

MONOBLOCK DIRECTIONAL
CONTROL VALVE

SD 11

 **walvoil**
HYDRAULIC CONTROL SYSTEMS

valvoilgroup

Features

Simple, compact and heavy duty designed monoblock valves from 1 to 6 sections for open and closed centre hydraulic systems.

- Fitted with a main pressure relief valve and a load check valve.
- Available with parallel or series circuit.
- Optional power beyond port (only for parallel circuit).
- Diameter 20 mm - 0.79 in interchangeable spools.
- A wide variety of service ports and circuit valves.
- Available manual, pneumatic, hydraulic, electro-hydraulic and remote with flexible cables spool control kits.

Additional information

This catalog shows the product in the most standard configurations.
Please contact Sales Dpt. for more detailed information or special request.

WARNING!

All specifications of this catalog 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.

2nd edition June 2009:

Questa edizione aggiorna tutte le precedenti.

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Working conditions

This catalog 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		70 l/min	18 US gpm
Operating pressure (maximum)	<i>parallel circuit</i>	315 bar	4600 psi
	<i>series circuit</i>	250 bar	3600 psi
Max. back pressure	<i>on outlet T</i>	25 bar	360 psi
Internal leakage A(B)→T	<i>Δp=100 bar - 1450 psi fluid and valve at 40°C - 104°F</i>	3 cm ³ /min	0.18 in ³ /min
Fluid		Mineral base oil	
Fluid temperature	<i>with NBR seals</i>	from -20°C to 80°C	from -4°F to 176°F
	<i>with FPM (VITON) seals</i>	from -20°C to 100°C	from -4°F to 212°F
Viscosity	<i>campo di lavoro</i>	from 15 to 75 mm ² /s	from 15 to 75 cSt
	<i>minima</i>	12 mm ² /s	12 mm ² /s
	<i>massima</i>	400 mm ² /s	400 mm ² /s
Max level of contamination		-/19/16 - ISO 4406	19/16 - ISO 4406
Ambient temperature for working conditions	<i>with mechanical control</i>	from -40°C to 60°C	from -40°F to 140°F
	<i>with hydraulic, pneumatic controls</i>	from -30°C to 60°C	from -22°F to 140°F
	<i>with electric controls</i>	from -20°C to 50°C	from -4°F to 122°F

NOTE - For different conditions please contact Sales Dept.

Filettature standard

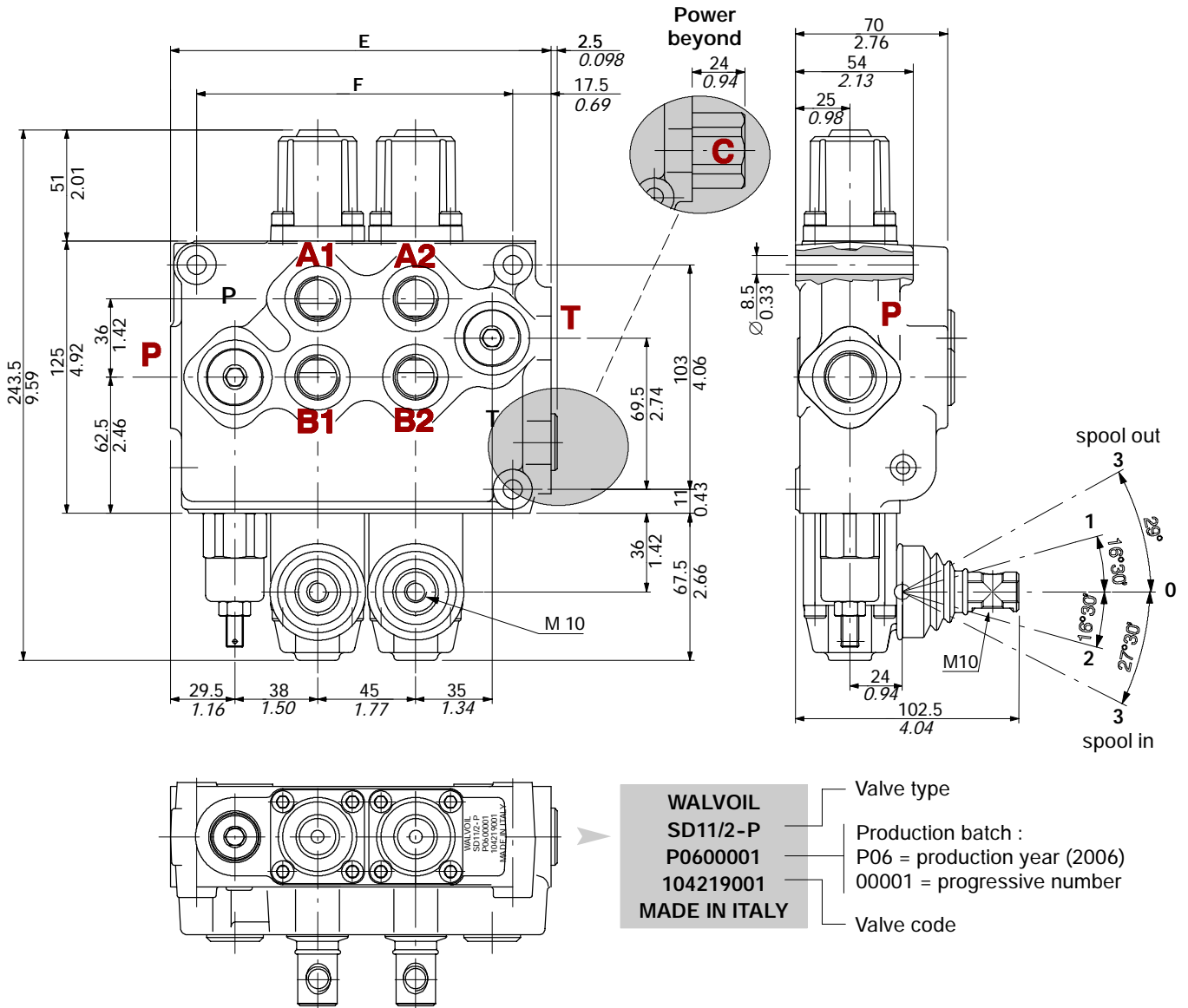
REFERENCE STANDARDS

		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 ACCORDING TO	ISO	1179	11926	9974-1	
	SAE		J1926		J476a
	DIN	3852-2 shape X or Y		3852-1 shape X or Y	

PORTS THREAD

MAIN PORTS	BSP	UN-UNF	METRIC
Inlet P and power beyond C	G 1/2	7/8-14 (SAE 10)	M18x1.5
Ports A and B	G 1/2	3/4-16 (SAE 8)	M18x1.5
Outlet T	G 3/4	7/8-14 (SAE 10)	M22x1.5
CONTROL PILOT PORTS			
Pneumatic	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27
Hydraulic	G 1/4	9/16-18 (SAE 6)	G 1/4

Dimensional data (parallel circuit)



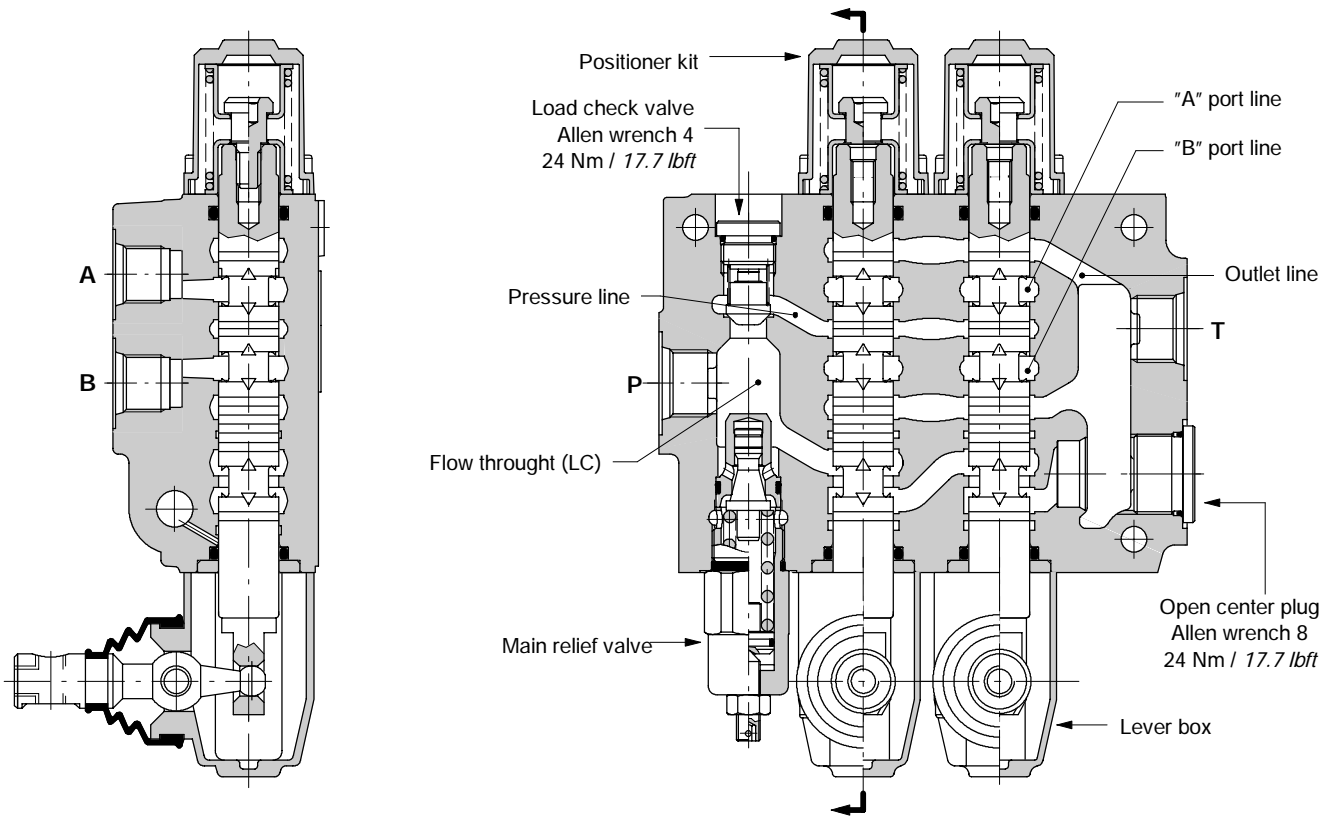
TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SD11/1-P	130	5.12	100	3.94	6.1	13.4
SD11/2-P	174.5	6.87	145	5.71	8.8	19.4
SD11/3-P	219.5	8.64	190	7.48	11.4	25.1

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SD11/4-P	264.5	10.41	235	9.25	14.2	31.3
SD11/5-P	309.5	12.19	280	11.02	16.7	36.8
SD11/6-P	354.5	13.96	325	12.80	19.4	42.8

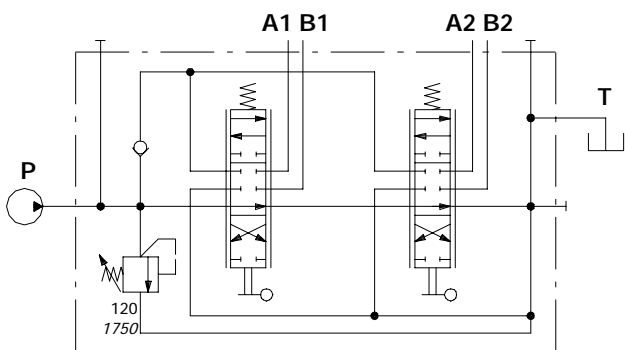
Hydraulic circuit

Parallel

Standard configuration with side inlet and open center circuit (AET configuration).

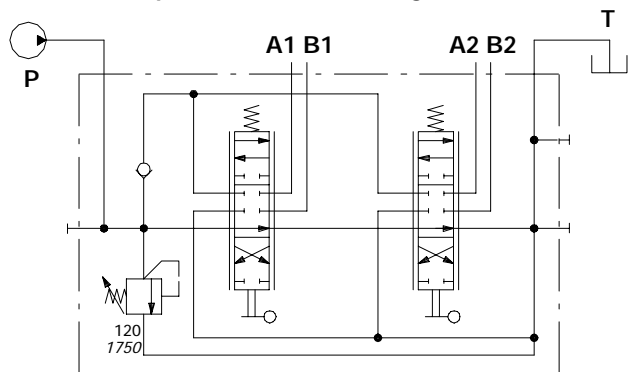


Standard configuration



Description example:
SD11/2-P(JG3-120)/18L/18L/AET-SAE

Top inlet and outlet configuration

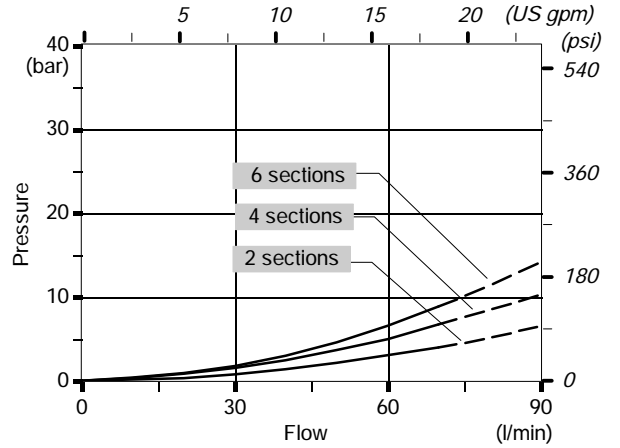
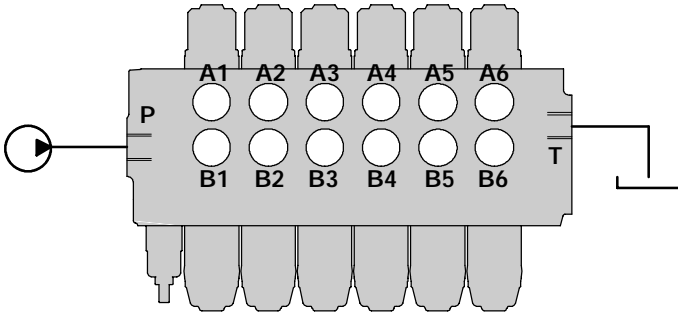


Description example:
SD11/2-P(JG3-120)/18L/18L/AET-PSA-SAE

Performance data (pressure drop vs. flow)

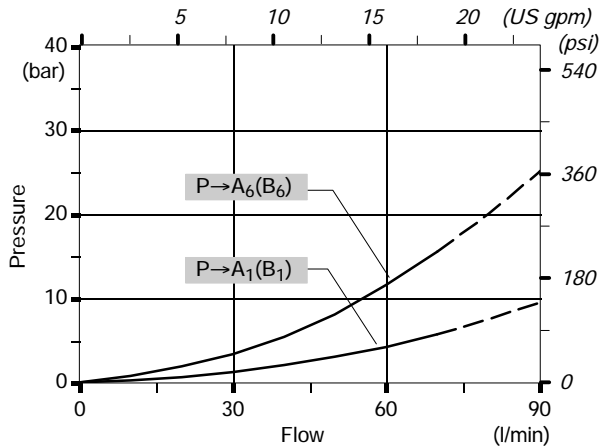
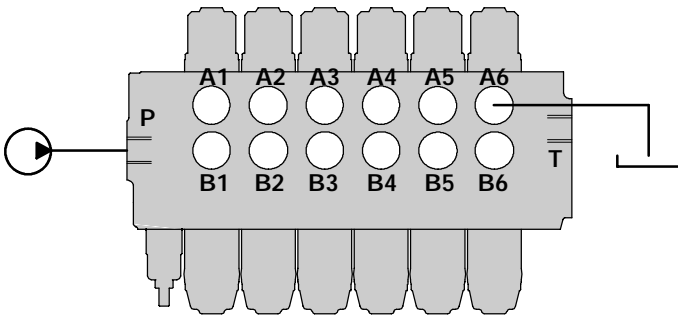
Open center

From side inlet to side outlet.



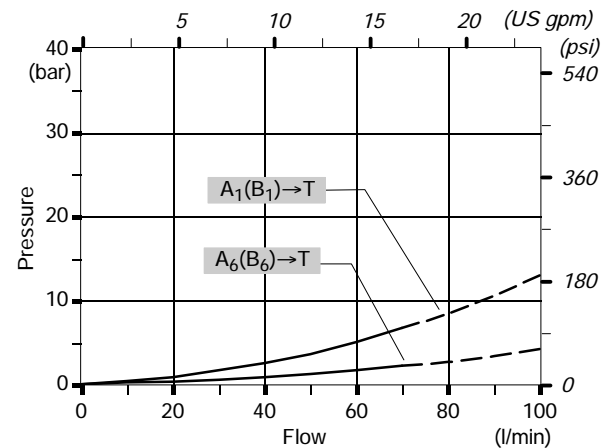
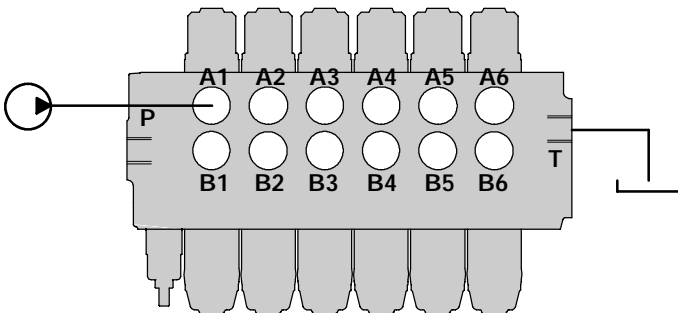
Inlet to work port

From side inlet to A port (spool in position 1) or B port (spool in position 2).



Work port to outlet

From A port (spool in position 2) or B port (spool in position 1) to side outlet.



NOTE - Measured with spool type 1.

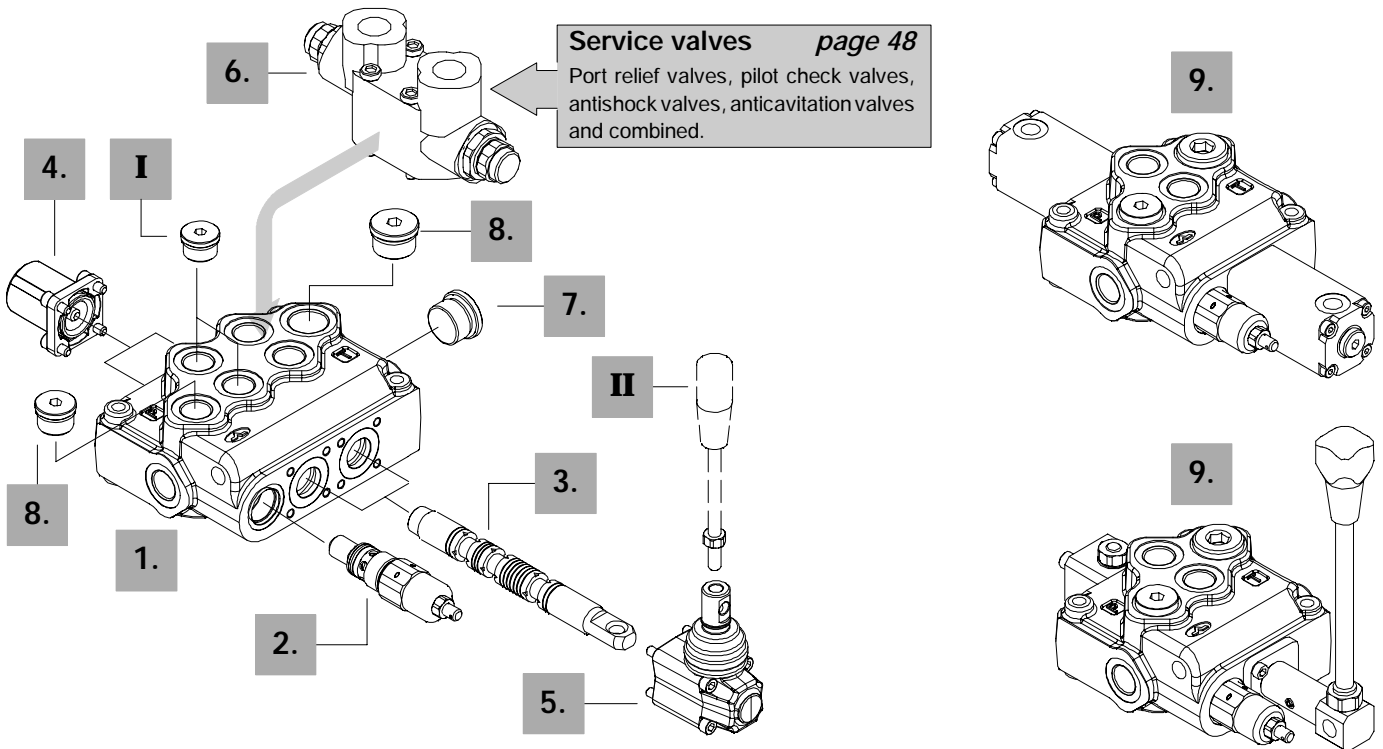
Ordering codes

Description example:

SD11 / 2 - P (KG3-120) / 1 8 L / 18L . P3(G3-120) / AET - PSL - SAE *

1. 2. 3. 4. 5. 6. 7. 8.

Main relief valve setting (bar) Port valve setting (bar)



1. Body kit *

TYPE	CODE	DESCRIPTION
1-P	5KC1417000	Parallel, 1 section
2-P	5KC1427000	Parallel, 2 sections
3-P	5KC1447000	Parallel, 3 sections
4-P	5KC1477000	Parallel, 4 sections
5-P	5KC1517000	Parallel, 5 sections
6-P	5KC1547000	Parallel, 6 sections

Include body, seals, rings and load check valves.

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

2. Inlet relief options

page 10

Standard setting is referred to 10 l/min / 2.6 US gpm flow.

TYPE	CODE	DESCRIPTION
SV	XTAP526340	Valve blanking plug
<u>VMD10/1: direct differential pressure relief valve type K (standard)</u>		
(KG2-80)	5KIT110112	Range 20 to 63 bar / 290 to 900 psi standard setting 40 bar / 580 psi
(KG3-120)	5KIT110113	Range 63 to 200 bar / 900 to 2900 psi taratura standard 120 bar / 1750 psi
(KG4-220)	5KIT110114	Range 180 to 315 bar / 2600 to 4600 psi standard setting 220 bar / 3200 psi
<u>VMD10/1: direct pressure relief valve type Y</u>		
(YG1-80)	3XCAR110211	Range 63 to 125 bar / 900 to 1800 psi standard setting 80 bar / 1150 psi
(YG2-125)	3XCAR110212	Range 100 to 160 bar / 1450 to 2300 psi standard setting 125 bar / 1800 psi
(YG3-175)	3XCAR110213	Range 125 to 250 / 1800 to 3600 psi standard setting 175 bar / 2500 psi
(YG4-220)	3XCAR110214	Range 200 to 315 / 2900 to 4600 psi standard setting 220 bar / 3200 psi
<u>VMP10/1: pilot pressure relief valve type X</u>		
(XG-125)	X006211120	Range 25 to 315 bar / 360 to 4600 psi standard setting 120 bar / 1750 psi

3. Spool options page 13

TYPE	CODE	DESCRIPTION
1	3CU1410130	Double acting, 3 positions, with A and B closed in neutral position
1A	3CU1421130	Double acting, 3 positions, with A open to tank in neutral position
1B	3CU1422130	Double acting, 3 positions, with B open to tank in neutral position
2	3CU1425130	Double acting, 3 positions, with A and B open to tank in neutral position
3	3CU1431130	Single acting on A, 3 positions, B plugged requires G3/8 plug (see part I)
4	3CU1435130	Single acting on B, 3 positions, A plugged requires G3/8 plug (see part I)
<u>Special spools for particular positioner kits page 16</u>		
5	3CU1442100	Double acting, 4 positions, floating circuit in 4 th position with spool in
5VR	3CU1443610	Double acting, 4 positions, floating circuit in 4 th position with spool out, with check valve
8	3CU1462110	Doppio effetto, 4 pos., rigenerativo in 4 ^a posizione con cursore a entrare
8F	3CU1461100	Double acting, 4 positions, regenerative circuit in 4 th position with spool in
<u>Special spools for standard positioner kits page 33</u>		
1(9A)	3CU1410300	Double acting, 3 positions, with A and B closed in neutral pos: for 9A positioner
1(11A)	3CU1410320	Double acting, 3 positions, with A and B closed in neutral pos: for 11A positioner

5. "B" side options page 36

TYPE	CODE	DESCRIPTION
L	5LEV110000	Standard lever box
LF1	5LEV110101	Lever box with adjustable flow limiter
LS	5LEV110020	Waterproof lever box
LB	5LEV310000	Steel lever
LEB	5LEV610000	Safety lever box
SLP	5COP110000	Without lever box, with dust-proof plate
TQ	5TEL110110	CD flexible cable connection
LCB	5CLO211100	Joystick lever for 2 sections operation

7. Outlet port options page 45

TYPE	CODE	DESCRIPTION
AET	3XTAP732201	Open center plug
AEK	3XTAP532450	Closed center plug
AE	3XGIU532660*	SAE10 power beyond sleeve
AET-EL	5CAR411312	With 12VDC electric control unloader valve; normally open circuit
	5CAR411314	As previous 24VDC

8. Inlet and outlet selection * page 6

TYPE	CODE	DESCRIPTION
PSL	3XTAP826160	SAE10 plug for upper inlet and outlet (nr.2 request): side ports open
PSA	3XTAP826160	SAE10 plug for side inlet and outlet (nr.2 request): upper ports open

9. Complete controls page 41

Proportional hydraulic control type 8IM and rotative control type R.

4. "A" side spool positioners page 20

TYPE	CODE	DESCRIPTION
7FC	5V07310000	With friction and neutral position sensor
8	5V08110000	With spring return in neutral position
8D	5V08110200	With spring return in neutral position and pin with M6 female thread for dual control
8D1	5V08110210	With spring return in neutral position and pin with \varnothing 8mm (0.32in) radial hole
8D2	5V08110220	With spring return in neutral position and pin with M8 male thread for dual control
8TL	5V08110310	Come tipo 8, per comando a cavo flessibile
8F2	5V08110101	Come tipo 8 con limitatore di corsa regolabile
8M3	5V08110400	Come tipo 8 con perno uscente per comando microinterruttore in posizione 1 e 2
19	5V19110000	2 positions, with spring return in neutral position from position 1
20	5V19110000	2 positions, with spring return in neutral position from position 2
11	5V11110000	Detent in positions neutral, 1 and 2
12	5V12110000	Detent in positions 1 and 2
15	5V15110000	2 positions, detent in positions 1 and neutral
16	5V16110000	2 positions, detent in positions 2 and neutral
21	5V21110000	Aggancio in pos. 2 e ritorno a molla in pos. 1
9B	5V09110000	With detent in position 1 and spring return in neutral position
10B	5V09110000	With detent in position 2 and spring return in neutral position
11B	5V11210000	Detent in positions 1 and 2 and spring return in neutral position
8MG3	5V08110050	As type 8 and microswitch in positions 1 and 2
8K	5V08710112	As type 8 and 12 VDC solenoid lock device
	5V08710124	As previous, 24 VDC
8P	5V08110701	ON/OFF pneumatic kit
8PG	5V08111706	Proportional pneumatic kit
8EPG3	5V08111725	12 VDC ON/OFF electropneumatic kit
	5V08111726	24 VDC ON/OFF electropneumatic kit
8ID3	5V08111801	Proportional hydraulic kit
8EI3	5V08110350	12 VDC ON/OFF electrohydraulic kit
	5V08110351	24 VDC ON/OFF electrohydraulic kit
<u>Special positioners for particular spools page 27</u>		
9A	5V09511000	With detent in position 1, automatic release in neutral position
11A	5V11511000	With detent in position 1 and 2, automatic release in neutral position
<u>Particular positioner kits for special spools pag. 33</u>		
13B	5V13111000	4 pos. with spring return in neutral pos. and detent in 4 th pos.: for spool 5
13C	5V13211000	4 pos. with spring return in neutral pos. and detent in 4 th pos.: for spool 5VR
8MCCR	5V08210021	Spring return in neutral position, with reduced spool stroke: for spool 8F
13FZ1	5V13611100	4 pos. with spring return in neutral pos. and detent in 2 nd pos.: for spool 8

I "A" and "B" ports plugs *

TYPE	CODE	DESCRIPTION
SAE8	3XTAP822150	For single acting spools type 3 and 4

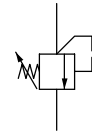
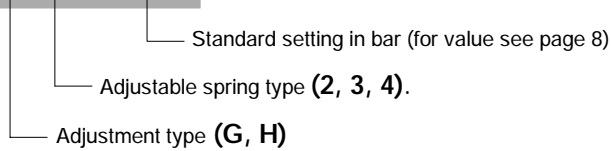
II Optional handlevers

TYPE	CODE	DESCRIPTION
AL01/M10x200	170012020	For lever L: height 200 mm / 7.87 in
AL08/M12x250	170013125	For joystick LCB: height 250 mm / 9.84 in

Inlet relief options

Direct differential pressure relief vave

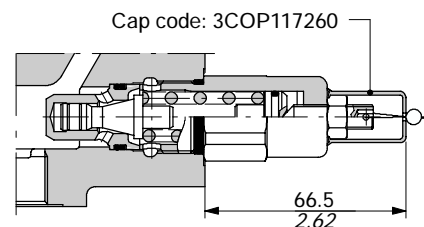
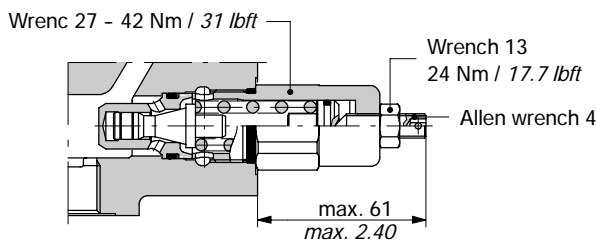
VMD10 (K G 3 - 120)



