominal voltage..... 12 VDC
Power rating .....5.5 W
Resistance at 20°C.....26.5 Ohm
Min unlocking force.....45 N
Duty cycle.....100%

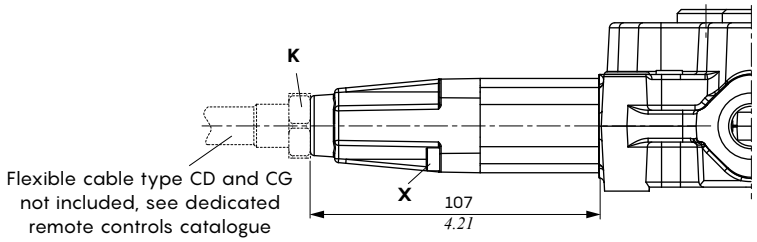
Type 9
Detent in position 1





Type 9TCL
As type 9, flexible cable control arrangement

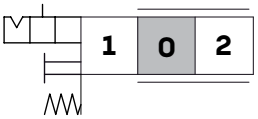


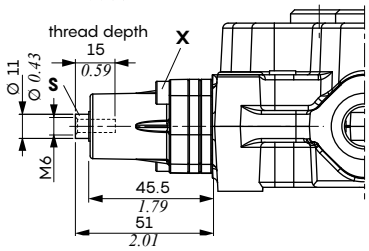


Flexible cable type CD and CG not included, see dedicated remote controls catalogue

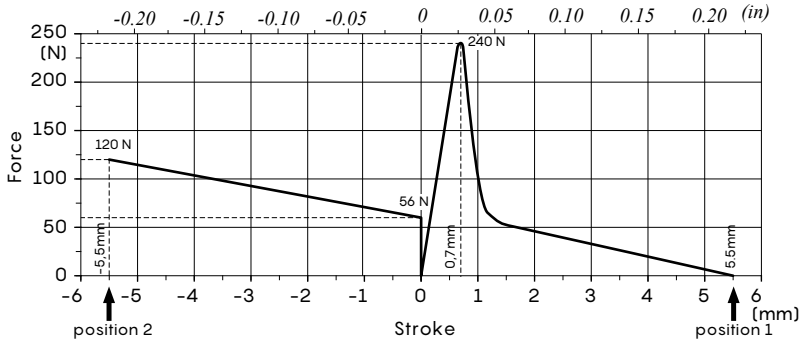
Technical features
Locking force (from 0 to 1) . . 240 N ± 30 N / *53.9 lbf ± 6.7 lbf*
Release force (from 1 to 0) . . 150 N ± 20 N / *33.7 lbf ± 4.5 lbf*

Type 9D
As type 9, M6 female threaded pin extension





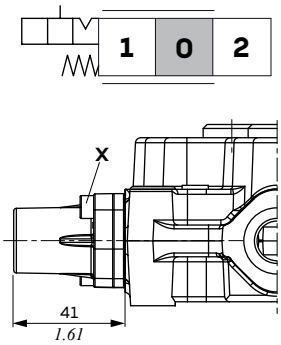
Force-Stroke diagram
(9 - 9D - 9TCL)



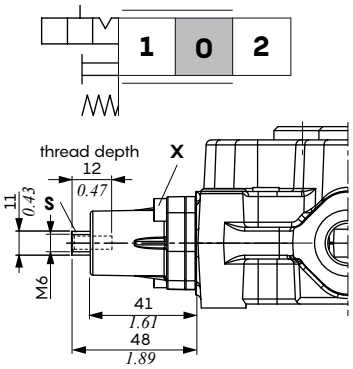
A side controls

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

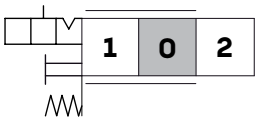


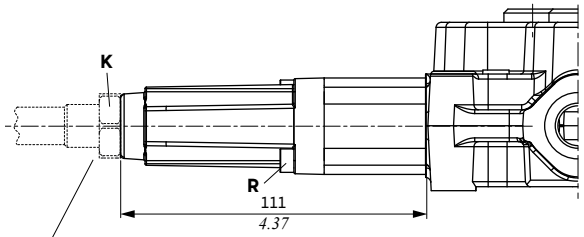
Technical features

Locking force (from 0 to 2) . . 240 N ± 30 N / *53.9 lbf ± 6.7 lbf*

Release force (from 2 to 0) . . 150 N ± 20 N / *33.7 lbf ± 4.5 lbf*

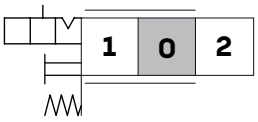
Type 10TCL
As type 10, flexible cable control arrangement

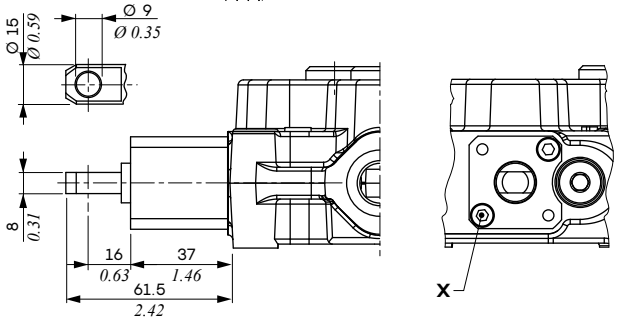




Flexible cable type CD and CG not included, see dedicated remote controls catalogue

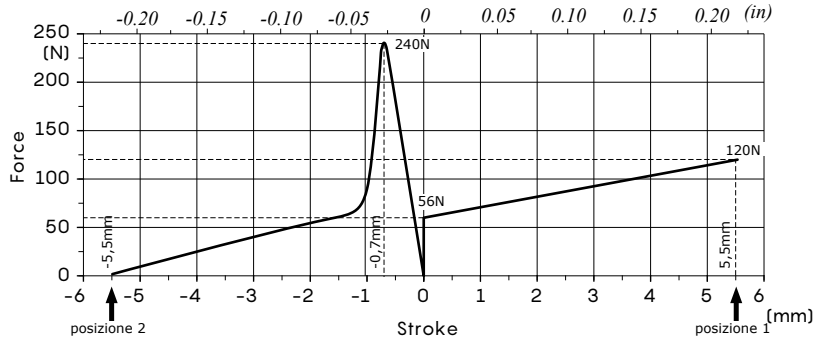
Type 10TL
As type 10, double control arrangement





Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 24
S= allen wrench 9-9.8 Nm *(7.2 lbtf)*
R= allen wrench 4-7.5 Nm *(5.51 lbtf)*

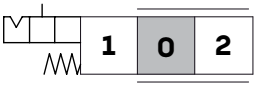
Force-Stroke diagram
(10 - 10D - 10TCL - 10 TL)



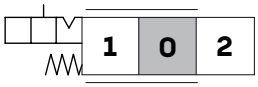
A side controls

3 positions, with detent, spring return in neutral position

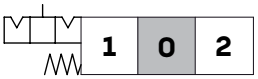
Type 9BZ
Detent in position 1

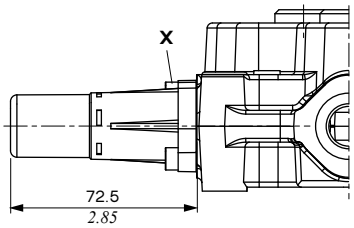


Type 10BZ
Detent in position 2



Type 11BZ
Detent in all positions

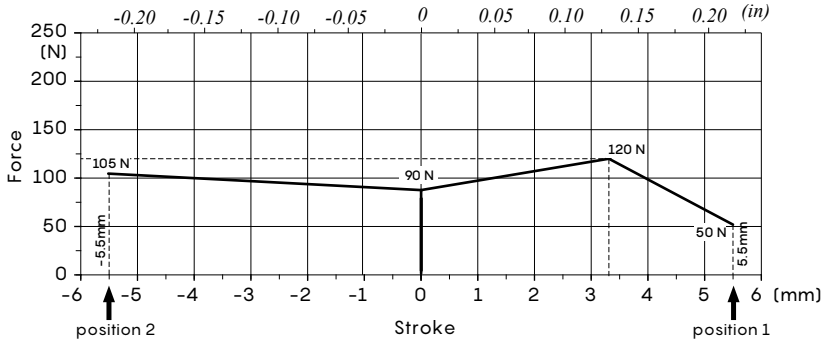




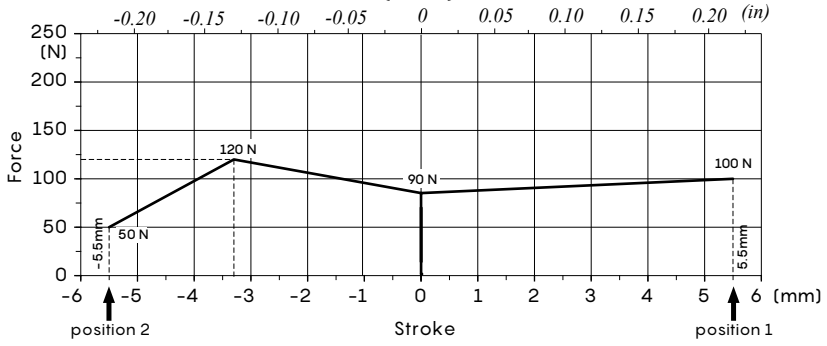
Technical features
Locking force..... 120 N / *27 lbf*
Release force ..... 230 N / *51.7 lbf*

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

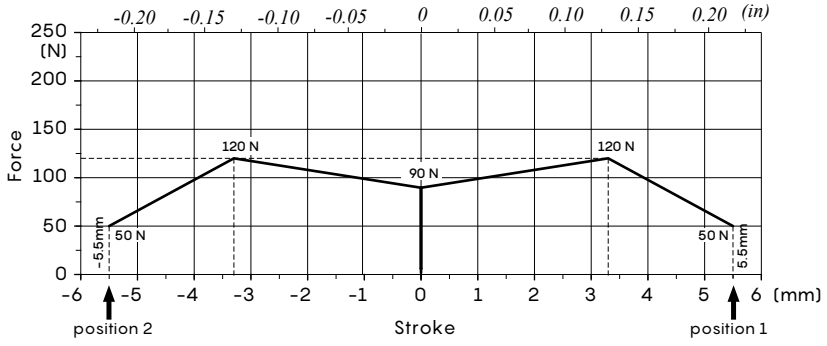
Force-Stroke diagram (9BZ)



Force-Stroke diagram (10BZ)



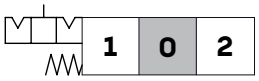
Force-Stroke diagram (11BZ)

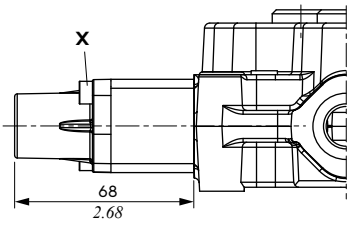


A side controls

3 positions, with detent, spring return in neutral position

Type 11B
Detent in positions 1 and 2

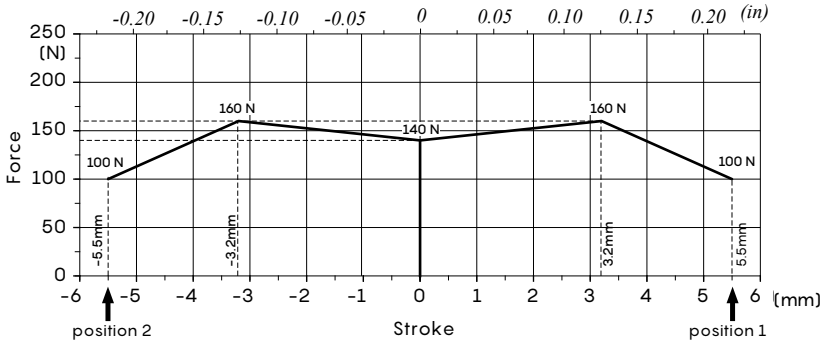




Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*

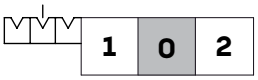
Technical features
Locking and release force ..... 120 N / *27 lbf*

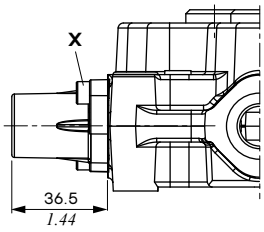
Force-Stroke diagram
(11B)



3 positions, with detent

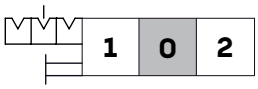
Type 11
Detent in all positions

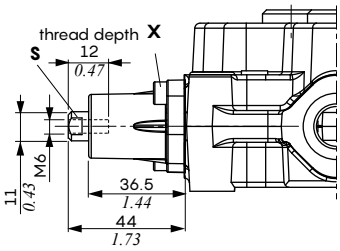




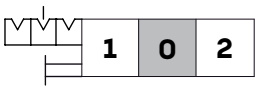
Type 11WPO
As type 11, water proof type

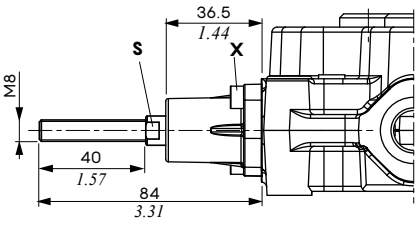
Type 11D
As type 11, M6 female threaded pin extension





Type 11D2
As type 11, M8 male threaded pin extension





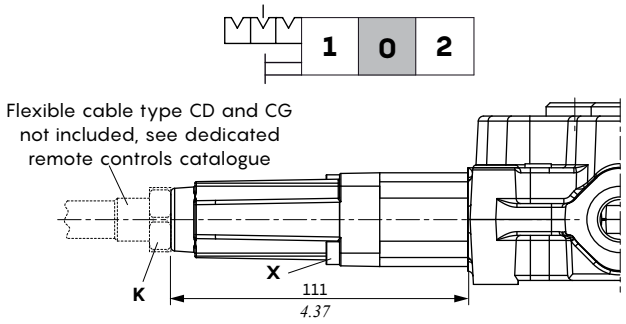
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
S= allen wrench 9-9.8 Nm *(7.2 lbtf)*

Technical features
Locking and release force: ..... 120 N / *27 lbf*

A side controls

3 positions, with detent

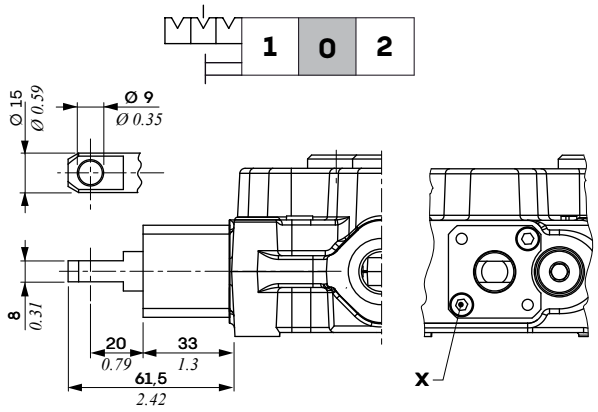
Type 11TCL
As type 11 flexible cable control arrangement



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)*

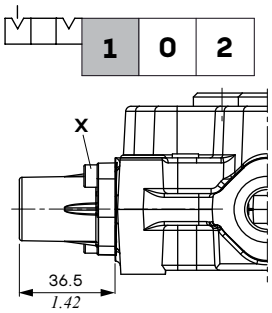
Technical features
Locking and release force ..... 120 N / *27 lbf*

Type 11TL
As type 11, double control arrangement



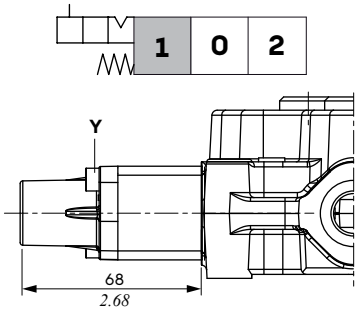
Technical features
Locking and release force ..... 120 N / *27 lbf*

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



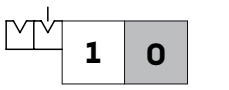
Technical features
Locking and release force ..... 300 N / *67.4 lbf*

A side controls

2 positions, with detent

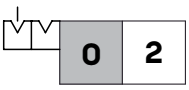
Type 15
Positions 1-0, detent in both positions

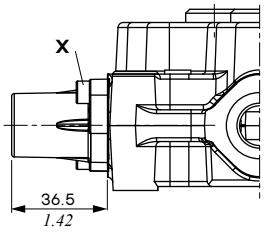
Type 15 WPO
As type 15, water proof type



Type 16
Positions 2-0, detent in both positions

Type 16 WPO
As type 16, water proof type



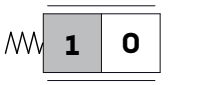


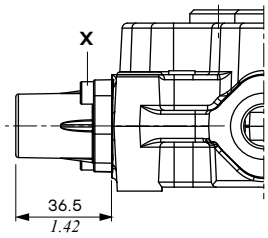
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*

Technical features
Locking and release force ..... 120 N / *27 lbf*

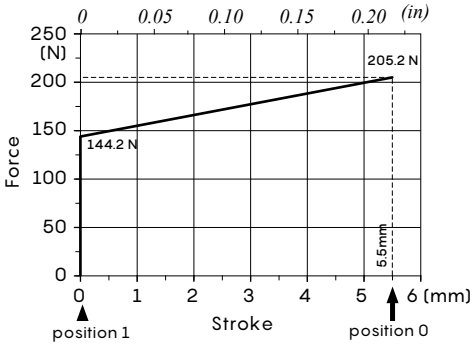
2 positions, spring return

Type 17A
Positions 1-0, spring return in position 1

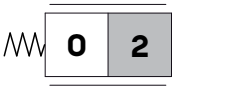


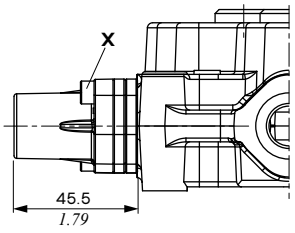


Force-Stroke diagram (17A)

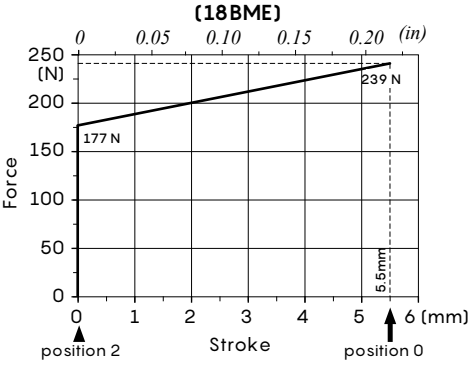


Type 18BME
Positions 2-0, spring return in position 2

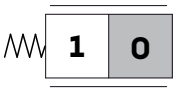


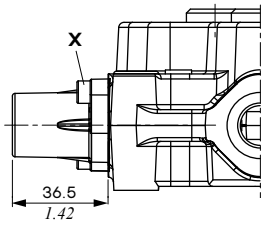


Force-Stroke diagram (18BME)

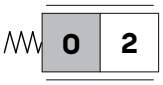


Type 19
Positions 1-0, spring return in position 0



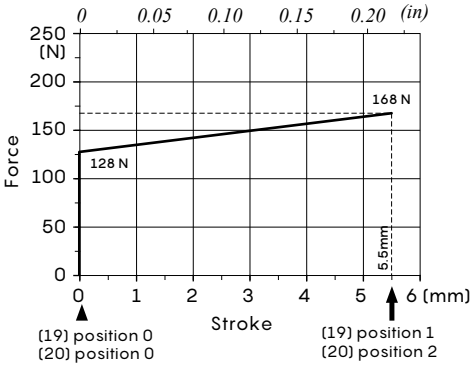


Type 20
Positions 2-0, spring return in position 0



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

Force-Stroke diagram (19-20)

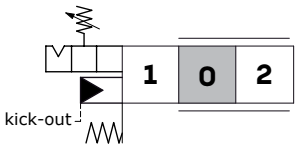


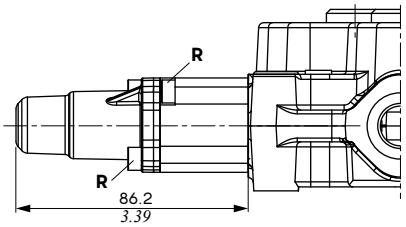
A side controls

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)**

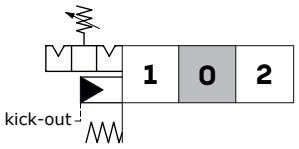


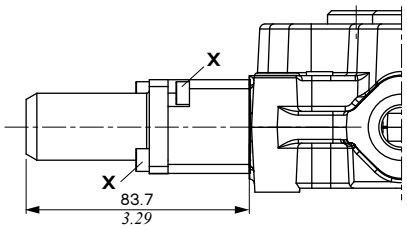


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
R= allen wrench 4-7.5 Nm *(5.51 lbtf)*

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

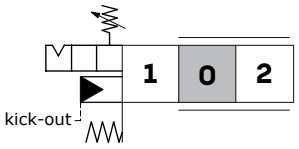
Type 11A
3 positions, detent in positions 1 and 2, kick-out to neutral position, **it requires spool type 1(11A)**

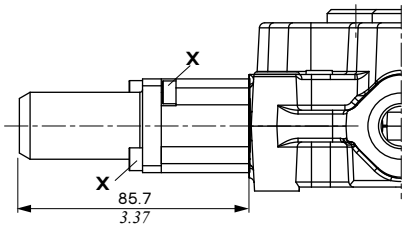




Technical features
Release pressure.....from 20 to 80 bar - *from 290 to 1160 psi*
(standard setting 63 bar - *914 psi*)

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

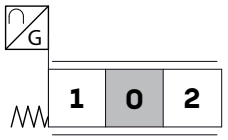


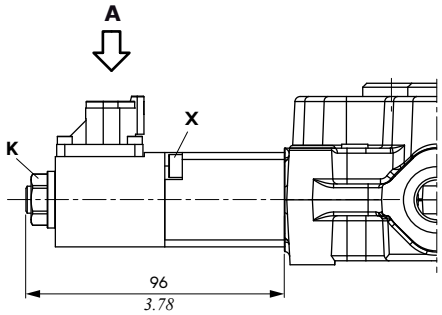


Technical features
Release pressure.... from 40 to 100 bar - *from 580 to 1450 psi*
(standard setting 63 bar - *914 psi*)

Spool positioning control, electric signal

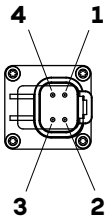
Tipo 8SPSL
As type 8, Hall effect sensor





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

view connector from A



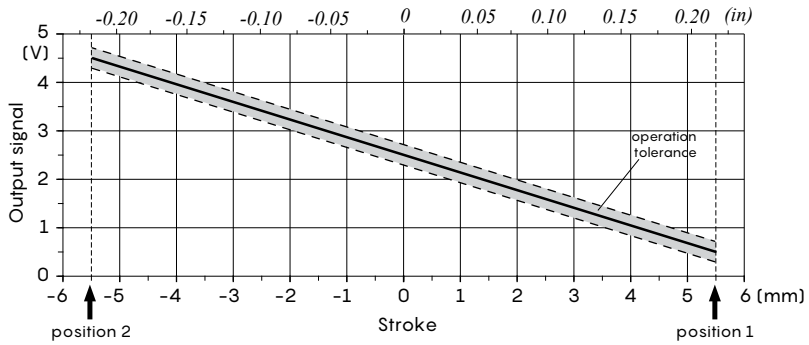
Pin-out DEUTSCH DT04-4P	
pin	**signal**
1	VCC
2	-
3	GND
4	out A

