

SECTIONAL DIRECTIONAL
CONTROL VALVES

SDS 100



walvoil
HYDRAULIC CONTROL SYSTEMS

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

- Fitted with a main pressure relief valve and a load check valve on every working section
- Available with parallel, tandem or series circuit.
- Optional carry-over port.
- A wide range of fixed setting antishock+anticavitation port valves.
- Intermediate sections for several types of circuit.
- Available manual, pneumatic, hydraulic and ON/OFF and proportional electro-hydraulic spool control kits.
- Diameter 14 mm (*0.55 in*) interchangeable spools.

Additional information

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

WARNING!

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

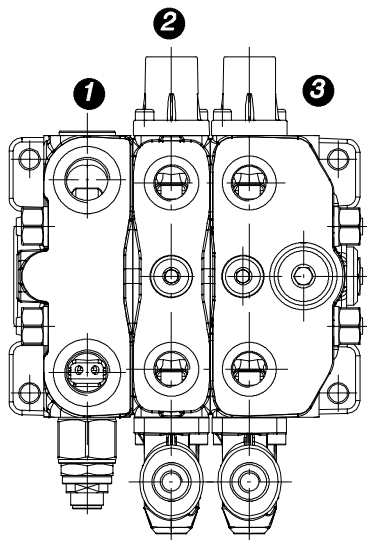
WALVOIL IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN
INCORRECT USE OF THE PRODUCT.

2nd edition April 2004:

This edition supercedes all prior documents.

Standard working sections

Fitted with manual, pneumatic, proportional hydraulic and ON/OFF solenoid control.

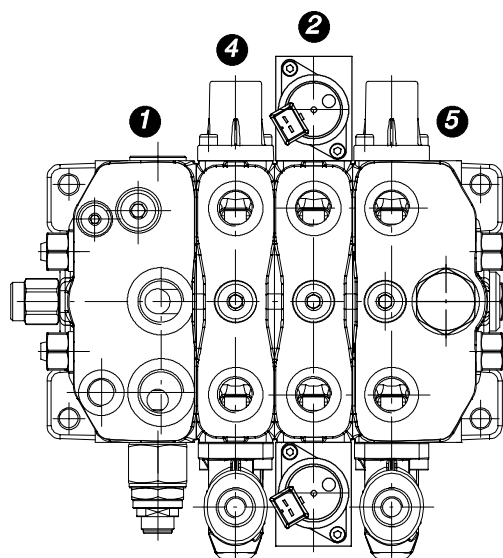
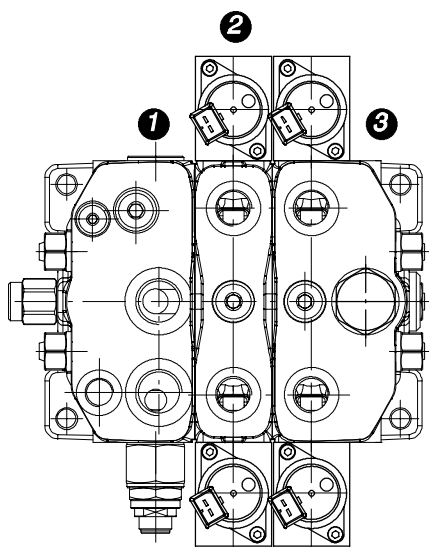


- 1) CN standard inlet section
- 2) Standard working section (type P, Q...).
- 3) Standard working section with outlet (type RP, RQ).

Working sections with internal pilot and drain lines

They need inlet section with pressure reducing valve and outlet section with backpressure valve.

They are prearranged for double side proportional electro-hydraulic control but it's possible to mount manual and mechanical control using sections with pilot through and drain



- 1) CR inlet section with pressure reducing valve, pilot lines on both sides, drain prearrangement, pressure reduced line prearrangement
- 2) Working sections (type PE, QE....) with double side electro-hydraulic control
- 3) Double side electro-hydraulic control working section with optional outlet (type RPE, RQE), pilot lines on both side and backpressure valve
- 4) Working section (type PA, QA....) with mechanical control and pilot through and drain.
- 5) Mechanical control working section with optional outlet (type RPA, RQA), O-ring seats for pilot through line closing, backpressure valve

General

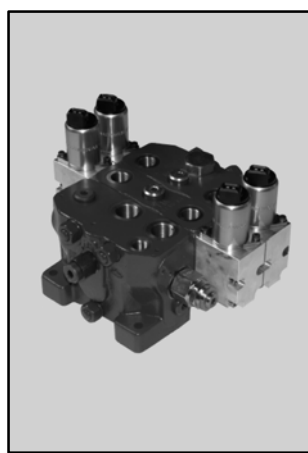
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Standard working sections



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Working sections with internal pilot and drain lines