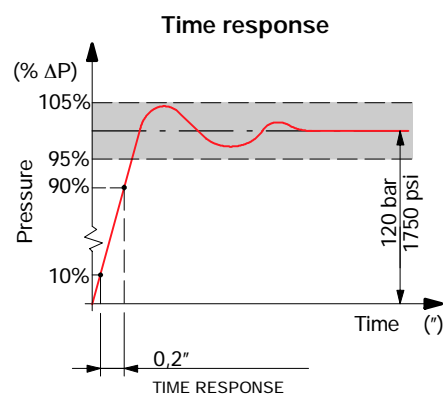
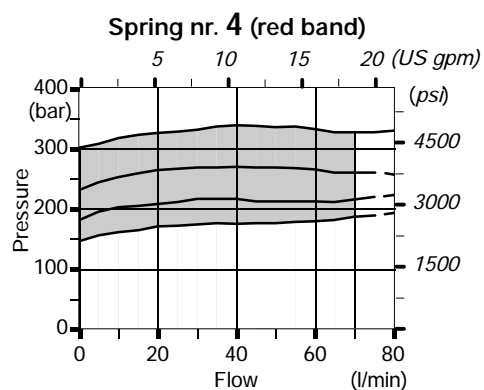
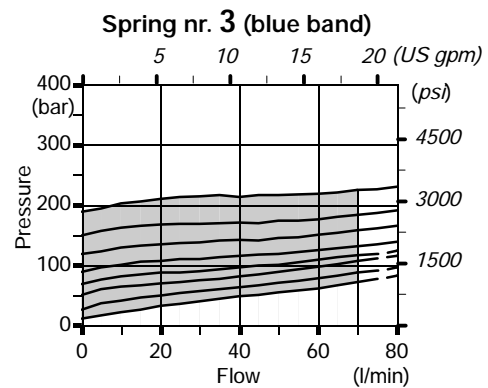
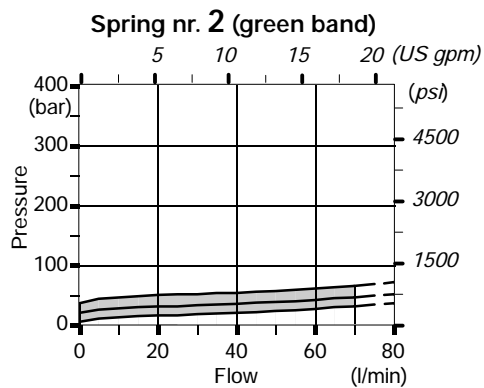
Adjustment type

G: with screw

H: valve set and locked



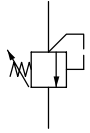
Performance data



Direct pressure relief valve

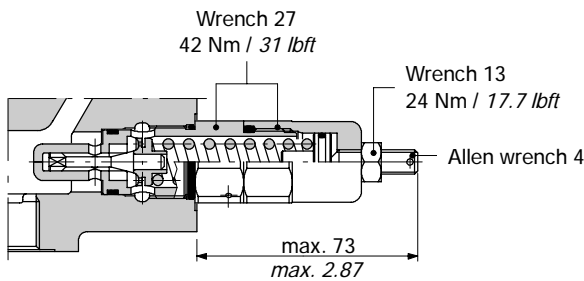
VMD10 (Y G 3 - 175)

- Standard setting in bar (for value see page 8)
- Adjustable spring type (2, 3, 4).
- Adjustment type (G, H)

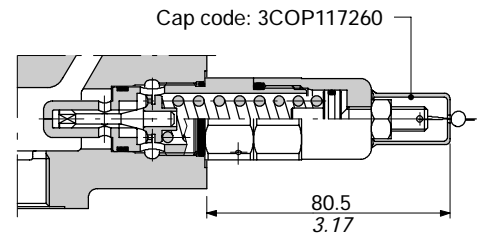


Adjustment type

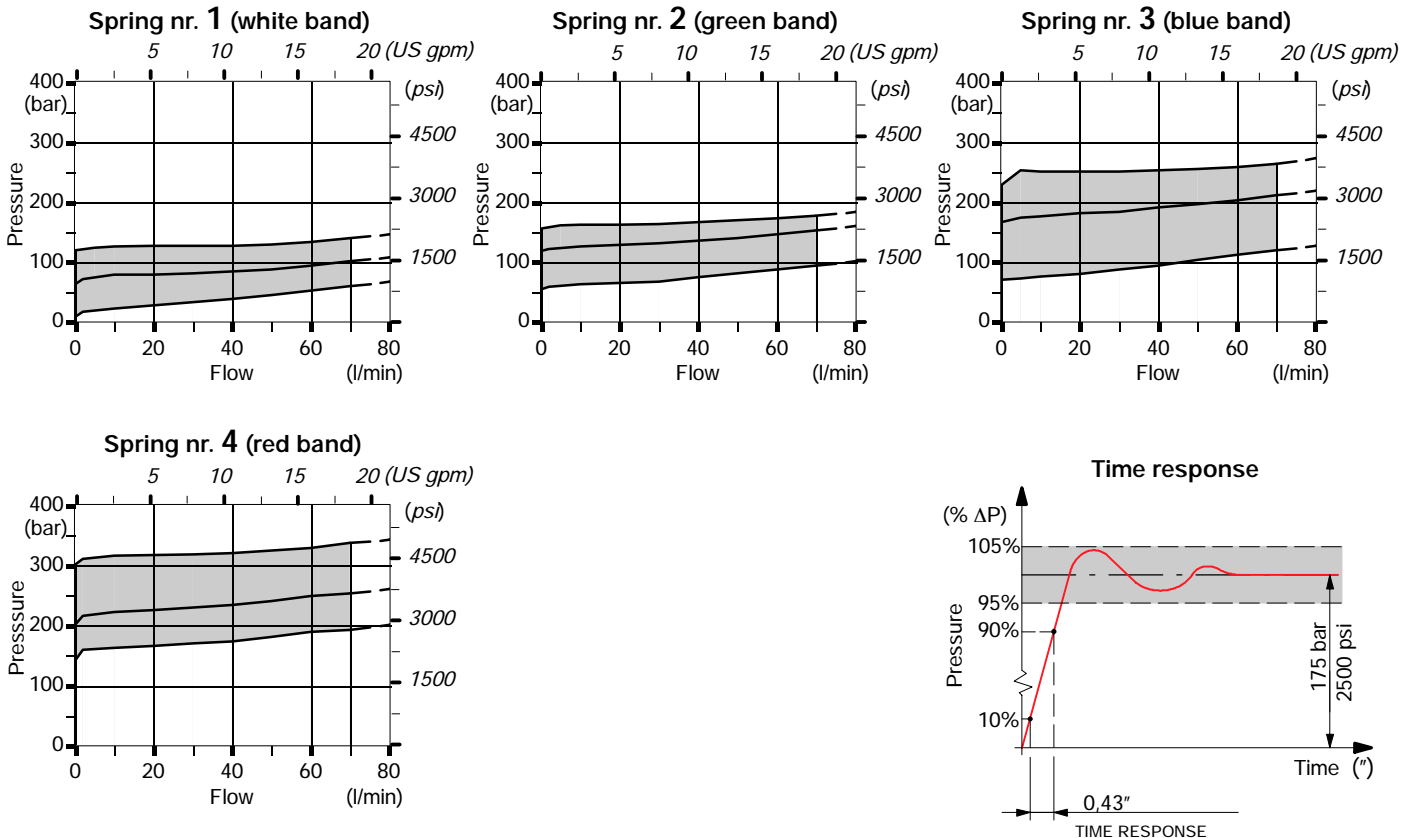
G: with screw



H: valve set and locked



Performance data



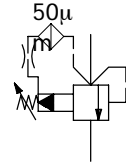
Inlet relief options

Pilot pressure relief vave

VMP150 (X G - 120)

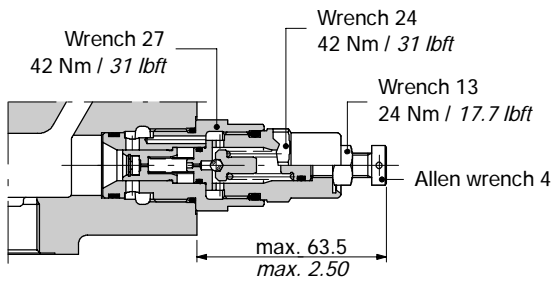
Standard setting in bar (for value see page 8)

Adjustment type (G, Z)

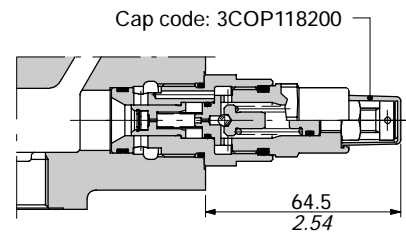


Adjustment type

G: with screw

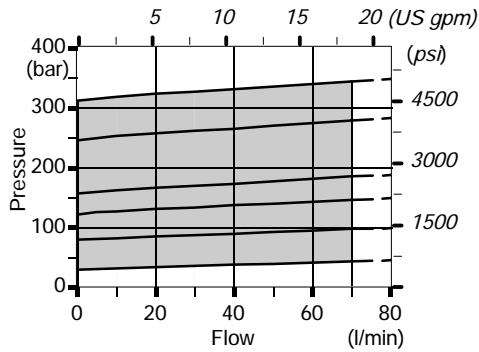


Z: with nylon tamper proof cap

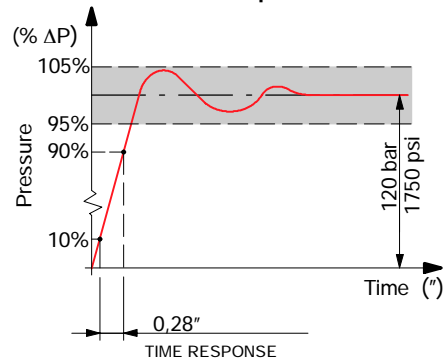


Performance data

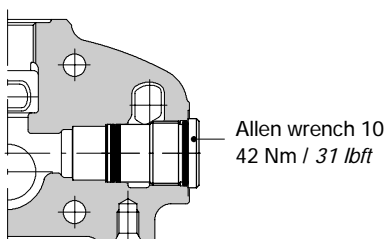
Spring nr. 3 (blue band)



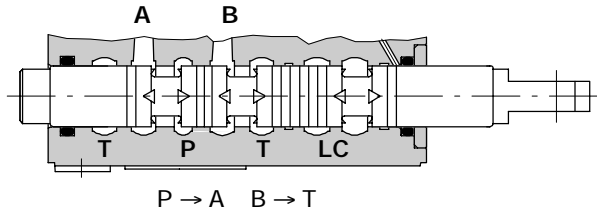
Time response



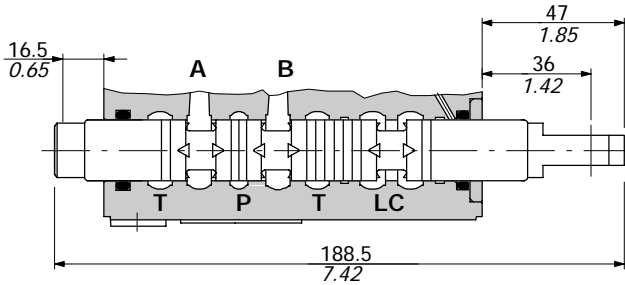
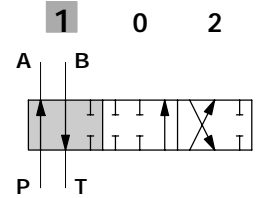
SV: relief valve blanking plug



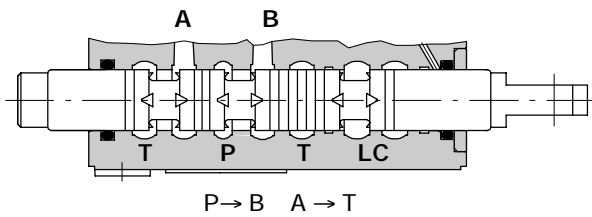
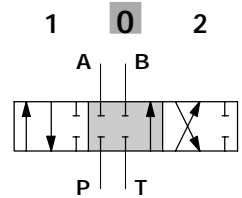
Type 1



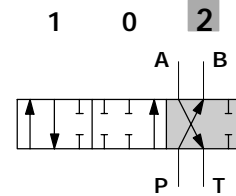
stroke:
+ 7 mm / 0.28 in



P-A-B-T closed, with flow through line (LC) open

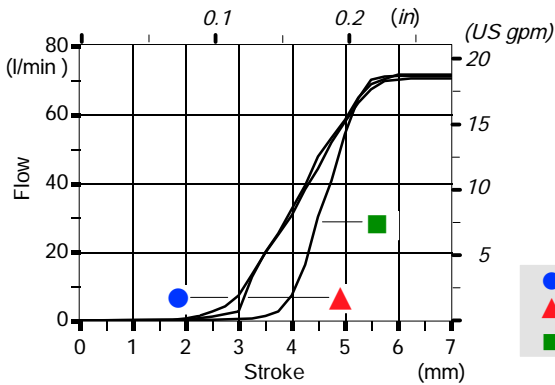


stroke:
- 7 mm / 0.28 in

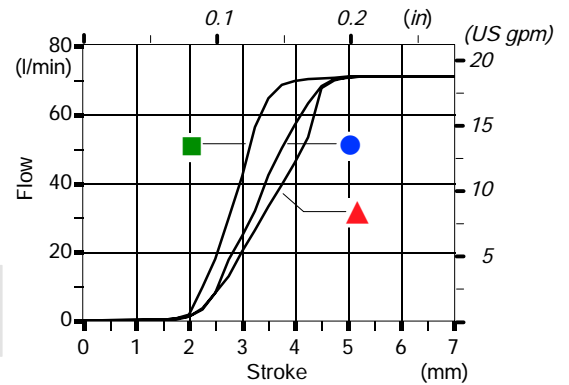


Performance data

Spool metering P → A(B)

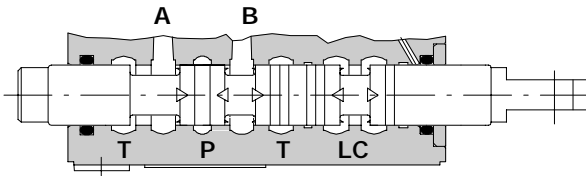


Spool metering A(B) → T



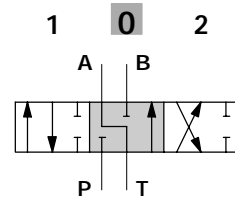
Spool options

Type 1A

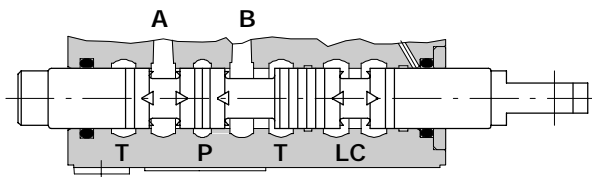


P-B closed, A→T, flow through line (LC) open

+ 7 mm / + 0.28 in
(1) ►
◄► (0)
◄ (2)
- 7 mm / - 0.28 in

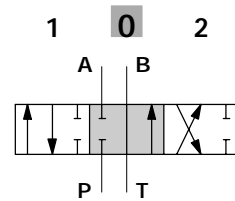


Type 1B

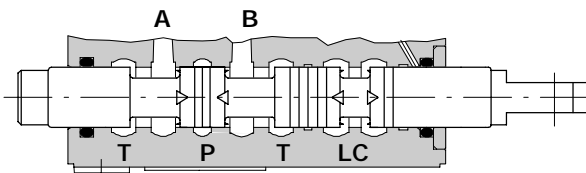


P-A closed, B→T, flow through line (LC) open

+ 7 mm / + 0.28 in
(1) ►
◄► (0)
◄ (2)
- 7 mm / - 0.28 in

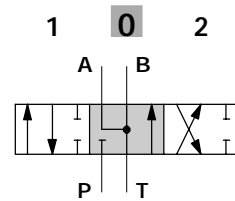


Type 2

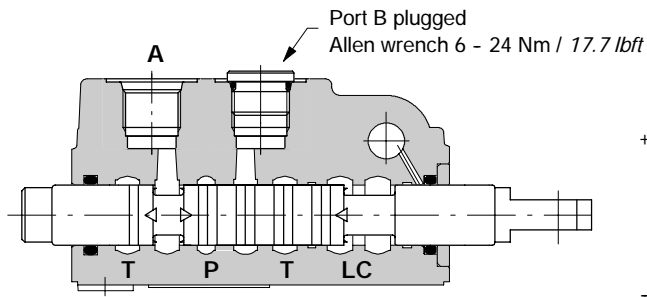


P closed, A-B→T, with flow through line (LC) open

+ 7 mm / + 0.28 in
(1) ►
◄► (0)
◄ (2)
- 7 mm / - 0.28 in

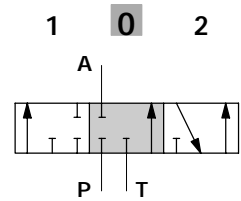


Type 3

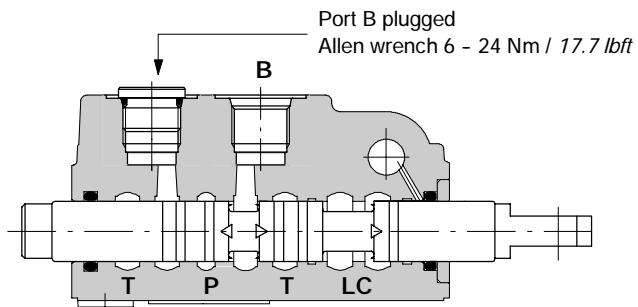


P-A-T closed, with flow through line (LC) open

+ 7 mm / + 0.28 in
(1) ►
◄► (0)
◄ (2)
- 7 mm / - 0.28 in

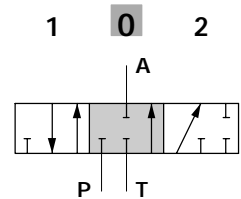


Type 4



P-B-T closed, with flow through line (LC) open

+ 7 mm / + 0.28 in
(1) ►
◄► (0)
◄ (2)
- 7 mm / - 0.28 in

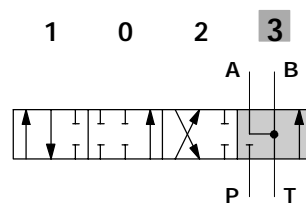
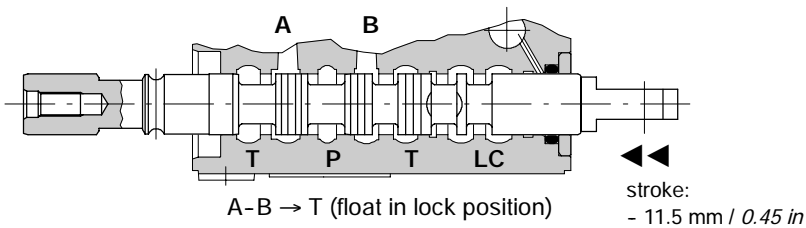
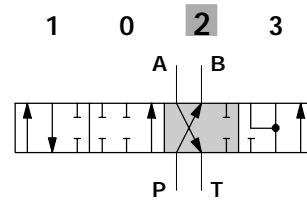
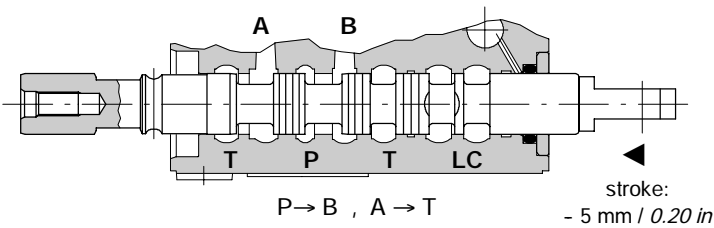
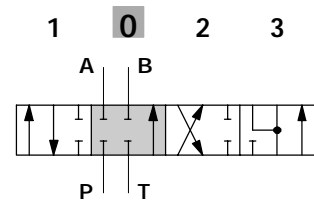
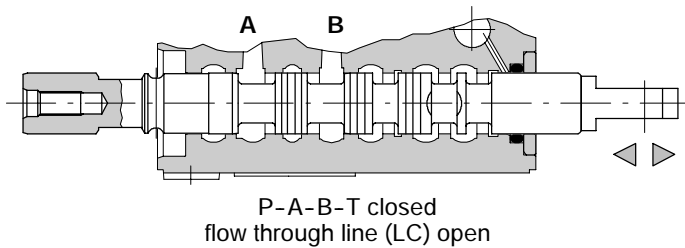
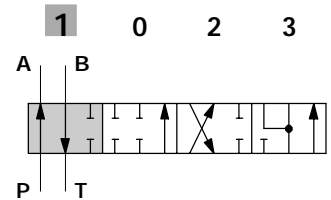
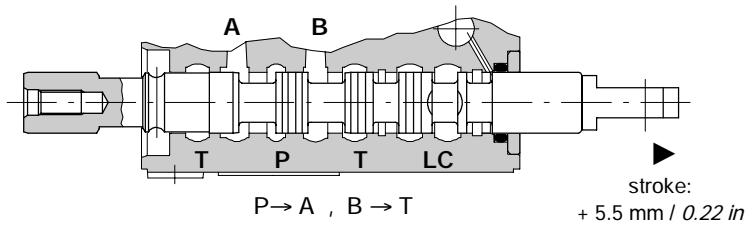


Spool options

Type 5

It needs special body with extra machining: for information please contact Sales Department.

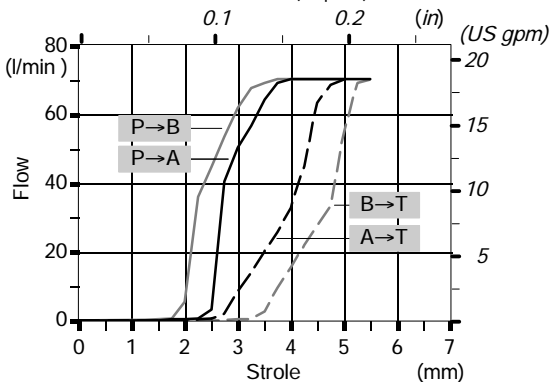
This spool must be coupled with positioner type 13B see page 34.



Performance data

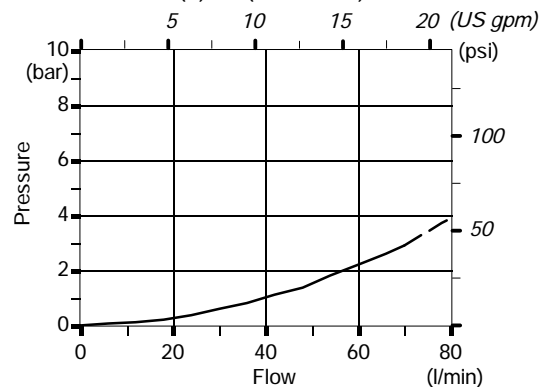
Spool metering

$Q_{in} = 70 \text{ l/min} - 18 \text{ US gpm} / P_{(on ports)} = 100 \text{ bar} - 1450 \text{ psi}$



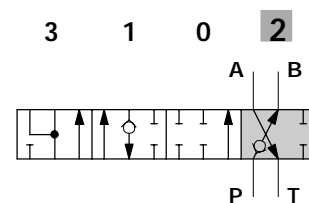
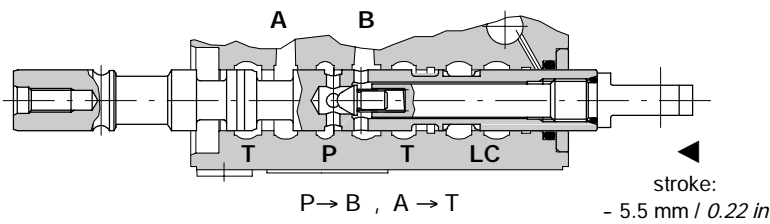
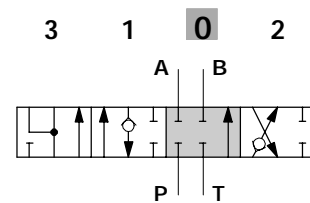
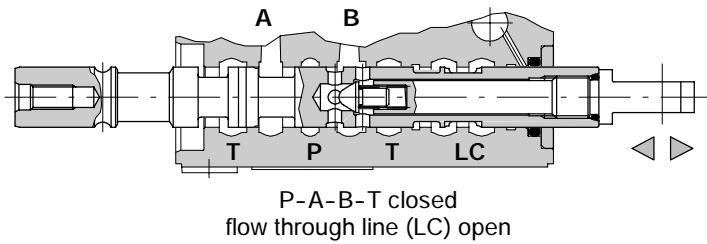
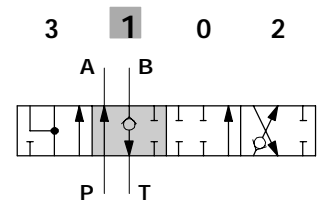
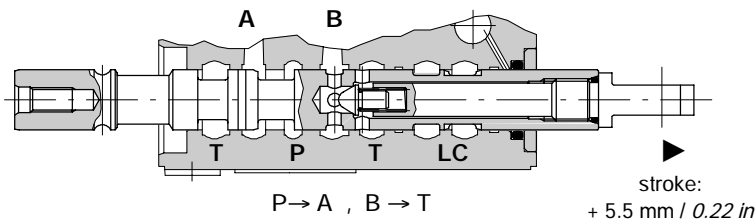
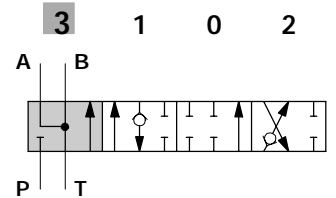
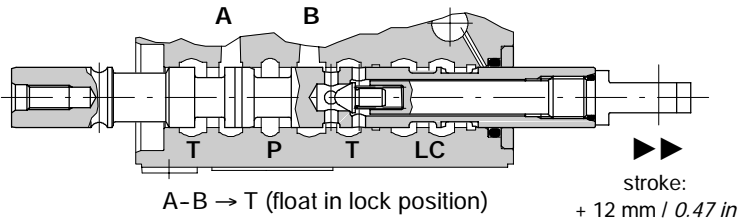
Pressure drop in position 3

A(B) → T (last section)



Type 5VR

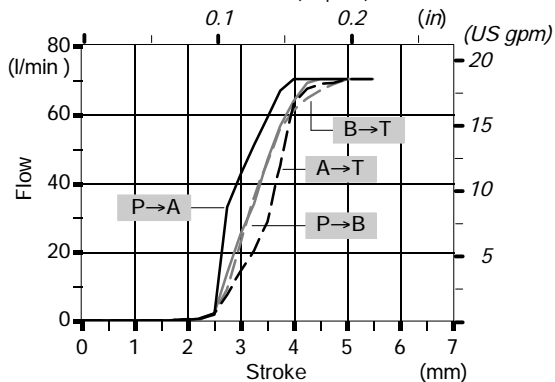
It needs special body with extra machining: for information please contact Sales Department.
This spool must be coupled with positioner type 13C see page 34.



Performance data

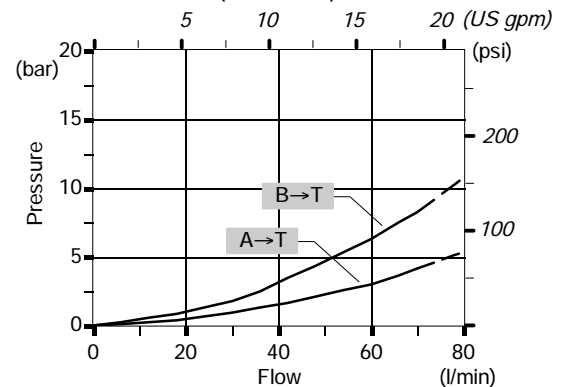
Spool metering

$Q_{in} = 70 \text{ l/min} - 18 \text{ US gpm}$ / $P_{(on ports)} = 100 \text{ bar} - 1450 \text{ psi}$



Pressure drop in position 3

(last section)

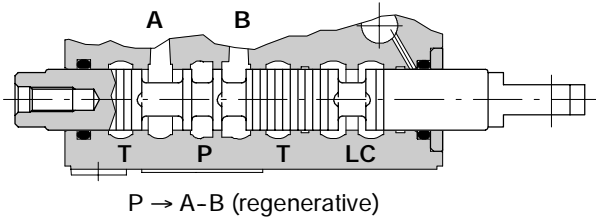


Spool options

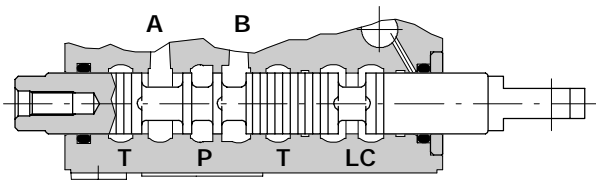
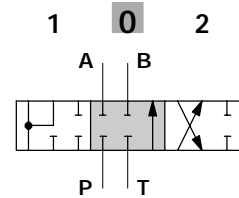
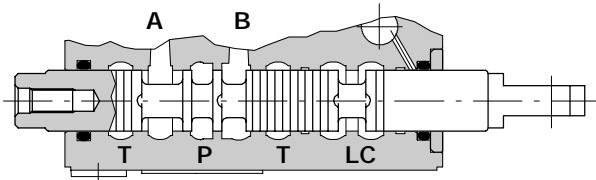
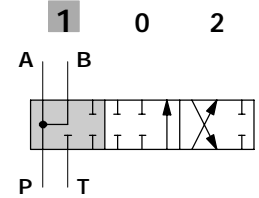
Type 8F

It needs special body with extra machining: for information please contact Sales Department.