Deutsch DT06-4S mating connector, code 5CON140072

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

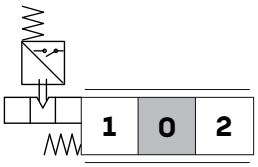
Output Voltage-spool stroke diagram



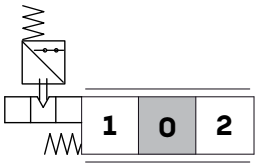
A side controls

Spool control with microswitch

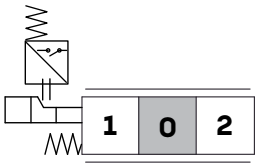
Type 8MG3(NO)
As type 8 with microswitch in positions 1 and 2, NO (normally opened) contact



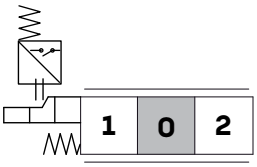
Type 8MG3(NC)
As type 8 with microswitch in positions 1 and 2, NC (normally closed) contact

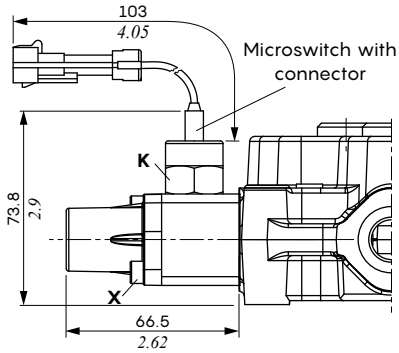


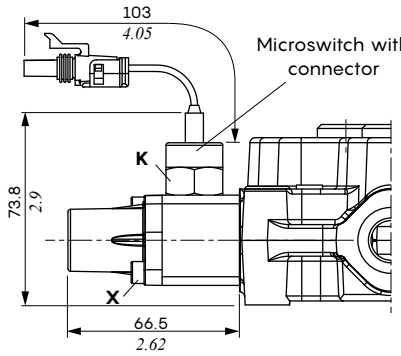
Type 8MG1(NO)
As type 8 with microswitch in position 1, NO contact



Type 8MG2(NO)
As type 8 with microswitch in position 2, NO contact



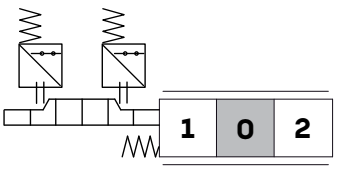




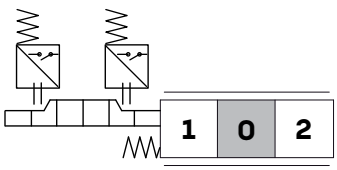
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 22-42 Nm *(31 lbtf)*
Q= wrench 22-24 Nm *(17.7 lbtf)*

Microswitches technical features
Mechanical life . . . . . $5x10^5$ operations
Electrical life (resistive load) . . . 10^5 operations - 7 A / 13.5 VDC
$5x10^4$ operations - 10 A / 12 VDC
$5x10^4$ operations - 3 A / 28 VDC

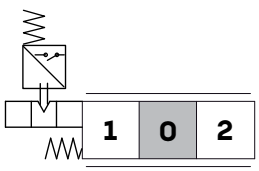
Type 8MG19\29(NC\NC)
As type 8 with 2 microswitches (NC normally closed)

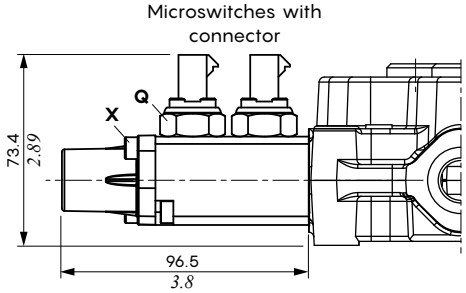


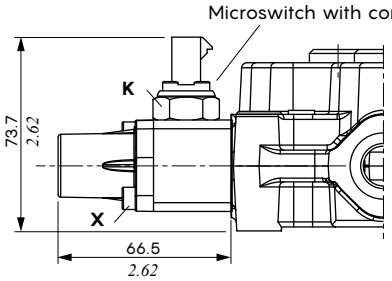
Type 8MG19\29(NO\NO)MC
As type 8 with 2 microswitches (NO normally opened), spring type C



Type 8MG39(NO)
As type 8MG3(NO) with integrated connector (NO normally opened)

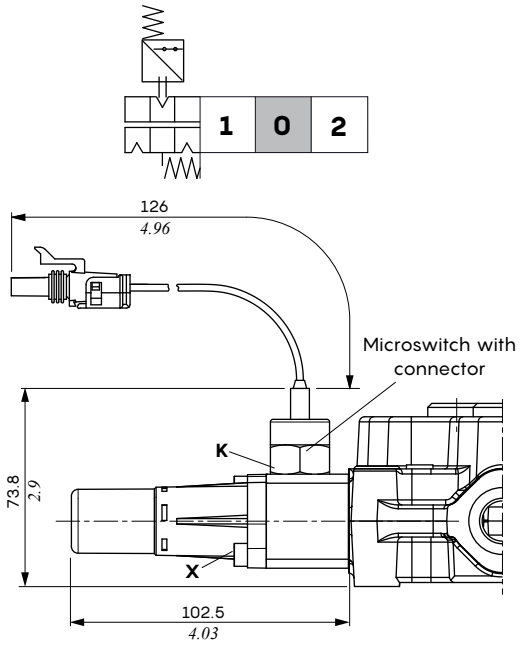






Spool control with microswitch

Type 11BMG3(NC)
As type 11B with microswitch in positions 1 and 2, NC (normally closed) contact

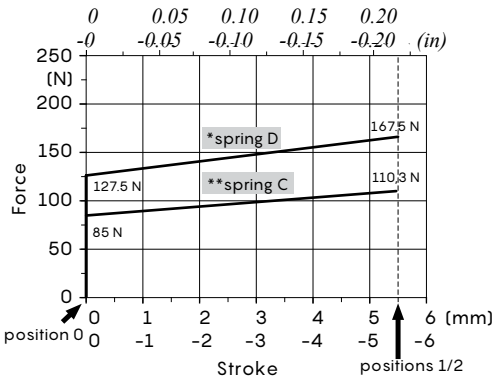


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 22-24 Nm *(17.7 lbtf)*

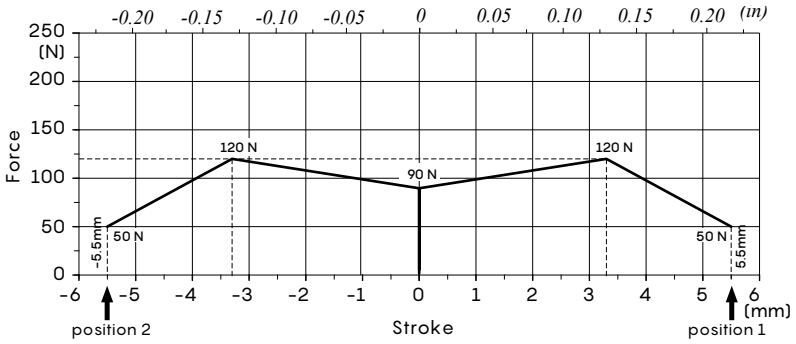
Control features
Locking force ..... 120 N / *27 lbf*
Release force ..... 230 N / *52 lbf*

Microswitches technical features
Mechanical life ..... $5x10^5$ operations
Electrical life (resistive load) ... 10^5 operations - 7 A / 13.5 VDC
$5x10^4$ operations - 10 A / 12 VDC
$5x10^4$ 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	**8MG1** position 1	**8MG2** position 2	**8MG3** position 1, 2
(NO)	5V08105670	5V08105680	5V08105660
(NC)	-	-	5V08105662

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

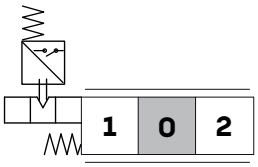
Connector codes		
For control type	**Microswitch with connector**	**Mating connector (not included)**
8MG3(NC)	4MIC744	5CON005
8MG3(NO) **8MG1(NO)** **8MG2(NO)**	4MIC734	5CON001
8MG39(NO)	4MIC733	5CON001
8MG19/29(NC/NC)	4MIC743	5CON140047
8MG19/29(NO/NO)MC	4MIC733	5CON140047
11BZMG3(NC)	4MIC744	5CON005

A side controls

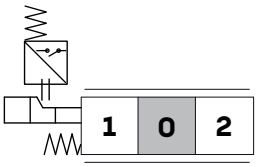
Spool control kit with prearranged centralized microswitch

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.

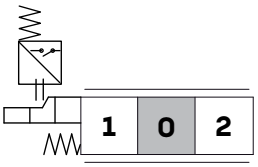
Type 8MS3
Switch in positions 1 and 2



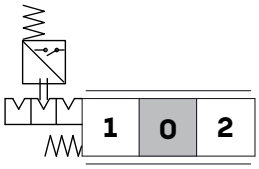
Type 8MS1
Switch in position 1



Type 8MS2
Switch in position 2

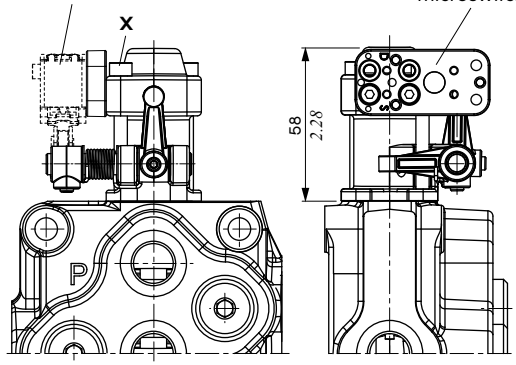


Type 11MS3
As 8MS3 with detent



microswitch code:
IP51 - 5MIC100
IP67 - 5MIC200

bracket for MIC100 microswitch

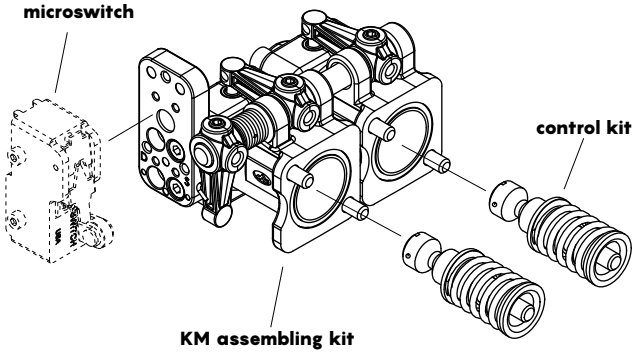


Assembly controls (IP51)				
nr. sections	**8MS1**	**8MS2**	**8MS3**	**11MS3**
1	5V08105510	5V08105520	5V08105500	5V11105500
2	5VMS005227	-	5VMS005200	5VMS005209
3	5VMS005303	-	5VMS005300	-
4	-	-	5VMS005400	-
5	-	-	5VMS005500	-
6	-	-	5VMS005600	-

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

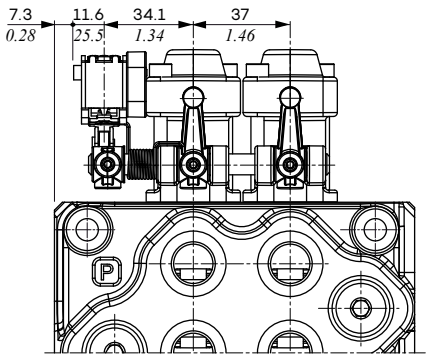
Notes - The order code for the control kit applies to each individual section.
(*) As 8MS1 with soft spring "type C" (**) As 8MS2 with short stroke.

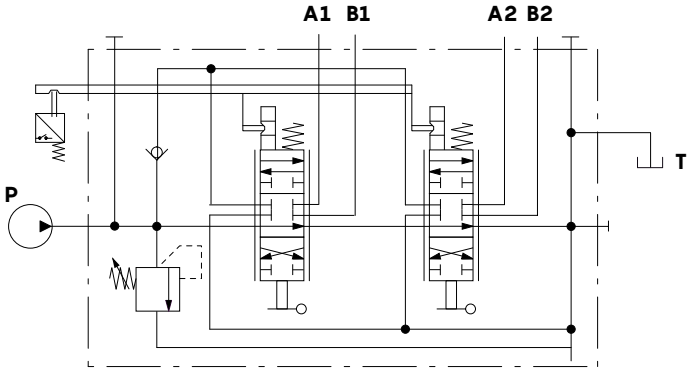


KM assembling kit				
nr. sections	**for microswitch IP51**		**for microswitch IP67**	
	type	**code**	**type**	**code**
1	KM1S51	5KM1S5102	KM1S67	5KM1S6702
2	KM2S51	5KM2S5102	KM2S67	5KM2S6702
3	KM3S51	5KM3S5102	KM3S67	5KM3S6702
4	KM4S51	5KM4S5102	KM4S67	5KM4S6702
5	KM5S51	5KM5S5102	KM5S67	5KM5S6702
6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

A side controls

Spool control kit with prearranged centralized microswitch





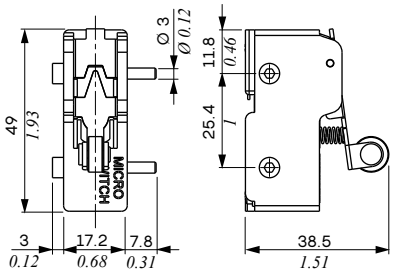
Example: SD5/2–P(JG3–120)/1**8MS3**L/1**8MS3**L/AET – **KM 2 S 51**

- 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.

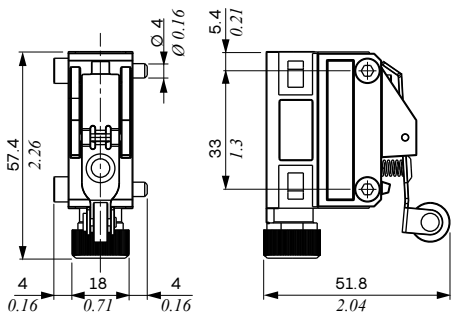
Type for IP51 code: 5MIC100



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. 10^6 operations

Type for IP67 code: 5MIC200
Dedicated bracket is needed for the assembly. Code: 3FLA225055



Technical features

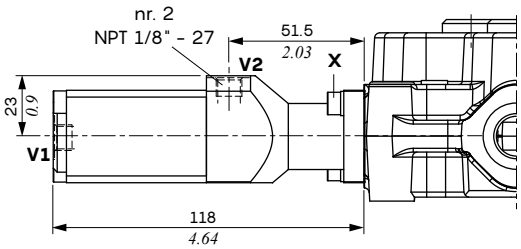
Max current/Voltage ..... 5A / 250 VAC
Weather protection IP67
Working temperature range ..... da - 10°C a +80°C
(from 14°F to 176°F)
Mechanical life ..... min. $2x10^6$ operations

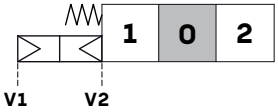
A side controls

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 lbtf)*

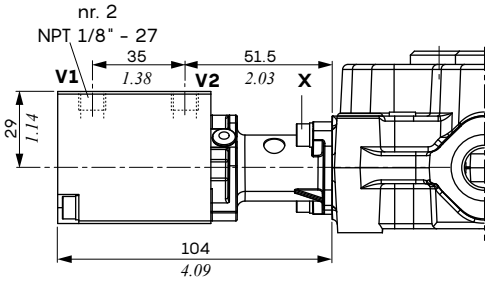


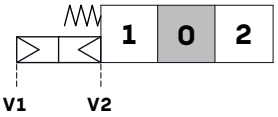


Technical features

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

Type 8PNB
As type 8P, waterproof

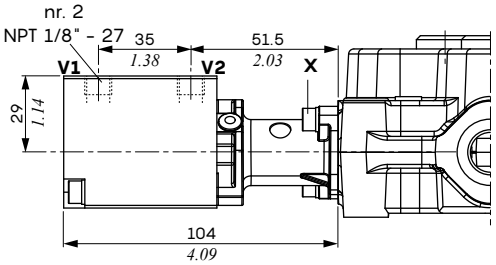


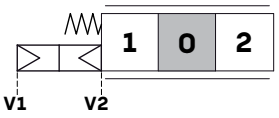


Technical features

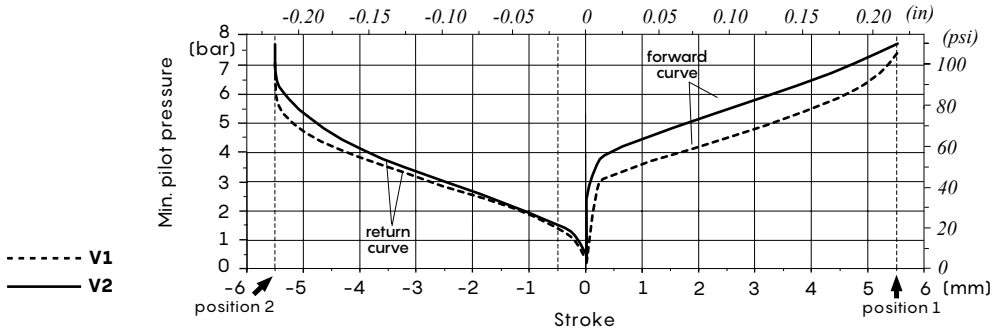
Pilot pressure..... min. 6 bar / *(87 psi)*
max. 15 bar / *(217 psi)*

Type 8PNBZ
Proportional pneumatic control





8PNBZ Pilot-Stroke diagram
(without oil passage)

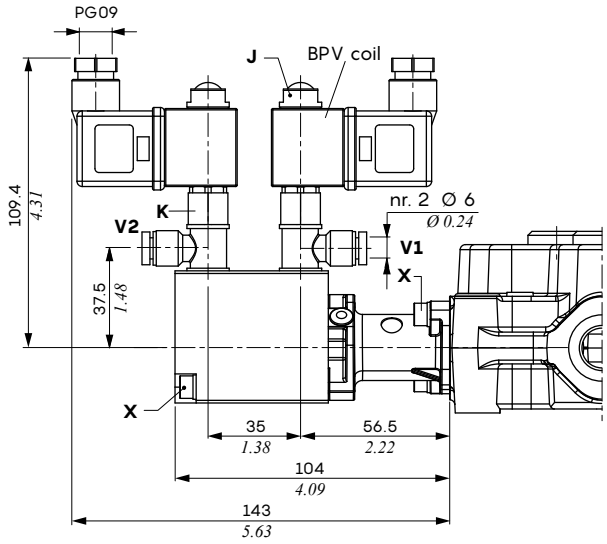


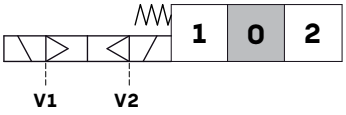
A side controls

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 pege 116

Wrenches and tightening torques

X= allen wrench 4-6.6 Nm *(4.9 lbtf)*

K= wrench 15-6.6 Nm *(4.9 lbtf)*

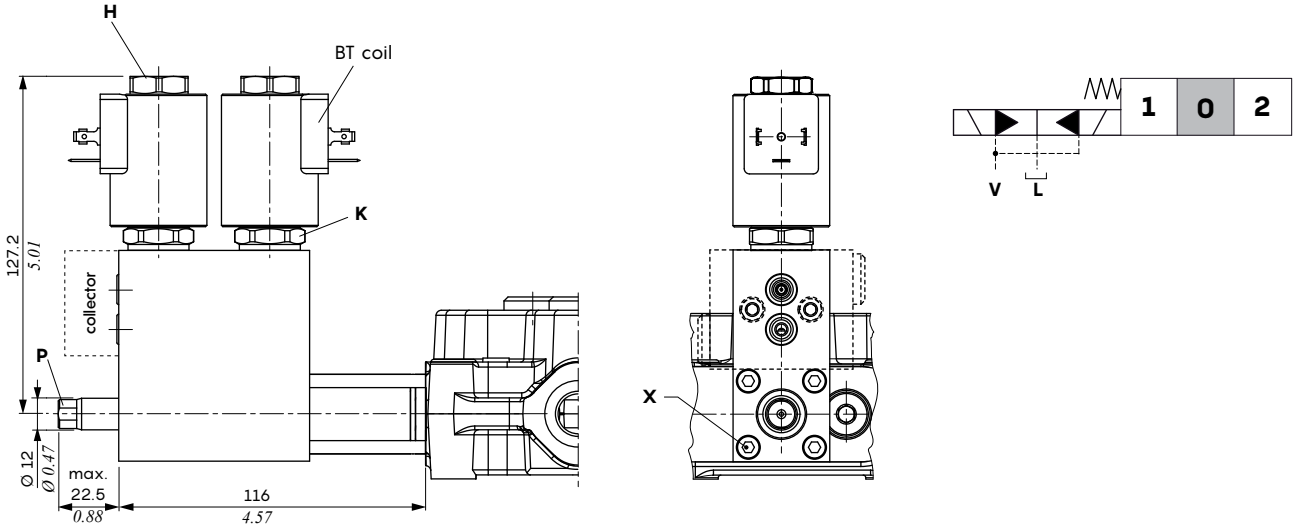
J= wrench 13-1.5 Nm *(1.1 lbtf)*

A side controls

Electrohydraulic controls

Type 8ED3
ON/OFF with spring return in neutral position, 12VDC / 24VDC.