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Working conditions

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

Nominal flow rating		60 l/min	
Operating pressure (maximum)		315 bar	4600 psi
Back pressure (maximum)	<i>on outlet port T</i>	10 bar	145 psi
Internal leakage A(B)→T	<i>Δp=100 bar - 1450 psi fluid and valve at 40°C</i>	5 cm ³ /min	0.31 in ³ /min
Fluid		Mineral based oil	
Fluid temperature	<i>with NBR (BUNA-N) seals</i>	from -20° to 80°C	
	<i>with FPM (VITON) seals</i>	from -20° to 100°C	
Viscosity	<i>operating range</i>	from 15 to 75 mm ² /s	<i>from 15 to 75 cSt</i>
	<i>min.</i>	12 mm ² /s	12 cSt
	<i>max.</i>	400 mm ² /s	400 cSt
Max level of contamination		19/16 - ISO 4406	
Ambient temperature		da -40° a 60°C	
Tie rods tightening torque (wrench 13)		35 Nm	26 lbft

NOTE - For different conditions please contact Sales Dept.

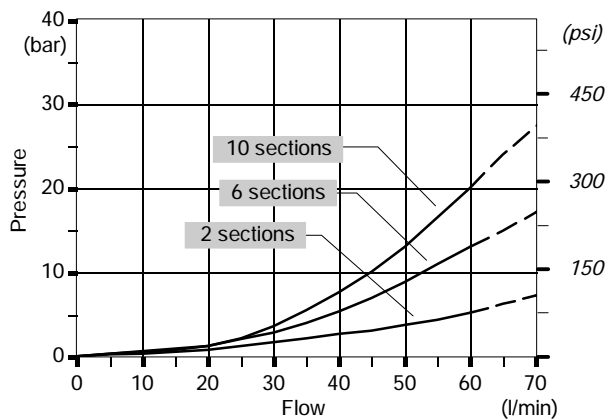
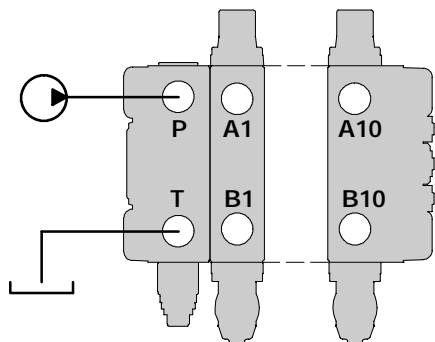
Standard threads

PORTS	BSP (ISO 228/1)	UN-UNF (ISO 11926-1)
Inlet P and carry-over C	G 1/2	7/8-14 (SAE 10)
Ports A and B	G 3/8	3/4-16 (SAE 8)
Outlet T	G 1/2	7/8-14 (SAE 10)
Pilot V and drain L	G 1/4	9/16-18 (SAE 6)
CONTROLS PILOT PORTS		
Hydraulic	G 1/4	7/16-20 (SAE 4)
Pneumatic	NPTF 1/8-27	NPTF 1/8-27

Performance data (pressure drop vs. flow)

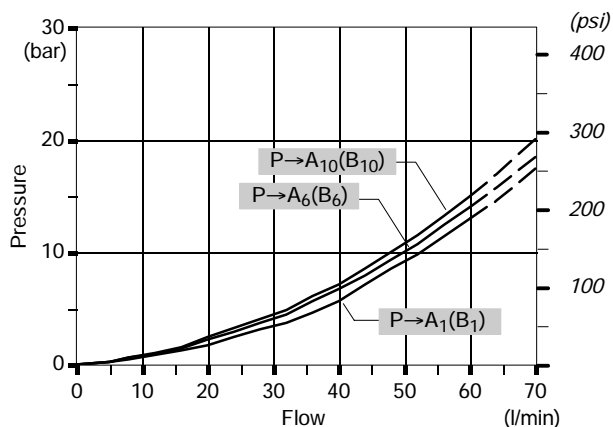
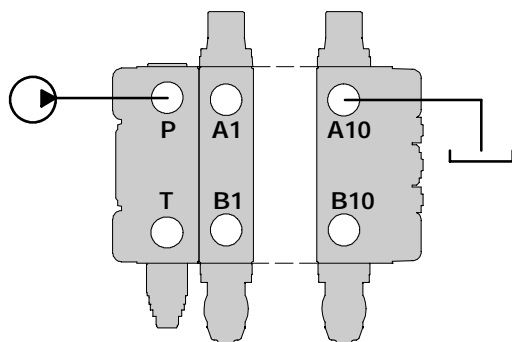
Open centre

From upper inlet to upper outlet.