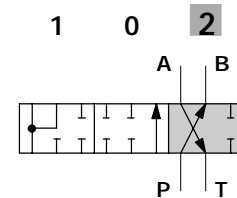
This spool must be coupled with positioner type 8CR see page 34.



stroke:
+ 5 mm / 0.20 in



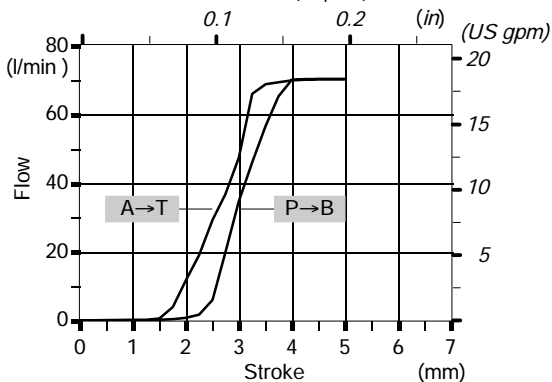
stroke:
- 5 mm / 0.20 in



Performance data

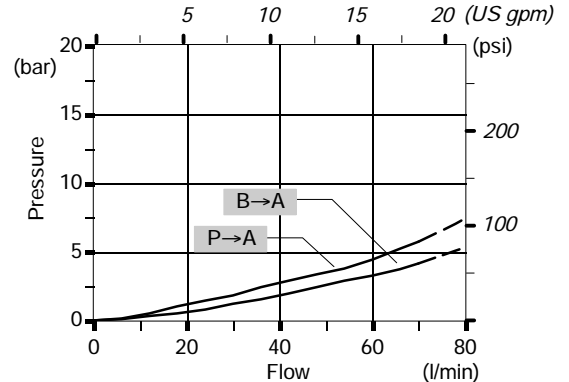
Spool metering

$Q_{in} = 70 \text{ l/min} - 18 \text{ US gpm} / P_{(on ports)} = 100 \text{ bar} - 1450 \text{ psi}$



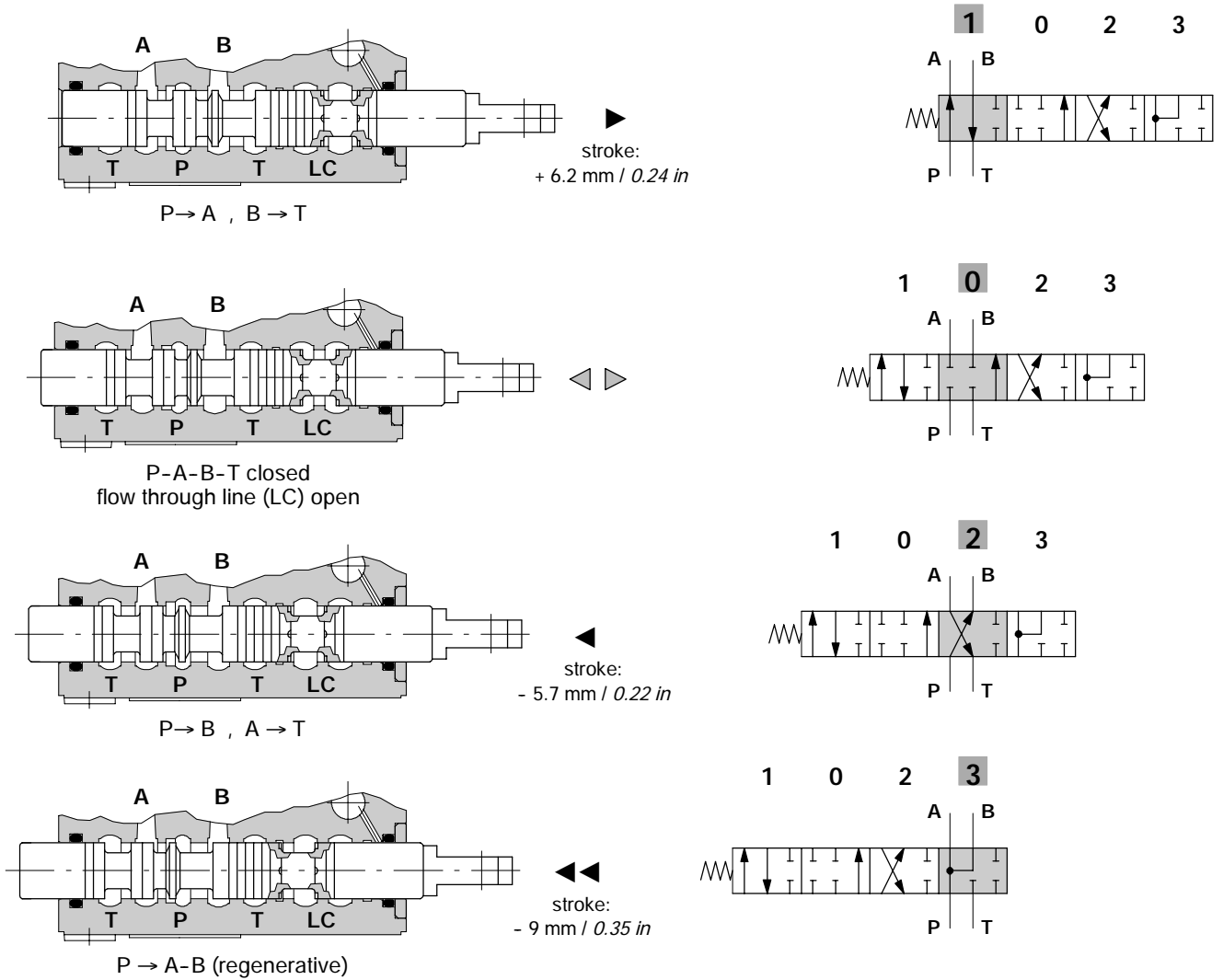
Pressure drop in position 1

(in first section)



Type 8

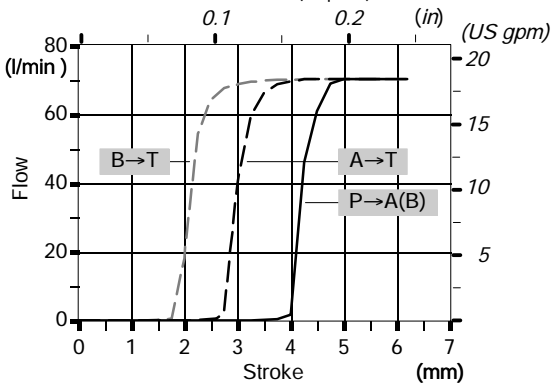
It needs special body with extra machining: for information please contact Sales Department.
This spool must be coupled with positioner type 13FZ1, see page 35.



Performance data

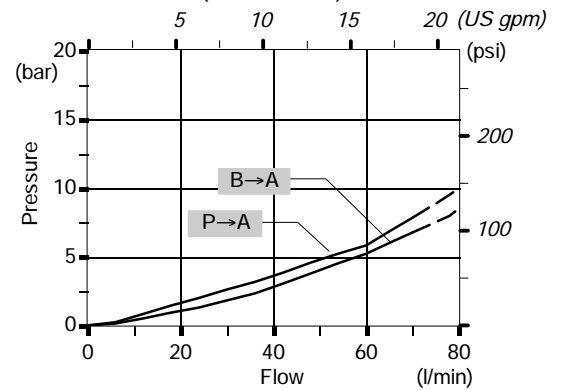
Spool metering

$Q_{in} = 70 \text{ l/min} - 18 \text{ US gpm}$ / $P_{(on ports)} = 100 \text{ bar} - 1450 \text{ psi}$



Pressure drop in position 3

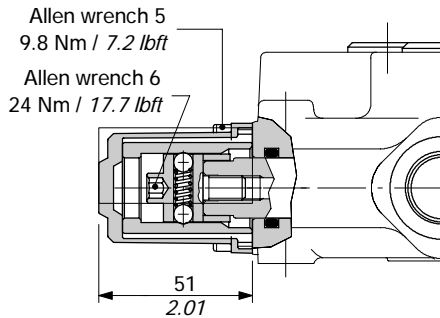
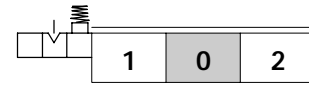
(in first section)



"A" side spool positioners

Tipo 7FC with friction

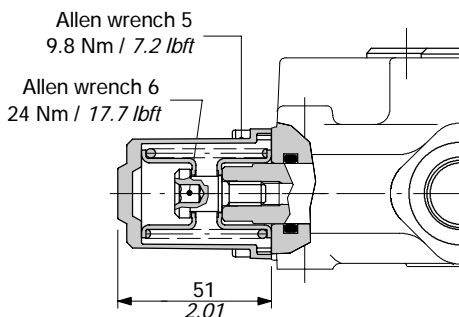
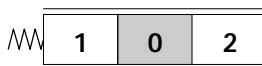
With sensor in neutral position



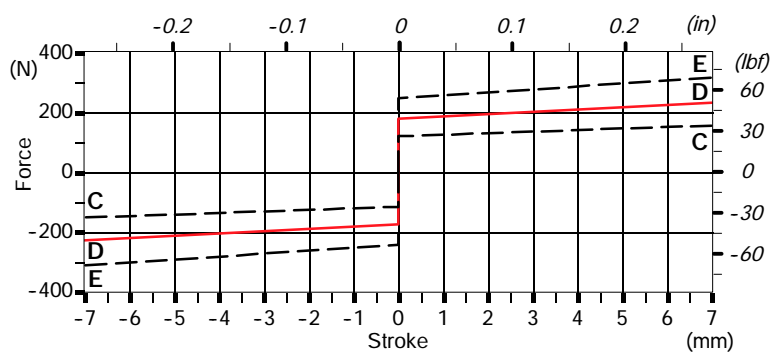
With spring return in neutral position

8 kit

It's supplied with standard spring type D (see force-stroke diagram) and available with lighter spring type C (8MC code: 5V08210000) or heavier type E (8ME code: 5V08410000).

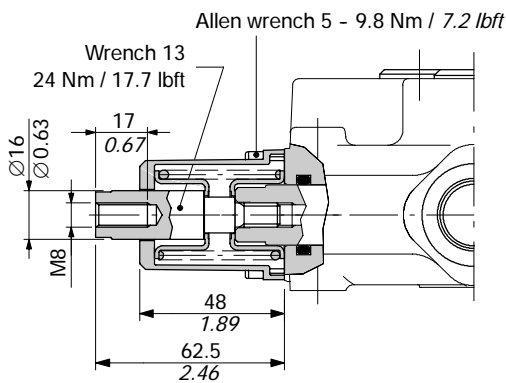
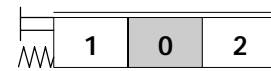


Force-stroke diagram

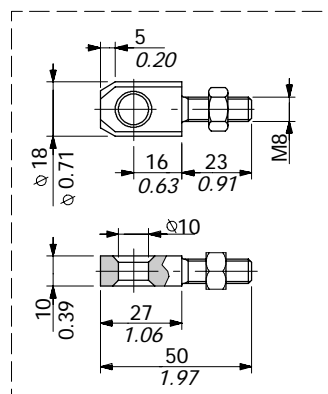


8D kit

Spool end joint code **XPER318500**, is available on request in order to screw onto pin.



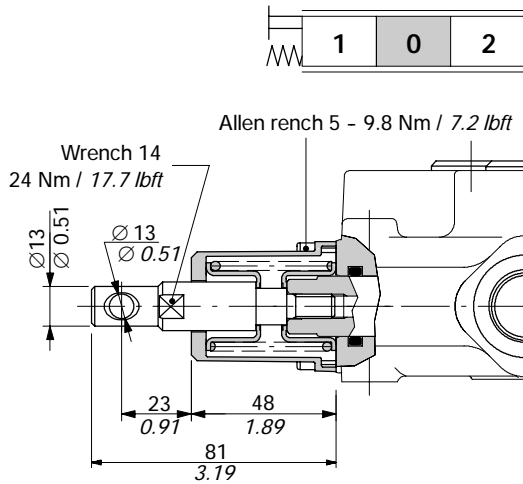
Spool end joint dimensions



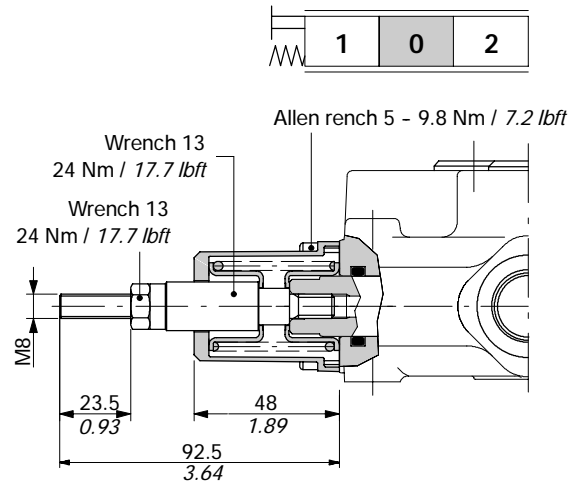
"A" side spool positioners

With spring return in neutral position

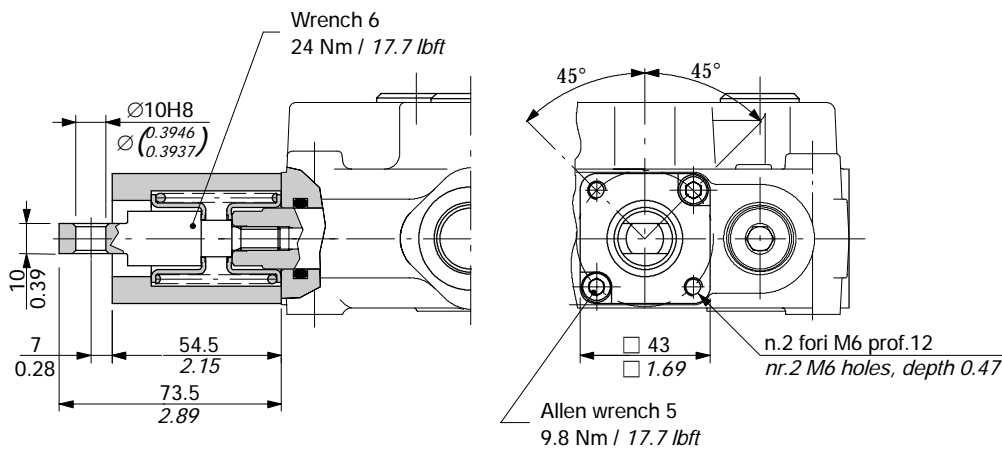
8D1 kit



8D2 kit

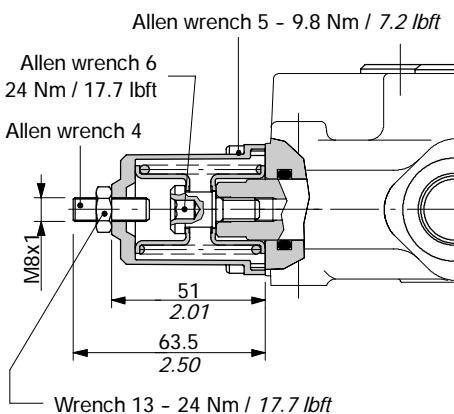


8TL kit



8F2 kit

Spool stroke adjusting towards position 2 (spool in).

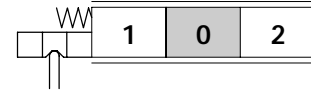
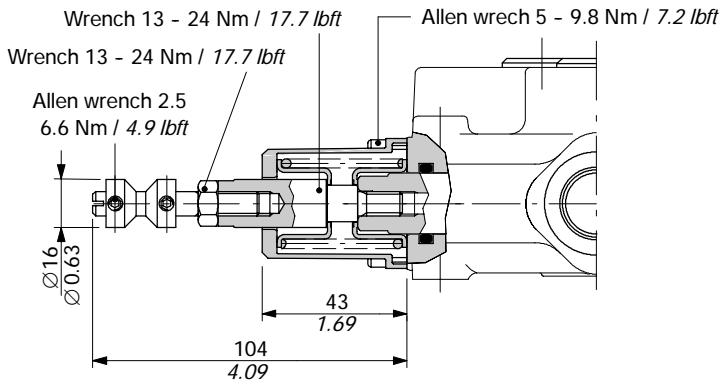


"A" side spool positioners

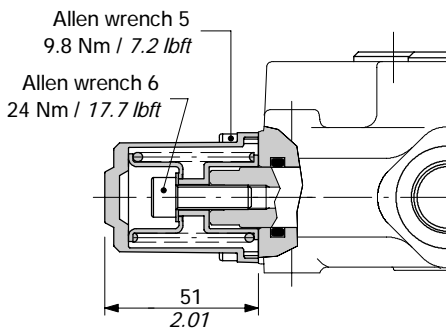
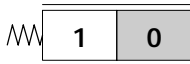
With spring return in neutral position

8M3 kit

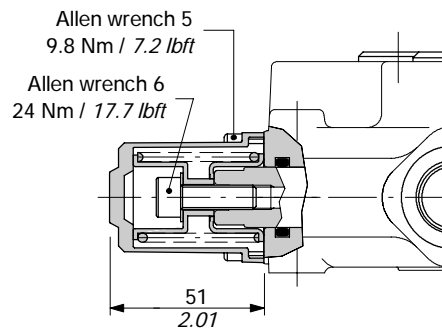
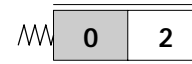
With cams for microswitch operation.



19 kit

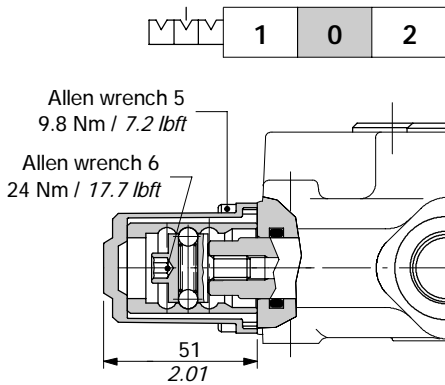


20 kit



With detent

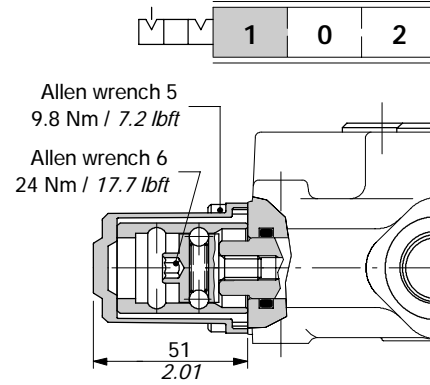
Kit 11



Operating features

Locking and release force : 280 N / 63 lbf ±10%

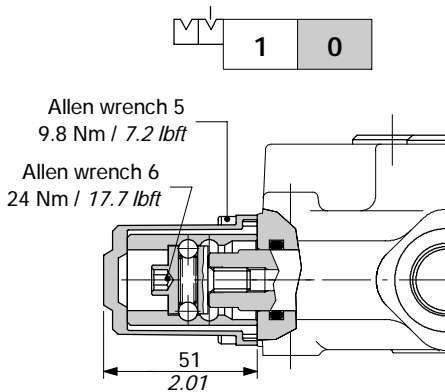
12 kit



Operating features

Locking and release force : 280 N / 63 lbf ±10%

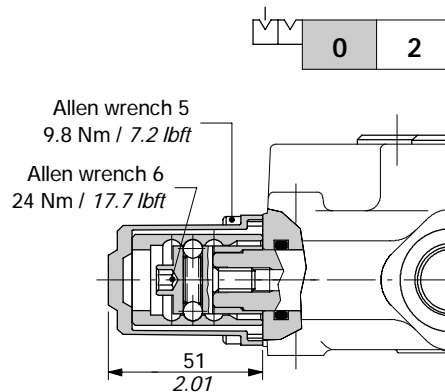
15 kit



Operating features

Locking and release force : 280 N / 63 lbf ±10%

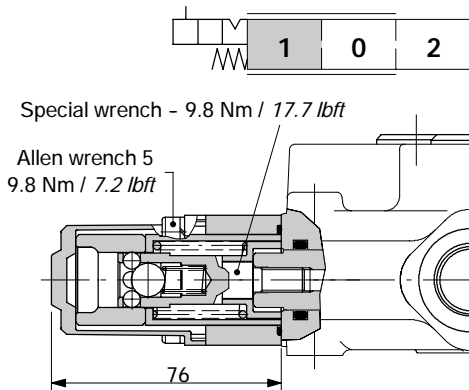
16 kit



Operating features

Locking and release force : 280 N / 63 lbf ±10%

21 kit



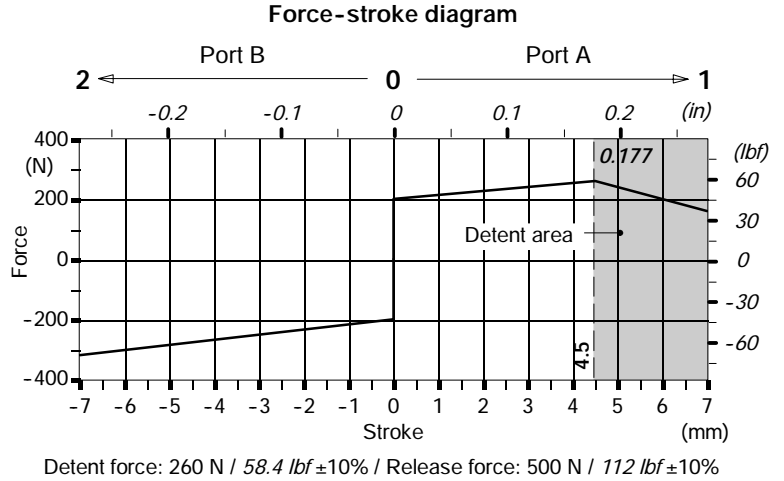
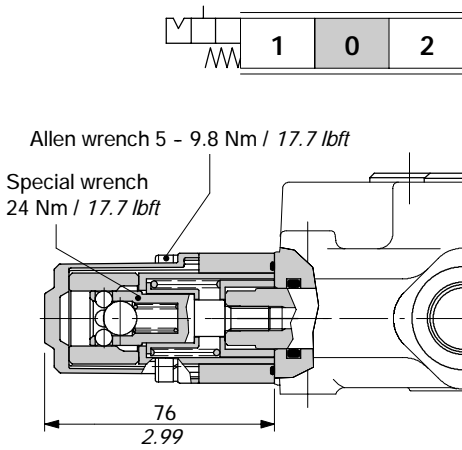
Operating features

Locking and release force : N ±10%

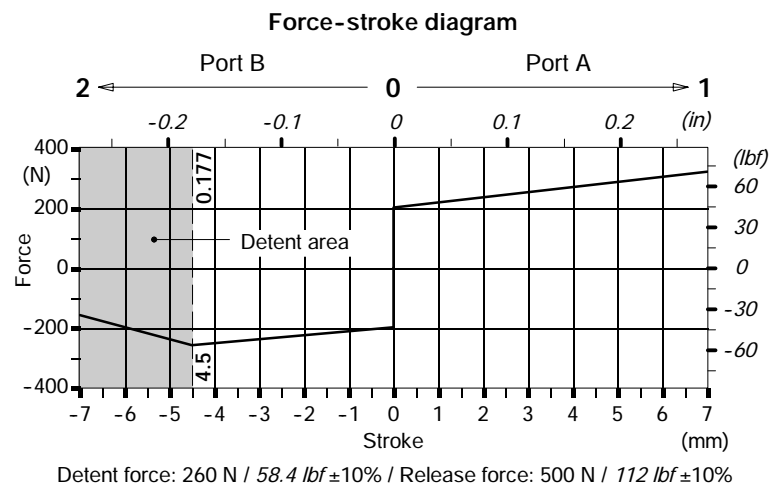
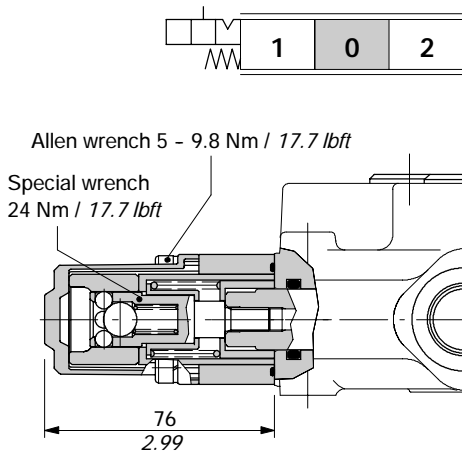
"A" side spool positioners

With detent and spring return to neutral position from either directions

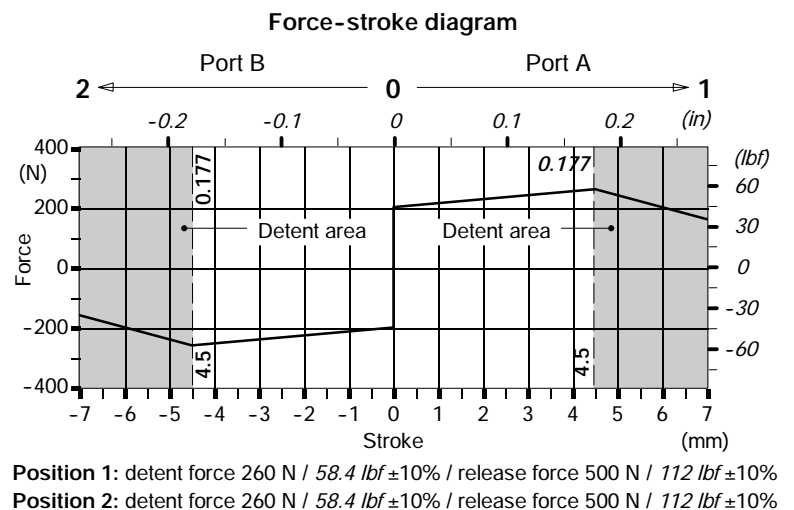
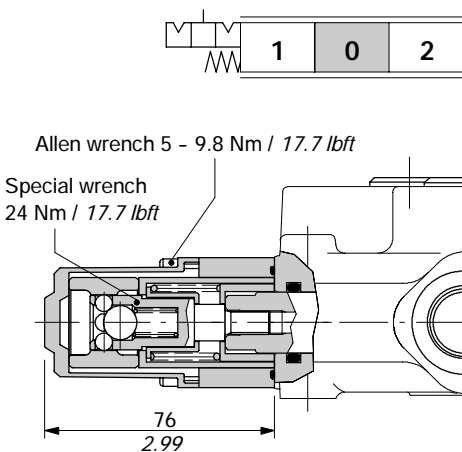
9B kit



10B kit



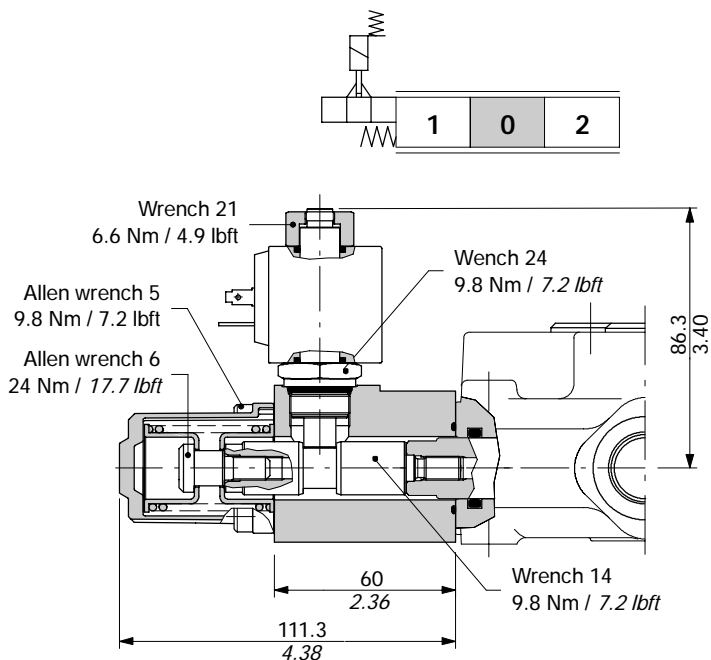
11B kit



"A" side spool positioners

Solenoid lock device type 8K

With spring return and spool electromechanical lock in neutral position; when coil is feeded the spool can be moved. It's possible to obtain further control configurations, using positioners with detent type 9B, 10B, 11B: for information contact Sales Department.



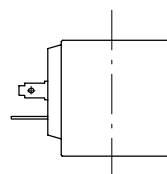
Operating features

ACTUATOR

Lock stroke : 3.5 mm / 0.14 in

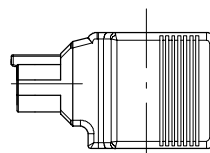
COIL

Depending on model: see following features



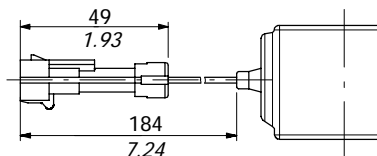
Coil with ISO4400 connector

Nominal voltage tolerance : ±10%
 Power rating : 18 W
 Nominal current : 1.58 A - 12 VDC
 : 0.81 A - 24VDC
 Coil insulation : Class F
 Weather protection : IP65
 Duty cycle : 100%



Coil with Deutsch DT connector

Nominal voltage tolerance : ±10%
 Power rating : 22 W
 Nominal current : 1.9 A - 12 VDC
 : 0.95 A - 24VDC
 Coil insulation : Class H
 Weather protection : IP65
 Duty cycle : 100%



Coil with Packard M-Pack connector

Nominal voltage tolerance : ±10%
 Power rating : 18 W
 Nominal current : 1.58 A - 12 VDC
 : 0.81 A - 24VDC
 Coil insulation : Class F
 Weather protection : IP65
 Duty cycle : 100%

COMPLETE CONTROLS CODES

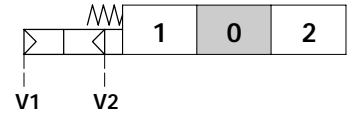
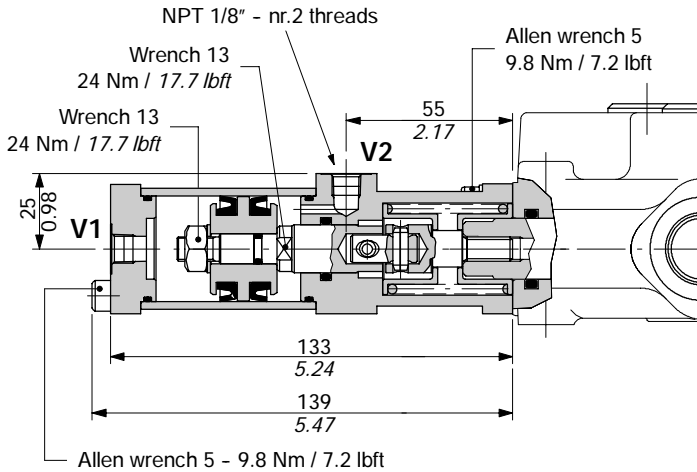
Voltage	CONNECTOR TYPE		
	ISO4400	Deutsch DT	Packard M-Pack
	CONTROL TYPE		
	8K	8K4	8K6
12 VDC	5V08708112	5V08708413	5V08708612
24 VDC	5V08708124	5V08708424	5V08708624
Need connector (page 65)	C02	C19	C20

COIL CODES

Voltage	CONNECTOR TYPE		
	ISO4400	Deutsch DT	Packard M-Pack
12 VDC	2X4300012	2X4300014	YSOL300014
24 VDC	2X4300024	2X4300026	YSOL300024

"A" side spool positioners

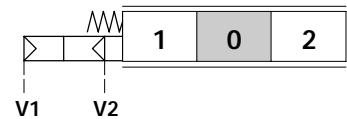
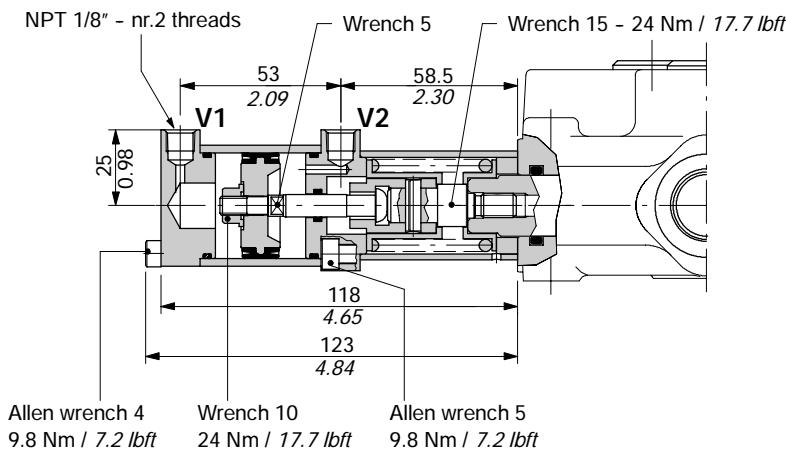
ON/OFF pneumatic kit type 8P