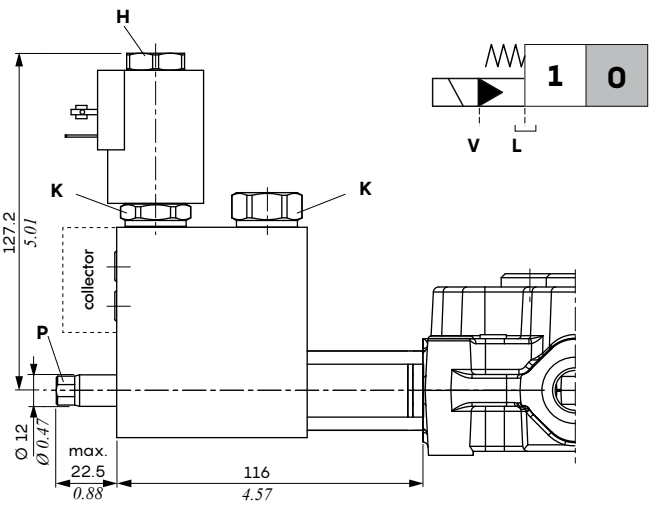
Type 8ED3(NFC)
without coils and restrictor



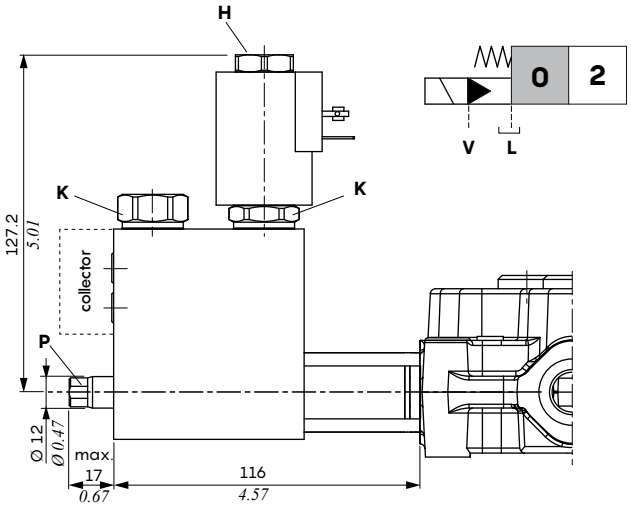
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 24-30 Nm *(22.1 lbtf)*
H= wrench 22-6.6 Nm *(4.9 lbtf)*
P= wrench 10

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



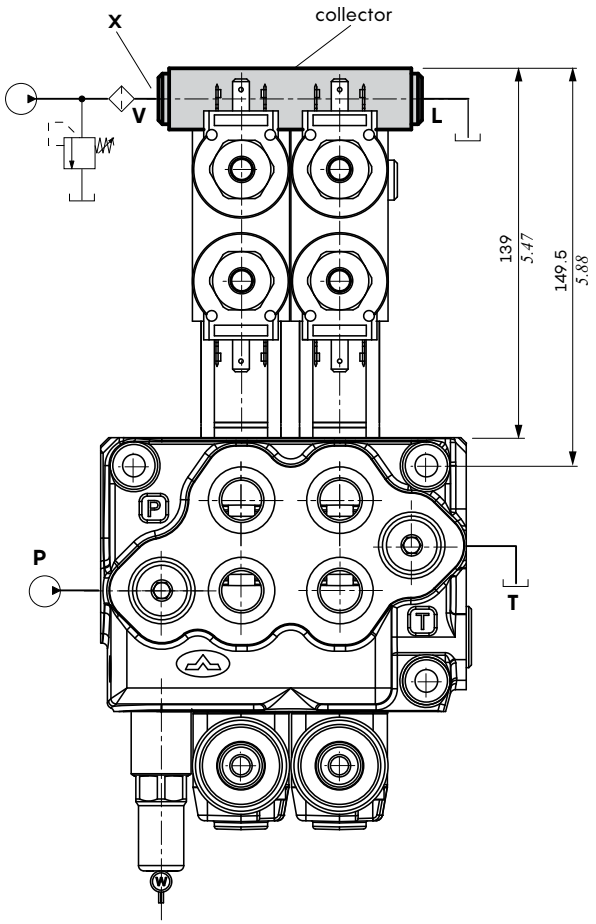
Type 20ED2
ON/OFF, 2 positions (2 and 0), spring return in position 0



A side controls

Electrohydraulic controls

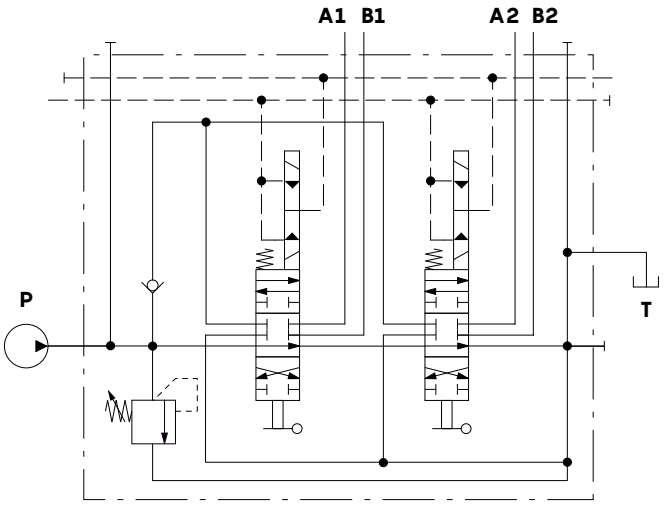
kit for external pilot and drain



Collector kit		
type	**code(*)**	**description**
KE1S0	5KE1S00030	kit per 1 sezione
KE2S0	5KE2S00230	kit per 2 sezioni
KE3S0	5KE3S00230	kit per 3 sezioni
KE4S0	5KE4S00230	kit per 4 sezioni
KE5S0	5KE5S00230	kit per 5 sezioni
KE6S0	5KE6S00230	kit per 6 sezioni
KE7S0	5KE7S00230	kit per 7 sezioni

(*) codes are referred to BSP thread

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



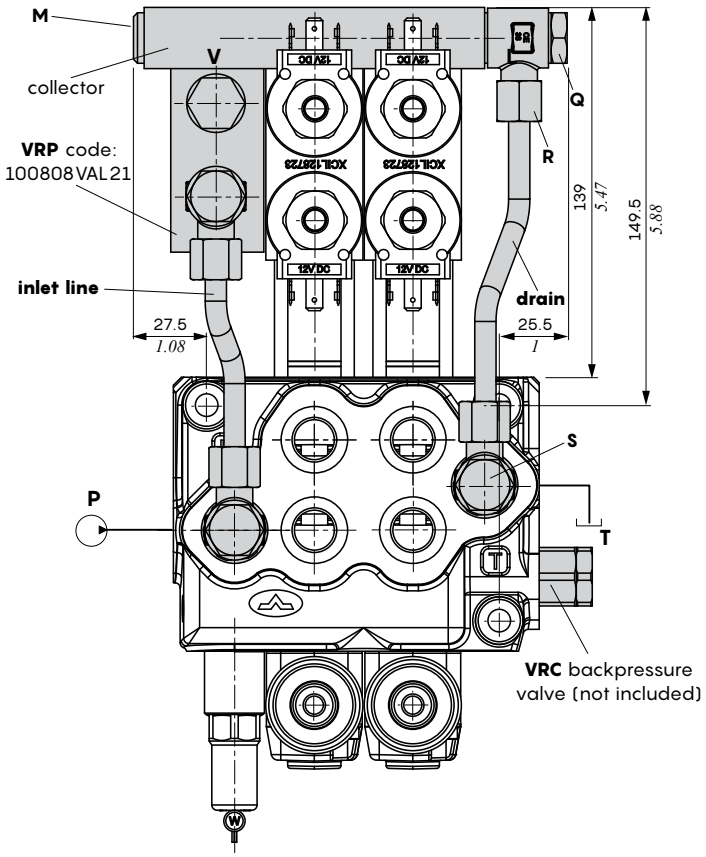
Description example:
SD5/2-P(KH4—200)/1**8ED3**L/1**8ED3**L/AET-**KE2S0-24VDC**

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 lbtf)*
Y= wrench 22-24 Nm *(17.7 lbtf)*
M= allen wrench 6-24 Nm *(17.7 lbtf)*
Q= wrench 19-24 Nm *(17.7 lbtf)*
R= wrench 17
S= wrench 22-24 Nm *(17.7 lbtf)*

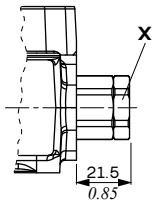
Collector kit		
type	**code(*)**	**description**
KE1R3	5KE1R30230	kit for 1 section
KE2R3	5KE2R30230	kit for 2 section
KE3R3	5KE3R30230	kit for 3 section
KE4R3	5KE4R30230	kit for 4 section
KE5R3	5KE5R30230	kit for 5 section
KE6R3	5KE6R30230	kit for 6 section
KE7R3	5KE7R30230	kit for 7 section

(*) codes are referred to BSP thread

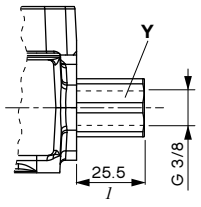
Backpressure valves		
type	**code**	**backpressure**
VRC(10bar)	X003600010	10 bar *(145 psi)*
VRC(20bar)	X003600020	20 bar *(290 psi)*
VRE*	3XGIU522505	8 bar *(116 psi)* with carry-over

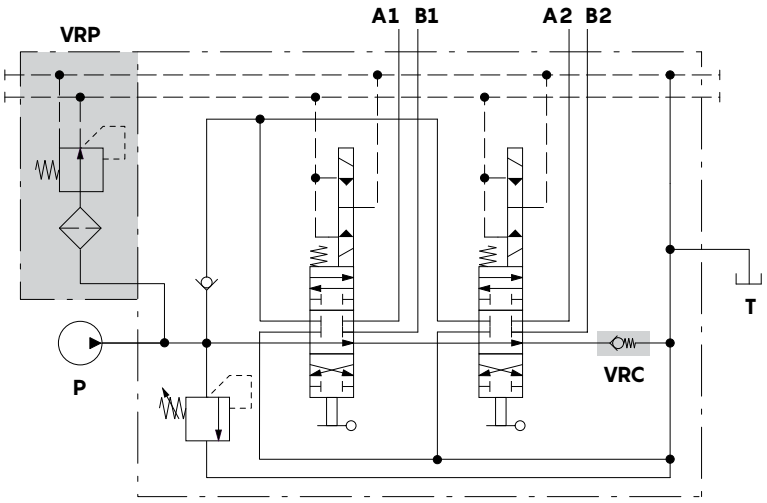
(*) codes are referred to BSP thread

Valve type VRC



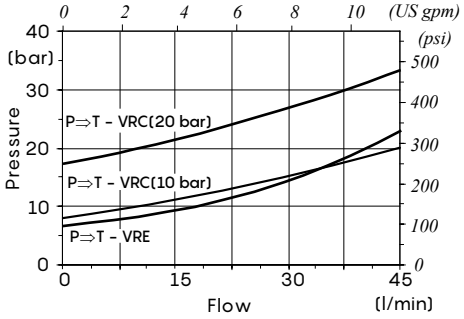
Valve type VRE





Description example:
SD5/2-P(KG3-120)/**18ED3**L/**18ED3**L/**VRC-KE2R3-12VDC**

Pressure drop (backpressure valves)



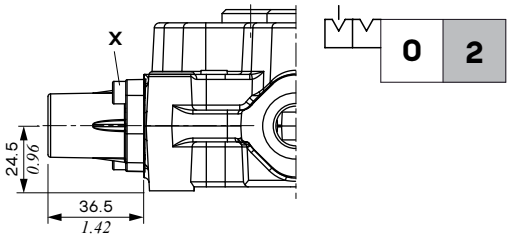
A side controls

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

2 positions

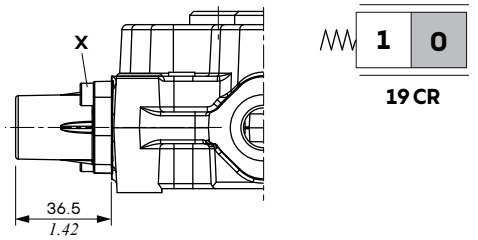
Type 16CR
Positions 2-0, detent in both positions

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

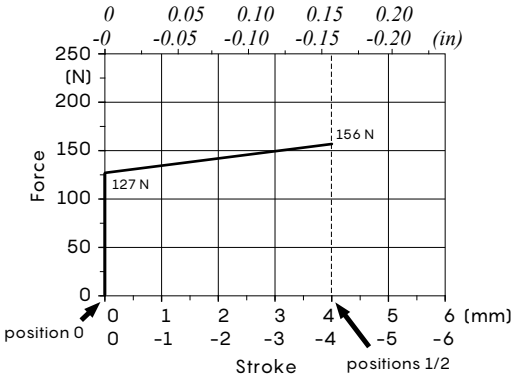


Type 19CR
Positions 1- 0, spring return in neutral position

Type 20CR
Positions 2- 0, spring return in neutral position



Force-Stroke diagram (19CR-20CR)



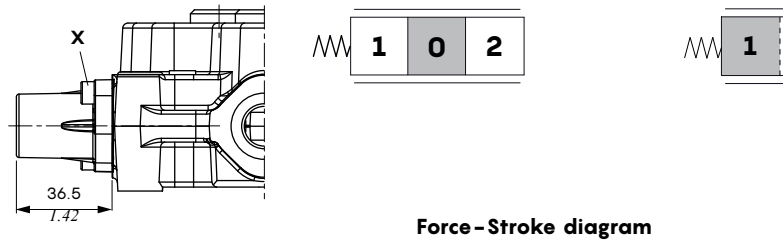
3 positions

Type 8CR
3 positions, spring return in neutral position

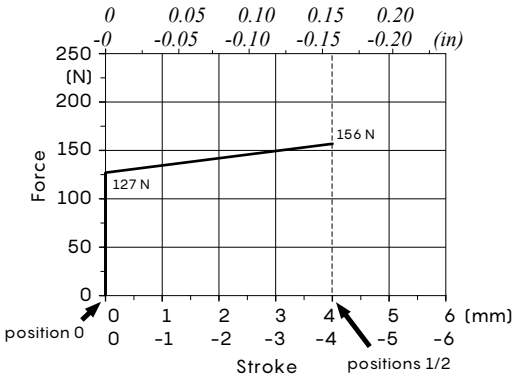
Tipo 8CRWPO
As type 8CR, water proof type

Type 17CR
Spring return in position 1, free neutral position

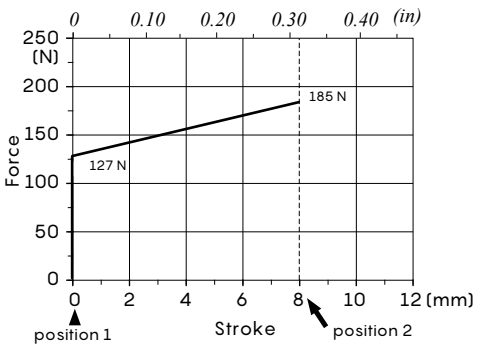
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbf)*



Force-Stroke diagram (8CR)



Force-Stroke diagram (17CR)



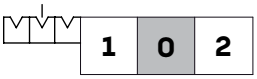
A side controls

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

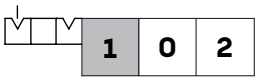
3 positions

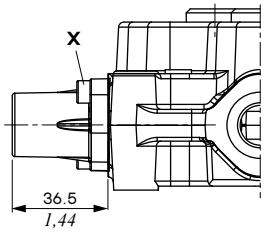
Type 11CR
Detent in both positions

Type 11CRWPO
As type 11CR, water proof type



Type 12CR
Detent in positions
1 and 2

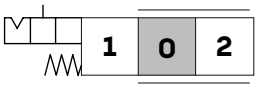




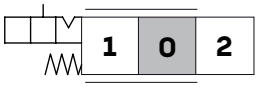
Technical features
Locking and release force ..... 120 N / *27 lbf*

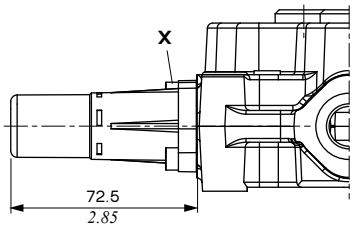
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
K= wrench 24-30 Nm *(22.1 lbtf)*
H= 6.6 Nm *(4.9 lbtf)*

Type 9BZCR
3 positions, detent in position 1 and
spring return in neutral position



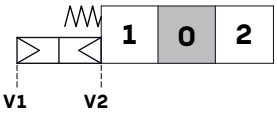
Type 10BZCR
3 positions, detent in position 2 and
spring return in neutral position

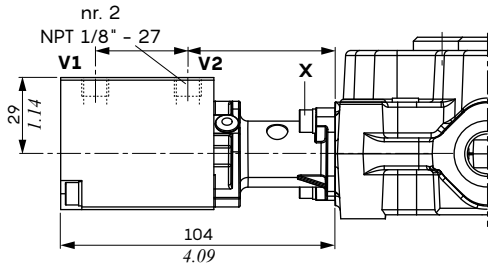




Technical features
Locking force..... 120 N / *27 lbf*
Release force ..... 230 N / *52 lbf*

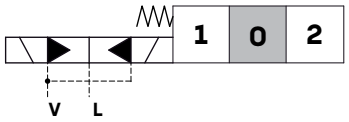
Type 8PNBCR
ON/OFF pneumatic control with spring
return in neutral position, waterproof

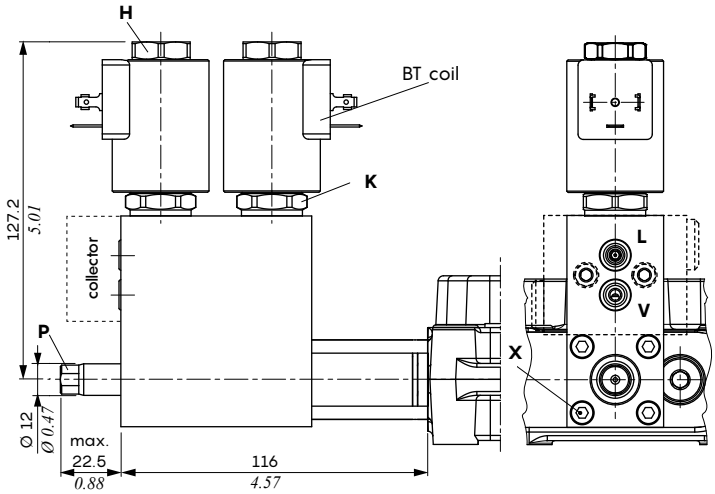




Technical features
Pilot pressure..... min. 6 bar / *(87 psi)*
max. 15 bar / *(217 psi)*

Type 8ED3CR
ON/OFF electrohydraulic control with
spring return in neutral position

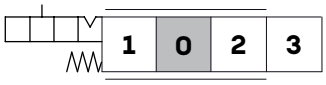




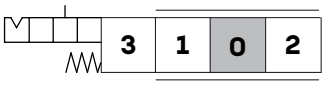
Technical features
Nominal voltage..... 12/24 VDC
Power absorption ..... 21 W
Weather temperature ..... from - 30°C to 60°C
(from - 22°F to 140°F)
Pilot pressure..... min. 10 bar / *(145 psi)*
max. 50 bar / *(725 psi)*
Max. backpressure..... min. 25 bar / *(360 psi)*
Note - For **BT** coils and connectors see page 116
For collectors see pages 45-46.

For floating circuit

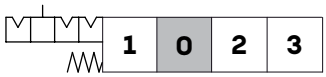
Type 13NZ (spool in)
4 positions, detent in position 3, spring return
in neutral position, **for spools type 5DY and 5WY**



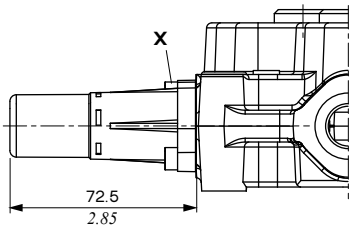
Type 13QN (spool out)
4 positions, detent in position 3, spring return
in neutral position, **for spool type 5PY**



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 lbtf)*



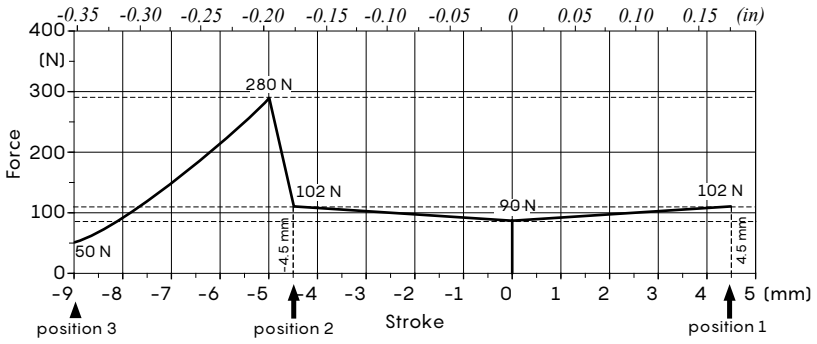
13 NZ technical features

Locking force	280 N / *63 lbf*
Release force	300 N / *68 lbf*

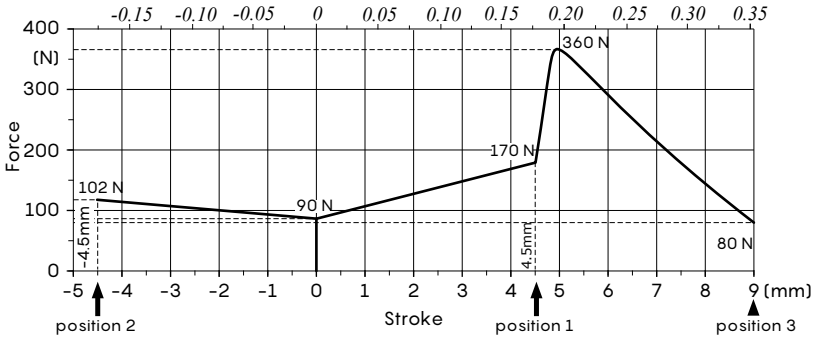
13QN technical features

Locking force	360 N / *81 lbf*
Release force	390 N / *88 lbf*

Force-Stroke diagram (13NZ)



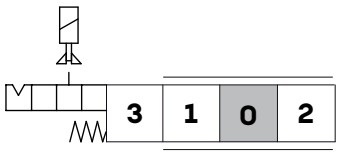
Force-Stroke diagram (13QN)

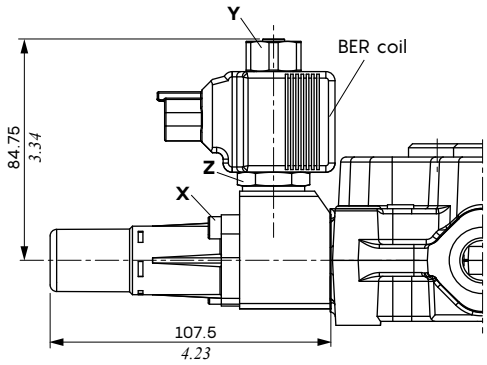


A side controls

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**

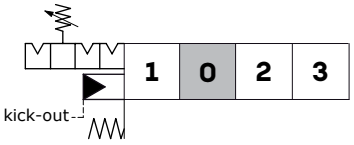


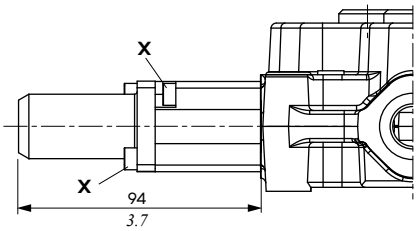


Technical features
Nominal voltage. . . . . .12 VDC
Power absorption . . . . . .19.2 W
Weather temperature . . . . . from - 30°C to 50°C
(from - 22°F to 122°F)

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

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



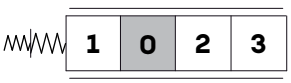


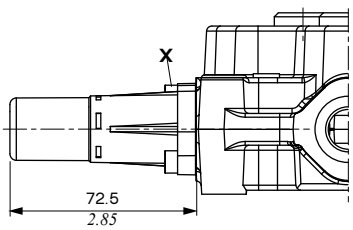
Technical features
Release pressure. . . . from 20 to 200 bar - *from 290 to 2900 psi*

Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
Y= wrench 21-6,6 Nm *(4.9 lbtf)*
Z= wrench 24-9.8 Nm *(7.2 lbtf)*

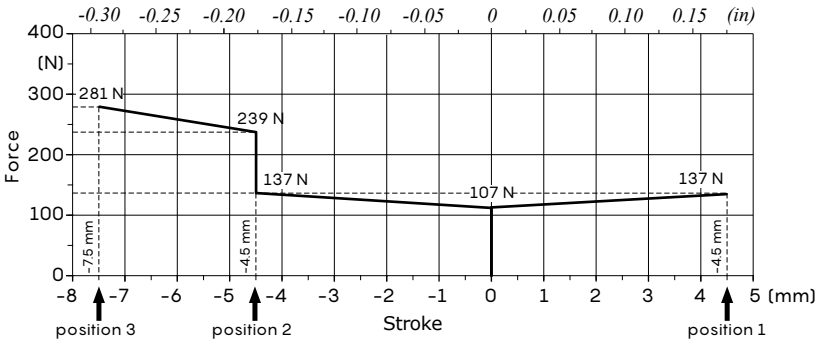
For regenerative circuit

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





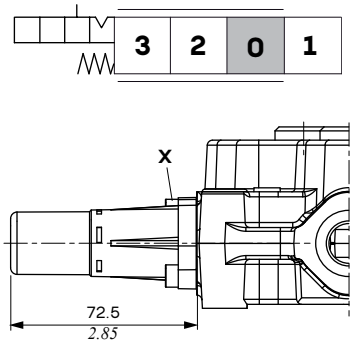
Force-Stroke diagram (13FZ)



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

For regenerative circuit

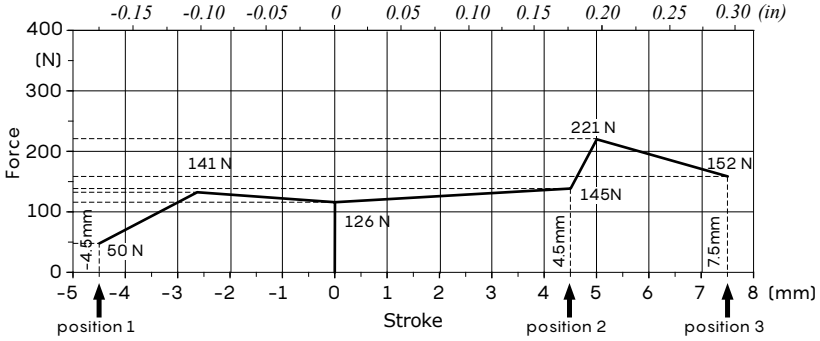
Type 13FZ1
4 positions, detent in position 1, spring return in neutral position, **for spool type 8(13FZ)**



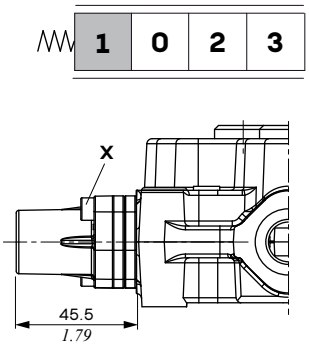
Technical features
Locking and release force (pos.1): . . . 170 N / *38 lbf*

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

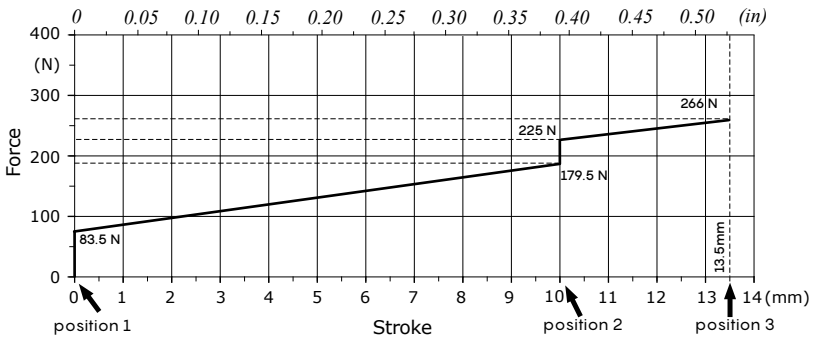
Force-Stroke diagram (13FZ1)



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



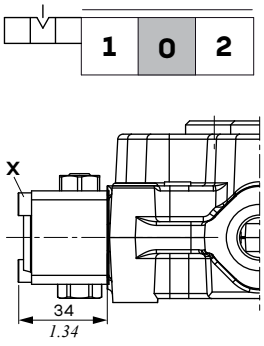
Force-Stroke diagram (17F)



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

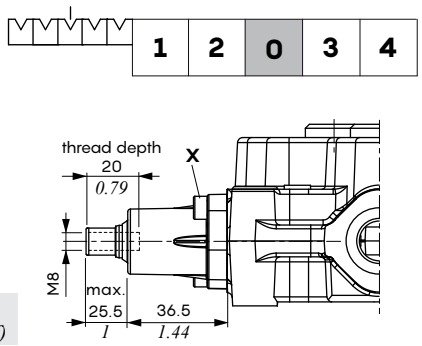


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*

5 positions manually operated configuration

The control with 5 positions manually operated needs dedicated spools, see page 19 and 59 for complete control kit.

Type 11D5
Control detent in all positions for 5 positions control configuration

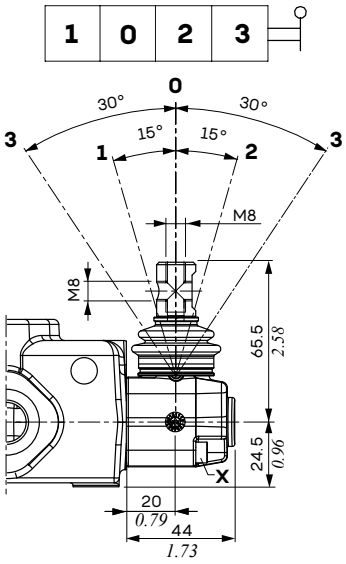


B side controls

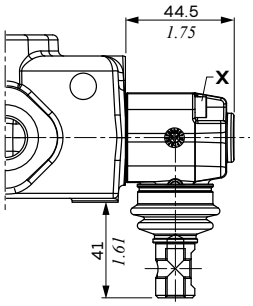
Aluminium lever kits

Type L
Standard lever kit

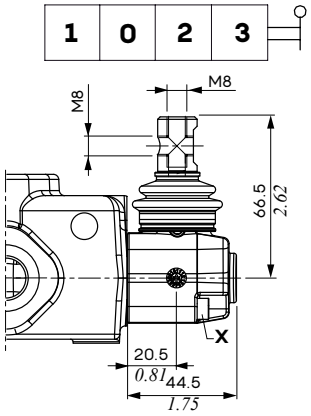
Type LW
As type L, with rust preventer treatment



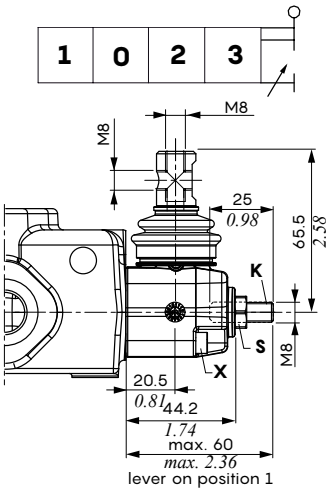
Execution L180



Type LSG
As type L, waterproof

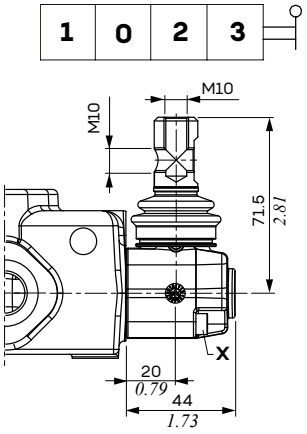


Type LSGF1
As type LSG, with stroke adjustment

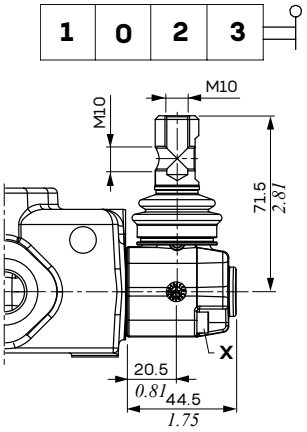


Type LM10
Lever kit with M10 thread

Type LWM10
As type LW, with rust preventer treatment



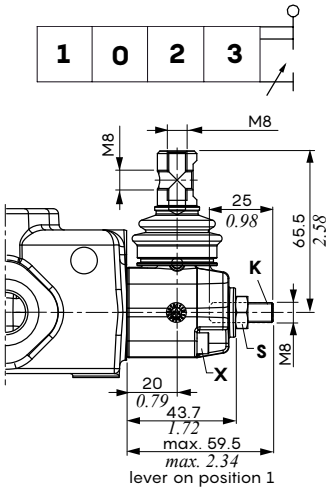
Type LMSGM10
As type LM10 waterproof



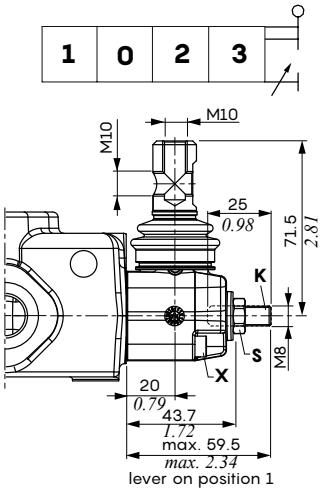
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbf)*
S= wrench 13-24 Nm *(17.7 lbf)*
K= allen wrench 4

Aluminium lever kits

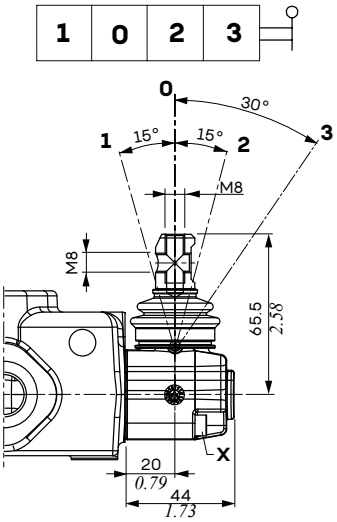
Type LF1
As type L with spool stroke adjustment



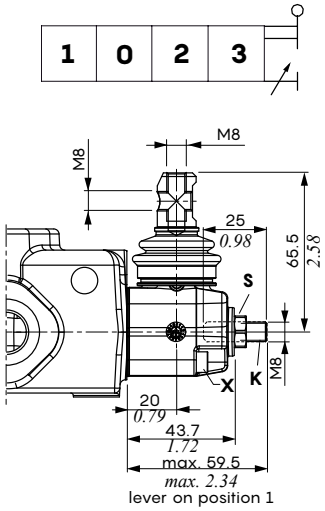
Type LF1M10
As type LF1 with M10 thread



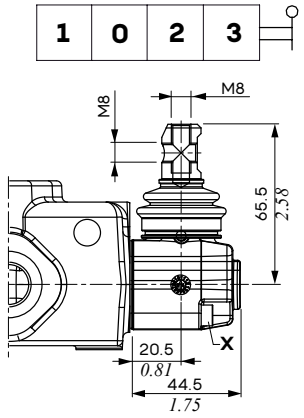
Type L1
With dull lever for P valves



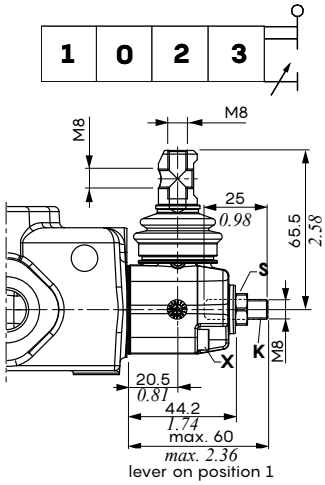
Type L1F1
As type L1, with spool stroke adjustment



Type LSG1
As type L1 waterproof



Type LSG1F1
As type L1F1 waterproof

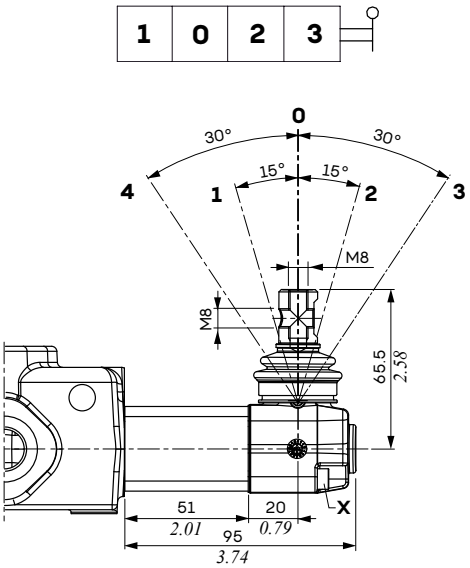


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
S= wrench 13-24 Nm *(17.7 lbtf)*
K= allen wrench 4

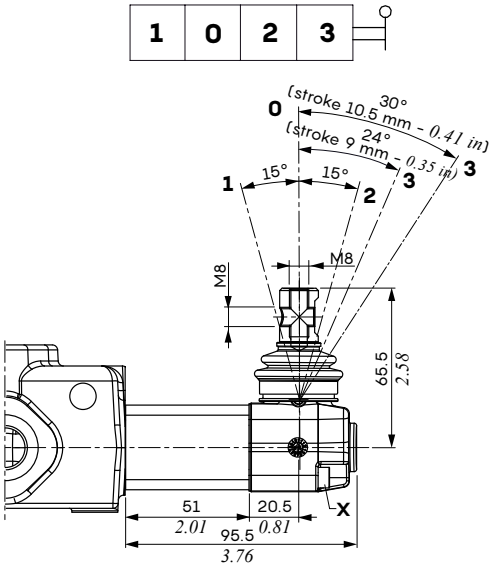
B side controls

Aluminium lever kits

Type L9
As type L with spool extension



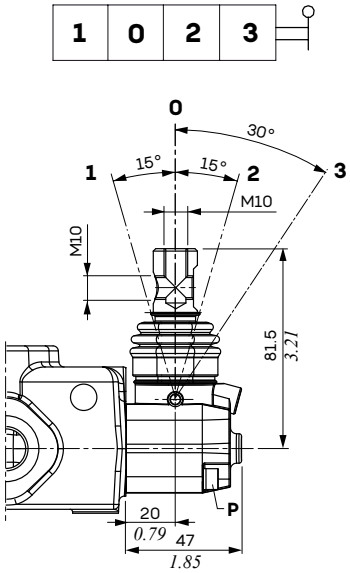
Type LSG9
As type L9 waterproof



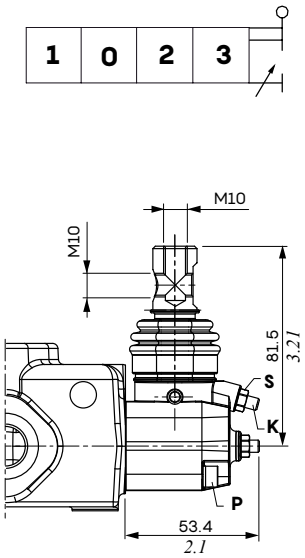
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*

Cast iron lever kits

Type LG
Standard lever kit



Type LFG
Standard lever kit, with spool stroke adjustment



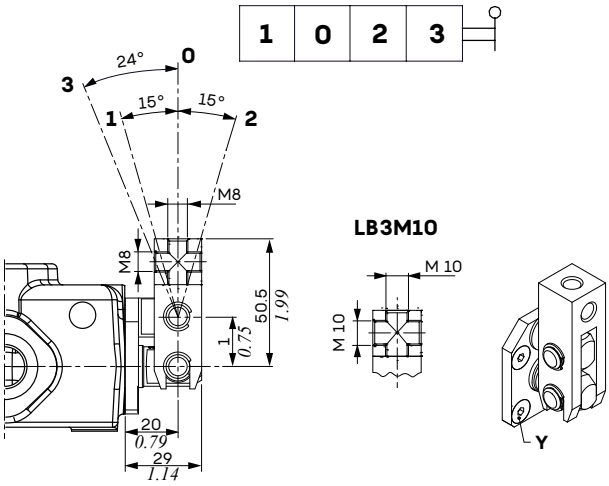
Wrenches and tightening torques
P= allen wrench 4-10 Nm *(7.3 lbtf)*
S= wrench 8-6.6 Nm *(4.9 lbtf)*
K= allen wrench 2.5

B side controls

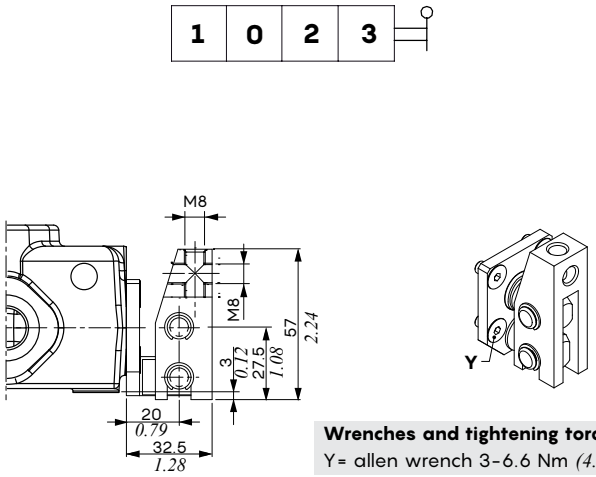
Steel lever kits

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 lbtf)*

Aluminium lever kits with detent

Type LEB
Detent in neutral position with safety lever box

Type LSGEB5
As type LEB waterproof

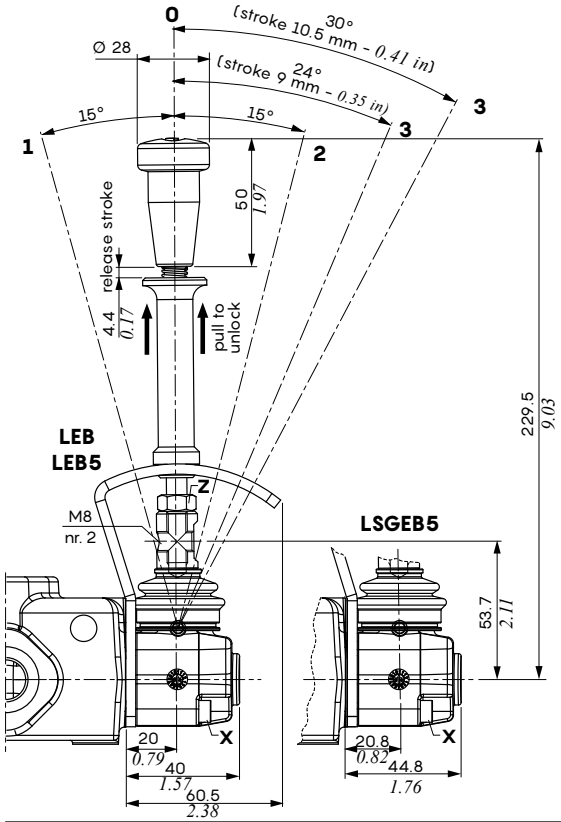


Type LEB5
Detent in positions 1 and 2 with safety lever box

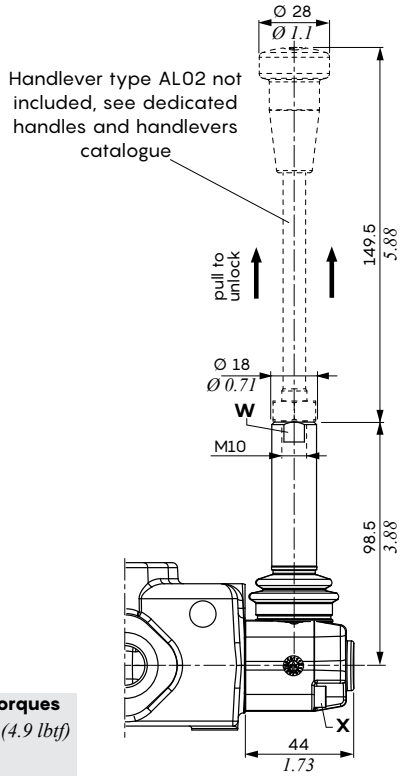


Type LE
Detent in neutral position





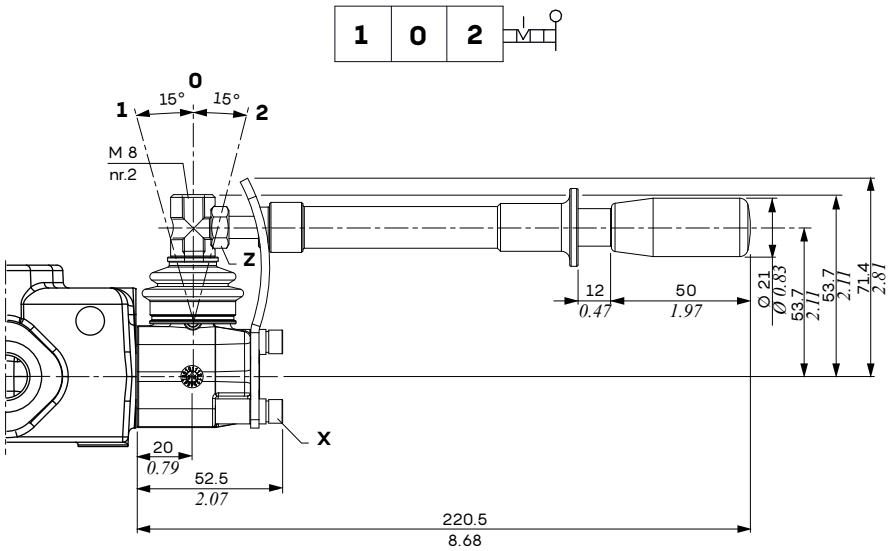
Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
W= wrench 16
Z= wrench 13-24 Nm *(17.7 lbtf)*



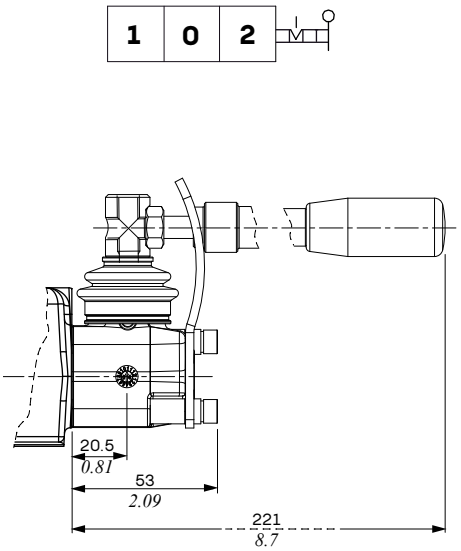
B side controls

Aluminium lever kits with detent

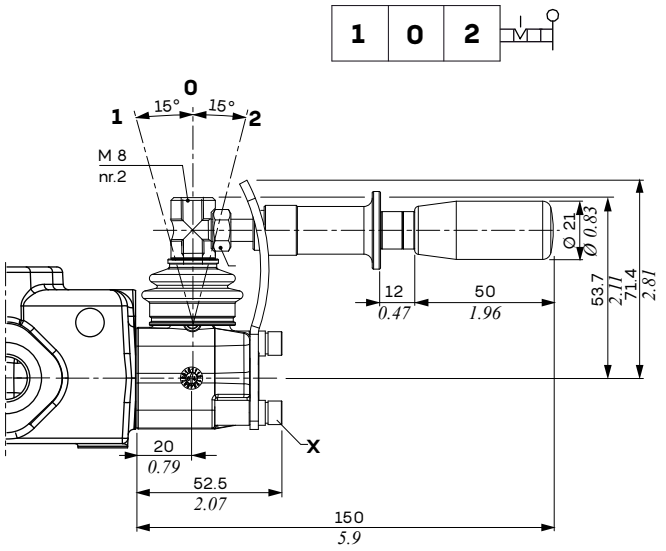
Type LUP
As type LEB with horizontal safety lever box