Operating features

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

Proportional pneumatic kit type 8PG

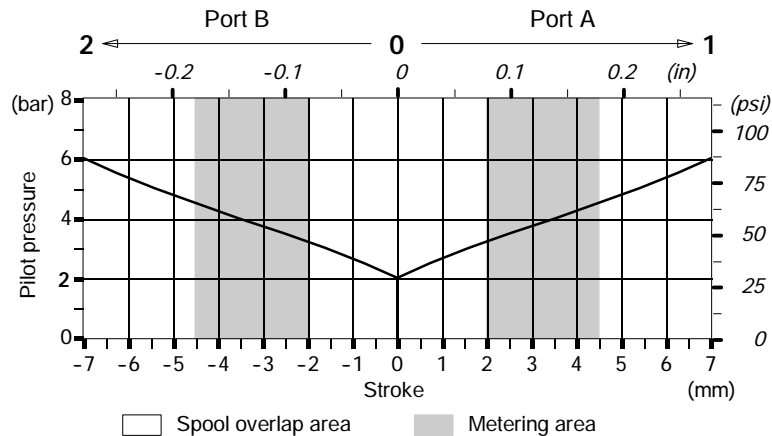


Operating features

Pilot pressure : min 6 bar / 87 psi
max 12 bar / 174 psi

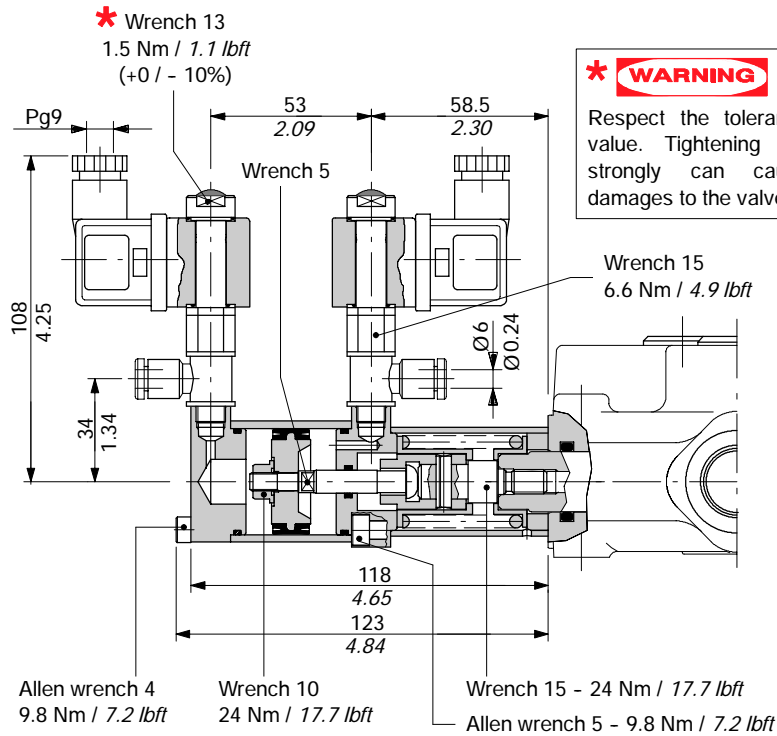
Pilot pressure - stroke diagram

(with spool type 1)

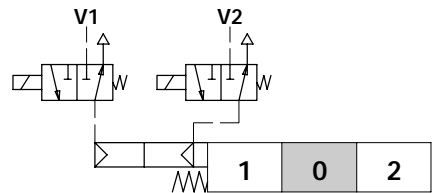


"A" side spool positioners

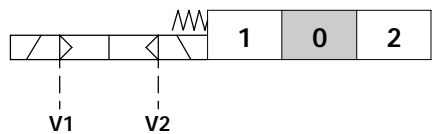
ON/OFF electropneumatic kit type 8EPG3



Symbol



Symbol ISO 1219



COMPLETE CONTROL CODES

CONNECTION TYPE		
	ISO6952	Flying leads
CONTROL TYPE		
Voltage	8EPG3	8EPG35
12 VDC	5V08111725	5V08111727
24 VDC	5V08111726	5V08111728
Need connector type (page 65)	C01 (included)	/

Operating features

CONTROL

Pilot pressure : 6 bar / 87 psi
: (max.12 bar / 174 psi)

COIL

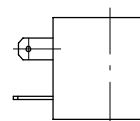
Nominal voltage tolerance : ±10%
Power rating : 8 W
Nominal current : 0.67 A - 12 VDC
: 0.33 A - 24VDC
Coil insulation : Class H
Weather protection : IP65
Duty cycle : 100%

COILS CODES

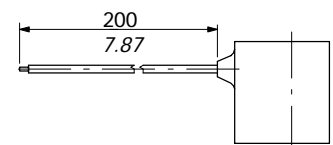
CONNECTION TYPE		
Voltage	ISO6952	Flying leads *
12 VDC	2XB1010121100	2XB1010120000
24 VDC	2XB1010241100	2XB1010240000

* Several type of connectors can be wired on request: contact Sales Department

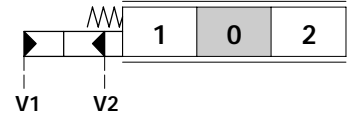
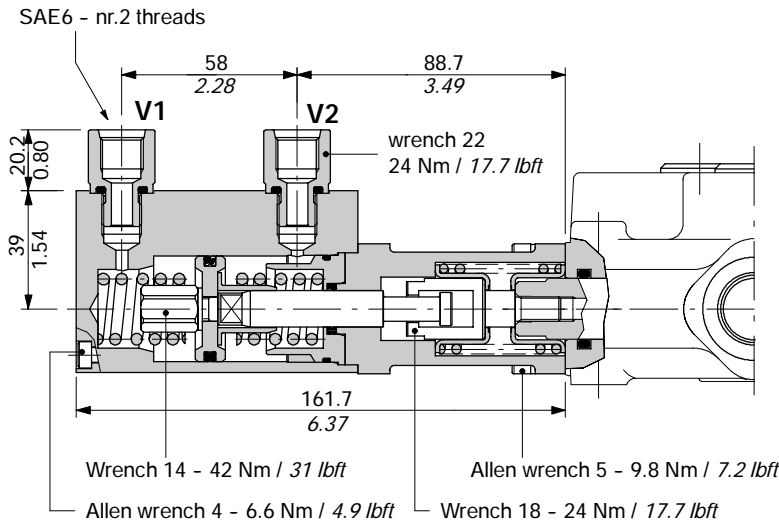
Coil with ISO6952 connector



Coil with flying leads



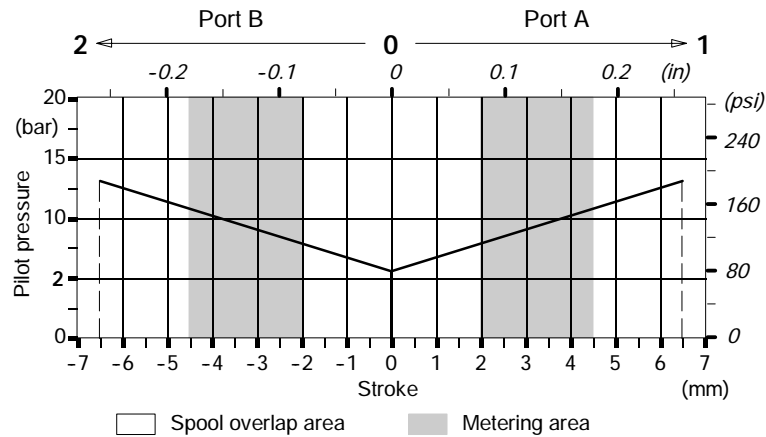
Proportional hydraulic control type 8ID



Operating features

Pilot pressure : max. 50 bar / 725 psi

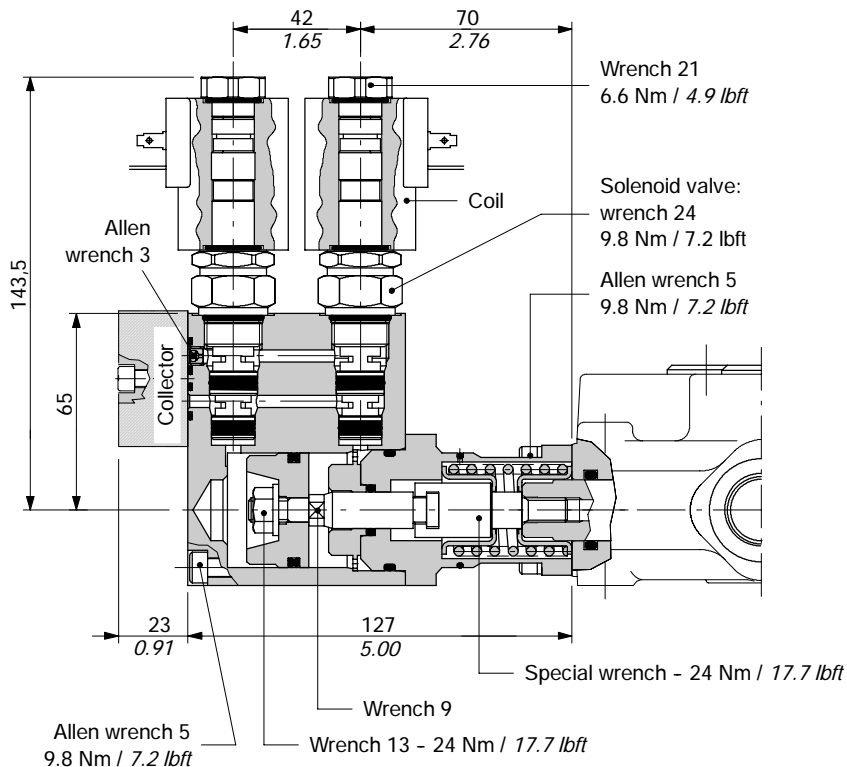
Pilot pressure - stroke diagram
(with spool type 1)



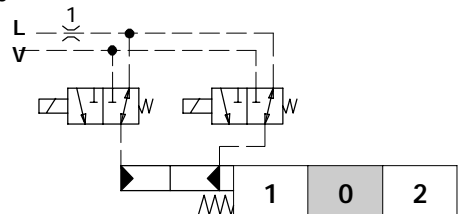
"A" side spool positioners

ON/OFF electrohydraulic kit type 8EI3

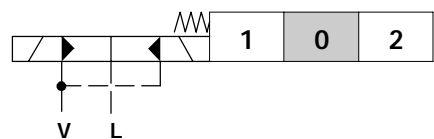
External pilot and drain.



Symbol



Symbol ISO 1219



Operating features

CONTROL

Pilot pressure : min. 10 bar / 145 psi
 : max. 50 bar / 725 psi
 Max backpressure on drain L : 25 bar / 360 psi

COIL

Nominal voltage tolerance : ±10%
 Power rating : 21 W
 Nominal current : 1.75 A - 12 VDC / 0.87 A - 24VDC
 Coil insulation : Class F
 Weather protection : depending on coil model: see next page
 Duty cycle : 100%

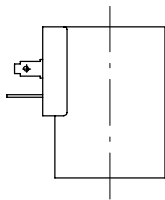
COMPLETE CONTROLS CODES

	CONNECTIO TYPE			
	ISO4400	AMP JPT		Deutsch DT
		without diode	with diode	
CONTROL TYPE				
Voltage	8EI3	8EI32	8EI32D	8EI34
12 VDC	5V08110350	5V08110372	5V08110374	5V08110376
24 VDC	5V08110351	5V08110373	5V08110375	5V08110377
Need connector type (page 65)	C02	C08	C08	C19

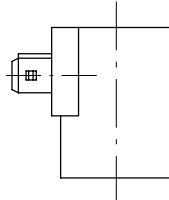
ON/OFF electrohydraulic kit type 8E13

COIL CODES				
CONNECTION TYPE				
Voltage	ISO4400	AMP JPT		Deutsch DT
		without diode	with diode	
12 VDC	2XB1400121100	2XB1400121200	2XB1400121210	2XB1400120400
24 VDC	2XB1400241100	2XB1400241200	2XB1400241210	2XB1400240400

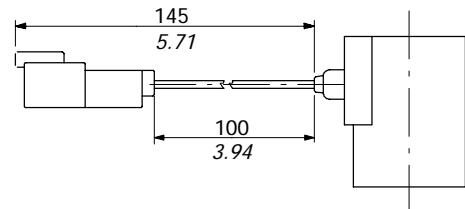
Coil with ISO4400 connection (weather protection IP65)



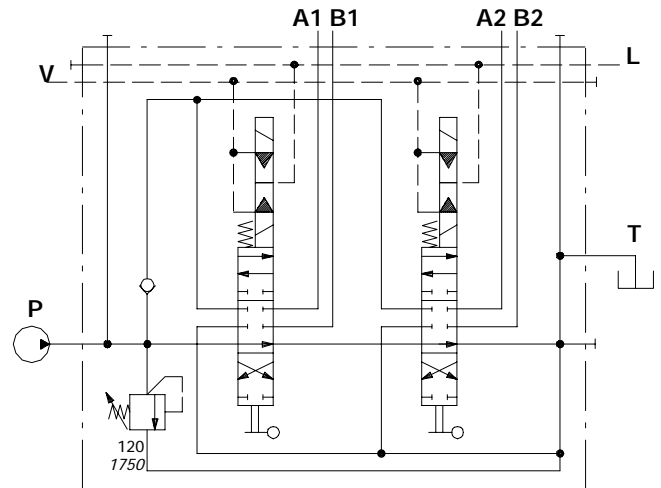
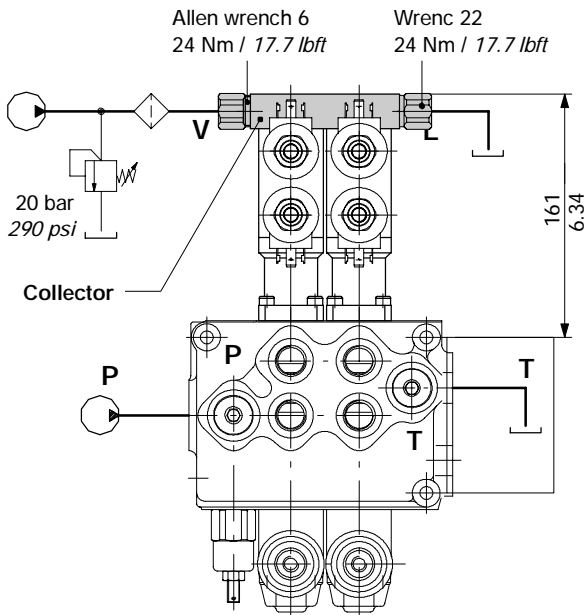
Coil with AMP JPT connection (weather protection IP65)



Coil with Deutsch DT connection (weather protection IP67)



Collector kit for external pilot and drain



COLLECTOR KIT CODES

Type	Code *	Description
KE1S0	5KE1S00070	For one section
KE2S0	5KE2S00470	For 2 sections
KE3S0	5KE3S00470	For 3 sections
KE4S0	5KE4S00470	For 4 sections
KE5S0	5KE5S00470	For 5 sections
KE6S0	5KE6S00470	For 6 sections

(*) codes are referred to UN-UNF thread

Description example:

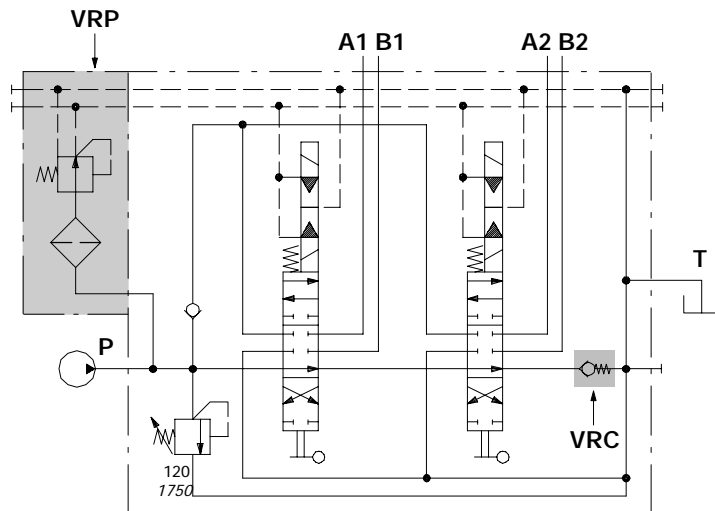
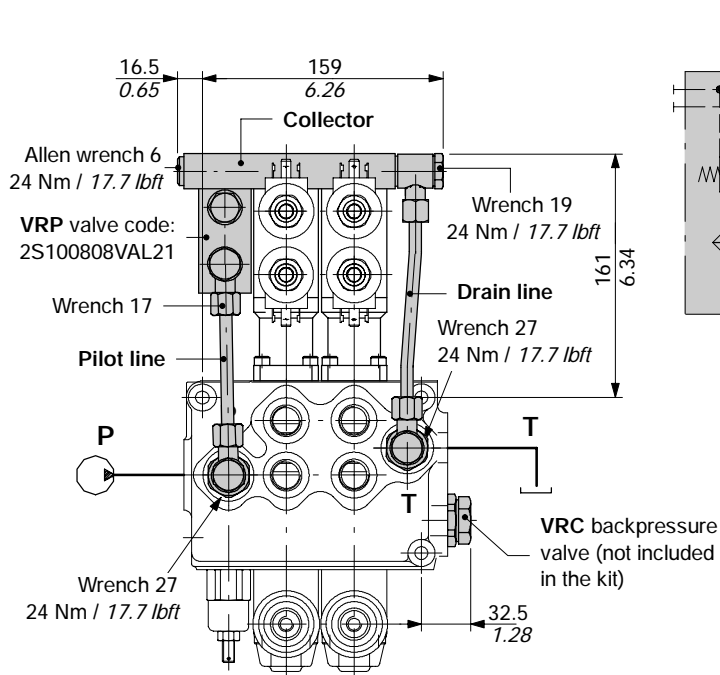
SD11/2-P(JG3-120)/18ED3L/18ED3L/AET-KE2S0-24VDC-SAE

"A" side spool positioners

ON/OFF electrohydraulic kit type 8EI3

Collector with pilot and drain

The kit consists of a collector with VRP pressure reducing valve and relative pipes.



Description example:
SD11/2-P(JG3-120)/18EI3L/18EI3L/VRC-KE2R3-24VDC-SAE

Operating features

VRP VALVE

- Output pressure : 20 bar / 290 psi
- Max flow : 8 l/min / 2.1 US gpm
- Filtering : 80 μ

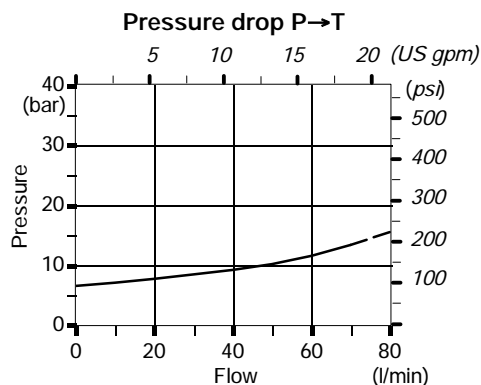
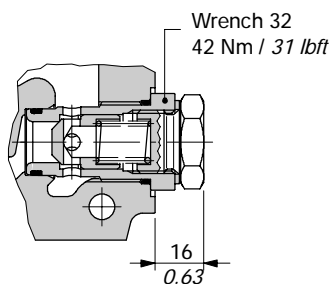
COLLECTOR KIT CODES

Type	Code *	Description
KE1R3	5KE1R30470	For one section
KE2R3	5KE2R30470	For 2 sections
KE3R3	5KE3R30470	For 3 sections
KE4R3	5KE4R30470	For 4 sections
KE5R3	5KE5R30470	For 5 sections
KE6R3	5KE6R30470	For 6 sections

(*) Codes are referred to UN-UNF thread

VRC backpressure valve: code 3XGIU532490

Valve assembled on flow through passage provides pilot pressure to the actuator.

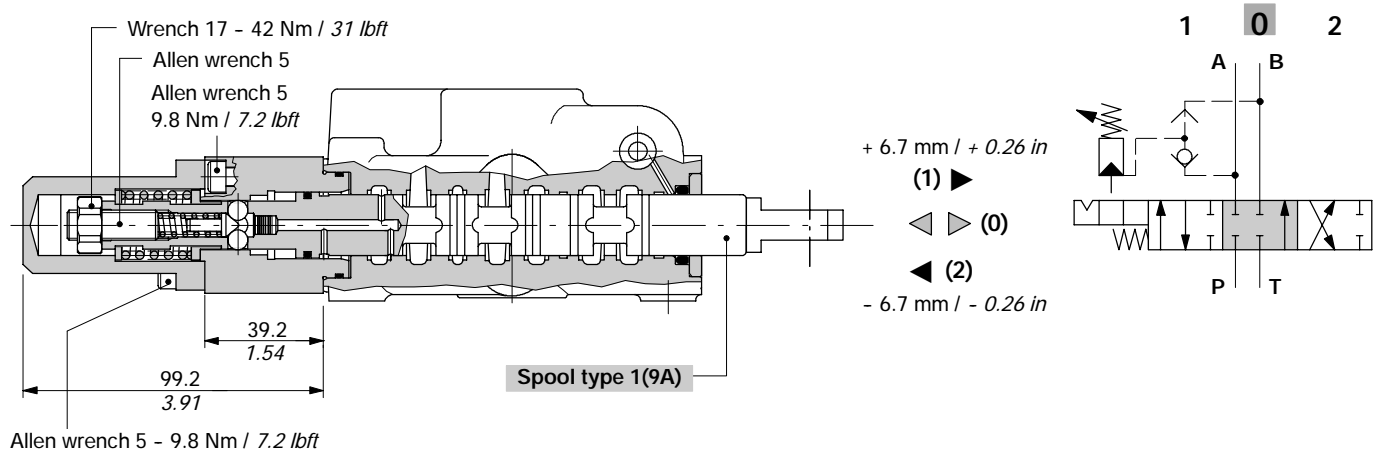


With detent and automatic release in neutral position

9A kit

Detent in position 1 with automatic release when pressure towards ports exceeds setting: standard setting 100 bar / 1450 psi, range from 40 to 120 bar / from 580 to 1750 psi.

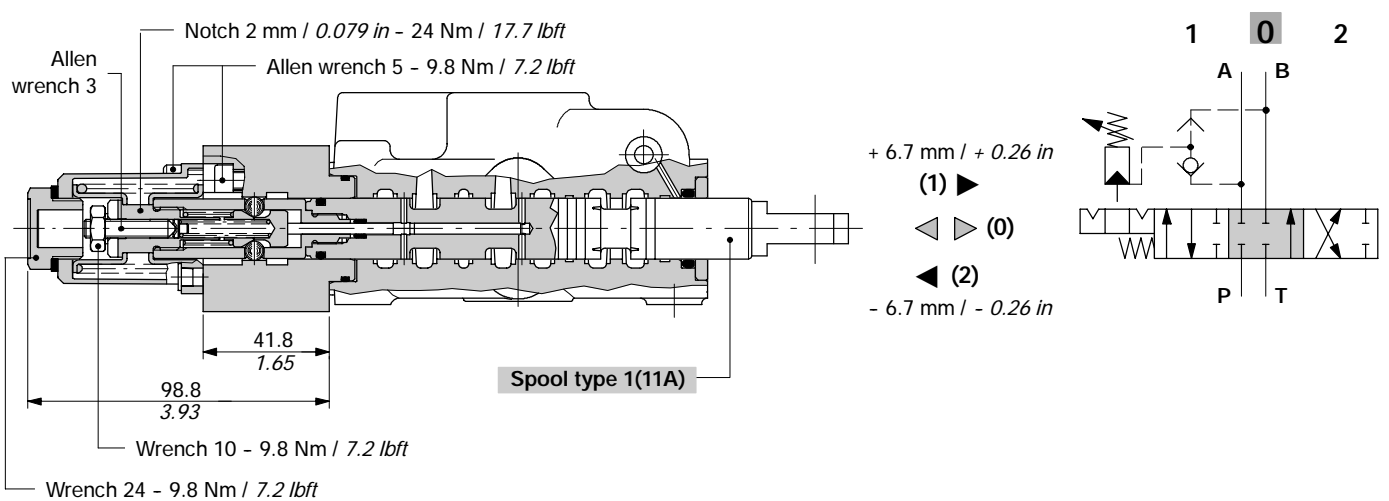
This kit needs spool type 1(9A) code 3CU1410300 and special body with extra machining: for information please contact Sales Department.



Kit 11A

Detent in positions 1 and 2 with automatic release when pressure towards ports exceeds setting: standard setting 100 bar / 1450 psi, range from 40 to 120 bar / from 580 to 1750 psi.

This kit needs spool type 1(11A) code 3CU1410320 and special body with extra machining: for information please contact Sales Department.

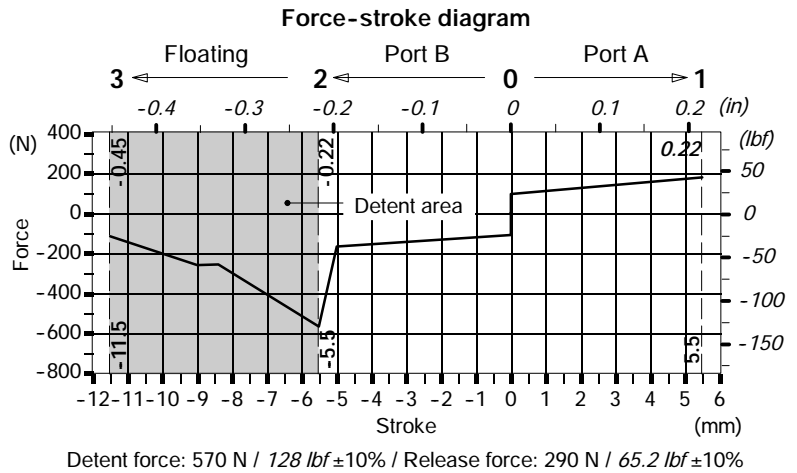
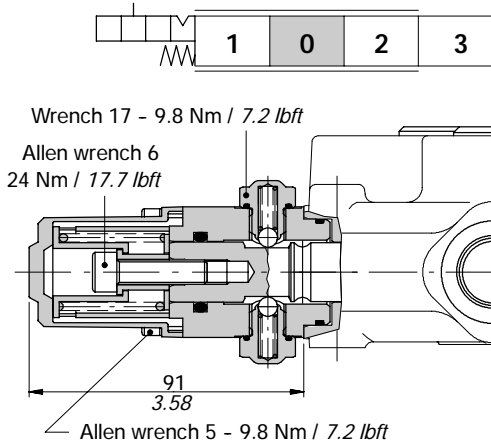


"A" side spool positioners

Particular positioner kits for special spools

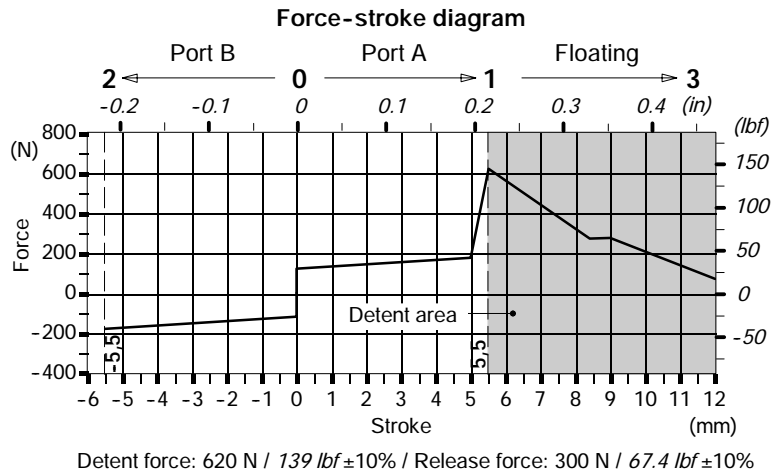
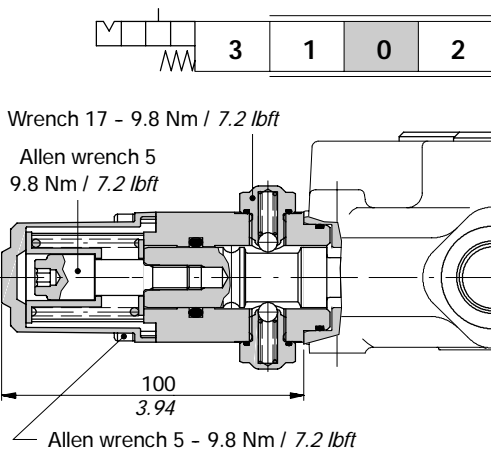
13B kit

Detent in position 3 and spring return in neutral position; to be only couple to floating circuit spool type 5 (see page 16).



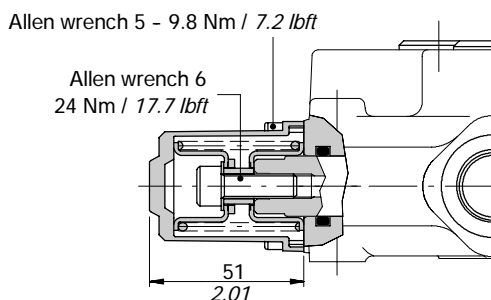
13C kit

Detent in position 3 and spring return in neutral position; to be only couple to floating circuit spool type 5VR (see page 17).



8CR kit

With spring return to neutral position and reduced stroke $\pm 5 \text{ mm} / \pm 0.197 \text{ in}$.
To be couple to generative circuit spool type 8F (see page 18).

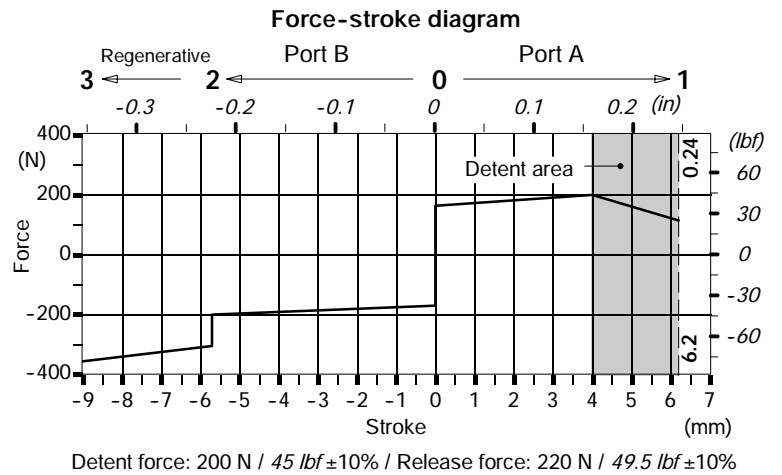
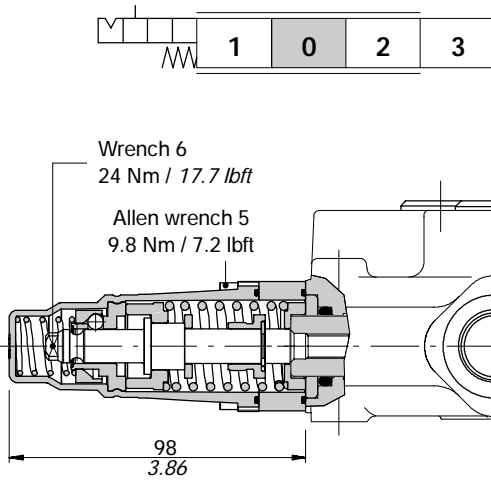


Particular positioner kits for special spools

13FZ1 kit

Detent in position 1 and spring return to neutral position.

To be couple to generative circuit spool type 8 (see page 19).

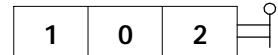
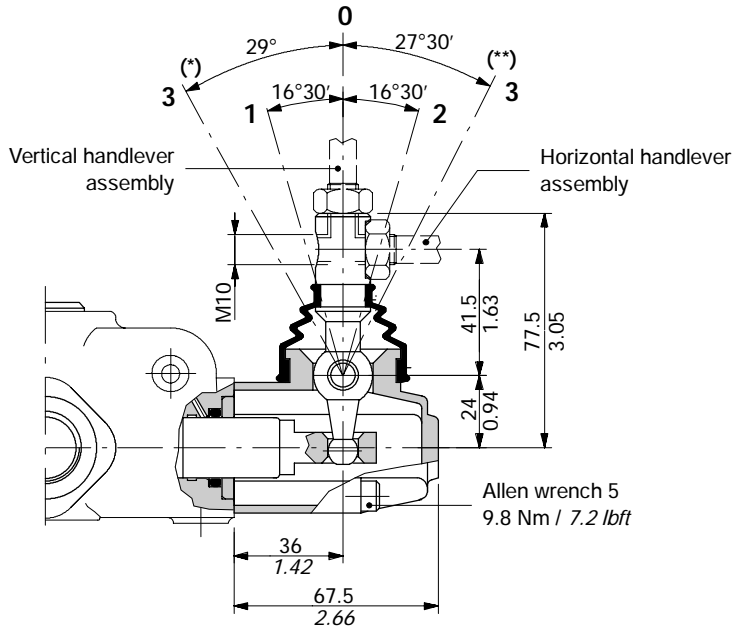


"B" side options

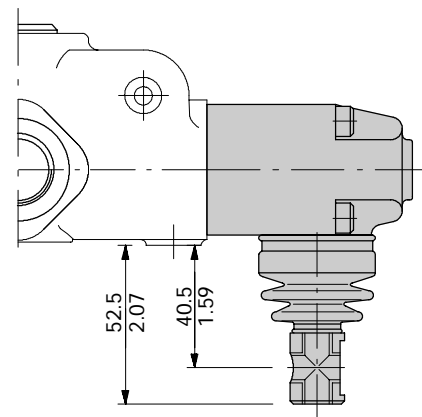
Lever control

Type L

Alluminium box with protection boot lever pivot box; it can be rotated 180° (configuration L180).



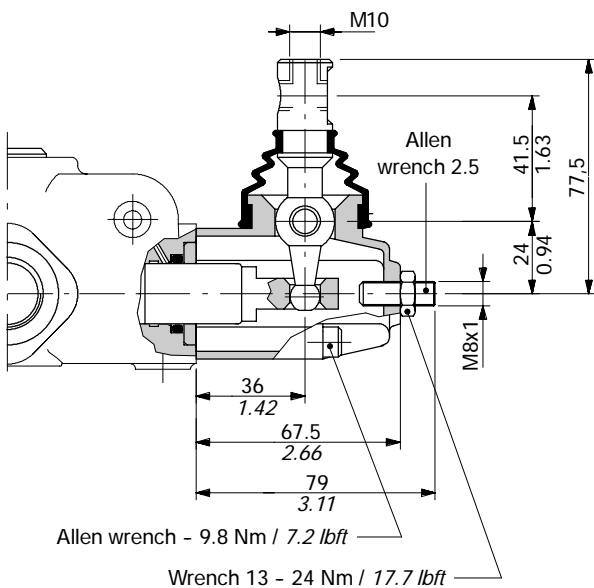
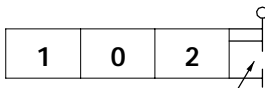
Configuration L180



NOTE (*) - With spool type 5VR (see page 17)
(**) - With spool type 5 (see page 16)

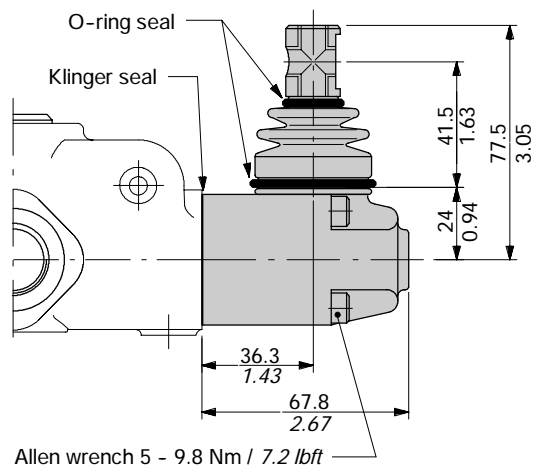
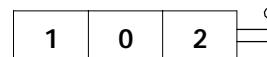
Type LF1

With spool stroke adjusting in position 1.



Type LS

Waterproof execution.

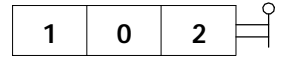


Lever control

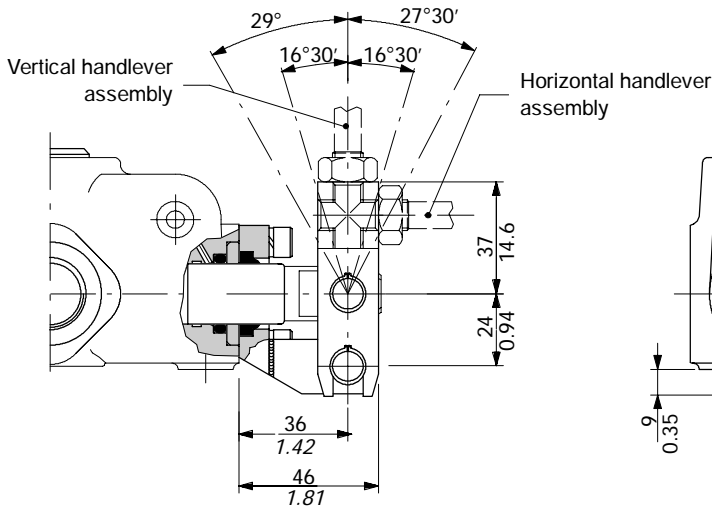
Type LB

Steel manufacture.

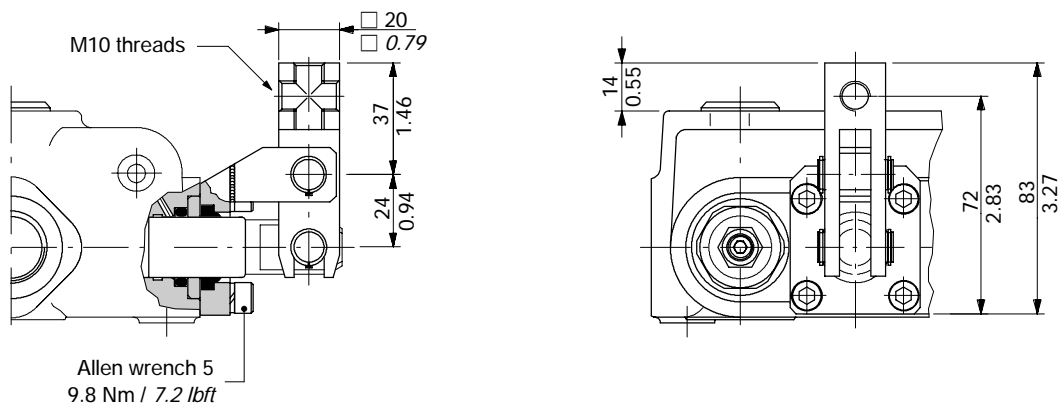
Pivot can be assembled below (LB1 configuration) or above (LB3 configuration).



Configuration LB1



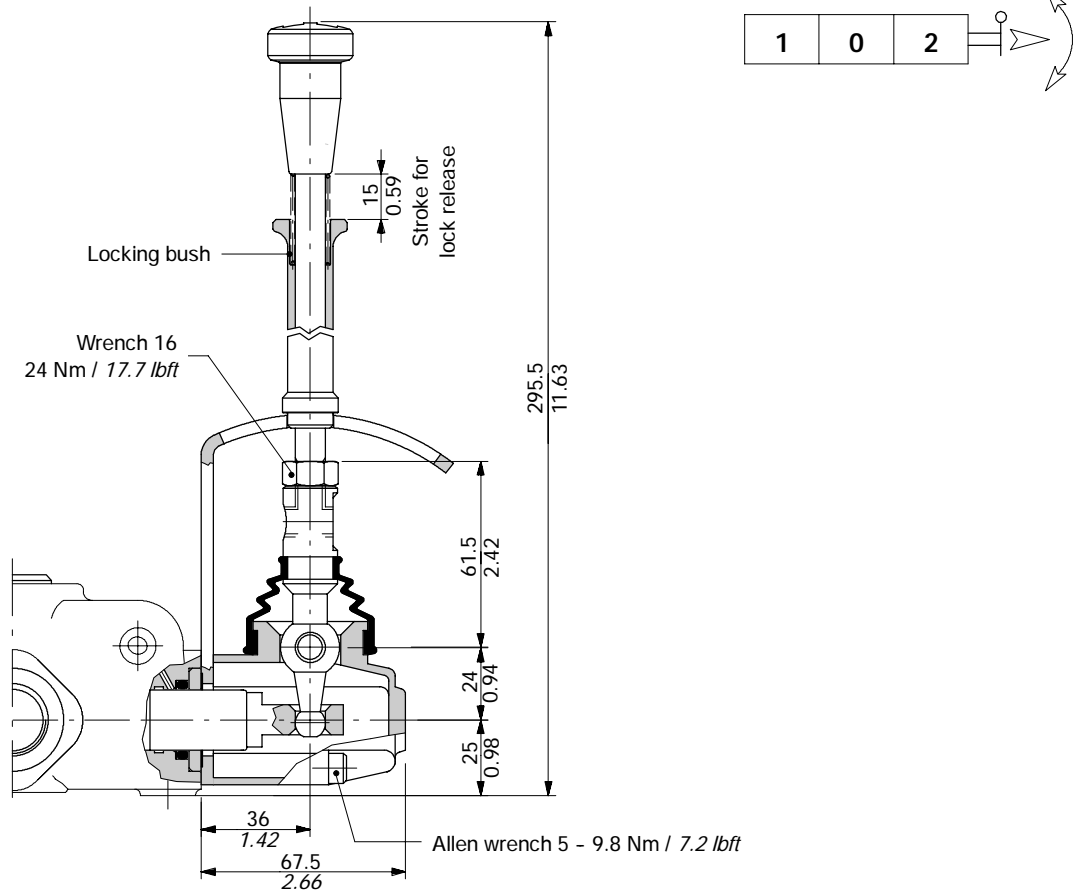
Configuration LB3



"B" side spool options

Safety lever type LEB

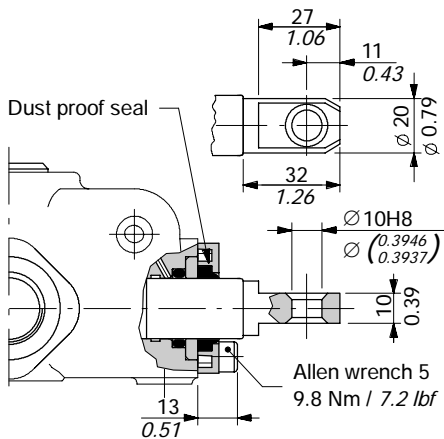
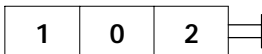
Safety levers with lock in neutral complete with handlever; lift handlever knob to operate.



Controls prearrangement

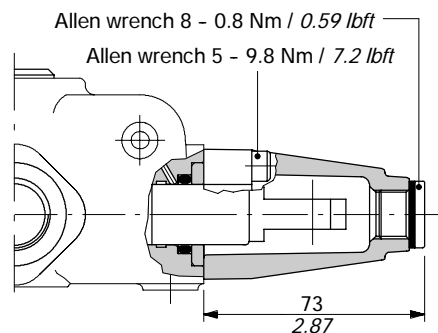
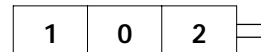
Type SLP

Mechanical control with dust-proof plate kit.



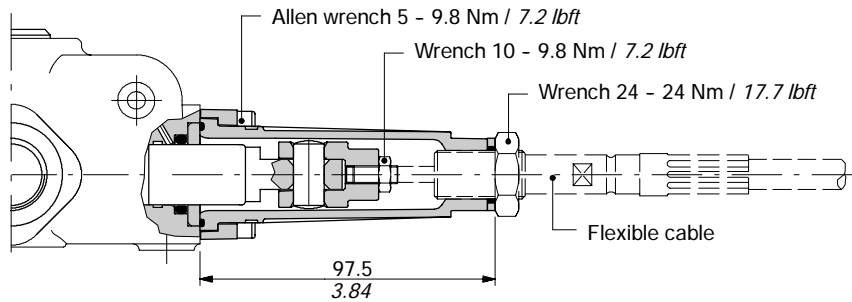
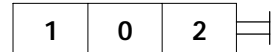
Type SLC

Protection cap usable with pneumatic 8P-8PG, electro-pneumatic 8EPG3, hydraulic 8ID endand electro-hydraulic 8EI3 spool positioners.



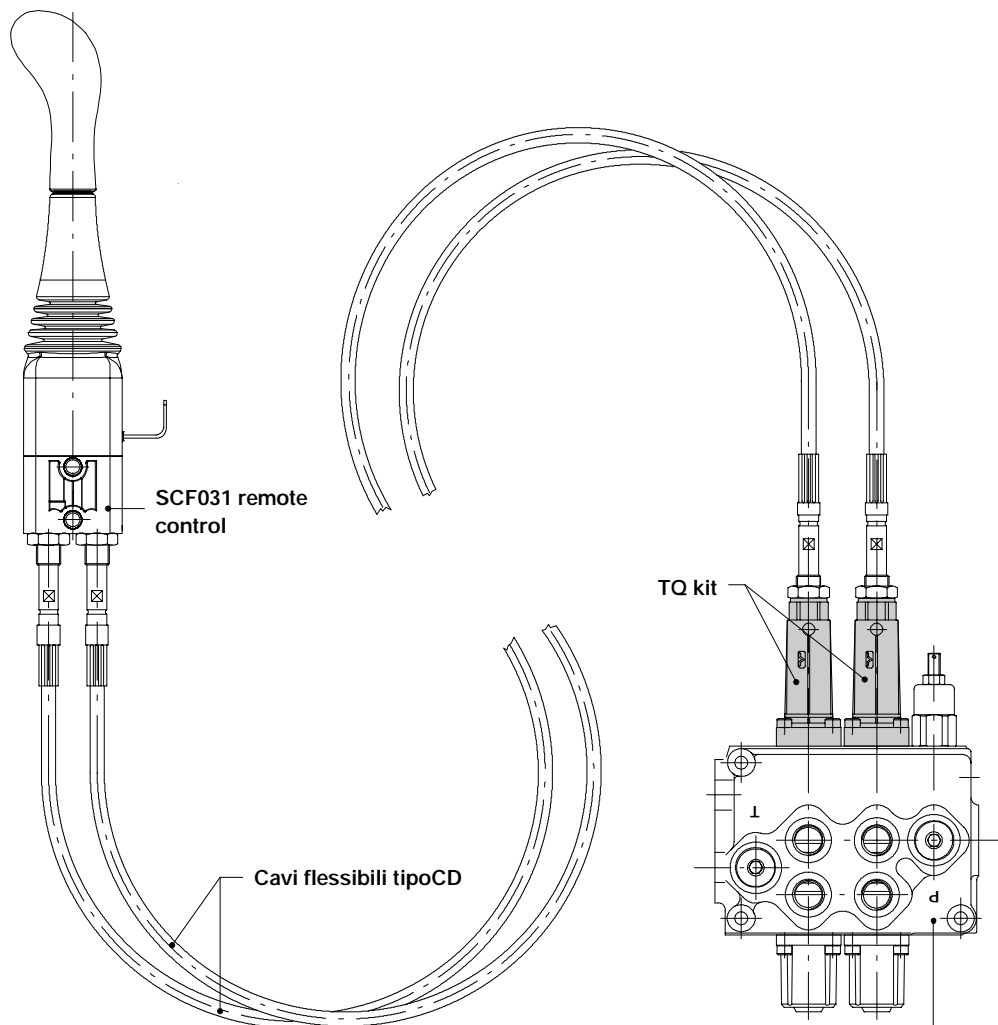
TQ cable remote control kit

Waterproof cap prearranged for remote control with flexible cable.



NOTE - For further information about remote cable control, require related documentation.

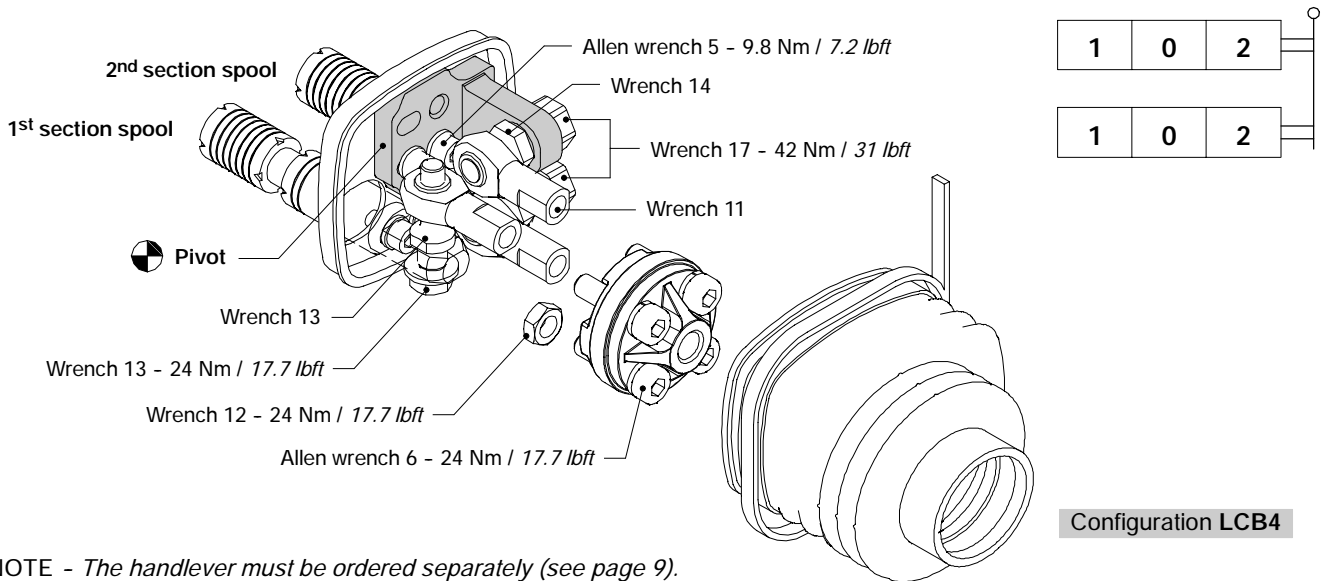
Example of cable control



SD11/2 directional control valve without lever boxes

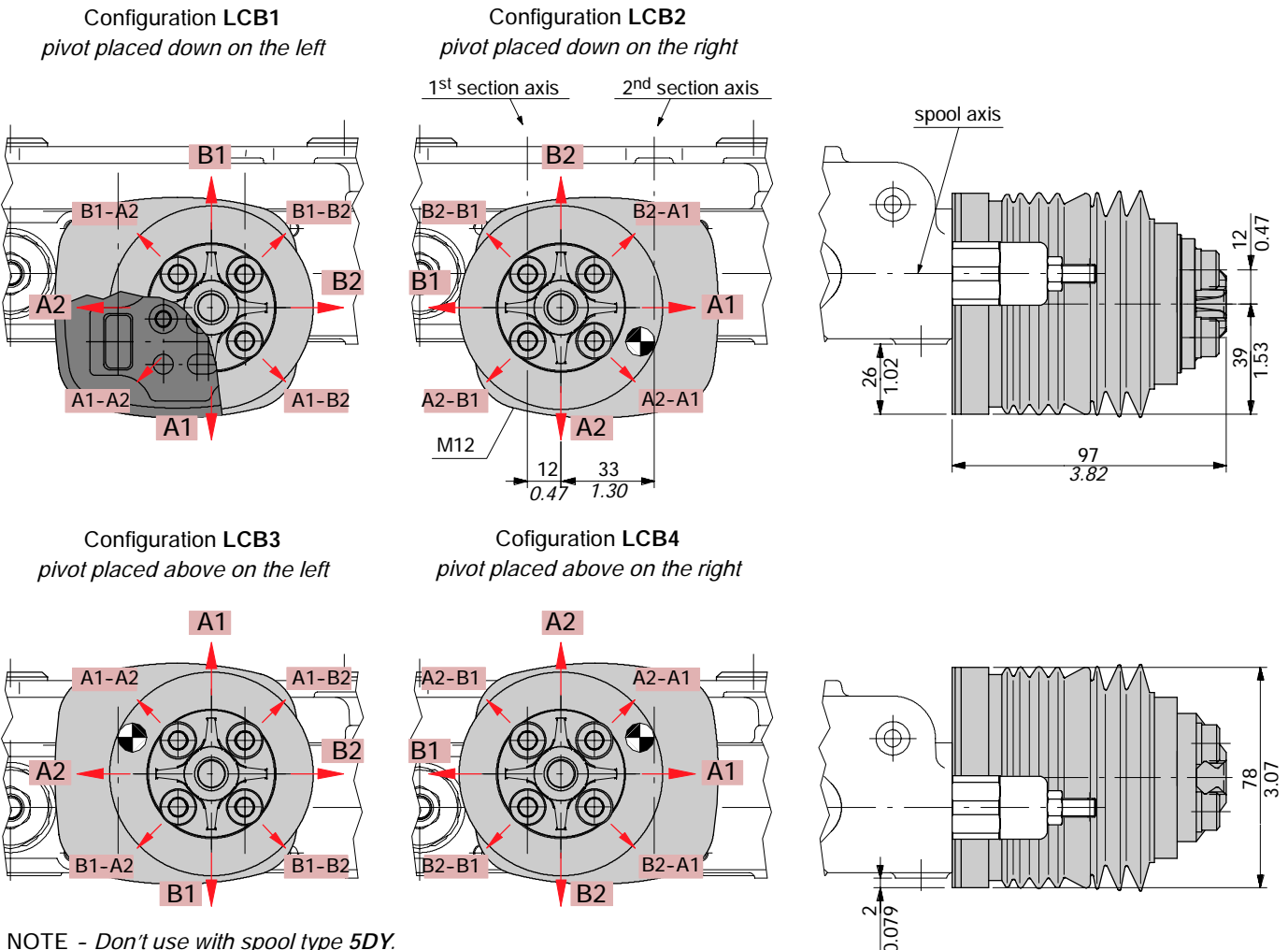
"B" side options

LCB mechanical joystick



NOTE - The handlever must be ordered separately (see page 9).

Dimensions and movement scheme

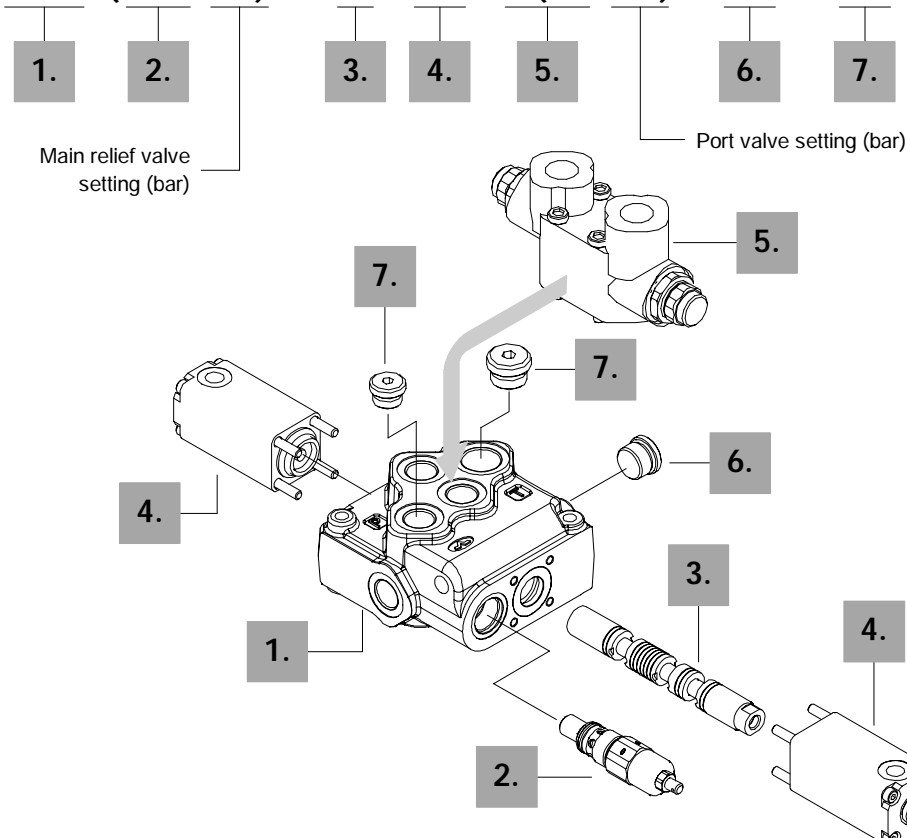


Proportional hydraulic control type 8IM

It can be used on valve with dedicated spools and body.

Description example:

SD11 / 1 - P (KG3-120) / 1C 8IM . P3(G3-120) / AET - PSL - SAE *



1. Body kit *

Include body and load check valve.

TYPE	CODE	DESCRIPTION
1-P	5KC1417141	Parallel, 1 section
2-P	5KC1427101	Parallel, 2 sectionS

For further body kits contact Sales Department.

2. Inlet relief options

For codes see page 8.

3. Spool options

TYPE	CODE	DESCRIPTION
1C	3CU1410400	Double acting, 3 positions, with A and B closed in neutral position
2C	3CU1425400	Double acting, 3 positions, with A and B open to tank in neutral position

4. Control *

TYPE	CODE	DESCRIPTION
8IM	5IDR210700	Bilateral proportional hydraulic control with spring return

5. Service valves

For types and codes see page 48.

6. Outlet port options *

TYPE	CODE	DESCRIPTION
AET	3XTAP732201	Tappo per centro aperto
AEK	3XTAP532450	Tappo per centro chiuso
AE	3XGIU532660*	SAE10 power beyond sleeve

7. Inlet and outlet selection *

TYPE	CODE	DESCRIPTION
PSL	3XTAP826160	SAE10 plug for upper inlet and outlet (nr.2 request): side ports open
PSA	3XTAP826160	SAE10 plug for side inlet and outlet (nr.2 request)

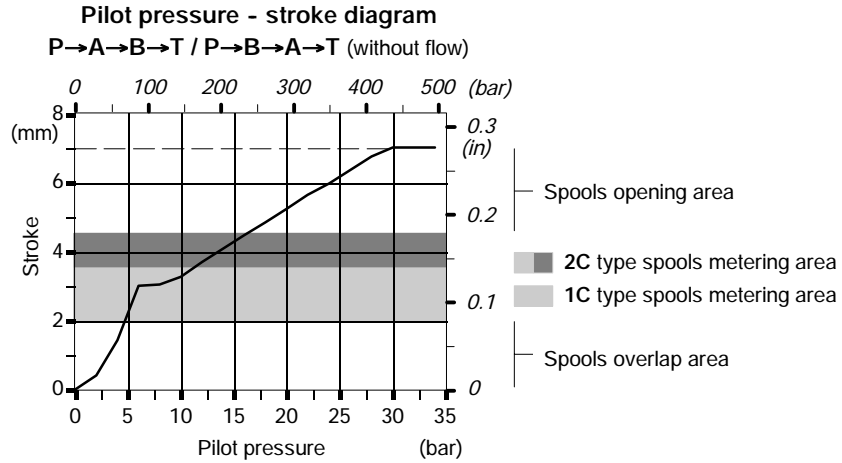
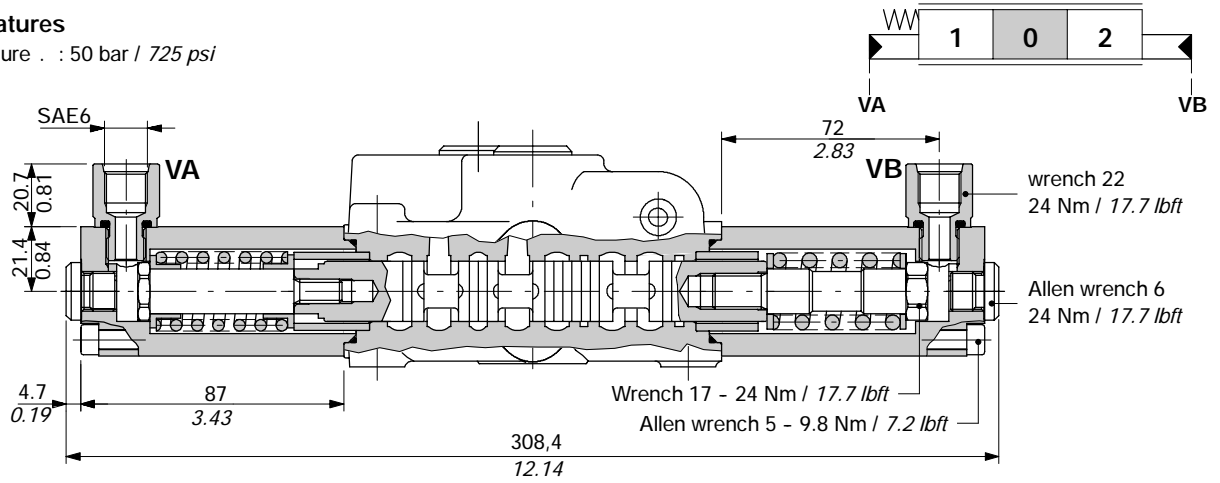
NOTE (*) - Items are referred to UN-UNF thread.