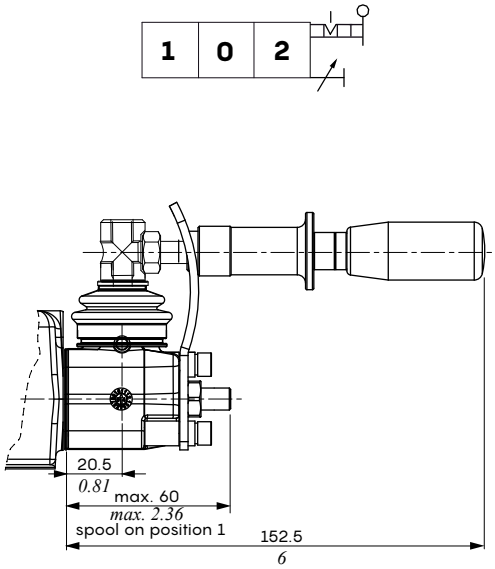
Type LSGUP
As type LUP, waterproof



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)*

B side controls

Joystick for 2 section operation

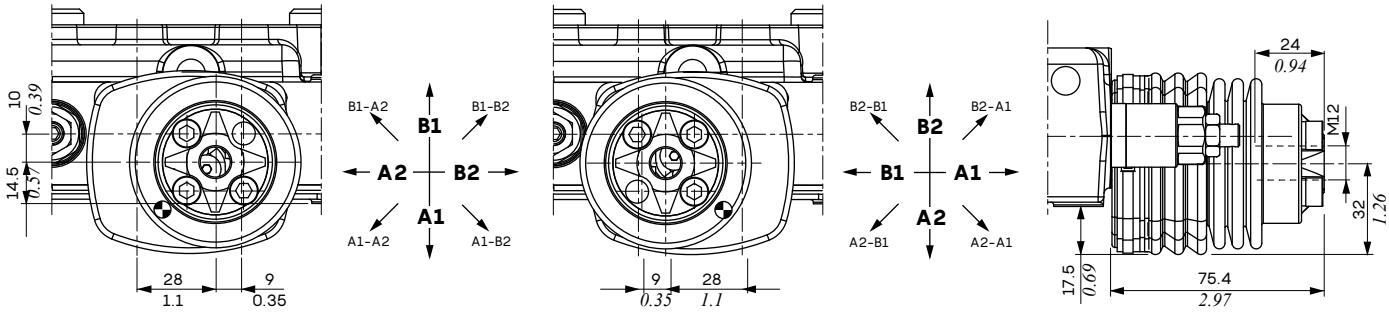
Type LCN1
Mechanical joystick, pivot placed down on the left, with nylon bearing

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

1	0	2	3
1	0	2	3

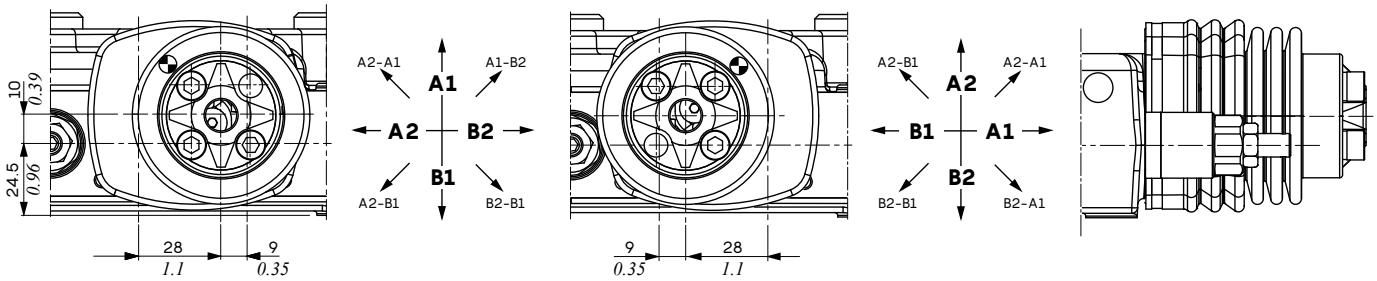


Type LCN3
Mechanical joystick, pivot placed above to the left, with nylon bearing

Type LCA3
Mechanical joystick, pivot placed above to the left, with bronze bearing

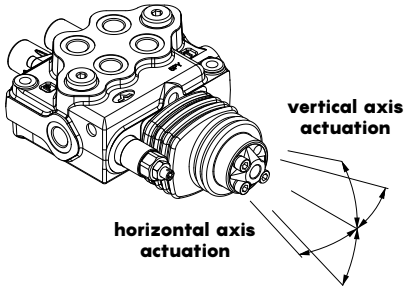
Type LCN4
Mechanical joystick, pivot placed above to the right, with nylon bearing

Type LCA4
Mechanical joystick, pivot placed above to the right, with bronze bearing

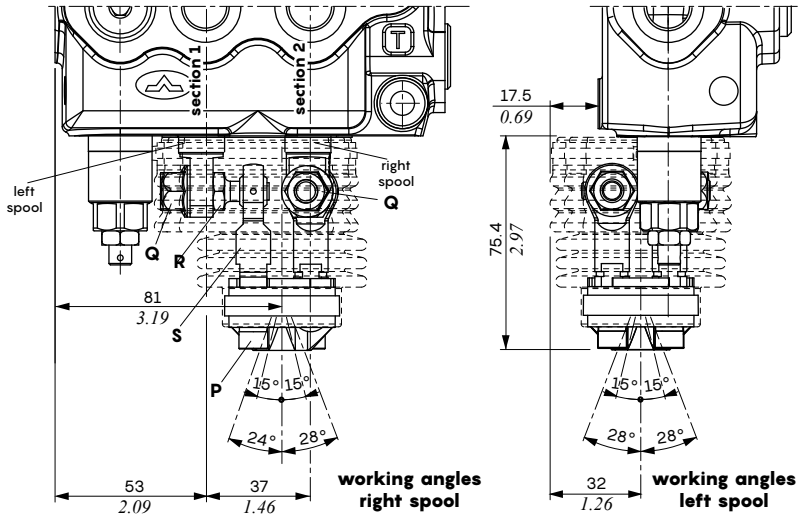


Wrenches and tightening torques
P= allen wrench 5-15 Nm
Q= wrench 13-24 Nm
R= wrench 13
S= wrench 9.4

Configuration example LCN1-4



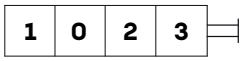
Working angles	right spool		left spool	
angle	15°		15°	
stroke	+ 5.5 mm *0.22 in*	- 5.5 mm *- 0.22 in*	+ 5.5 mm *0.22 in*	- 5.5 mm *- 0.22 in*
angle	24°	28°	28°	
stroke	+ 9 mm *0.35 in*	- 10.5 mm *- 0.41 in*	+ 9 mm *0.35 in*	- 9 mm *- 0.35 in*

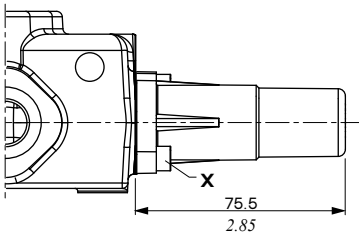


B side controls

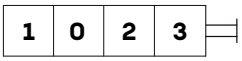
Other devices

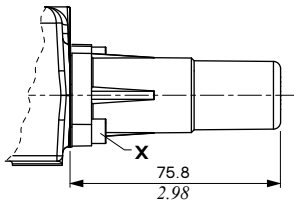
Type SLCZ
With endcap



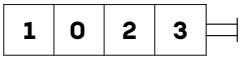


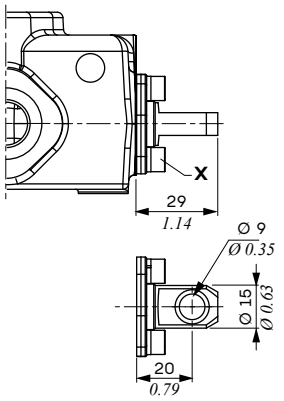
Type SLCZWP
As type SLCZ, waterproof





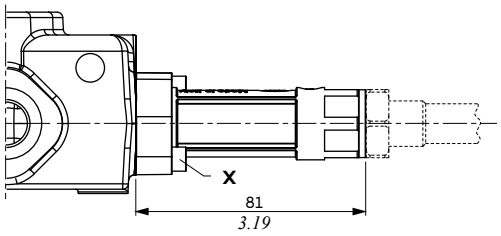
Type SLP
Dust proof plate





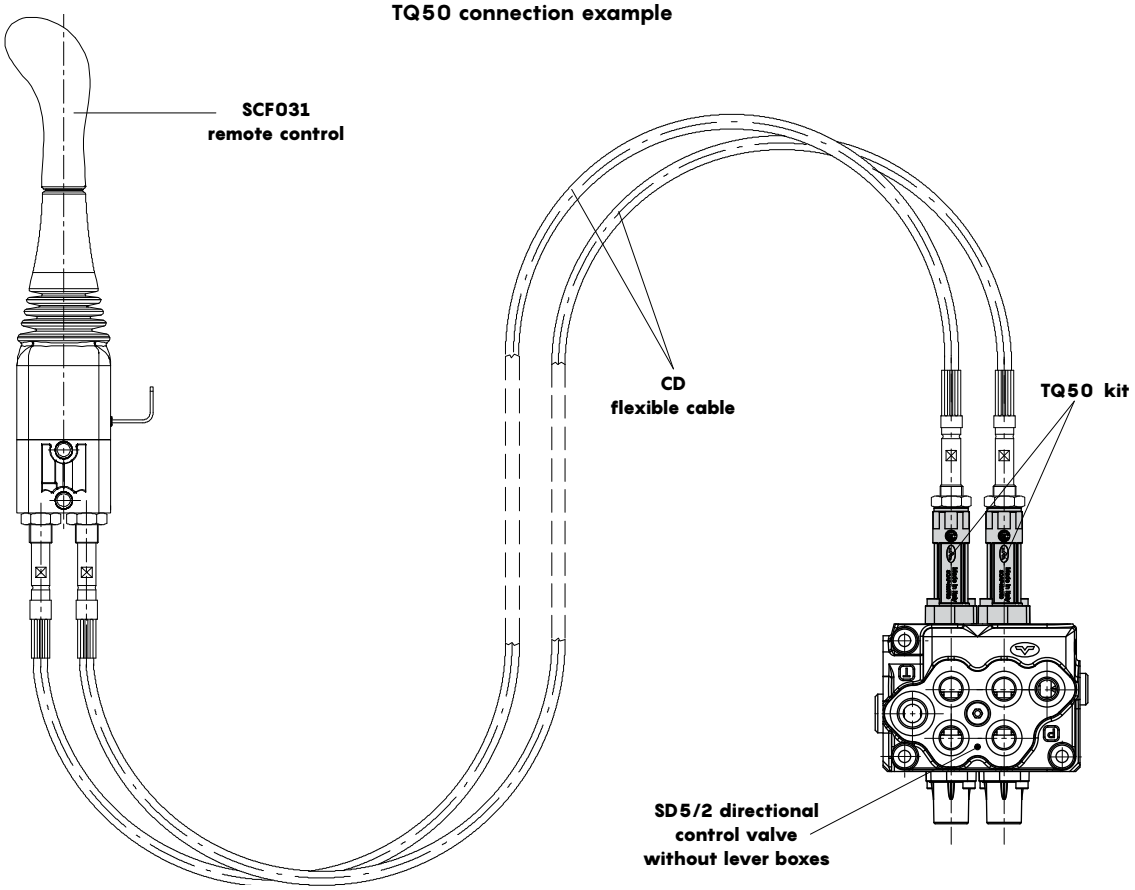
Type TQ50
Cable connection





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

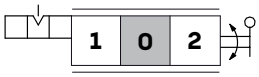
TQ50 connection example



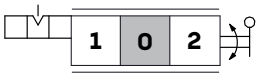
For rotary spool control kit configuration

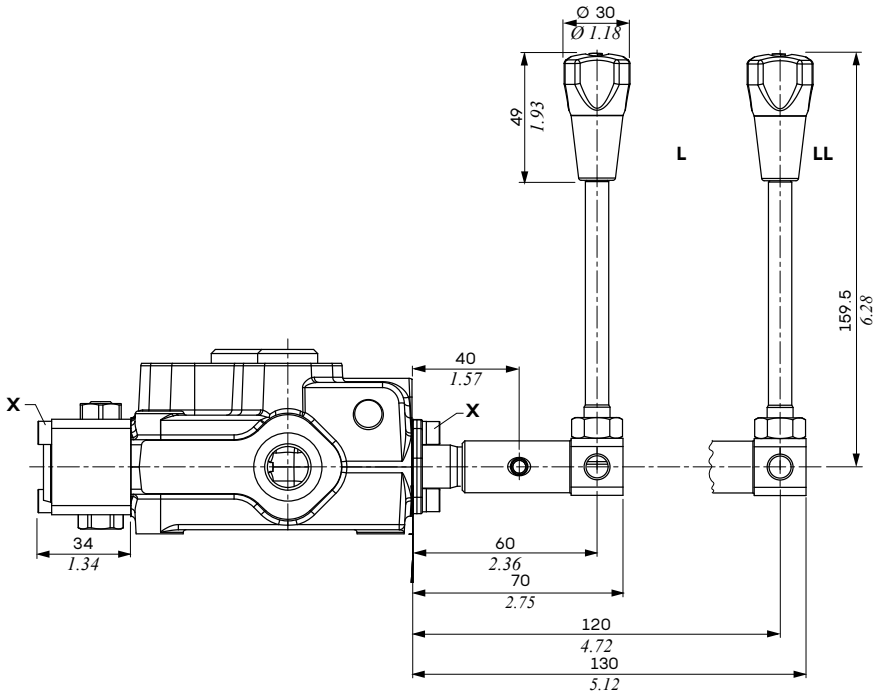
Rotary spool controls requires dedicated spools, see page 18.

Type L
Control kit for rotary spool configuration

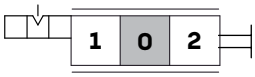


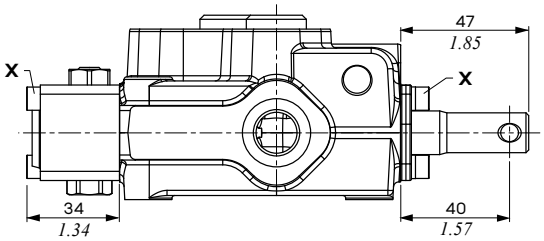
Type LL
Long control kit for rotary spool configuration





Type SLP
Configuration with dust proof plate



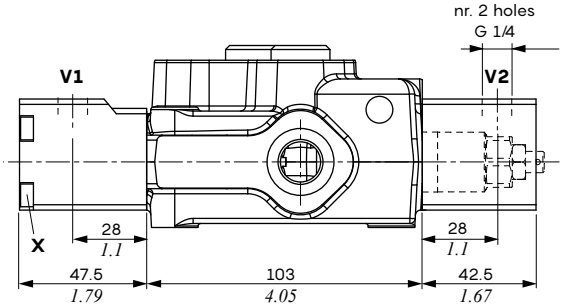


Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbf)*

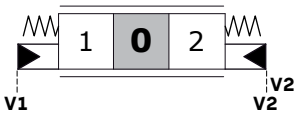
Complete controls

Proportional hydraulic control

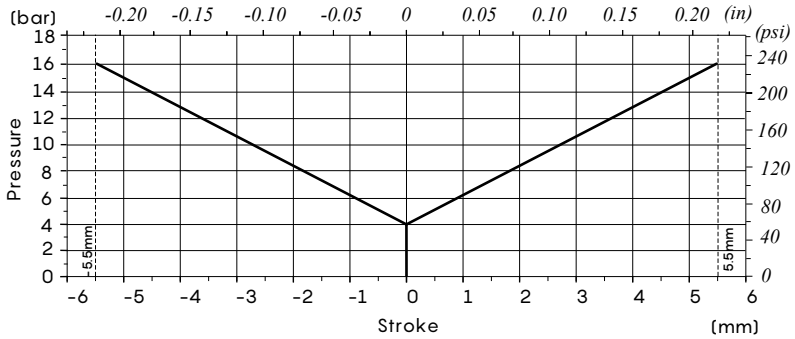
Type 8IM
Pilot control kit



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



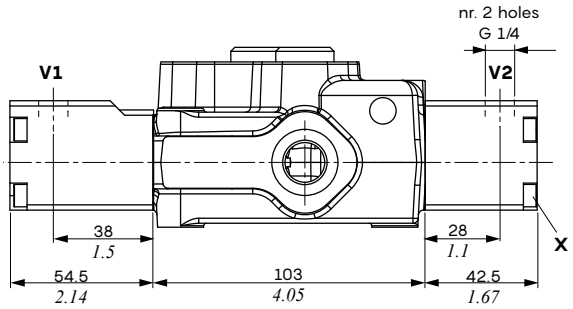
Pilot pressure-Stroke diagram

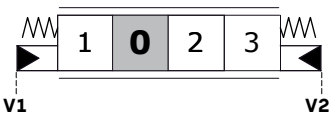


Technical features

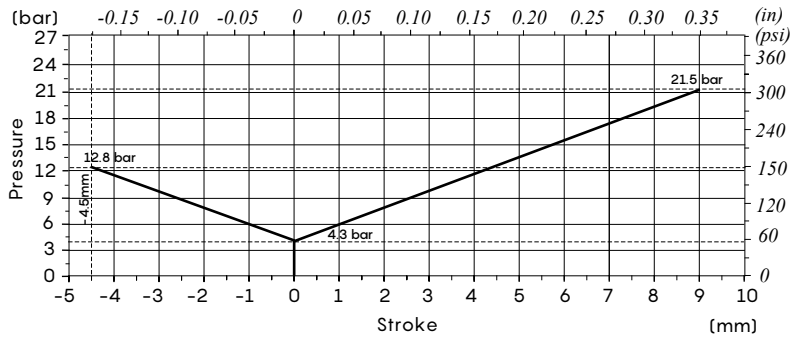
Pilot pressure: ..... max. 50 bar / *725 psi*

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





Pilot pressure-Stroke diagram



Technical features

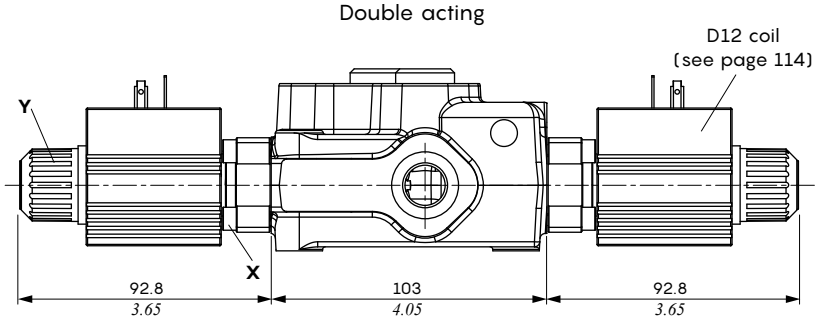
Pilot pressure: ..... max. 100 bar / *1450 psi*

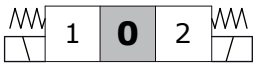
Note - 13IM control requires dedicated spool type 5DY.

Complete controls

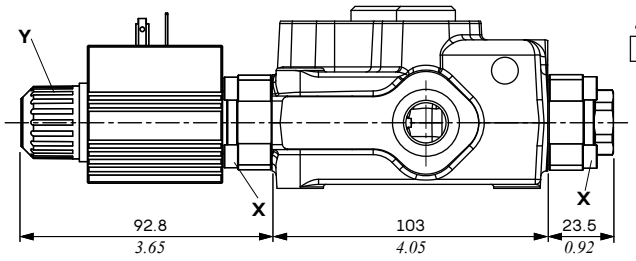
ON/OFF direct solenoid control kits

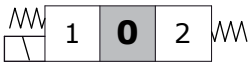
Type 8ES3
Double acting



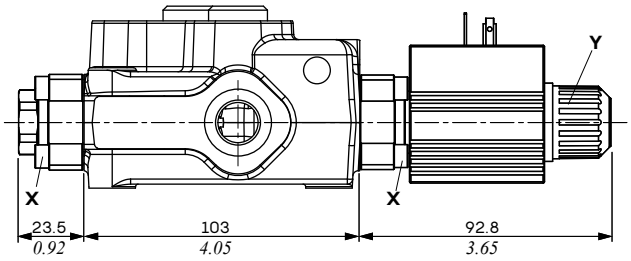


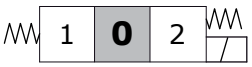
Type 8ES1
Single acting in A



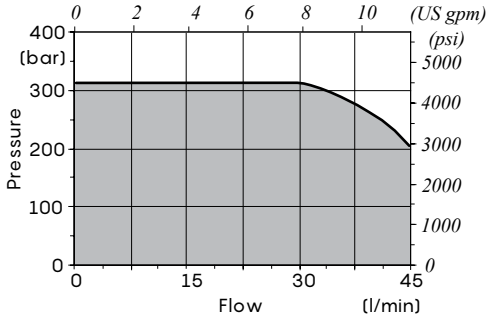


Type 8ES2
Single acting in B





Operating condition diagram

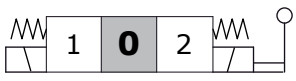


Technical features

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

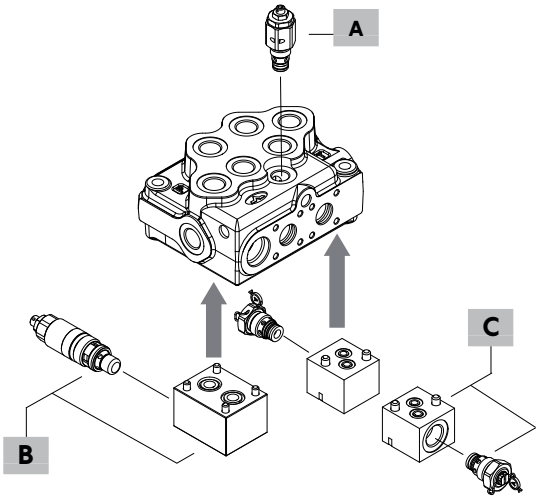
Note - For **D12** coils and connectors see page 116.