Complete controls

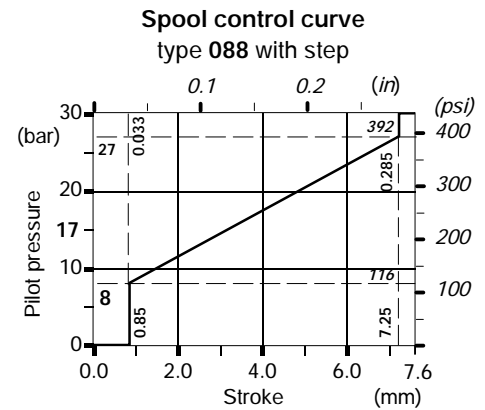
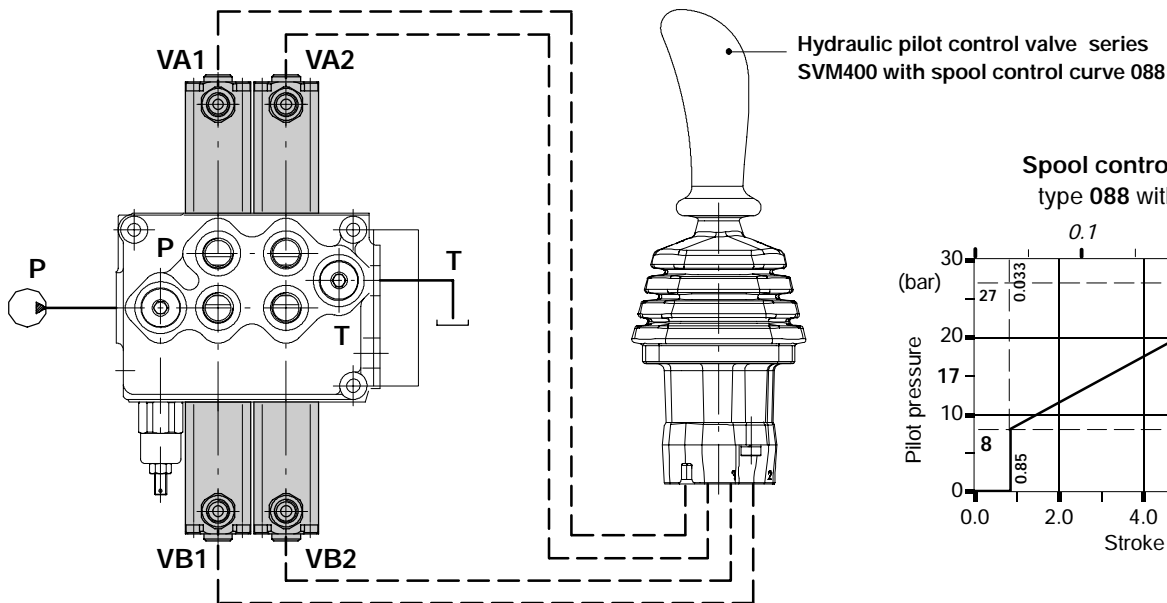
Proportional hydraulic control type 8IM

Operating features

Max. pilot pressure . . : 50 bar / 725 psi



Connection example

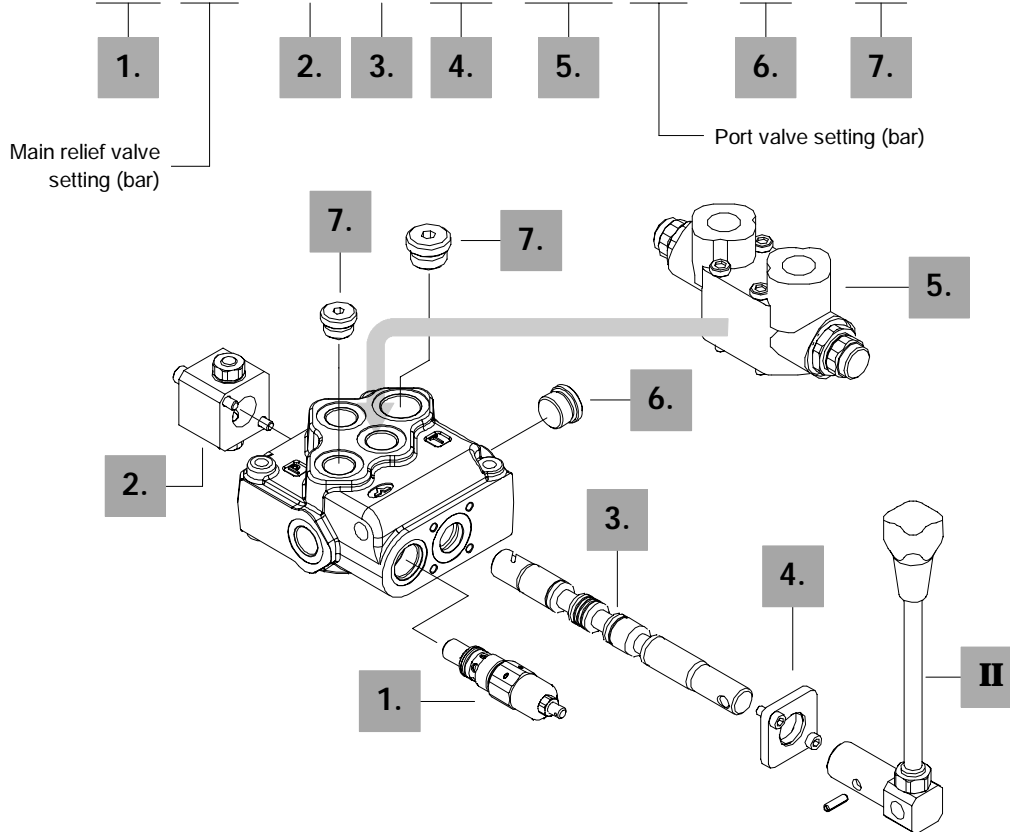


Rotative control type R

It can be used on valve with dedicated spools and standard body.

Description example:

SD11 / 1 - P (KG3-120) / 1 R SLP . P3(G3-120) / AET - PSL - SAE *



1. Inlet relief options

For codes see page 8.

2. Spool options

TYPE	CODE	DESCRIPTION
1R	3CU1410551	Double acting, 3 positions, with A and B closed in neutral position
2R	3CU1425551	Double acting, 3 positions, with A and B open to tank in neutral position

3. "A" side spool positioners

TYPE	CODE	DESCRIPTION
R	5ROT110000	3 positions rotative control with neutral position sensor

4. "B" side options

TYPE	CODE	DESCRIPTION
SLP	5COP110000	Without lever box, with dust-proof plate

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

5. Service valves

For types and code see page 48.

6. Outlet port options

TYPE	CODE	DESCRIPTION
AET	3XTAP732201	Tappo per centro aperto
AEK	3XTAP532450	Tappo per centro chiuso
AE	3XGIU532660*	SAE10 power beyond sleeve

7. Inlet and outlet selection *

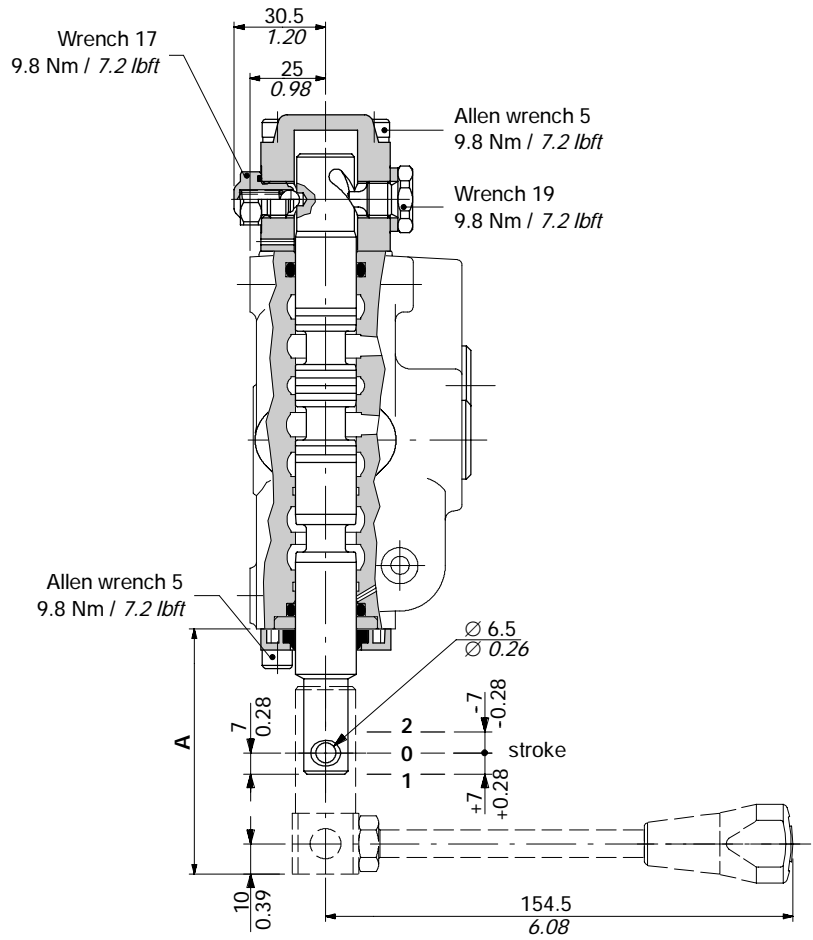
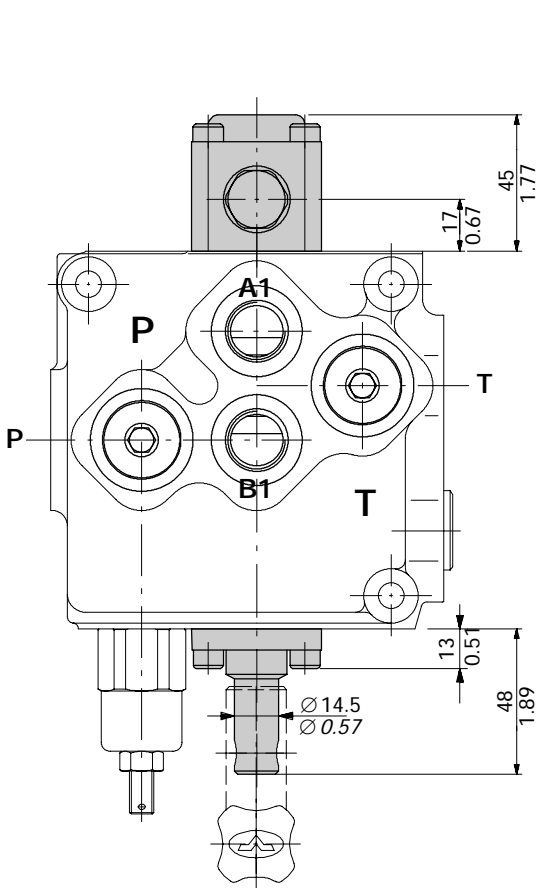
TYPE	CODE	DESCRIPTION
PSL	3XTAP826160	SAE10 plug for upper inlet and outlet (nr.2 request): side ports open
PSA	3XTAP826160	SAE10 plug for side inlet and outlet (nr.2 request): upper ports open

I Optional handlever with joint

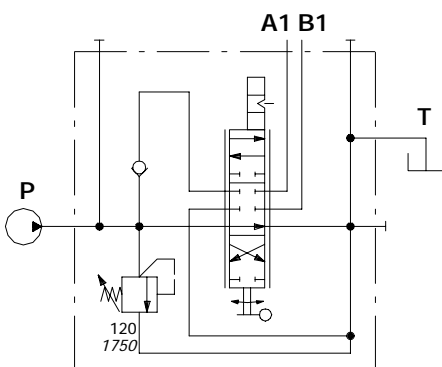
CODE	DESCRIPTION
3XGIU422620	Standard model
3XGIU422990	Lengthened model

Complete control

Rotative control type R



Hydraulic circuit



A (mm / in)	Description
81 / 3.19	Dimension with standard handlever
131 / 5.16	Dimension with lengthened handlever

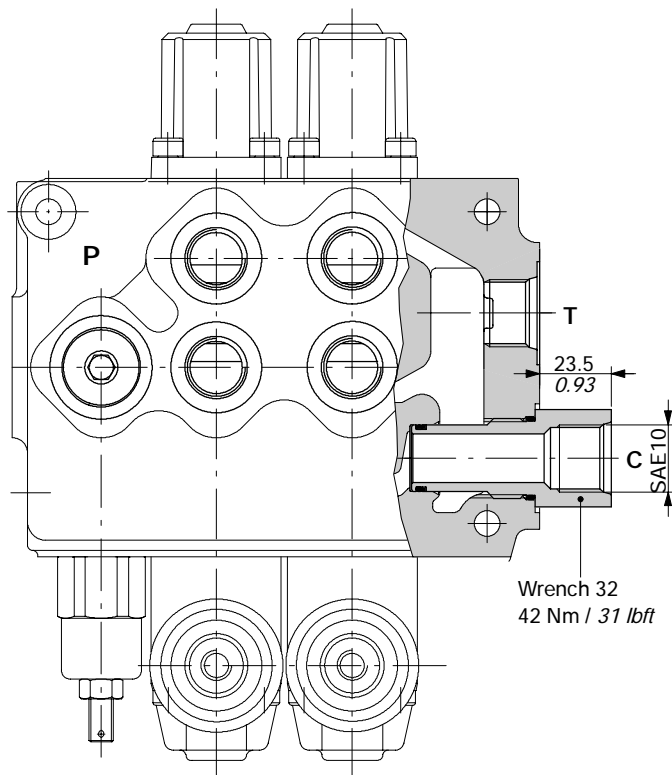
It's possible to have open center, closed center and power beyond.

Unloader valves are available: these valves need special bodies with appropriate cavity on lateral outlet port, the tank connection T must be on top.

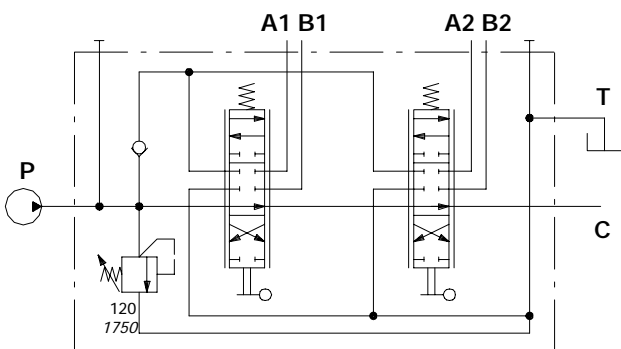
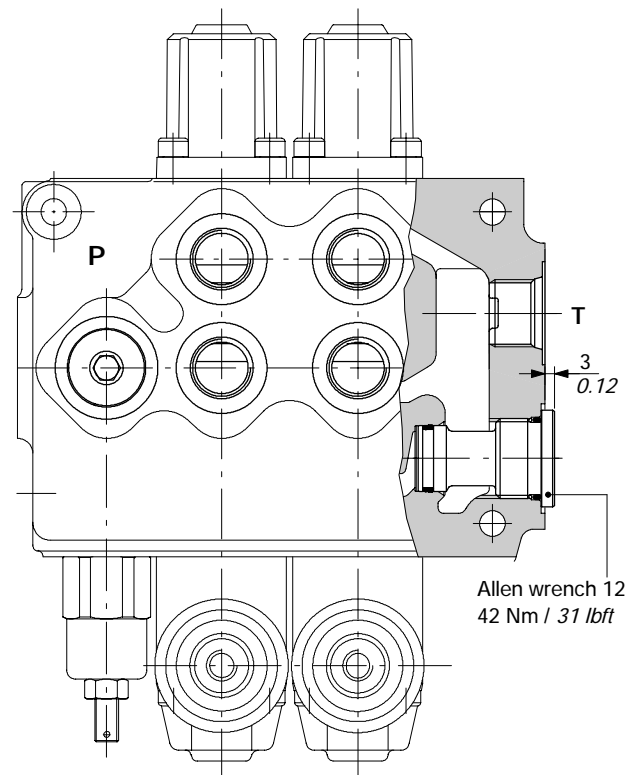
AET: open center (standard)

See page 6

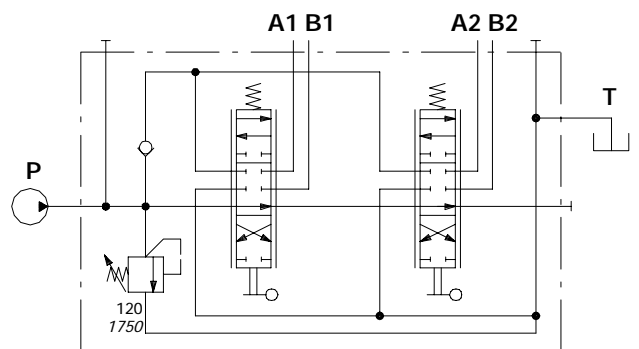
AE: with power beyond sleeve



AEK: closed center



Description example:
SD11/2-P(KG3-120)/18L/18L/AE-SAE



Description example:
SD11/2-P(KG3-120)/18L/18L/AEK-SAE

Outlet port options

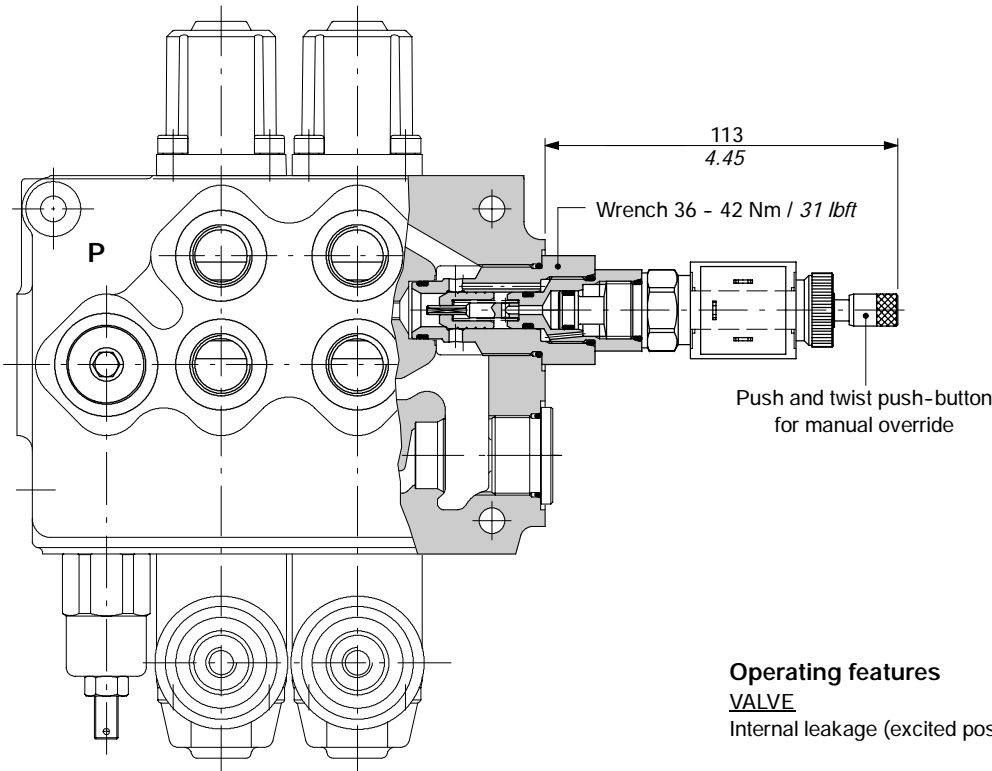
Solenoid pilot unloader valves

Emergency with push button and spring return; for detent position turn the button after press it: **WARNING** the manual override option is intended for emergency use, not for continuous duty operation.

Codes show at page 10 are referred to valves with ISO4400 coil, for complete valves with different electric connection contact Sales Department.

Spare coils with several connectors are available, with and without diode

Directional valve body with extra-machining is requested: contact Sales Department.



Operating features

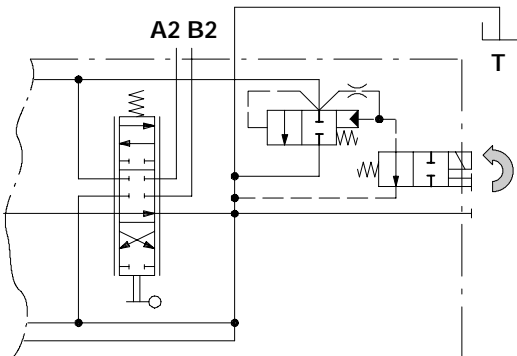
VALVE

Internal leakage (excited position) : max. 5 cm³/min at 100 bar
max. 0.31 in³/min at 1450 psi

COIL

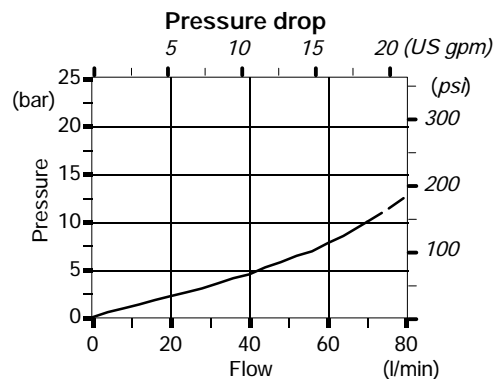
Depending on model: see following page

Hydraulic circuit



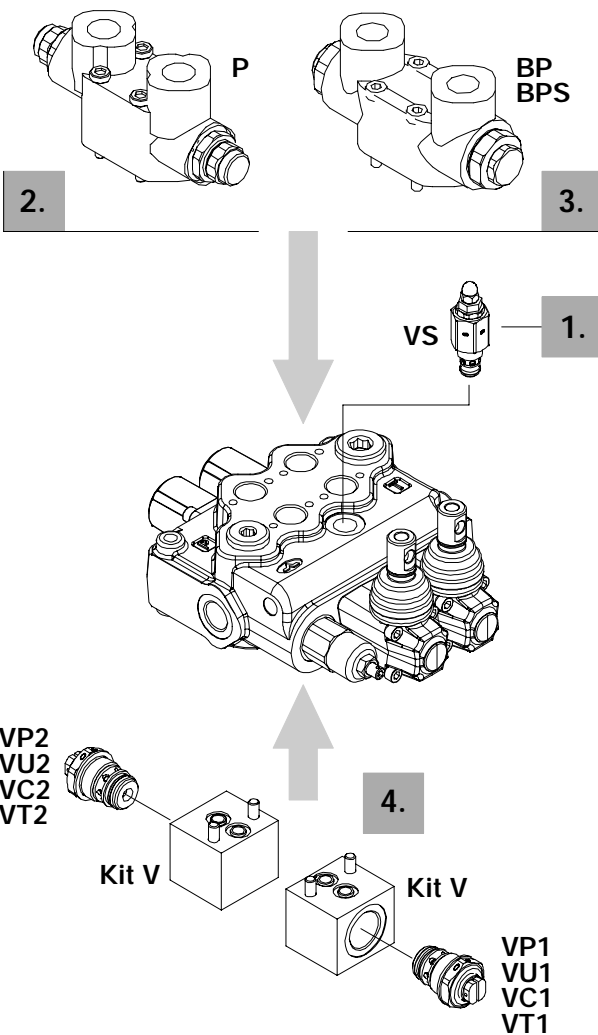
Description example:

SD11/2-P(KG3-120)/18L/18L/AET-EL-12VDC-SAE



Service and auxiliary valves

All service and auxiliary valves need **special body**: contact Sales Department.



1. Relief valves page 49

TYPE	CODE	DESCRIPTION
VS(G3-100)	3XCAR511113	Range 80 a 170 bar / 1150 to 2450 psi standard setting 100 bar / 1450 psi

2. P antishock valves page 50

Cross return type, supplied with mounting block

TYPE	CODE	DESCRIPTION
P1(G3-100)	604007000*	Block with valve on port A
P2(G3-100)	604007000*	Block with valve on port B
P3(G3-100)	604007100*	Block with valve on ports A and B
P(G2-60)	5CAR211112	Single valve: range 80 to 120 bar / 1150 to 1750 psi, std setting 80 bar / 1150 psi
P(G3-100)	5CAR211113	Single valve: range 120 to 180 bar / 1750 to 2600 psi, std setting 100 bar / 1450 psi
P(G4-200)	5CAR211113	Single valve: range 160 to 315 bar / 2300 to 4600 psi, std setting 200 bar / 2900 psi
PT	XTAP526430	Valve blanking plug (for configuration P1, P2)

3. Pilot check valves page 51

With pre-opening, supplied with mounting block

TYPE	CODE	DESCRIPTION
BPS1	604003005*	Block with valve on port A
BPS2	604003005*	Block with valve on port B
BPS3	604003105*	Block with valves on ports A and B
BPS	XCAR616200	Single valve
BPT	XTAP330360	BPS valves blanking plug

4. Anti-shock+anti-cavitation valve page 54

They are flange mounted on the opposite side of working ports connected in parallel with A and B ports, with outlet on T port.

TYPE	CODE	DESCRIPTION
Kit V	5CO2840100	Mounting block kit
T	5TAP528320	Valve blanking plug
VC	5KIT410100	Anti-cavitation valve

Anti-shock valves

VP(G2)	5KIT210212	Range 50 to 100 bar / 725 to 1450 psi standard setting 60 bar / 870 psi
VP(G3)	5KIT210213	Range 80 to 250 bar / 1150 to 3600 psi standard setting 100 bar / 1450 psi
VP(G4)	5KIT210214	Range 160 to 315 bar / 2300 to 4600 psi standard setting 200 bar / 2900 psi

Anti-shock + anti-cavitation valves

VU(G2)	5KIT310112	Range 50 to 100 bar / 725 to 1450 psi standard setting 60 bar / 870 psi
VU(G3)	5KIT310113	ange 80 to 200 bar / 1150 to 2900 psi standard setting 100 bar / 1450 psi
VU(G4)	5KIT310114	Range 160 to 280 bar / 2300 to 4100 psi standard setting 200 bar / 2900 psi

NOTE - Valve settings at points 2-4 are referred to 10 l/min / 2.6 US gpm flow.
- (*) Codes are referred to UN-UNF threads.

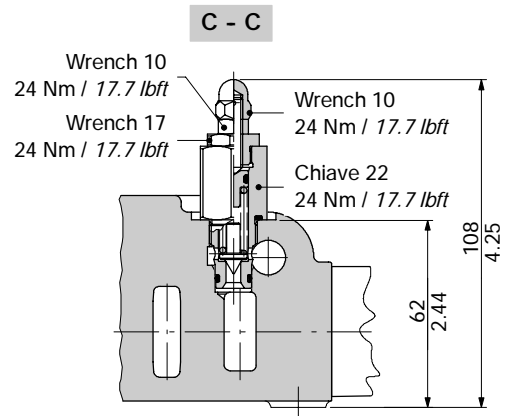
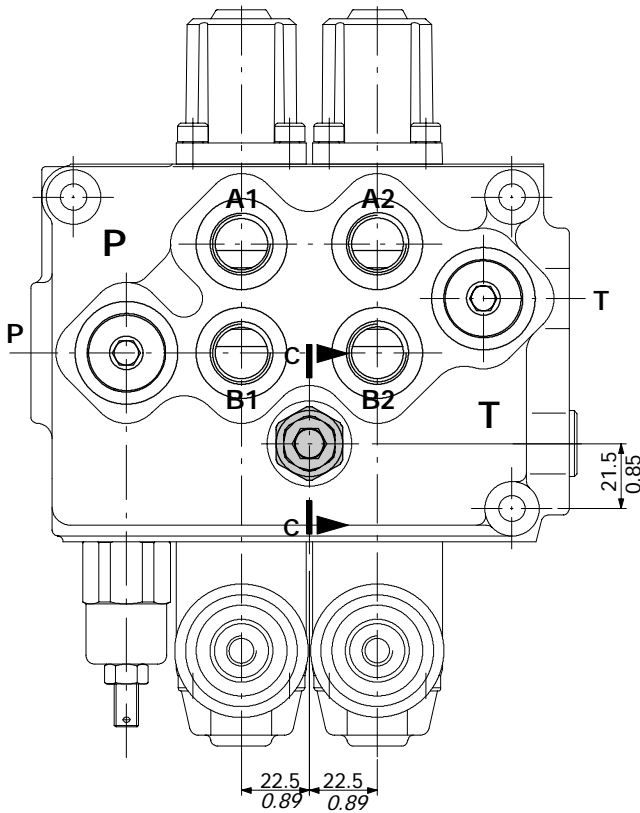
VS relief valve

It's mounted on parallel body to limitate the pressure, at lower value than main relief valve (min. gap 20 bar / 290 psi), on downstream section.

It's in parallel with flow trough and it works only with single operation.

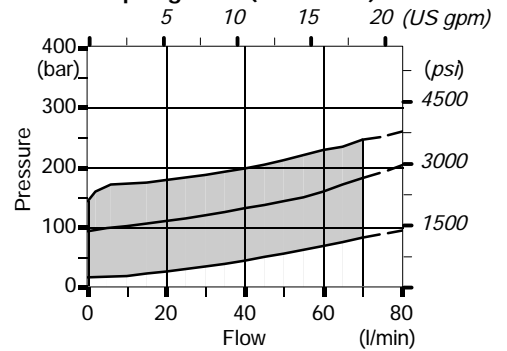
VS (D 3 - 100)

- Pressure setting in bar (standard 100 bar / 1450 psi)
- Tamper proof execution with blind nut

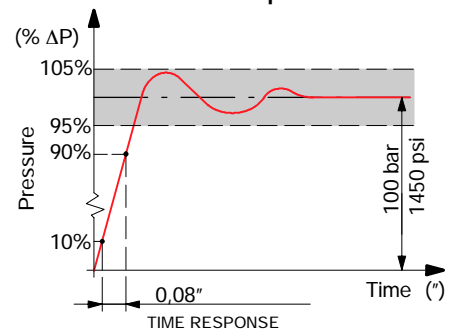


Performance data

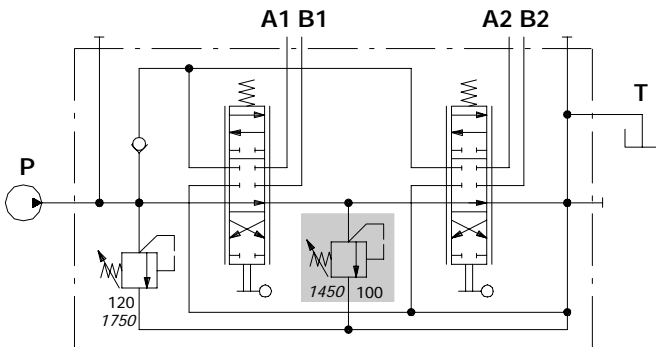
Spring nr. 3 (blue band)



Time response



Hydraulic circuit



Description example:

SD11/2-P(KG3-120)/18L/VS(D3-100)/18L/AET-PSA-SAE

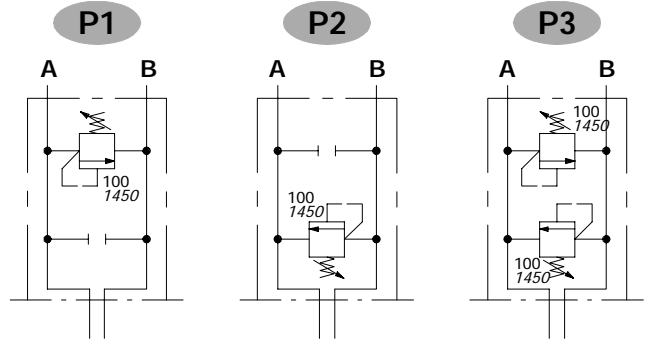
Valvole secondarie

P anti-shock valves with cross return

Cast iron block with antishock valves; for dimensions and assembling see page 52.

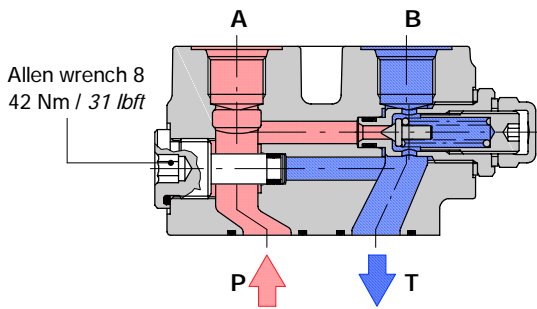
P 1 (D 3 - 100)

- Standard setting in bar (for value see page 48).
- Spring type (2, 3, 4).
- Adjustment with blind nut (D).
- 1 mounted on port A.
- 2 mounted on port B.
- 3 mounted on ports A and B.



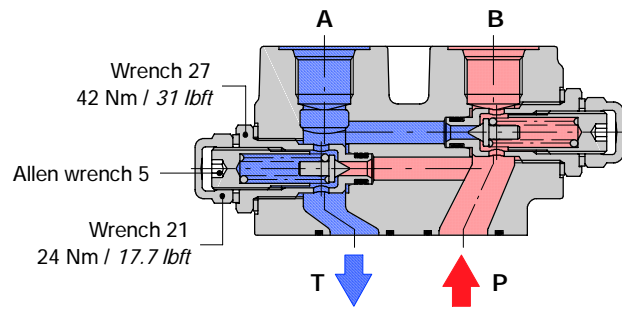
P1 configuration

Example of pressure on port A and port B to tank



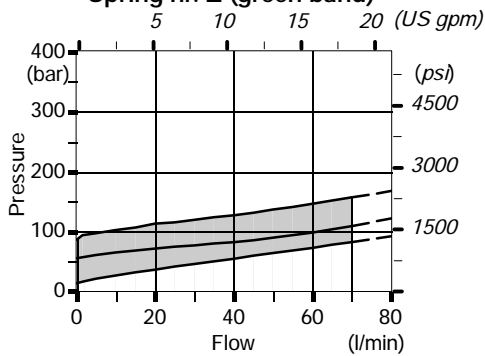
P3 configuration

Example of pressure on port B and port A to tank

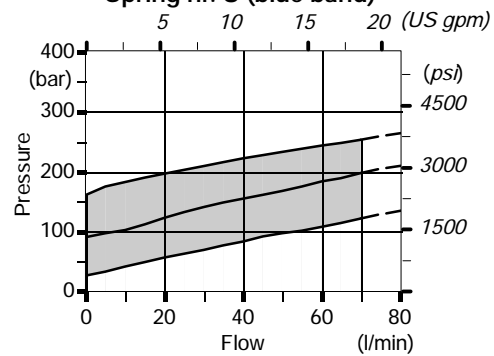


Performance data

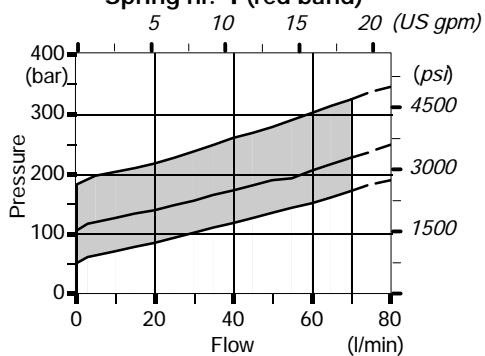
Spring nr. 2 (green band)



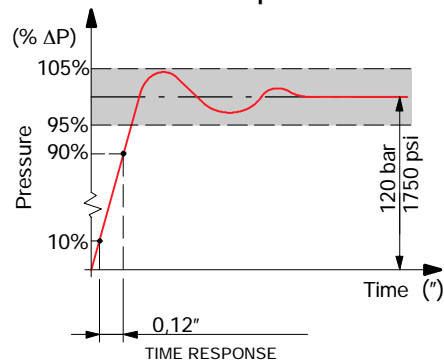
Spring nr. 3 (blue band)



Spring nr. 4 (red band)



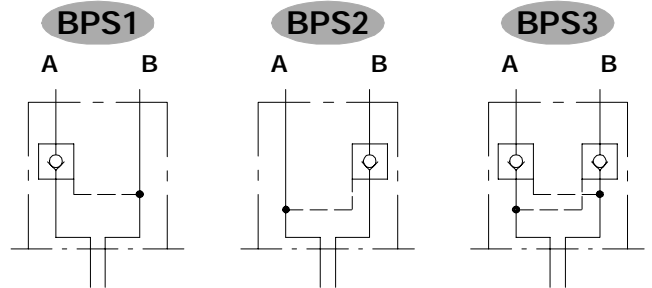
Time response



BPS pilot check valves with pre-opening

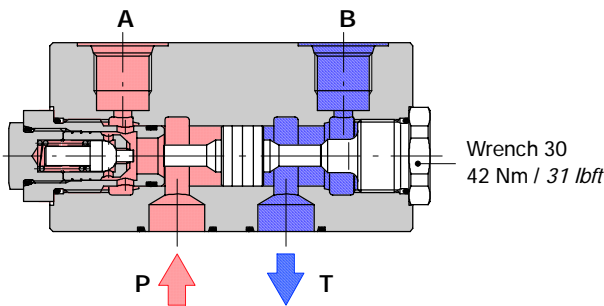
Cast iron block with pilot check valves; for dimensions and assembling see page 52.

- BPS 1**
- 1 mounted on port A.
 - 2 mounted on port B.
 - 3 mounted on ports A and B.
- Valve type



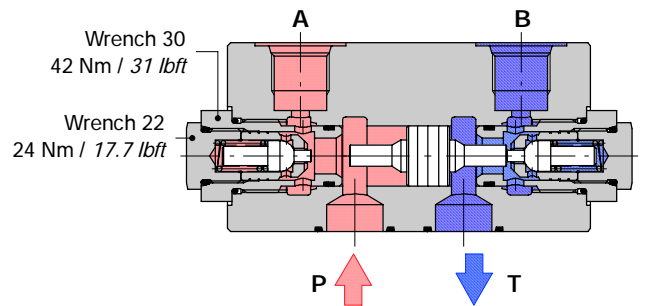
BPS1 configuration

Example of pressure on port A and port B to tank

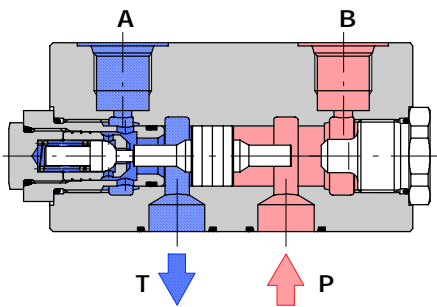


BPS3 configuration

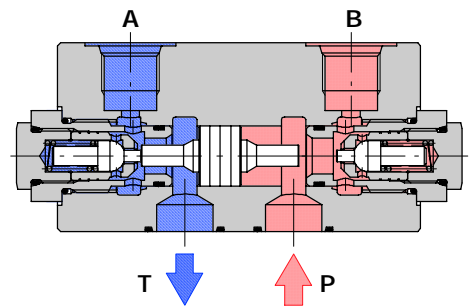
Example of pressure on port A and port B to tank



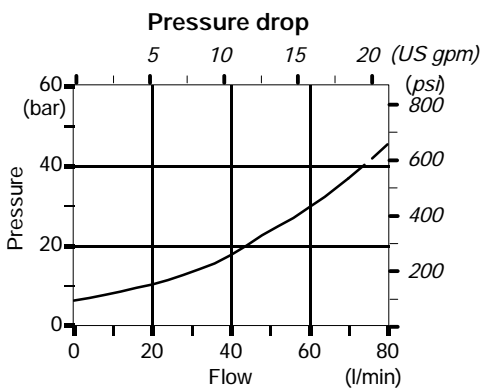
Example of pressure on port B and port A to tank



Example of pressure on port B and port A to tank



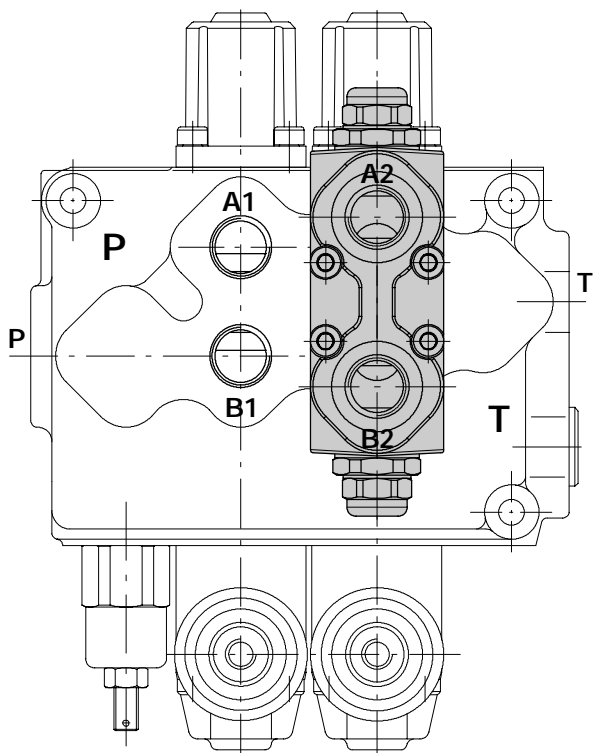
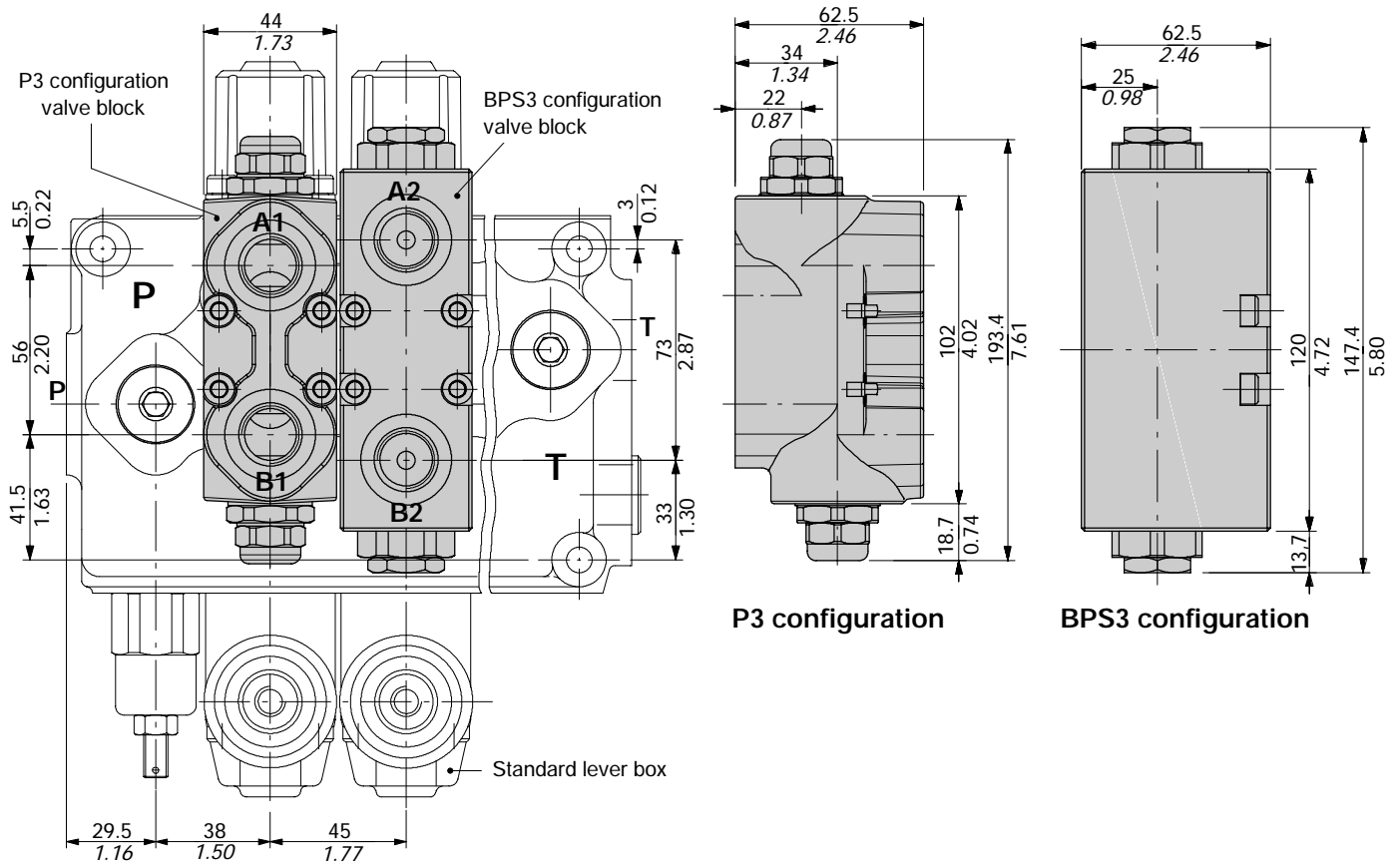
Performance data



Type	Pilot ratio	
	With pre-opening	Main
BPS	1 : 16	1 : 3

Service and auxiliary valves

Type P and BPS valves assembling example



If valve block is assembled on last section, directional valve can be only supplied in PSL configuration, with side inlet and outlet ports.

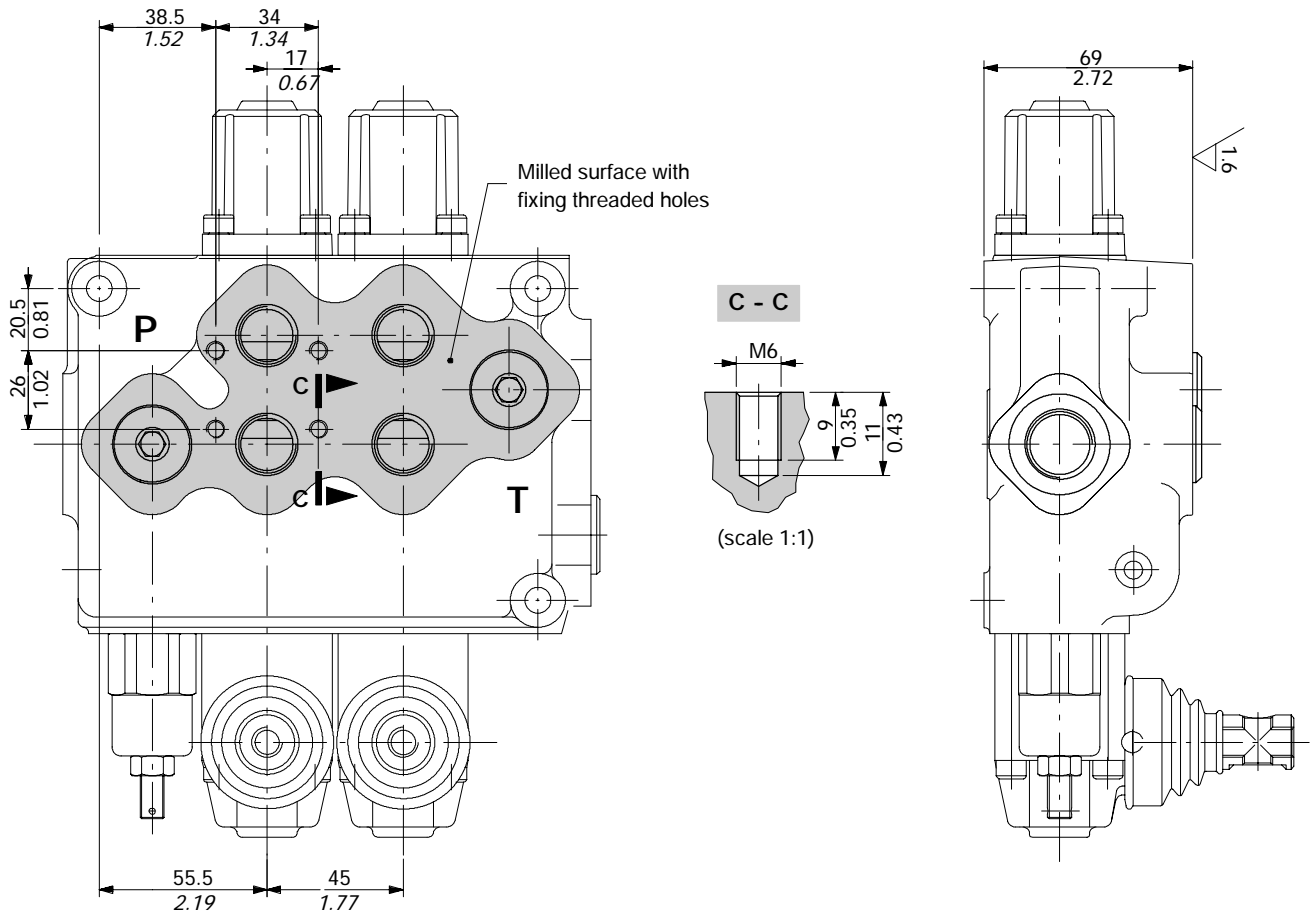
Description example:

SD11/2-P(KG3-120)/18L/18L.P3(D3-100)/AET-PSL

Type P and BPS valves assembling example

Extra machining on directional valve body

The same extra machining allows assembling of either valve blocks (P and BPS).

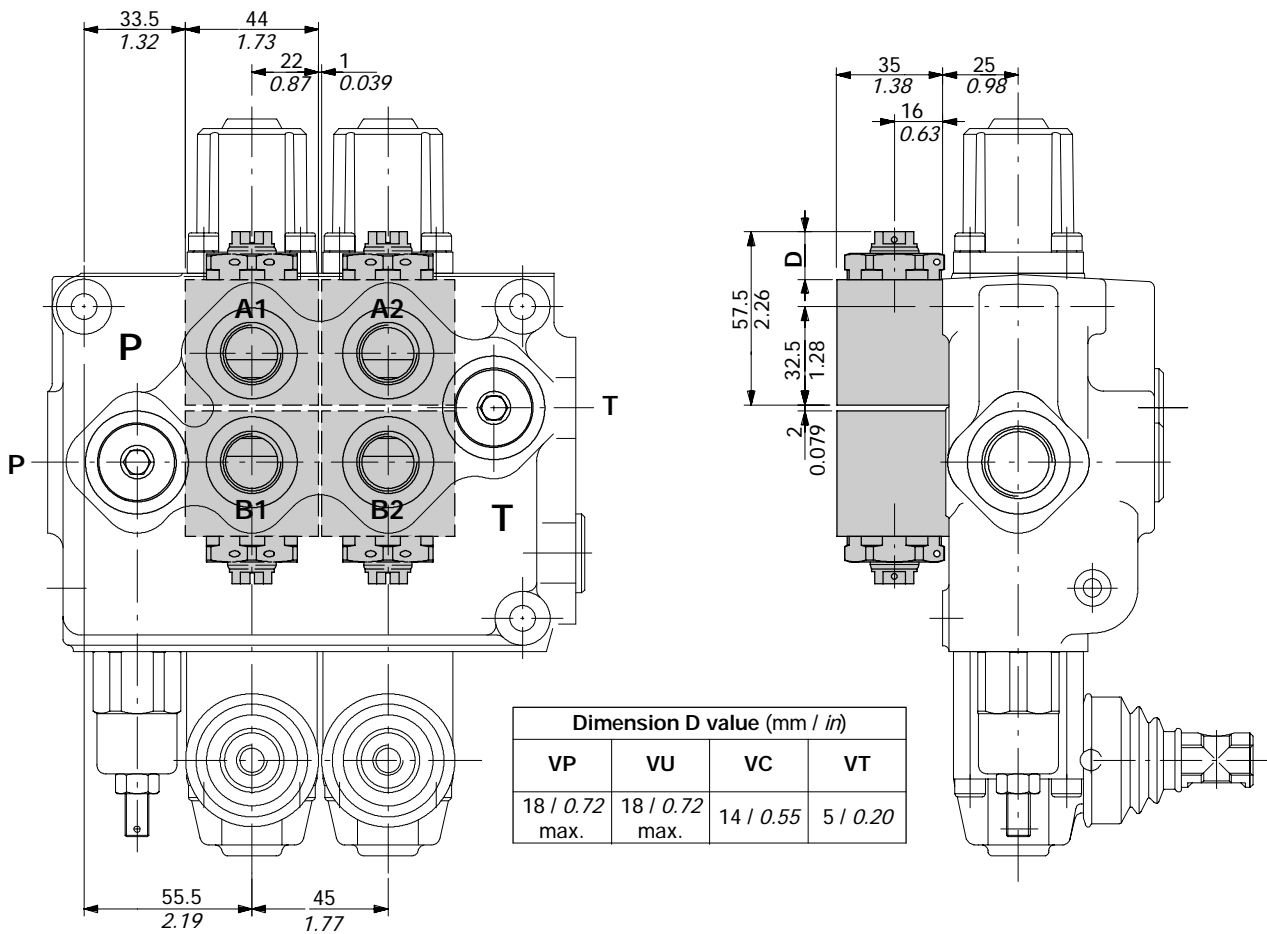
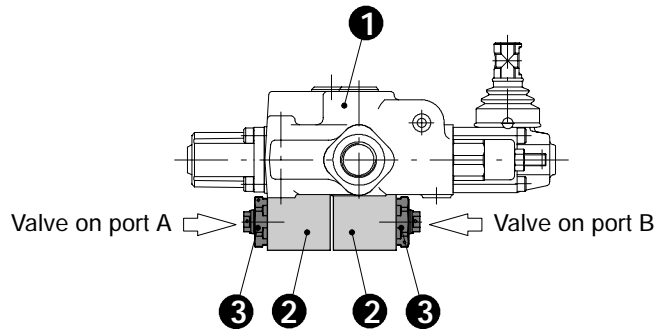


Service and auxiliary valves

Anti-shock and anti-cavitation

They need a dedicated body with extra machining: for production requirements, the blocks (2) are flanged on body (1) before the final honing of spool hole, while the valves (3) are mounted during final assembling phase.

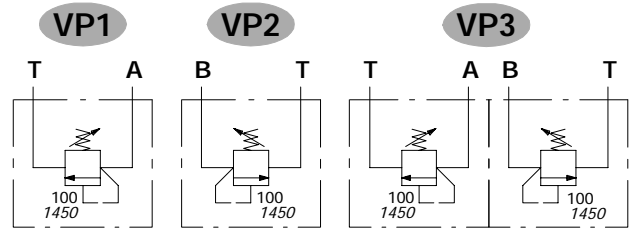
For information contact Sales Department.



VP anti-shock valve

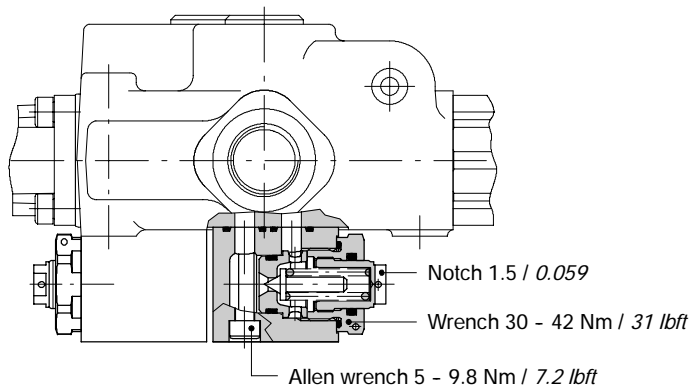
VP 1 (G 3 - 100)

- Standard setting in bar (for value see page 43).
- Spring type (2, 3, 4).
- Adjustment type (G, H).
- 1 mounted on port A.
- 2 mounted on port B.
- 3 mounted on ports A and B.

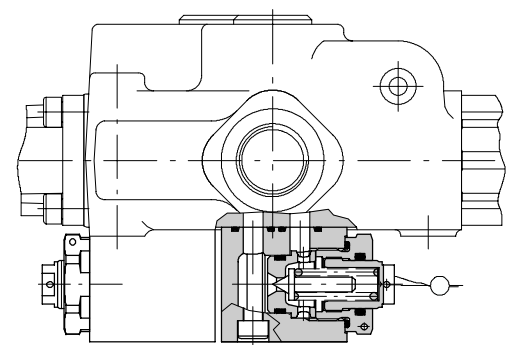


Adjustment type

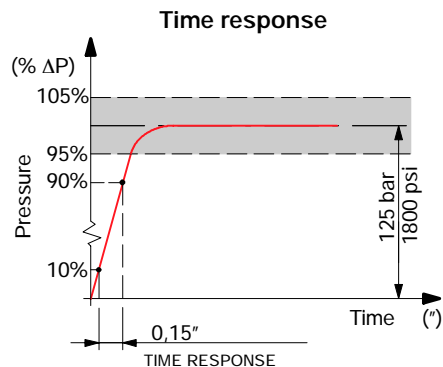
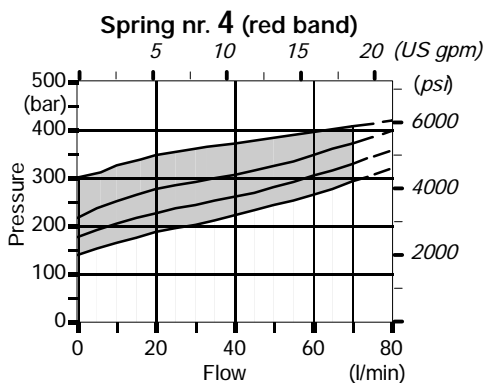
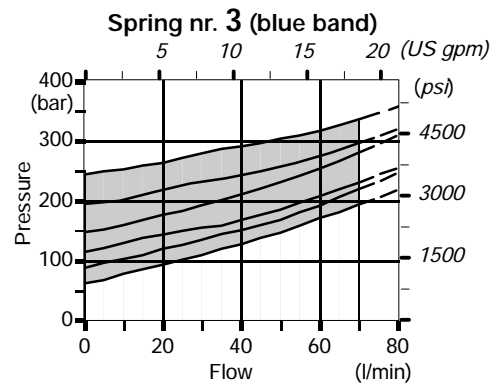
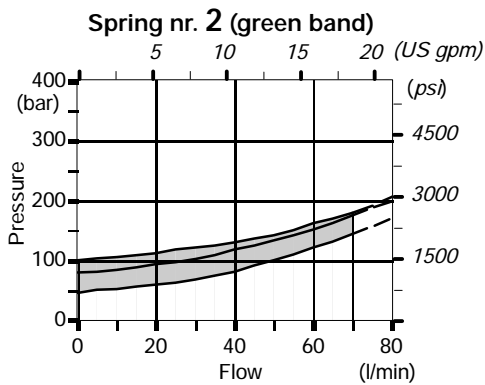
G: with screw



H: valve set and locked



Performance data

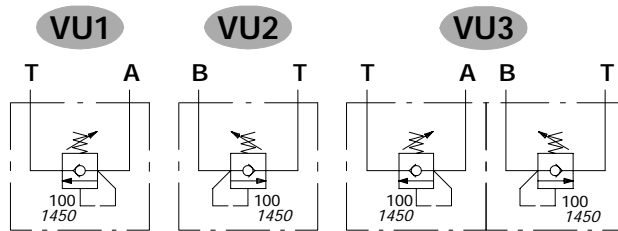


Service and auxiliary valves

VU anti-shock and anti-cavitation valves

VU 1 (G 3 - 100)

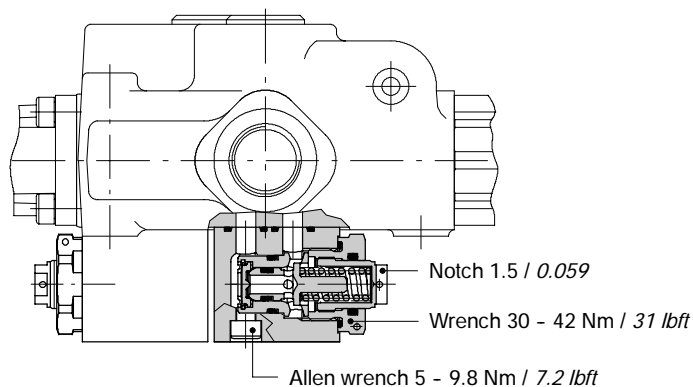
- Standard setting in bar (for value see page 43).
- Spring type (2, 3, 4).
- Adjustment type (G, H).
- 1 mounted on port A.
- 2 mounted on port B.
- 3 mounted on ports A and B.