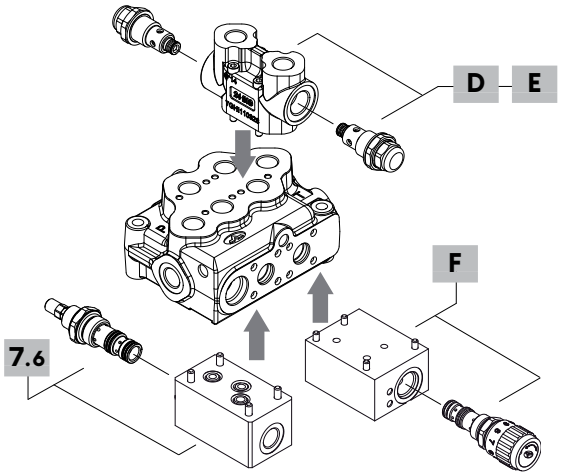
Type 8ES3LHE
Double acting with manual override for emergency only



Wrenches and tightening torques
X= allen wrench 4-6.6 Nm *(4.9 lbtf)*
Y= 6.6 Nm *(4.9 lbtf)*

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: **P**antishock 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**

Type VS relief service valve

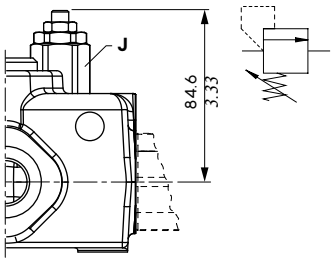
It's suggested for flow up to 25 l/min - *6.6 US gpm*, and it's mounted on parallel body to limitate the pressure, a lower value than main relief valve (min. gap 20 bar - *290 psi*), on downstream section.
It requires additional SD5 body machining. Please contact our Sales Dpt for the machining of the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

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

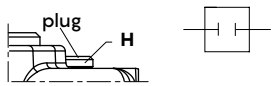
Description example: SD5/2-P(KG3-120)/18L/ **VS(G3-100)** /18L/AET-PSA

relief service valve

Valve VS



Valve blanking plug VST



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

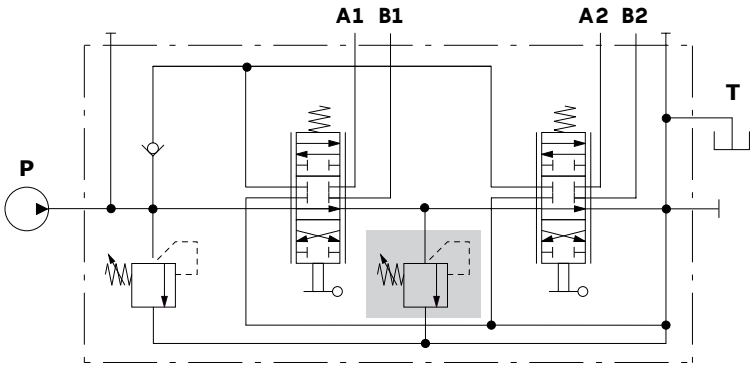
Ordering codes

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

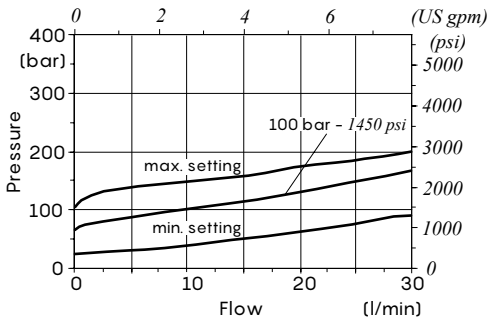
Note - (*) Please contact our Sales Dpt for more information.

Hydraulic circuit with VS valve



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

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.

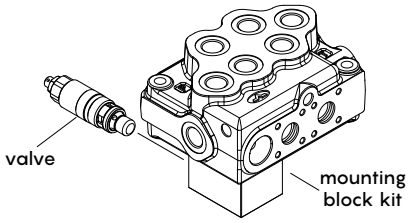
Type VSC

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.

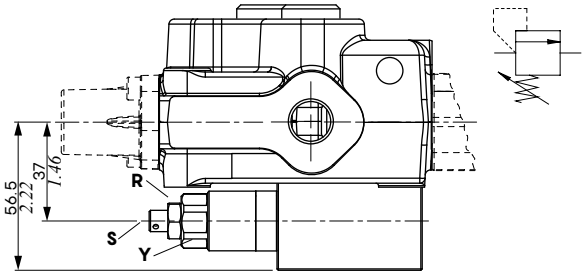
Adjustment type **G**= with screw, **H**= set and locked — Spring type — Valve setting (bar)

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

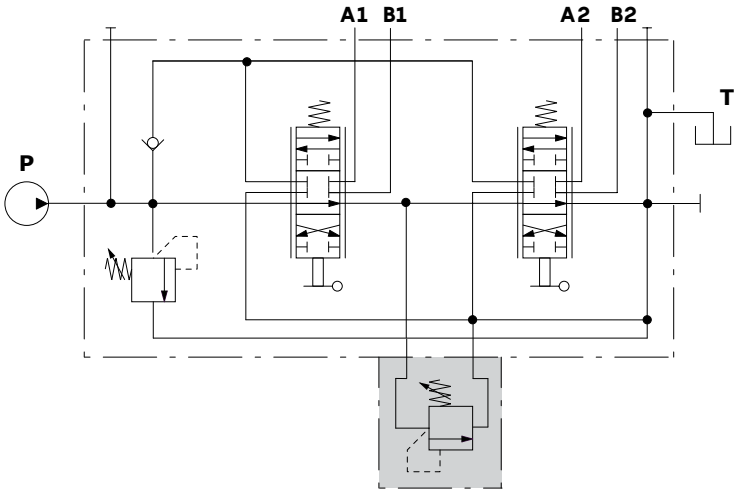
flange mounted relief service valve



VSC valve

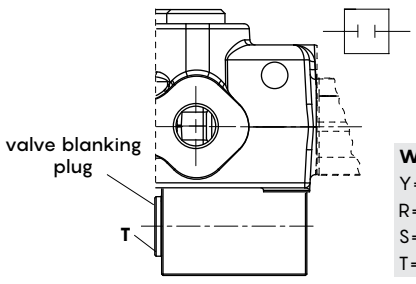


Hydraulic circuit with VSC valve



Description example:
SD5/2-P(JG3—120)/18L/**VSC(KG3-100)**/18L/AET

SV valve blanking plug



Wrenches and tightening torques
Y= wrench 19-24 Nm *(17.7 lbtf)*
R= wrench 13-24 Nm *(17.7 lbtf)*
S= allen wrench 4
T= wrench 10-24 Nm *(17.7 lbtf)*

Auxiliary valves

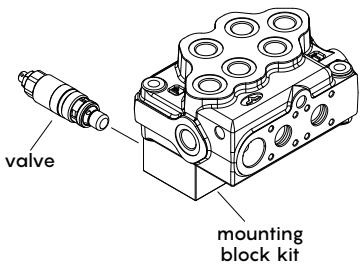
Tipe VSB

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

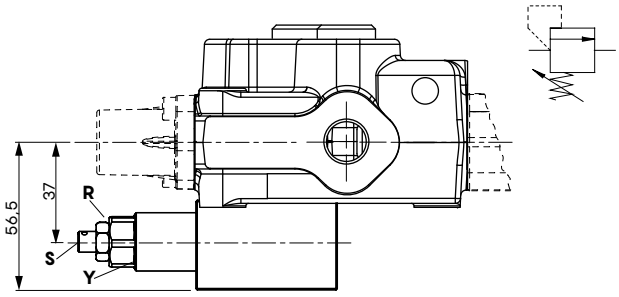
Adjustment type **G**= with screw
H= set and locked
Spring type
Valve setting (bar)

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

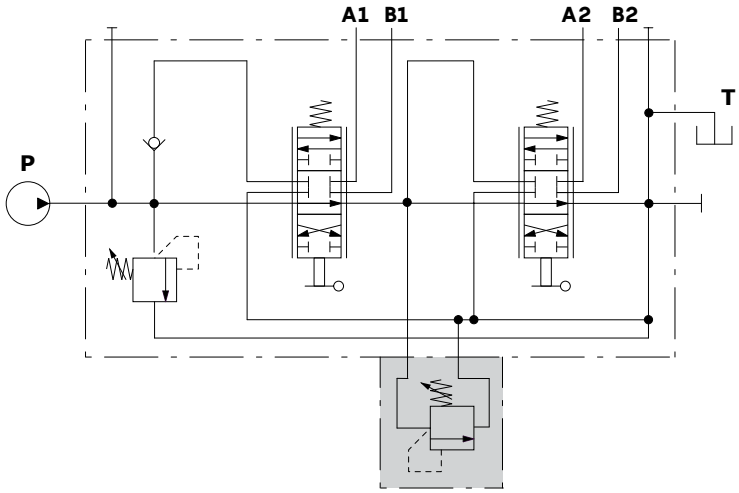
flange mounted relief service valve



VSB valve

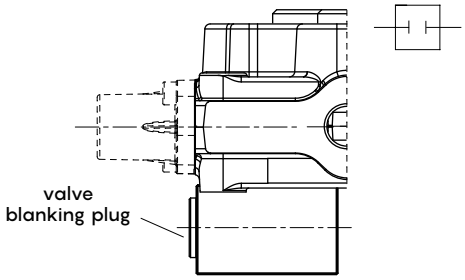


Hydraulic circuit with VSB



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

SV valve blanking plug



Wrenches and tightening torques
Y= wrench 19-24 Nm *(17.7 lbtf)*
R= wrench 13-24 Nm *(17.7 lbtf)*
S= allen wrench 4
T= wrench 10-24 Nm *(17.7 lbtf)*

Auxiliary valves

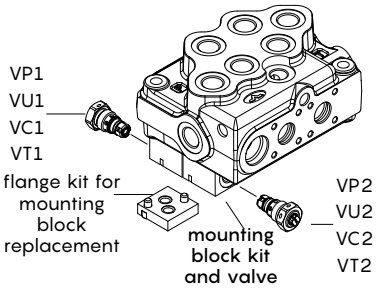
Type VP-VU-VC flange mounted service valves

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 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.

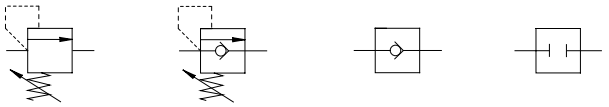
Adjustment type **G**= with screw
H= set and locked
Spring type
Valve setting (bar)

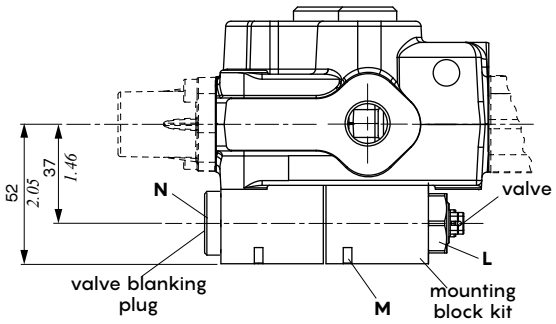
Description example: SD5/2-P(JNG4-220)/18L/18L.**VP3(G3-120)** /AET

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 VU anticavitation
Type SV valve blanking plug



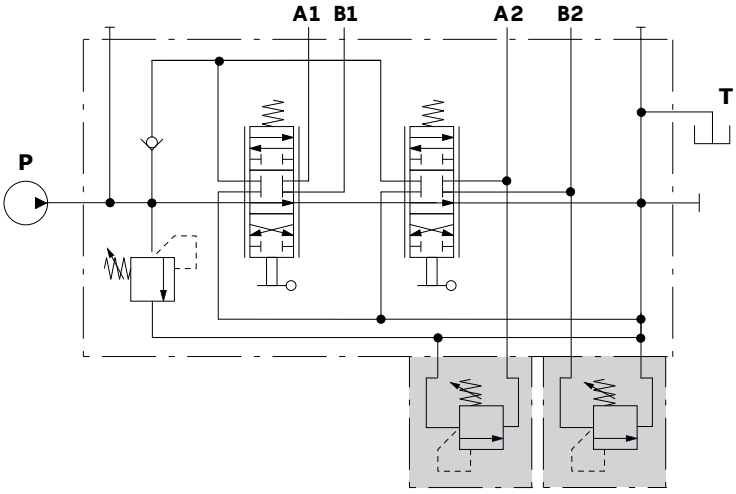


Wrenches and tightening torques
L= wrench 22-42 Nm *(31 lbtf)*
M= allen wrench 5-9.8 Nm *(7.2 lbtf)*
N= allen wrench 8-24 Nm *(17.7 lbtf)*

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

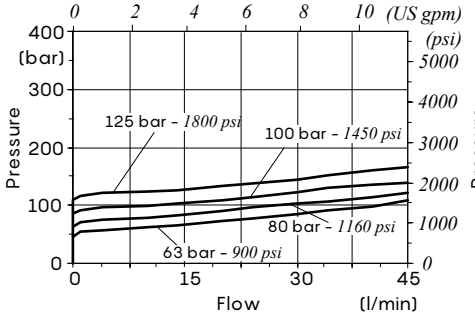


Description example:
SD5/2-P(JNG4-220)/18L/18L.**VP3(G3-120)** /AET

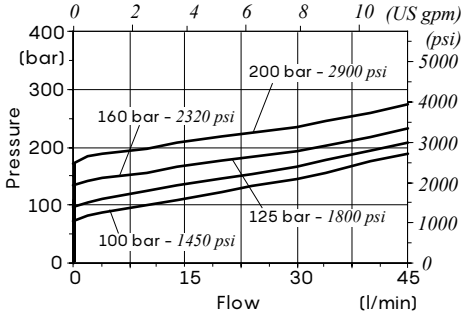
Type VP-VU-VC flange mounted service valves

Type VP antishock valve performance data

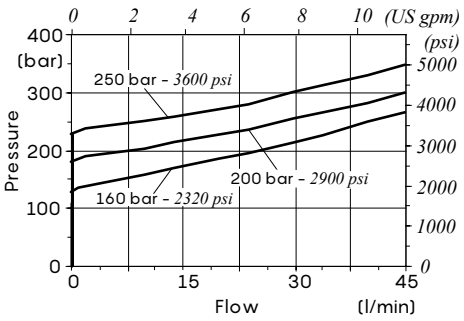
Setting range spring nr.2



Setting range spring nr.3

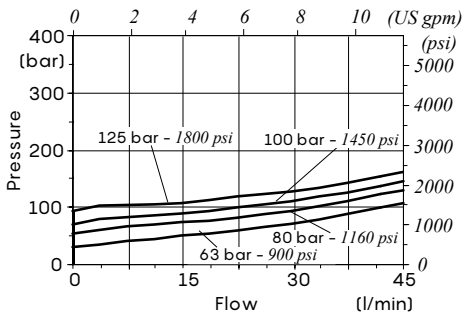


Setting range spring nr.4

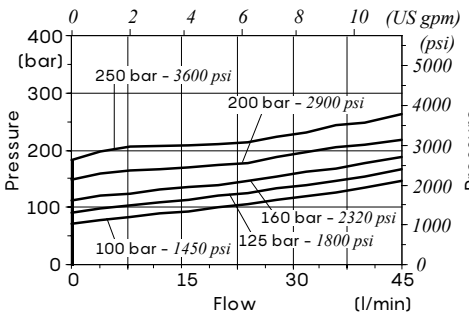


Type VU antishock and anticavitation valve performance data

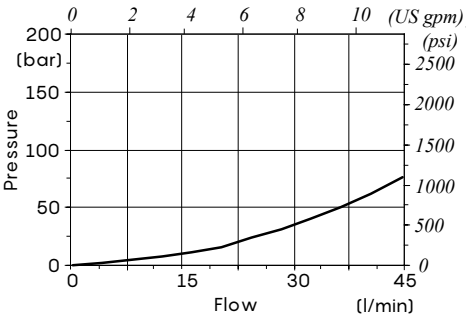
Setting range spring nr.2



Setting range spring nr.3

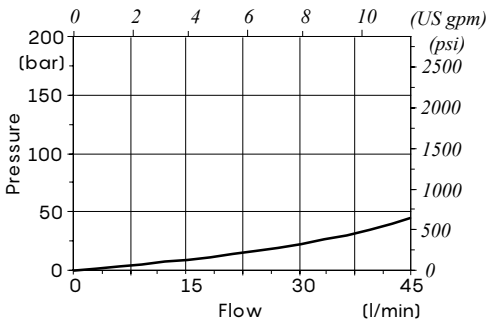


Pressure drops



Type VC anticavitation valve performance data

pressure drops



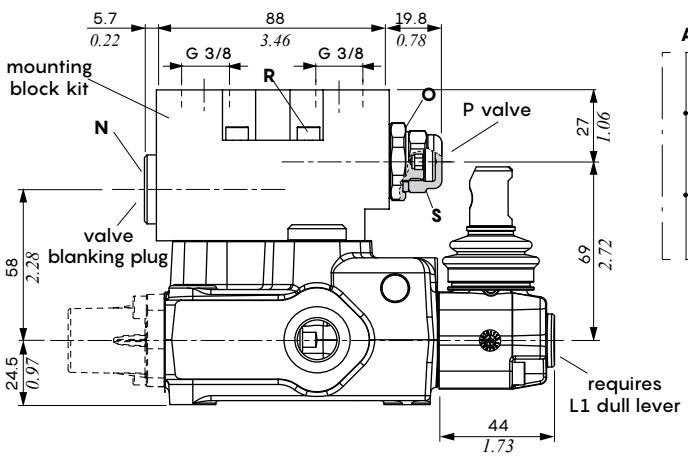
Auxiliary valves

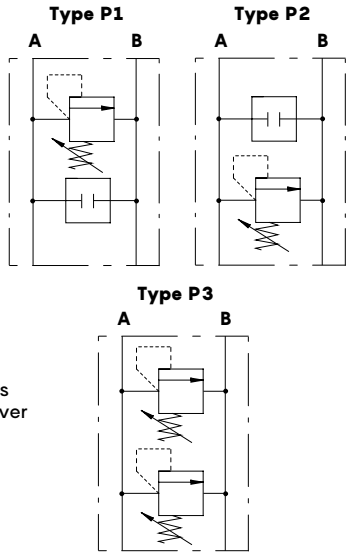
Type P antishock cross return valve

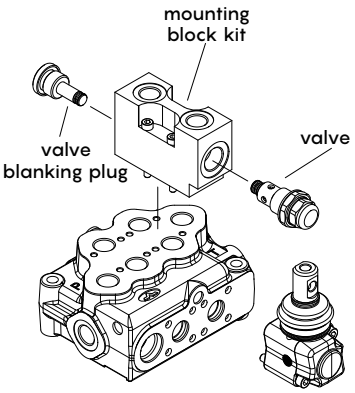
Cast iron block with antishock valves fol lever kit **L1**, **LSG1**, **L1F1** and **LSG1F1**. They requires special machining on the SD5 body. Please contact our Sales Dpt for the machining of the body and information.

Taratura valvola (bar)

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







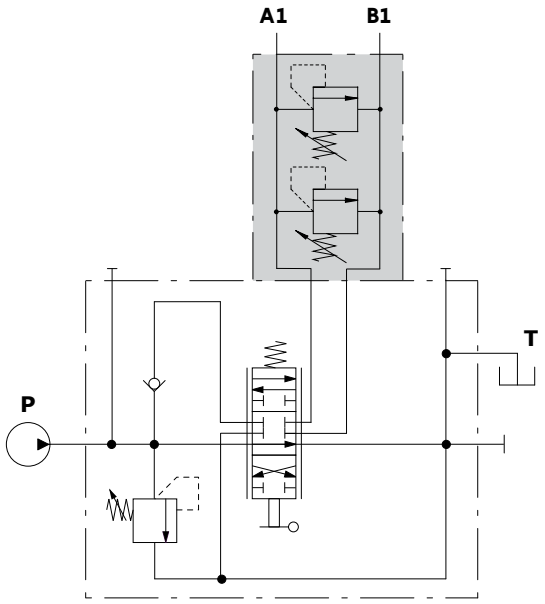
Wrenches and tightening torques
N= allen wrench 8-24 Nm *(17.7 lbtf)*
O= wrench 27-42 Nm *(31 lbtf)*
R= allen wrench 4-9.8 Nm *(7.2 lbtf)*
S= wrench 5

Ordering codes

TYPE	CODE	DESCRIPTION
Complete P valve block (cross return type; it requires L1, LSG1 and LSGF1 dedicated lever kit)		
P1(D3)	602001000 (1)	Block with valve on port A
P2(D3)	602001000 (1)	Block with valve on port B
P3(D3)	602001100 (1)	Block with valve on ports A and B
Mounting block		
-	5CO2720300 (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 **BSP** threads

Hydraulic circuit with P valve

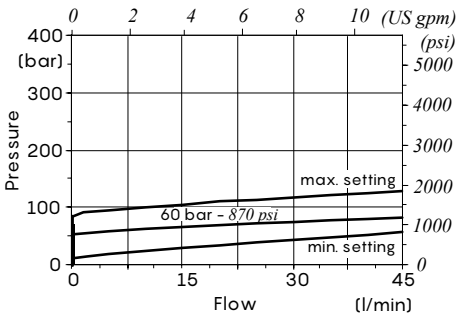


Description example:
SD5/1-P(KG4—200)/18L.**P3(G4-200)**/AET

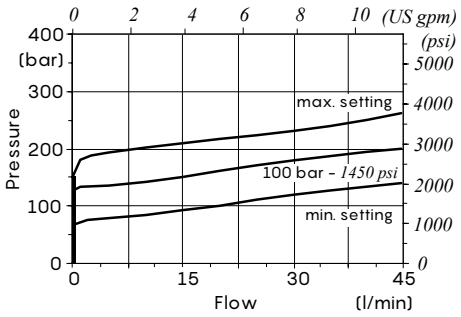
Type P antishock cross return valve

Performance data

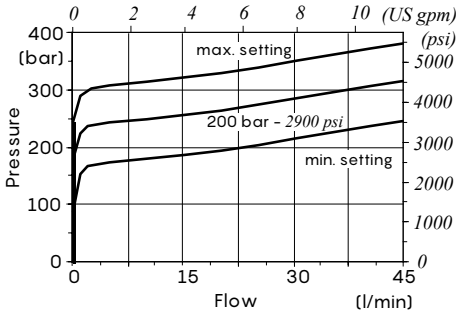
Setting range spring nr.2



Setting range spring nr.3



Setting range spring nr.4



Auxiliary valves

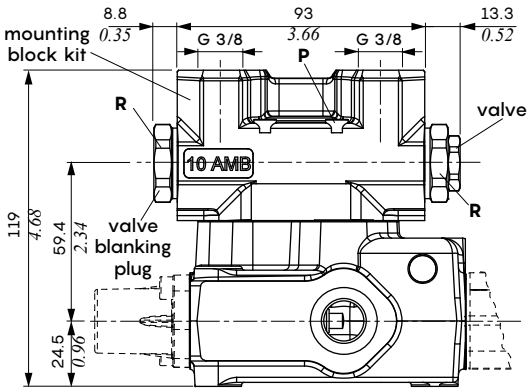
Type BP-BPS pilot operated check valves

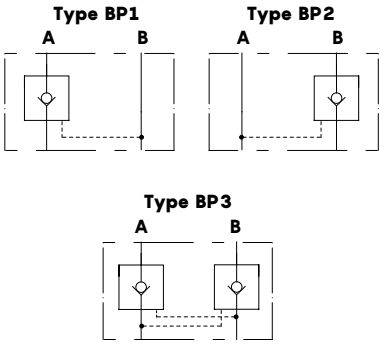
They requires additional machining on the SD5 body. Please contact our Sales Dpt for the machining of the body and information.