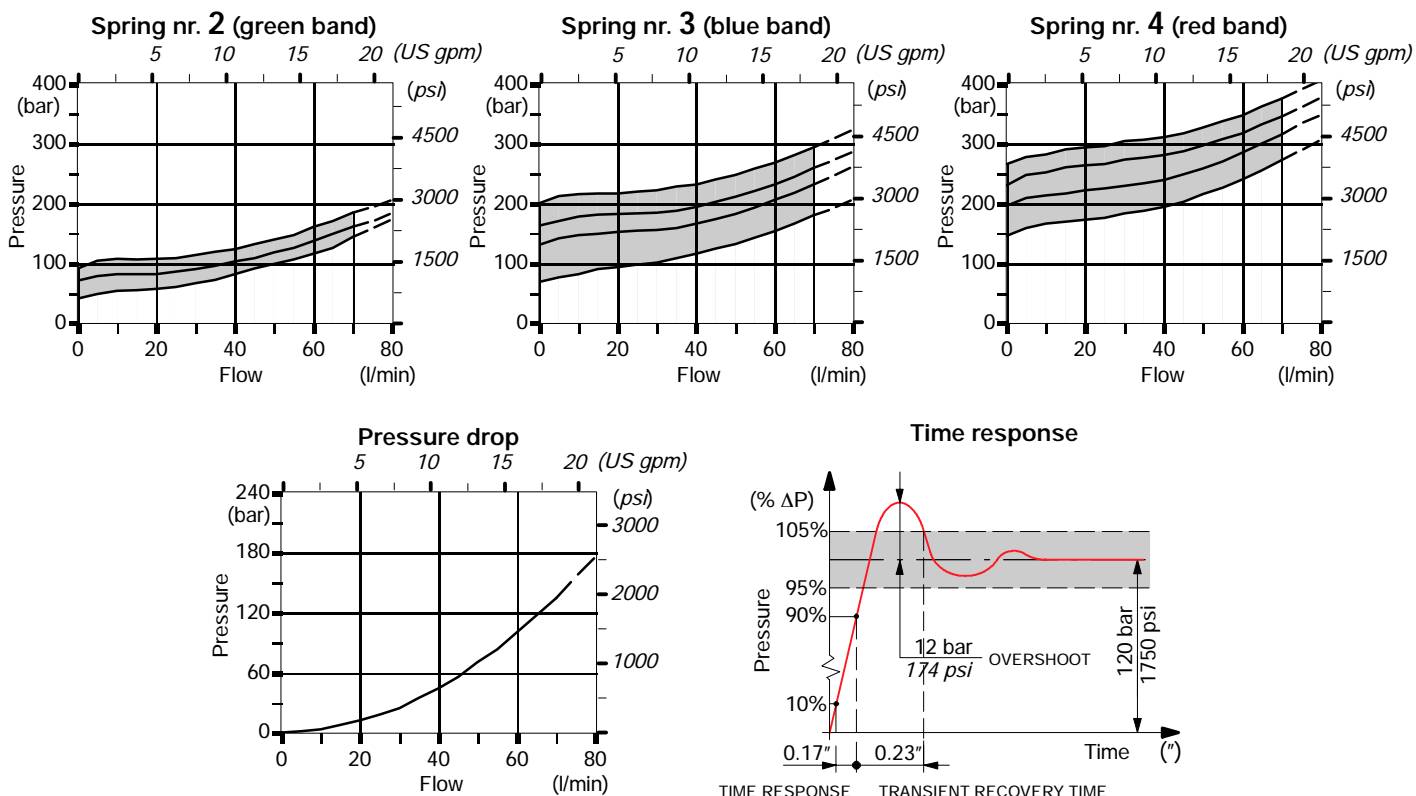
Adjustment type

G: with screw

H: valve set and locked



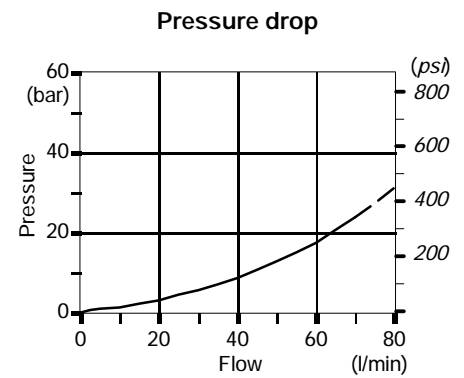
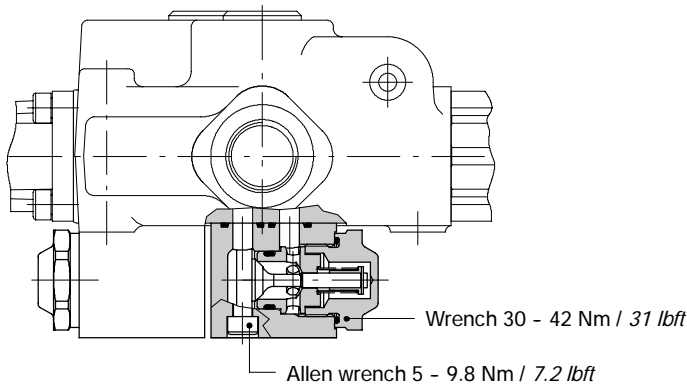
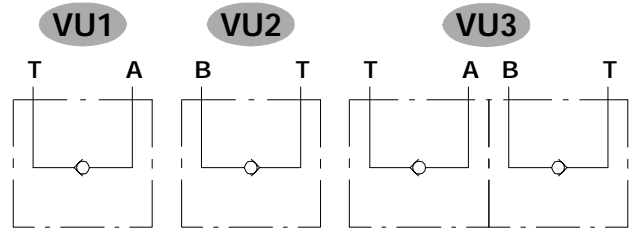
Performance data



VC anti-cavitation valves

VC 1

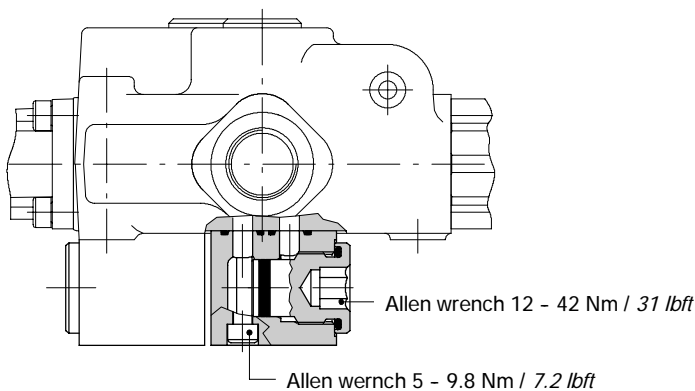
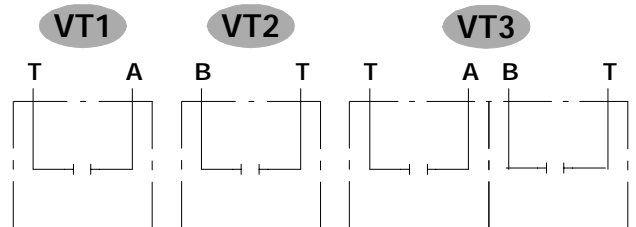
- 1 mounted on port A.
- 2 mounted on port B.
- 3 mounted on ports A and B.



VT valve blanking plug

VT 1

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



SD11/1-N page 60



It's available only with one working section and it can be used in hydraulic circuits where power beyond doesn't required.

- For controls, spool positioning and valves, refer to directional valve with parallel circuit.

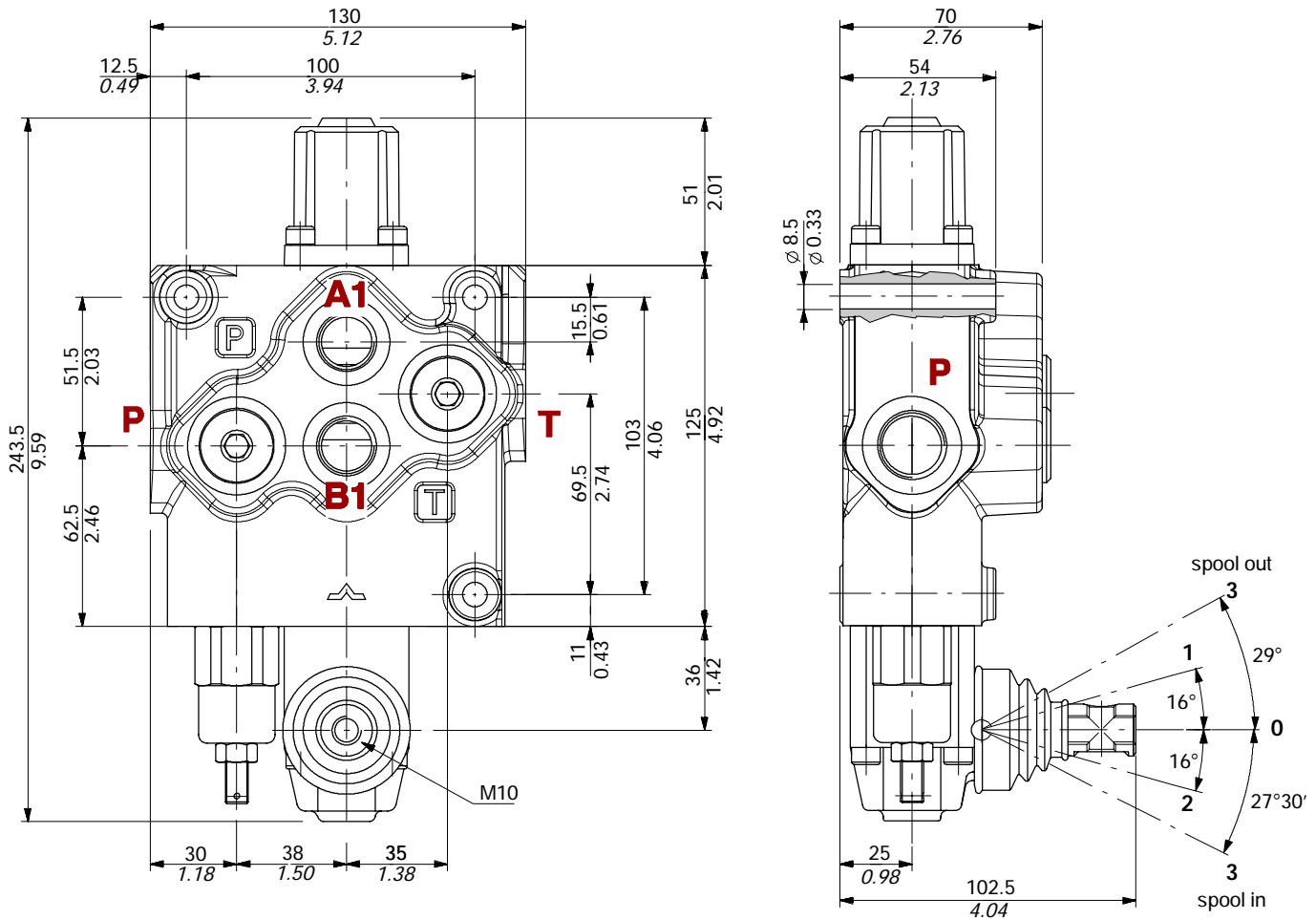
SD11-S: con circuito in serie page 61



Available from 2 to 6 sections, it can be used in systems wich one downstream section from series connection must work with upstream ones at the same time.

- Power beyond circuit is not available
- On the same body are possible more than one connection.
- For controls, spool positioning and valves, refer to directional valve with parallel circuit.

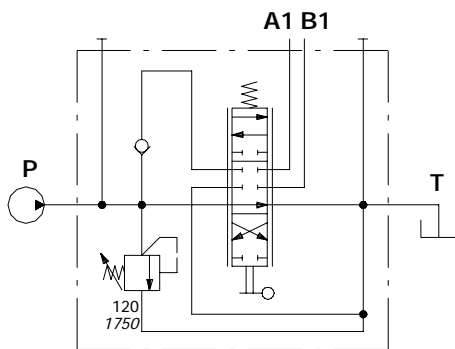
Dimensional data



Standard threads

PORTS	BSP (ISO228/1)	UN-UNF (ISO 11926-1)	METRIC (ISO 262)
Inlet P	G 1/2	7/8-14 UNF-2B (SAE 10)	M18x1.5
Ports A and B	G 1/2	3/4-16 UNF-2B (SAE 8)	M18x1.5
Outlet T	G 3/4	7/8-14 UNF-2B (SAE 10)	M22x1.5

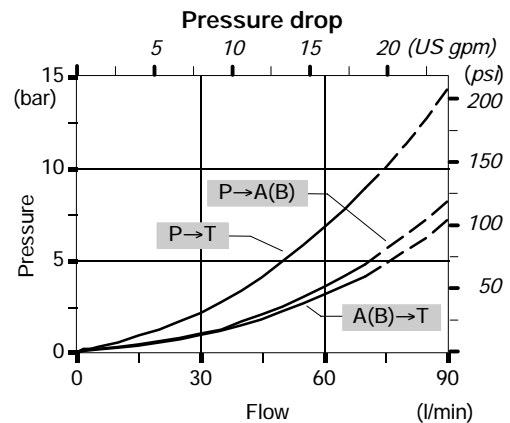
Hydraulic circuit

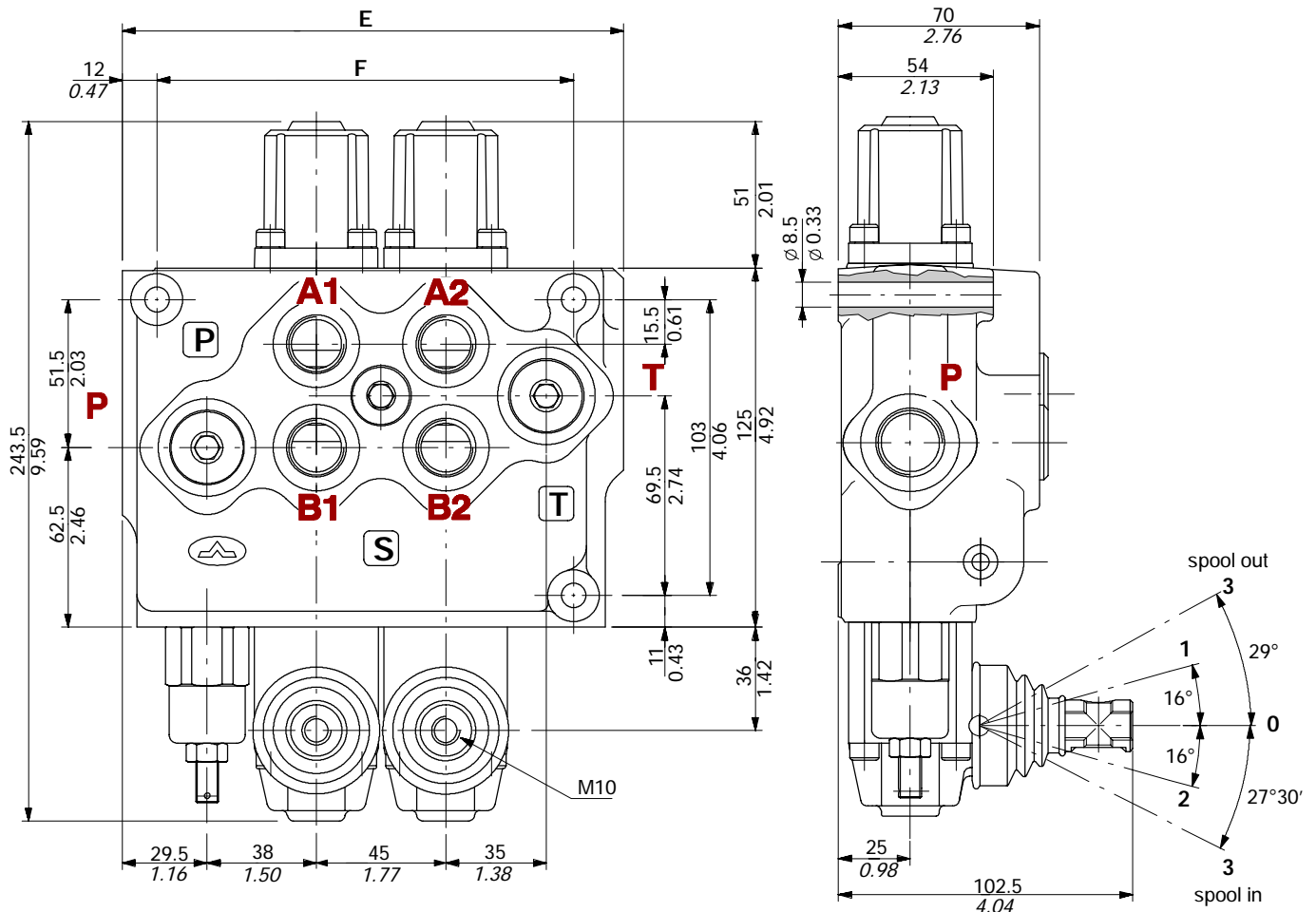


Description example:

SD11/1-N(KG3-120)/18L-SAE - Code: 104119001

Performance data





TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SD11/2-S	174.5	6.87	145	5.71	9.9	21.8
SD11/3-S	219.5	8.64	190	7.48	13.4	29.5
SD11/4-S	264.5	10.41	235	9.25	16.8	37

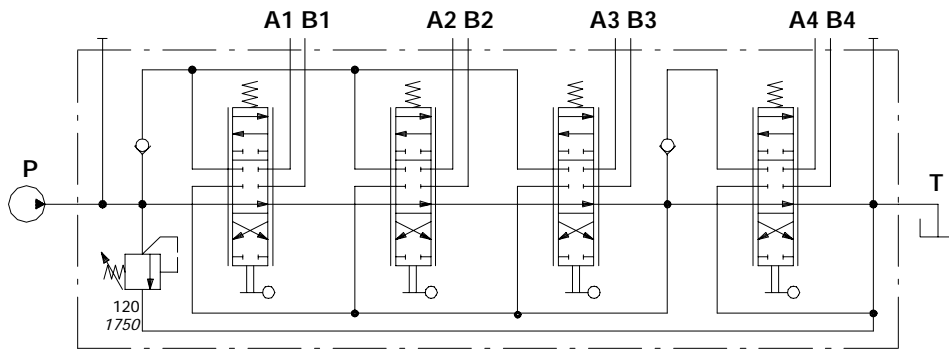
TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SD11/5-S	309.5	12.18	280	11.02	20.1	44.3
SD11/6-S	354.5	13.96	325	12.79	23.4	51.6

Standard threads

PORTS	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)	METRIC (ISO 262)
Inlet P	G 1/2	7/8-14 UNF-2B (SAE 10)	M18x1.5
Ports A and B	G 1/2	3/4-16 UNF-2B (SAE 8)	M18x1.5
Outlet T	G 3/4	7/8-14 UNF-2B (SAE 10)	M22x1.5

Hydraulic circuit

The description of SD11 valve with series circuit is marked with letter "S" and one figure which indicate the downstream sections from series connection.



Es.: SD11/4-S1(KG3-120)/18L/18L/18L/18L-SAE

Codice: 1044B0002

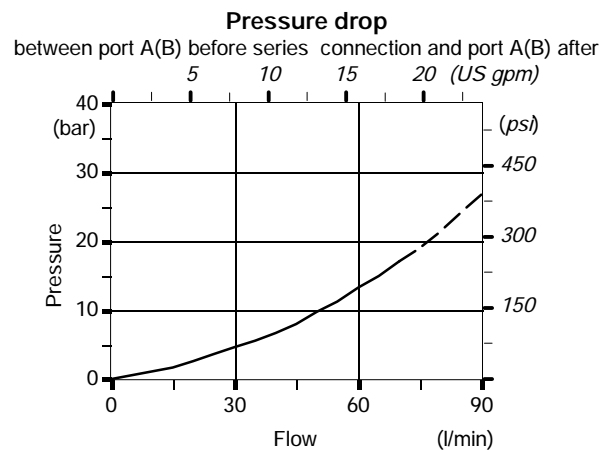
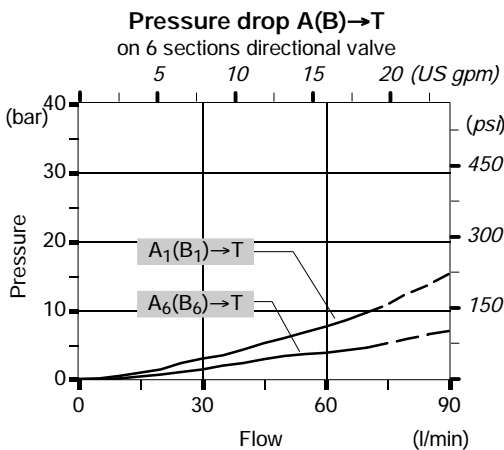
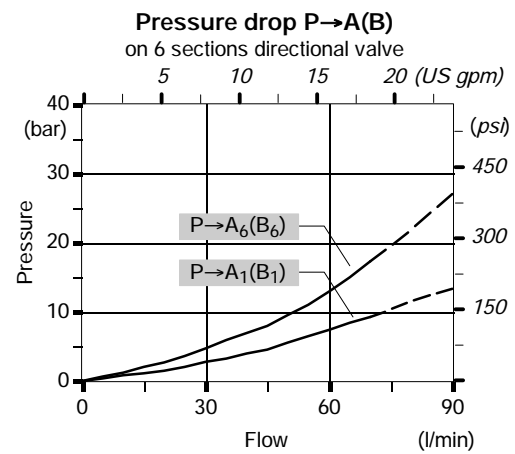
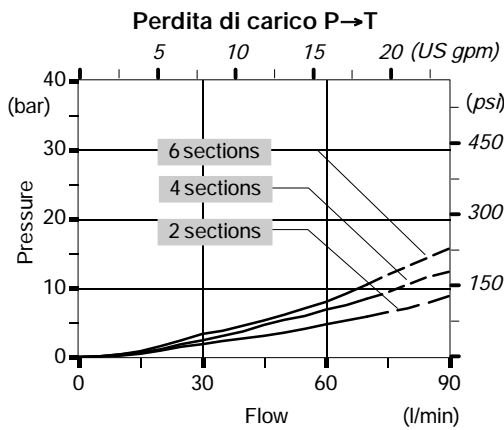
Available body kits *

CODE	DESCRIPTION
5KC1437040	SD11/2-S1
5KC1467000	SD11/3-S1
5KC1507000	SD11/4-S1
5KC1537000	SD11/5-S1
5KC1567000	SD11/6-S1

Include body, seals, rings and load check valves.

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

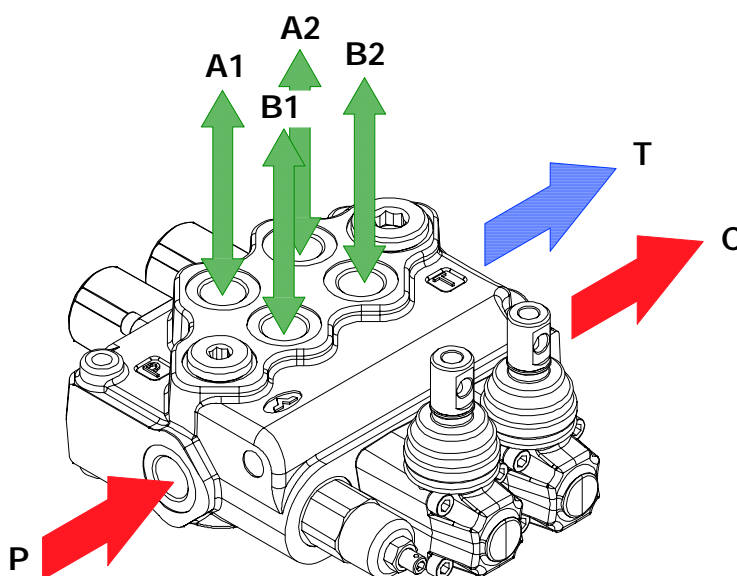
Performance data



The SD11 valve is assembled and tested as per the technical specification of this catalogue.

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

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



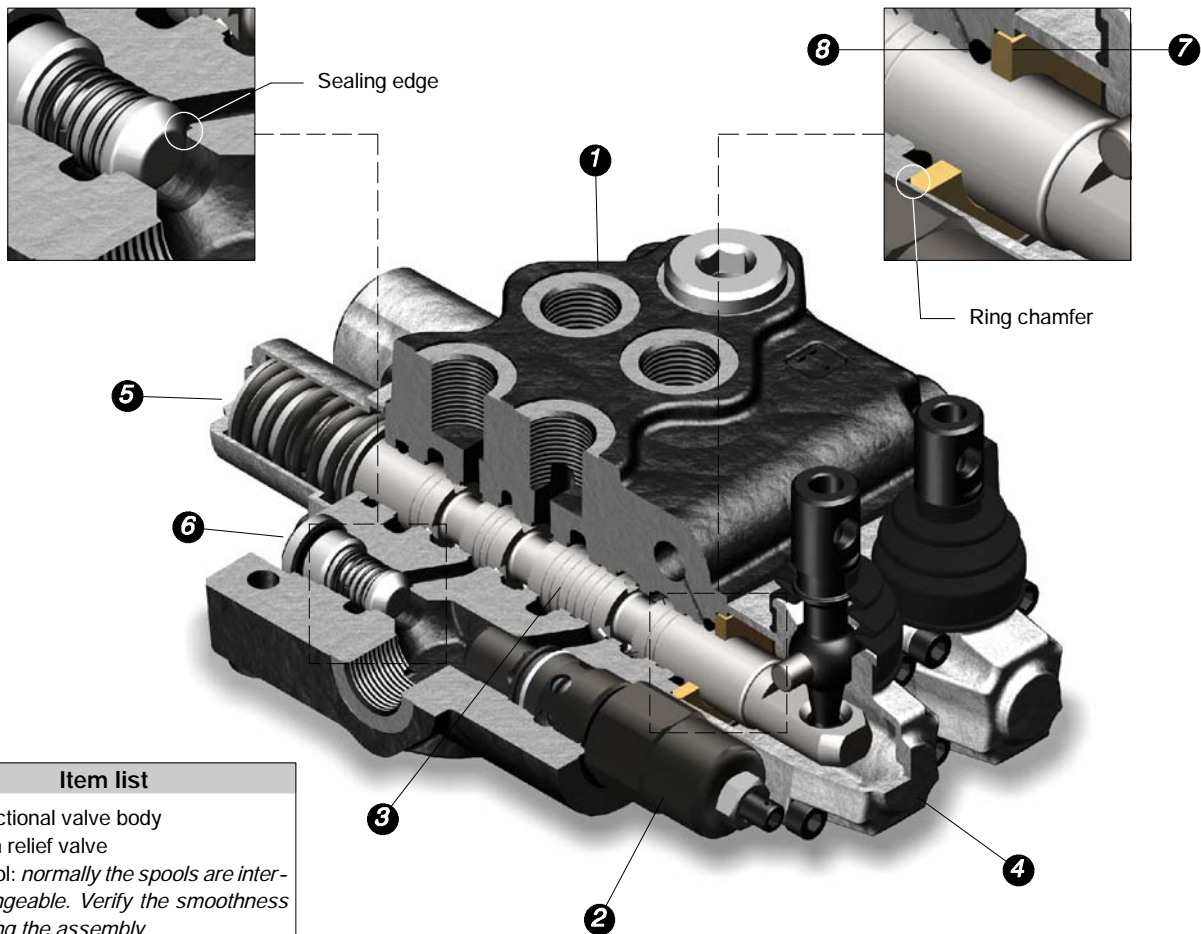
Directional valve with port beyond configuration

Fittings tightening torque - Nm / lbft

THREADS TYPE	P and C ports	A and B ports	T port
BSP (ISO 228/1)	G 1/2	G 1/2	G 3/4
With O-Ring seal	50 / 37	50 / 37	70 / 51.6
With copper washer	60 / 44.3	60 / 44.3	70 / 51.6
With steel and rubber washer	60 / 44.3	60 / 44.3	70 / 51.6
UN-UNF (ISO 11926-1)	7/8-14 UNF-2B (SAE 10)	3/4-16 UNF-2B (SAE 8)	7/8-14 UNF-2B (SAE 10)
With O-Ring seal	60 / 44.3	50 / 37	60 / 44.3
METRICA (ISO 262)	M18x1.5	M18x1.5	M22x1.5
With O-Ring seal	35 / 25.8	35 / 25.8	50 / 37
With copper washer	40 / 29.5	40 / 29.5	60 / 44.3
With steel and rubber washer	40 / 29.5	40 / 29.5	60 / 44.3

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

Installation and maintenance



Item list

- 1) Directional valve body
- 2) Main relief valve
- 3) Spool: *normally the spools are interchangeable. Verify the smoothness during the assembly*
- 4) Lever box
- 5) Side "A" spool positioner
- 6) Load check valve
- 7) Holding O-Ring bushing
- 8) O-Ring seal 18x2,5
code: 4GUA120235

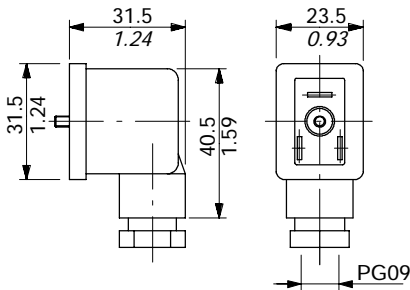
NOTE - All articulated parts inside cap, lever box and mechanical joystick are lubricated with synthetic base grease grade NLGI2

Malfunction	Cause	Remedy
External leakage pivot box lever or control kit side.	Worn spool seal due to mechanical actuation or high back pressure.	Locate the leakage and replace the seal. Check back pressure level.
Excessive internal leakage on A and B ports.	Increase clearance between spools and body due to high wear.	Replace the directional control valve and check the oil contamination level.
Dropping load during transition while raising.	High leakage on the load check valve	Remove the load check valve and clean the seat, verifying it's not dented.
Inability to build pressure on A and B ports.	Pressure relief valve blocked open. Low pump pressure and flow.	Remove and clean or replace the valve. Check the pump and circuit.

Connectors

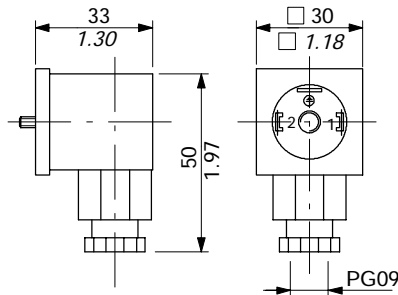
Type C01 code: 2X1001020

2P+T according to EN175301-803



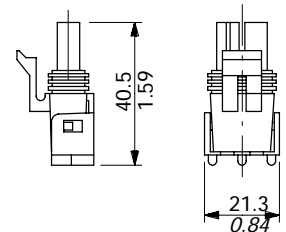
Type C02 code: 2X1001010

2P+T according to ISO4400 / EN175301-803



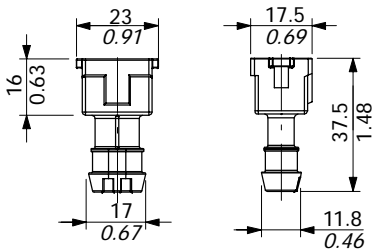
Type C07 code: 5CON001

2P male case with female end type PACKARD "Weather Pack"



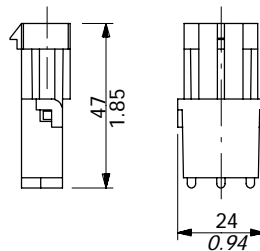
Type C08 code: 5CON003

2P female case with female end type AMP "Junior-Power-Timer"



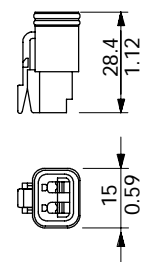
Type C17 code: 5CON005

2P female case with male end type PACKARD "Weather Pack"



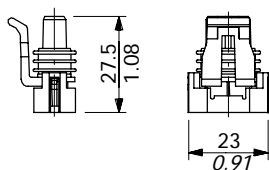
Type C19 code: 5CON007

2P male case with female end type Deutsch DT06-2S



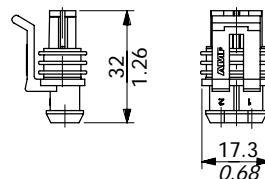
Type C20 code: 5CON017

2P male case with female end type PACKARD "Metri-Pack"



Type C24 code: 5CON0031

2P male case with female end type AMP "Superseal"



Type	Poles	Nominal voltage	Nominal current	Permitted conductor section range	Permitted cable diameter range	Weather protection
C01	2P + T	250 VAC / 300 VDC	10 A	max.1.5 mm ² / max.0.0023 in ²	6-8 mm / 0.24-0.31 in	IP65
C02	2P + T	250 VAC / 300 VDC	10 A	max.1.5 mm ² / max.0.0023 in ²	6-8 mm / 0.24-0.31 in	IP65
C07	2P	/	20 A	1-2 mm ² / 0.00155-0.0031 in ²	2.8-3.5 mm / 0.11-0.14 in	IP67
C08	2P	250 VAC	12 A	0.5-1 mm ² / 0.00077-0.00155 in ²	1.4-1.6 mm / 0.055-0.063 in	IP65
C17	2P	/	20 A	1-2 mm ² / 0.00155-0.0031 in ²	1.3-1.7 mm / 0.051-0.067 in	IP67
C19	2P	/	13 A	1-1.2 mm ² / 0.00155-0.00186 in ²	2.2-3.5 mm / 0.088-0.14 in	IP67
C20	2P	/	14 A	0.8-1 mm ² / 0.00124-0.00155 in ²	1.3-1.7 mm / 0.051-0.067 in	IP65
C24	2P	/	14A	0.3-0.5 mm ² / 0.00046-0.00077 in ²	1.4-1.7 mm / 0.055-0.067 in	IP67



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