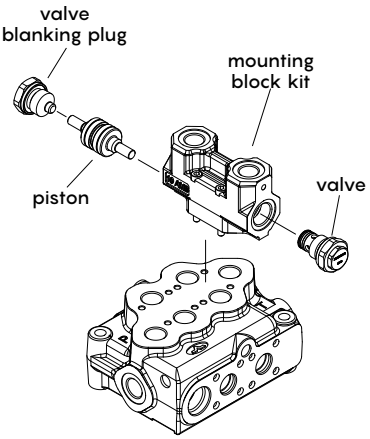
BP direct type

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

check valve







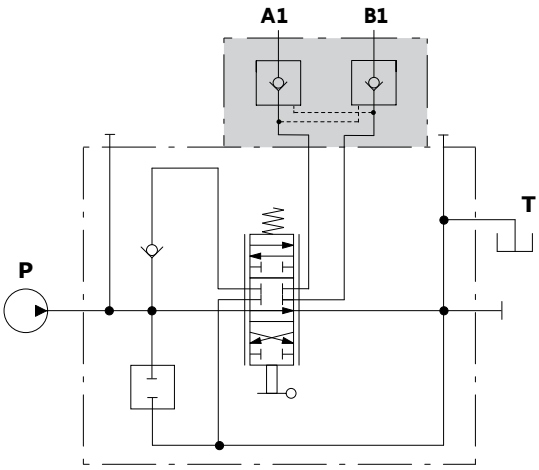
Wrenches and tightening torques
R= wrench 27-42 Nm *(31 lbtf)*
P= allen wrench 4-9.8 Nm *(7.2 lbtf)*

Ordering codes

TYPE	CODE	DESCRIPTION
Complete BP-BPS valve block, dyrect type (1)		
BP1	602002000	Block with valve on port A
BP2	602002030	Block with valve on port B
BP3	602002100	Block with valve on ports A and B
Mounting block		
-	5CO2620300 (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

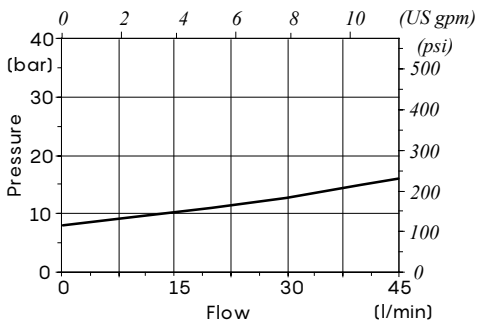
Note - (1) Codes are referred to **BSP** threads

Hydraulic circuit with BP valve



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

BP valve pressure drops



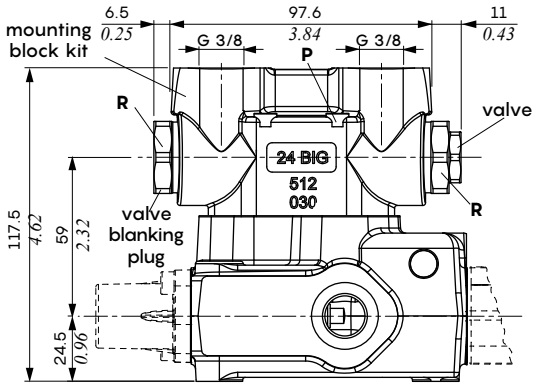
Type	Pilot ratio With pre-opening	Pilot ratio Main
BP	-	1:5.3

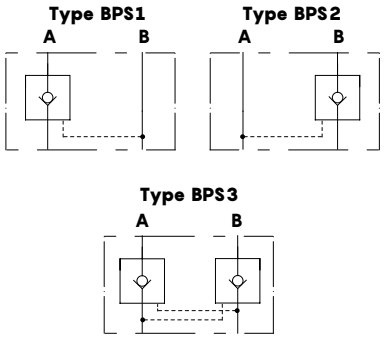
Type BP-BPS pilot operated check valves

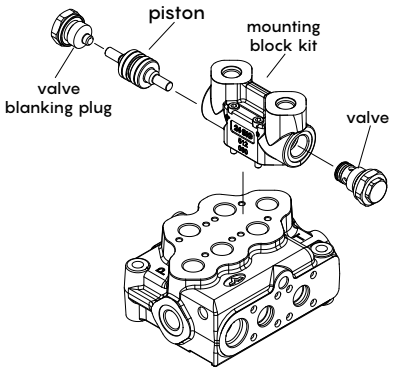
BPS with pre-opening type

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

check valve







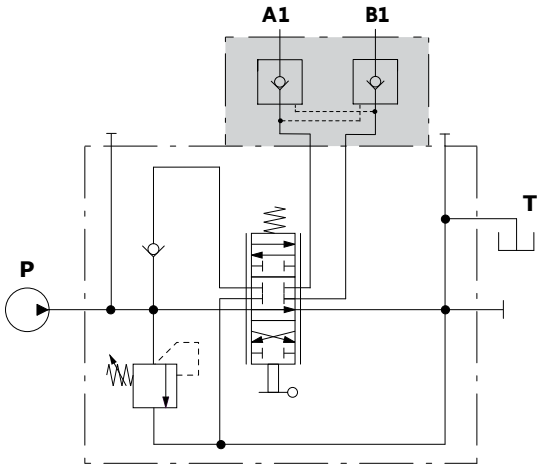
Wrenches and tightening torques
R= wrench 27-42 Nm *(31 lbtf)*
P= allen wrench 4-9.8 Nm *(7.2 lbtf)*

Ordering codes

TYPE	CODE	DESCRIPTION
With pre-opening (1)		
BPS1	602003000	Block with valve on port A
BPS2	602003001	Block with valve on port B
BPS3	602003100	Block with valve on ports A and B
Mounting block		
-	5CO2620300 (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

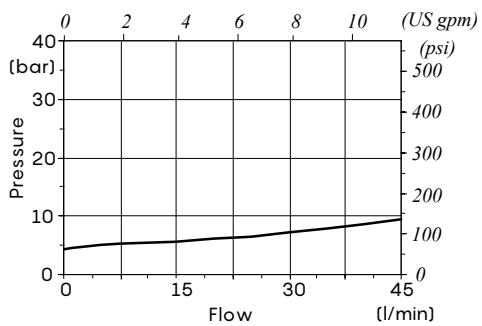
Note - (1) Codes are referred to **BSP** threads

Hydraulic circuit with BPS valve



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

BPS valve pressure drops



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

Auxiliary valves

Flow control valves

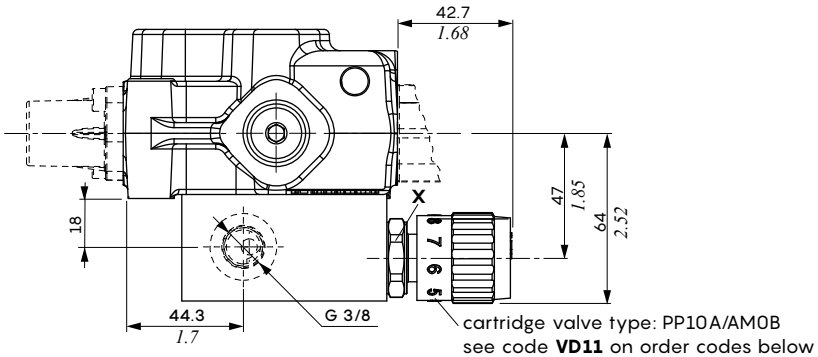
Valve type VD1

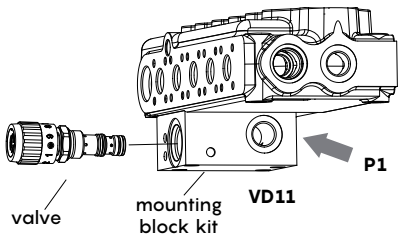
Block with pressure compensated 3-way flow regulator valve, to be flange mounted on body with parallel circuit. The cavity is oriented toward lever side. The flow is regulated on every working section while the exceeding flow goes to tank: max regulated flow 30 l/min *(7.9 USgpm)* with inlet on port 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

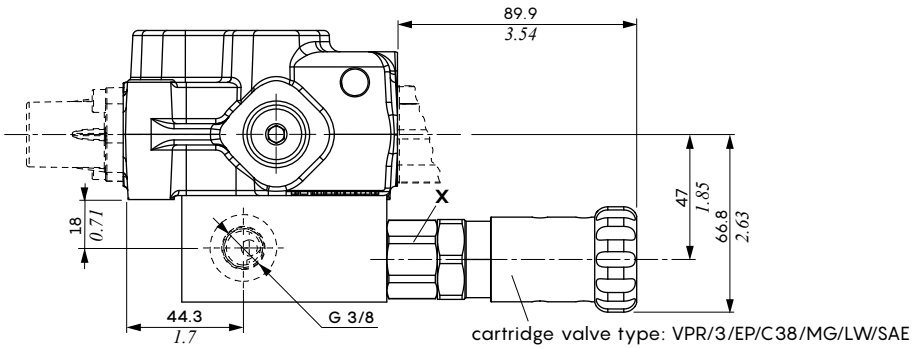
VD11 valve: continuous fine regulation
VD12 valve: one turn with detent handknob regulated

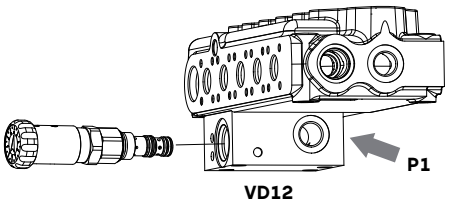
Type VD11
continuous fine regulation





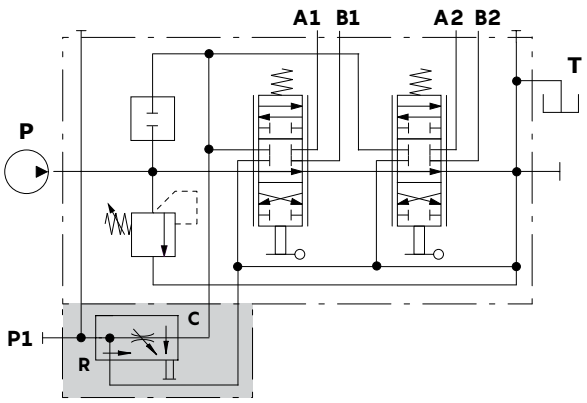
Type VD12
one turn with detent handknob regulated





Wrenches and tightening torques
X= wrench 27-50 Nm *(36.9 lbf)*

Hydraulic circuit with VD11 valve



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

Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VD1 type		
-	5CO63602201 (1)	Mounting block kit
VD1 valves		
VD11	0PP10002000	Fine regulation from 3 to 20 l/min *(from 0.79 to 5.28 US gpm)*
VD12	1636020211	One turn with detent (n. 10 notchs)

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

Flow control valves

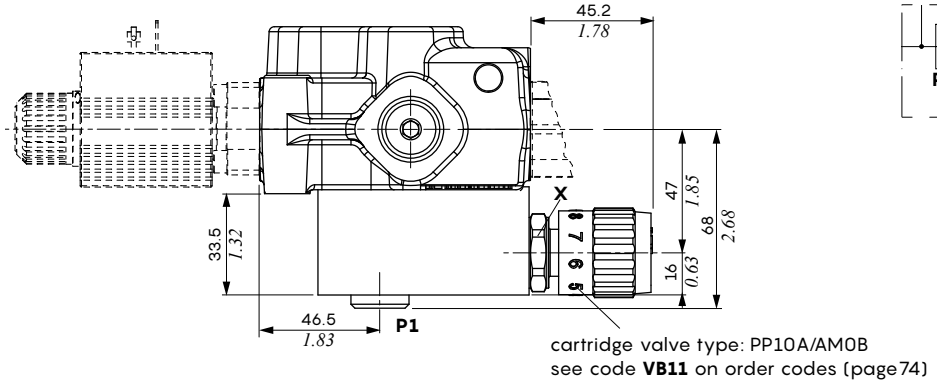
Valve type VB1

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

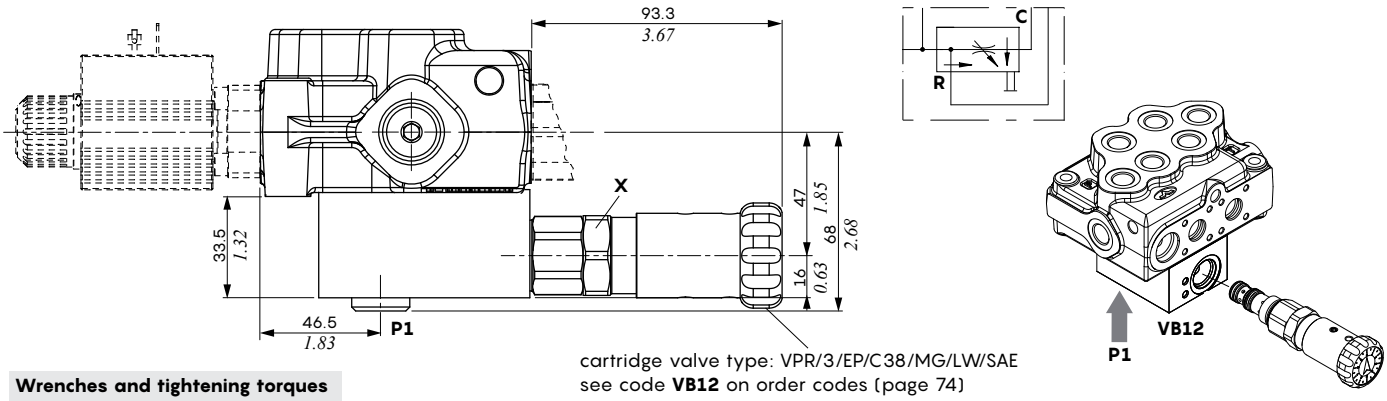
VB11 valve: continuous fine ragulation
VB12 valve: one turn with detent handknob regulated
VB13 valve: electroproportional operated
VB15 valve: screw regulation with blind nut

VB11 type
continuous fine regulation



cartridge valve type: PP10A/AM0B
see code **VB11** on order codes (page74)

VB12 type
one turn with detent handknob regulated



cartridge valve type: VPR/3/EP/C38/MG/LW/SAE
see code **VB12** on order codes (page 74)

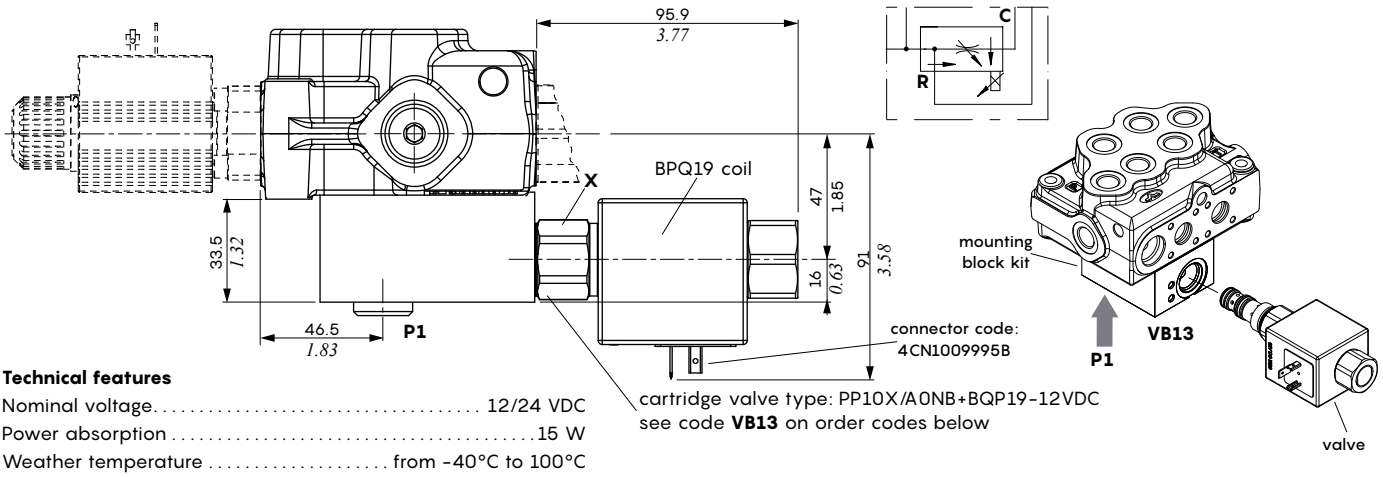
Wrenches and tightening torques
X= wrench 27-50 Nm *(36.9 lbtf)*

Auxiliary valves

Flow control valves

Valve type VB1

VB13 type
electroproportional operated

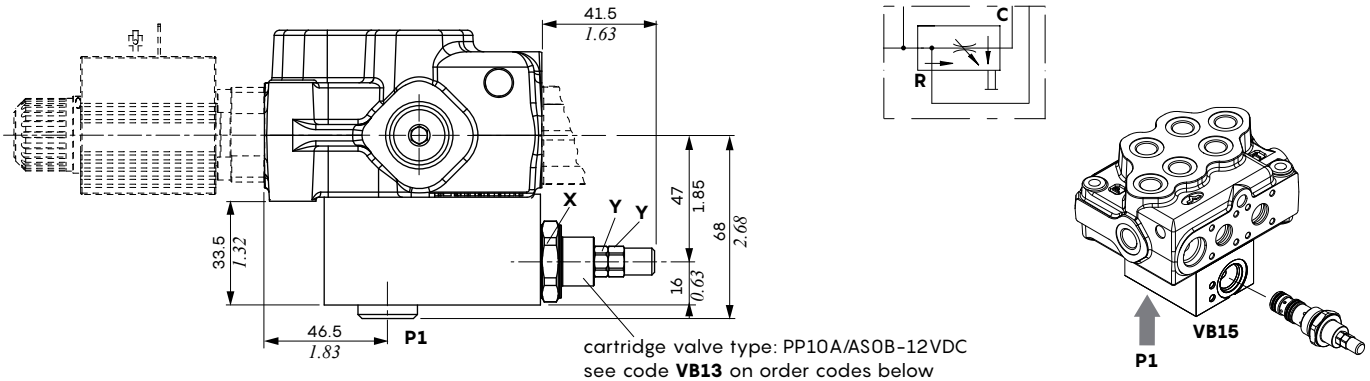


Technical features

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

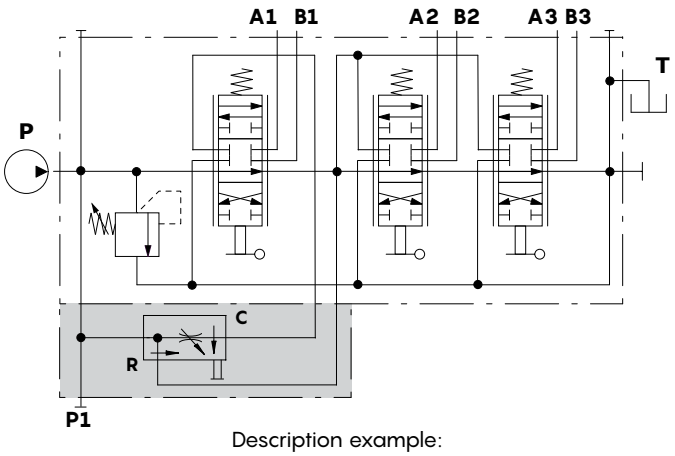
Note - For **BQP19** coils and connectors see page 116

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)*

Hydraulic circuit with VB11 valve



Description example:
SD5/3-SP2(JNG120)/**VB11**/18L/18L/AET

Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VB1 type		
-	5CO63602205 (1)	Mounting block kit
VB1 valves		
VB11	0PP10002000	Fine regulation from 3 to 20 l/min *(from 0.79 to 5.28 US gpm)*
VB12	1636020211	One turn with detent (n. 10 notchs)
VB13	0PP10002037	Electroproportional operated
VB15	0PP10002005	Screw regulation with blind nut
Coil (see page 116)		
BPQ19	4SL5000126A	Type BPQ19, 12VDC, conn. ISO4400

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

Flow control valves

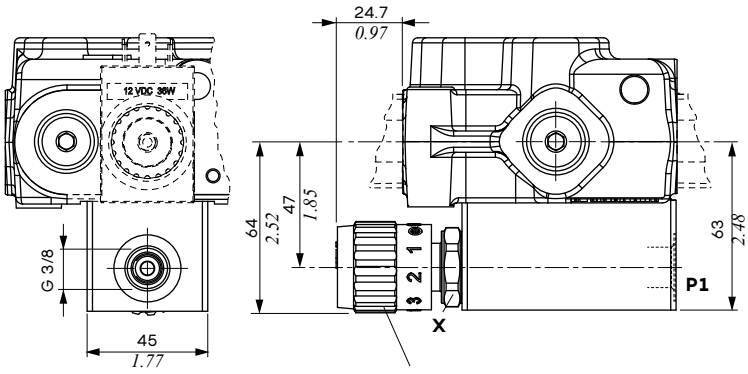
Valve type VD2

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.

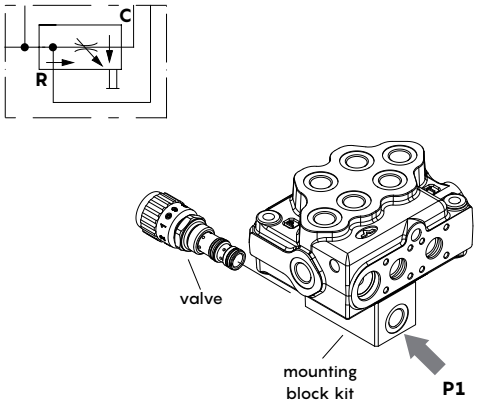
Description example: SD5/3-P(JNG3-150)/**VD25**/18ES3/18ES3/18ES3/AET

VD21 valve: PP10A/AM0B
VD22 valve: VPR/3/EP/C38/MG/LW/SAE
VD23 valve: PP10X/A0NB+BQP19-12VDC
VD25 valve: PP10A/AS0B-12VDC

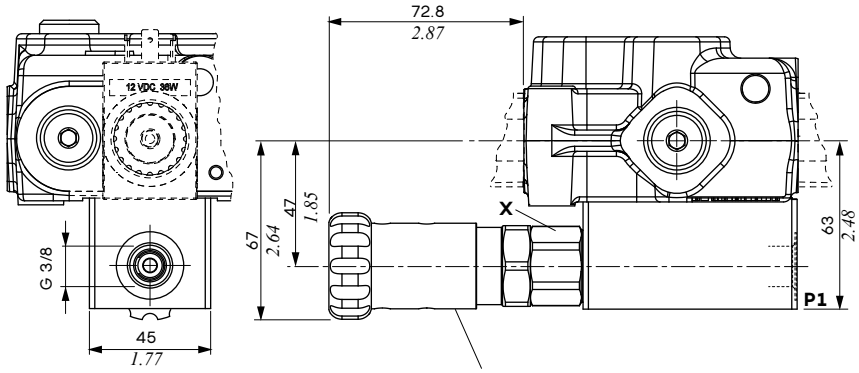
VD21 type
continuous fine regulation



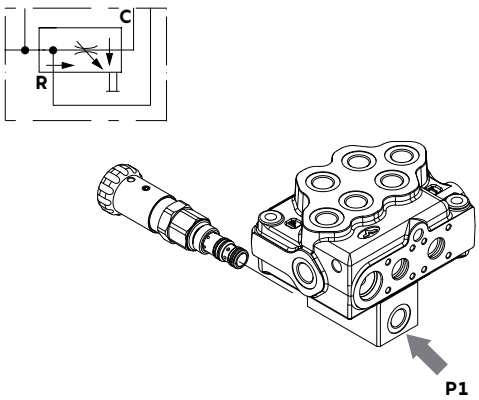
cartridge valve type: PP10A/AM0B
see code **VD21** on order codes (page 76)



VD22 type
one turn with detent handknob regulated



cartridge valve type: VPR/3/EP/C38/MG/LW/SAE
see code **VD22** on order codes (page 76)



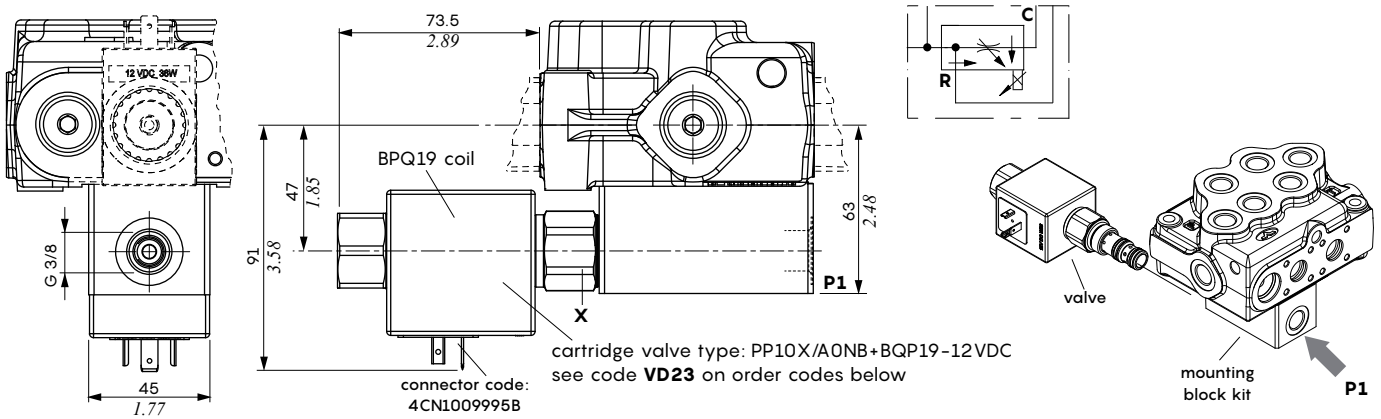
Wrenches and tightening torques
X= wrench 27-50 Nm *(36.9 lbf)*

Auxiliary valves

Flow control valves

Valve type VD2

VD23 type
electroproportional operated



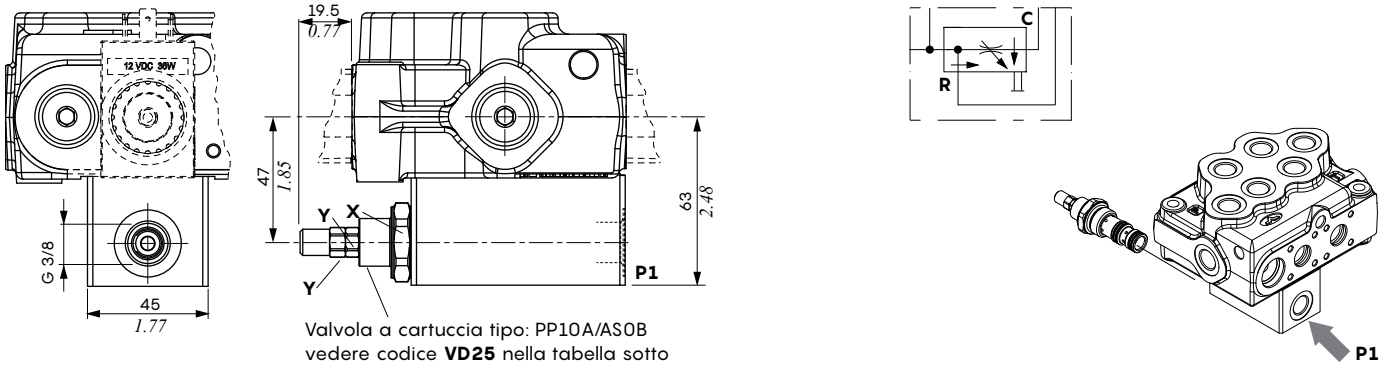
Technical features

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 **BQP19** coils and connectors see page 116

Wrenches and tightening torques
X= wrench 27-50 Nm *(36.9 lbtf)*
Y= wrench 10-6.6 Nm *(4.87 lbtf)*

VD25 type
screw regulation with blind nut

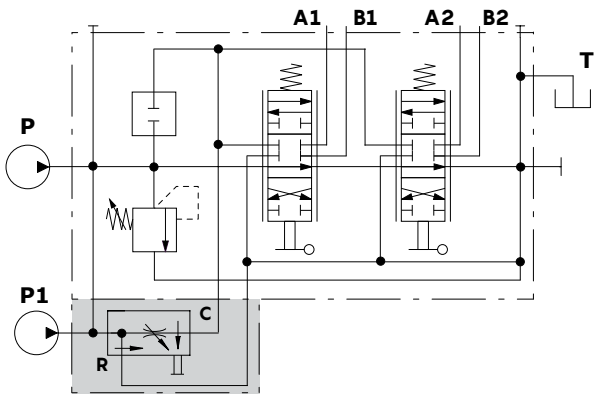


Ordering codes

TYPE	CODE	DESCRIPTION
Mounting block VD2 type		
-	5CO63602203 (1)	Mounting block kit
VD2 valves		
VD21	0PP10002000	Fine regulation from 3 to 20 l/min *(from 0.79 to 5.28 US gpm)*
VD22	1636020211	One turn with detent (n. 10 notchs)
VD23	0PP10002037	Electroproportional operated
VD25	0PP10002005	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

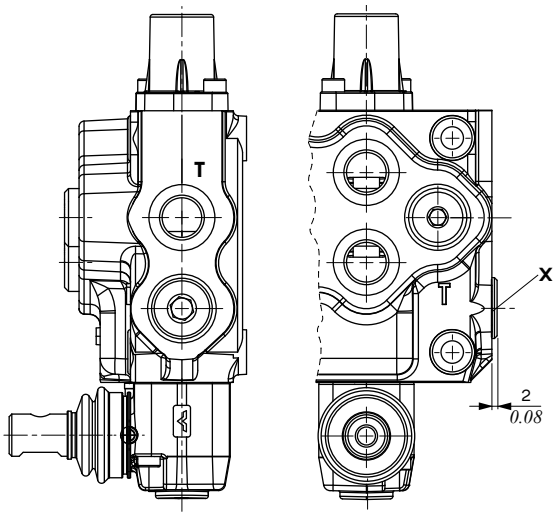


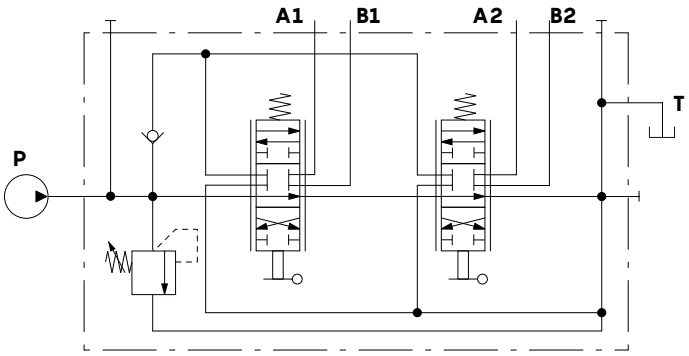
Description example:
SD5/2-P(JNG120)/**VD23**/18L/18L/AET

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

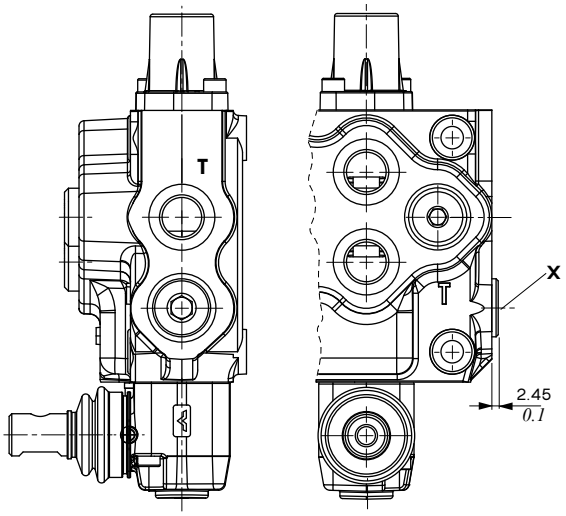


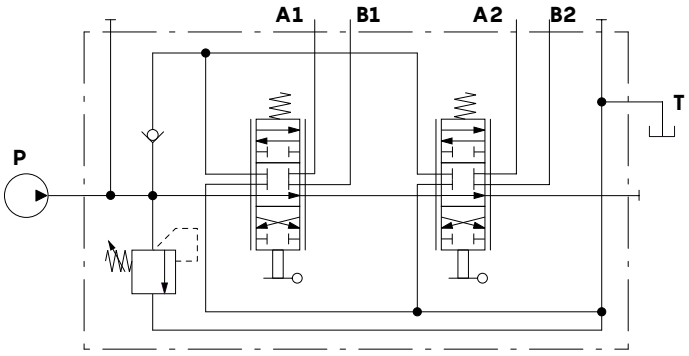


Description example:
SD5/3-P(JG3—120)/18L/18L/**AET**
(see page 6 for other AET examples)

Wrenches and tightening torques
X= allen wrench 8-24 Nm *(17.7 lbtf)*

AEK: closed center





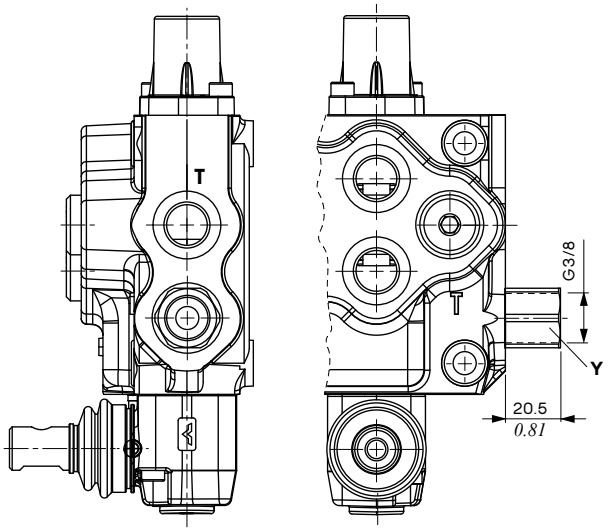
Description example:
SD5/3-P(JG3—120)/18L/18L/**AEK**

Wrenches and tightening torques
X= allen wrench 8-24 Nm *(17.7 lbtf)*

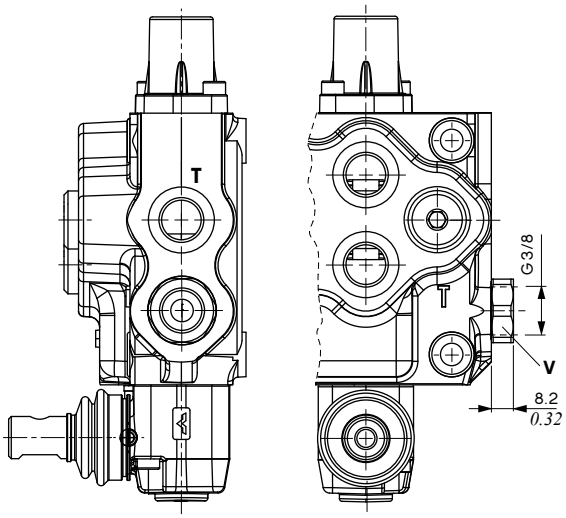
Outlet port options

AE: with carry-over

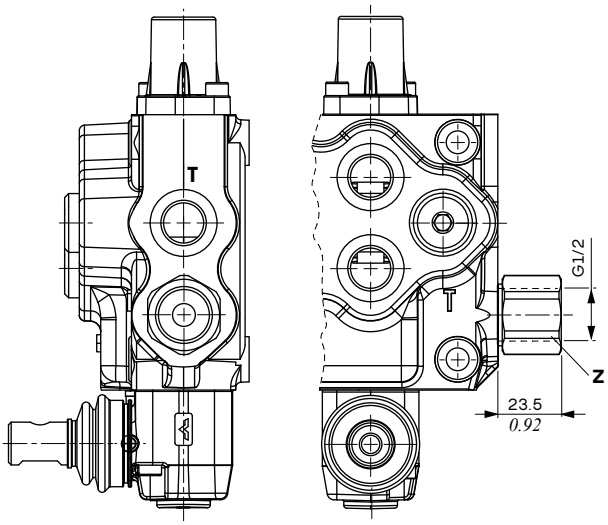
AE-G3/8



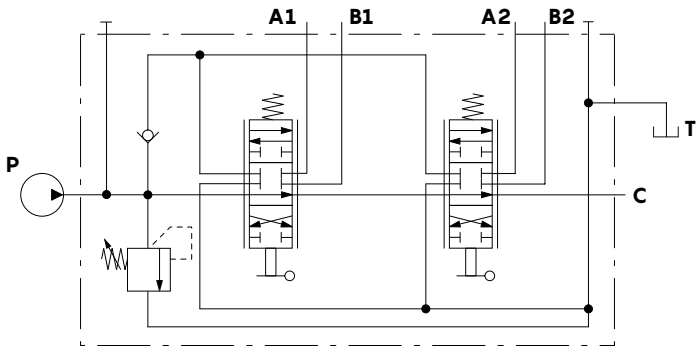
AE2-G3/8



AE-G1/2



Wrenches and tightening torques
Y= wrench 22-24 Nm *(17.7 lbtf)*
V= wrench 24-24 Nm *(17.7 lbtf)*
Z= wrench 27-24 Nm *(17.7 lbtf)*



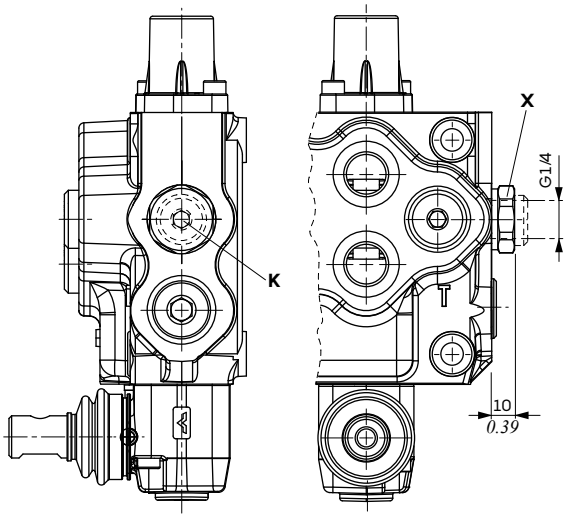
Description example:
SD5/2-P(JNG3—120)/18L/18L/**AE**

Unloader valves (with hydraulic pilot type L)

Dimensions

NOTE: The directional valve is supplied with the unloader valve plugged.

Type L configuration
Unloader valve with hydraulic pilot

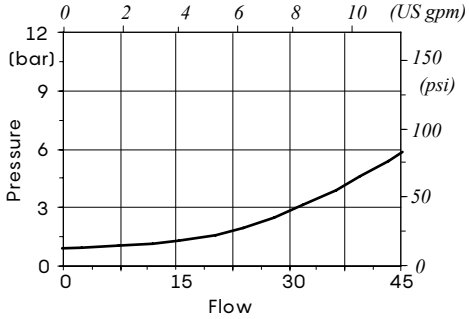


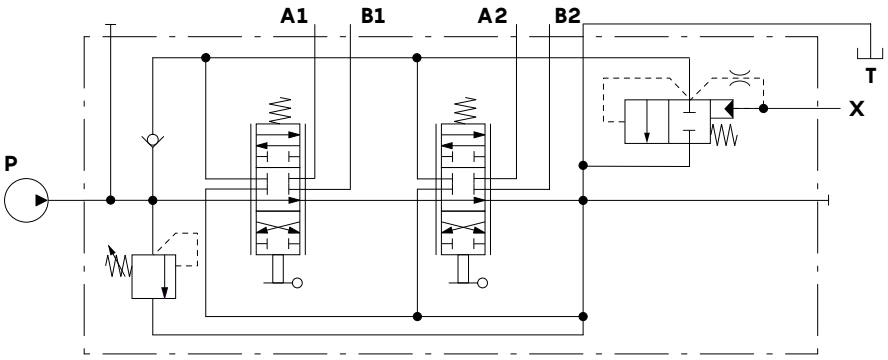
Wrenches and tightening torques
X= wrench 24-42 Nm *(31 lbtf)*
K= allen wrench 6

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



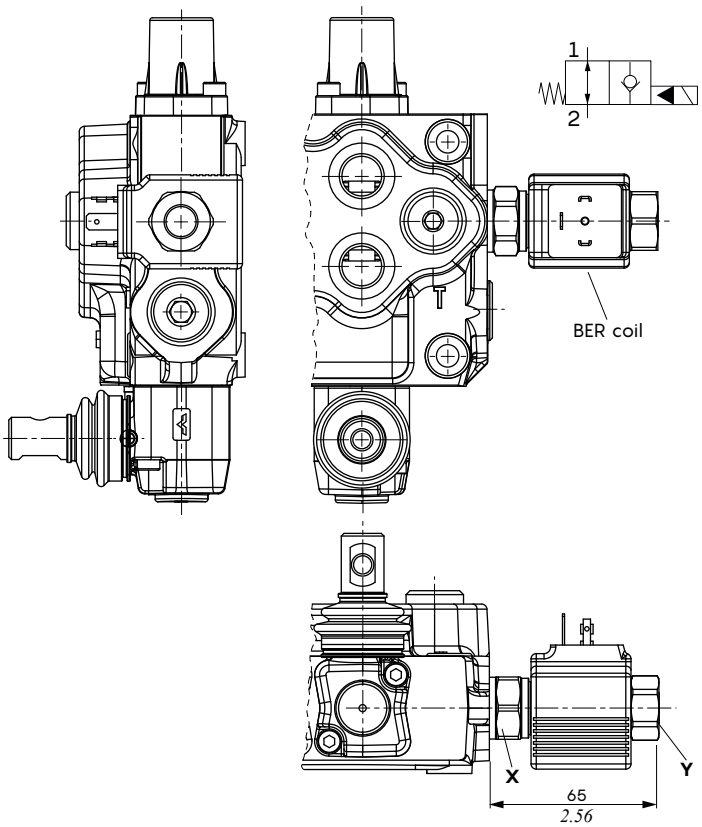


Description example:
SD5/3-P(JNG3—120)/18L/18L/AET-L

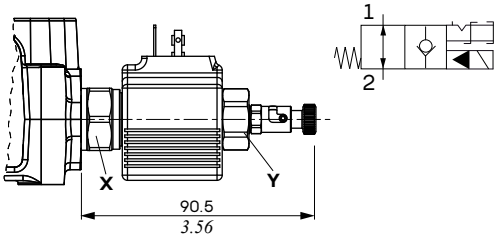
Unloader valves (with solenoid pilot type)

Dimensions

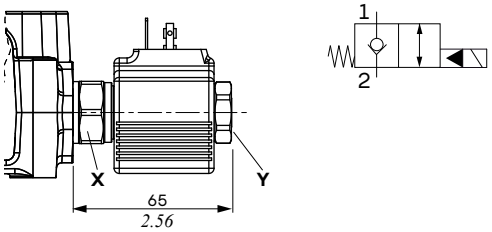
ELNW(NO)
Without manual emergency, NO circuit



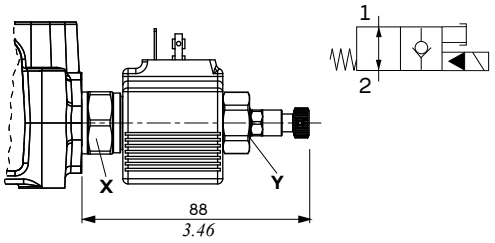
ELTW (NO)
With "push&twist" manual emergency, NO circuit



ELNW(NC)
Without manual emergency, NC circuit



ELPW (NO)
With push-button manual emergency, NO circuit



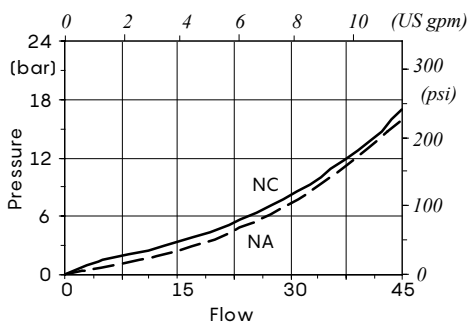
Technical features

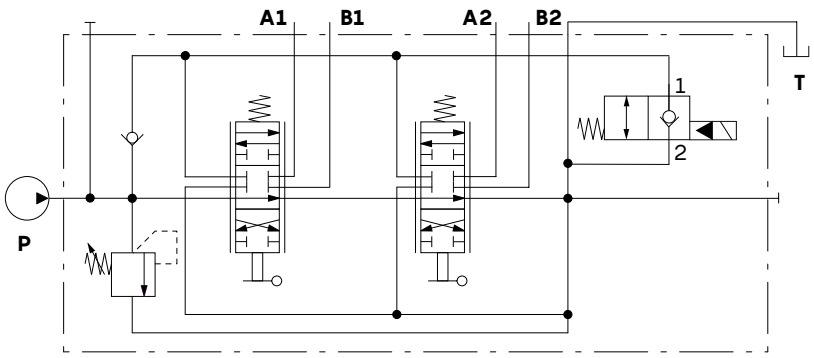
Max. flow: ..... 45 l/min *(12 USgpm)*
Max. pressure: ..... 315 bar *(4600psi)*
Internal leakage: ..... max. 3 cm³/min at 100 bar *(max. 4.6 in³/min at 1450 psi)*
Nominal voltage..... 12/24 VDC
Power absorption ..... 19.2 W
Weather temperature .....from - 30°C to 50°C *(from - 22°F to 122°F)*
Note -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

Wrenches and tightening torques
X= wrench 24-42 Nm *(31 lbtf)*
Y= max. 6.6 Nm *(4.9 lbtf)*

Performance data and hydraulic circuit

Pressure drops



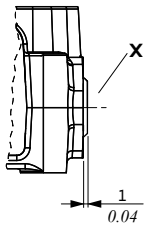


Description example:
SD5/3-P(JNG3—120)/18L/18L/AET-**ELNW**

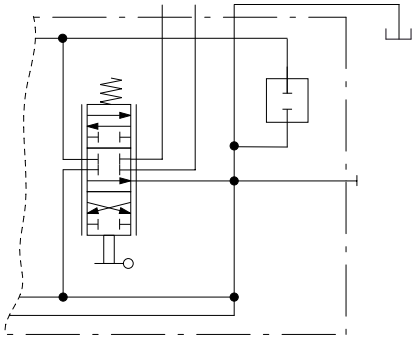
Unloader valves (valve blanking plug: AET-LT)

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**