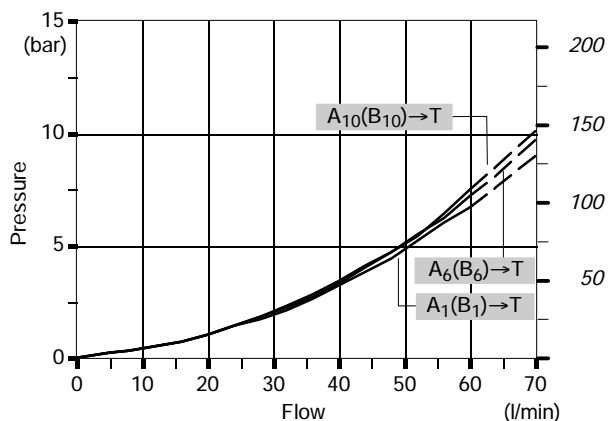
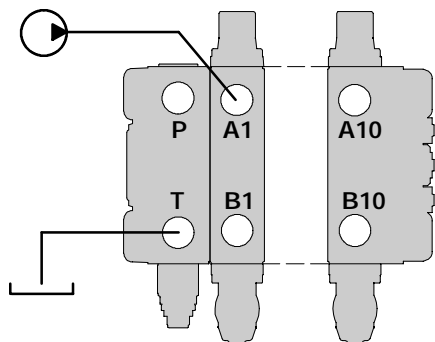
Inlet to work port

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

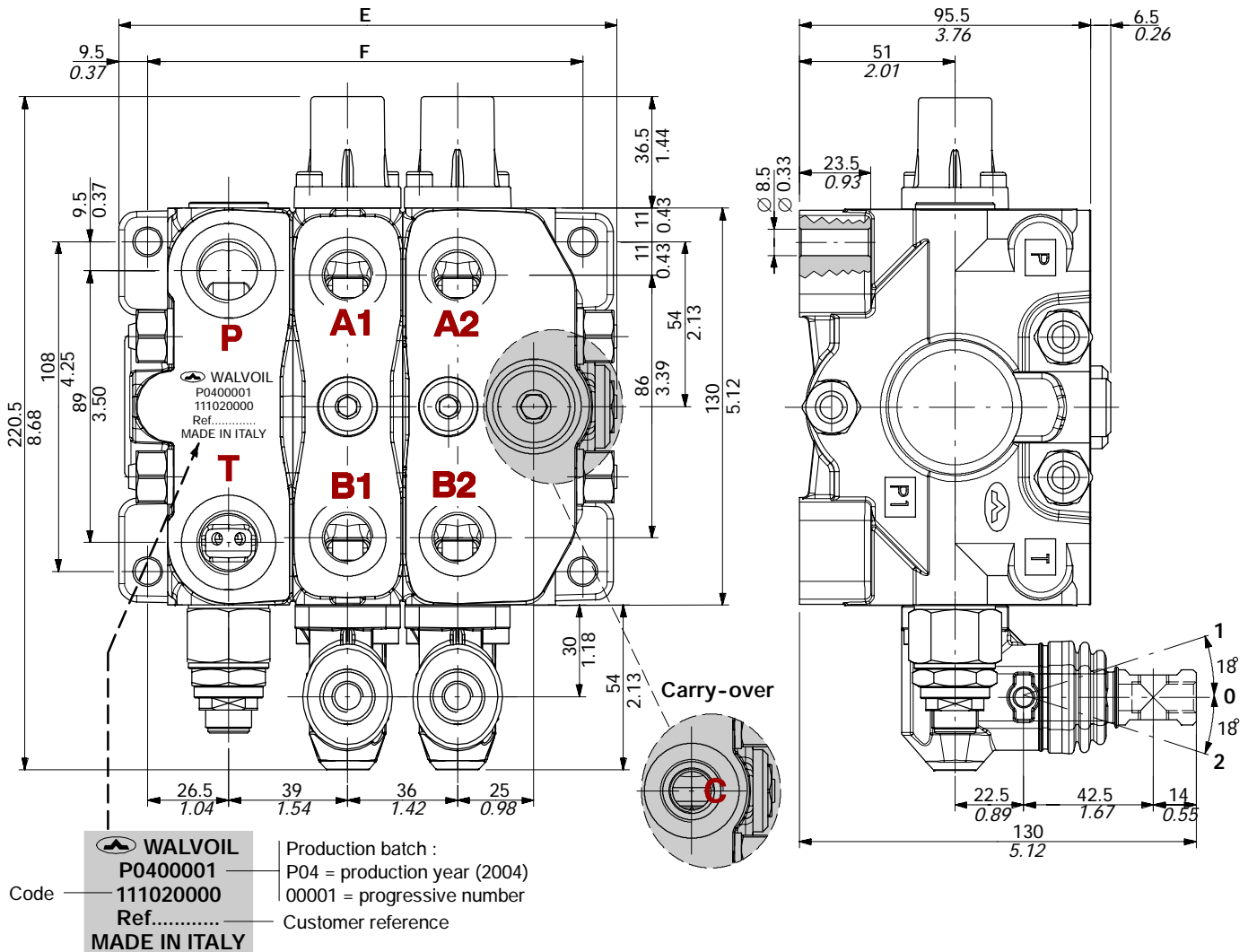


Work port to outlet

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



NOTA - Rilevate con cursore tipo 101.



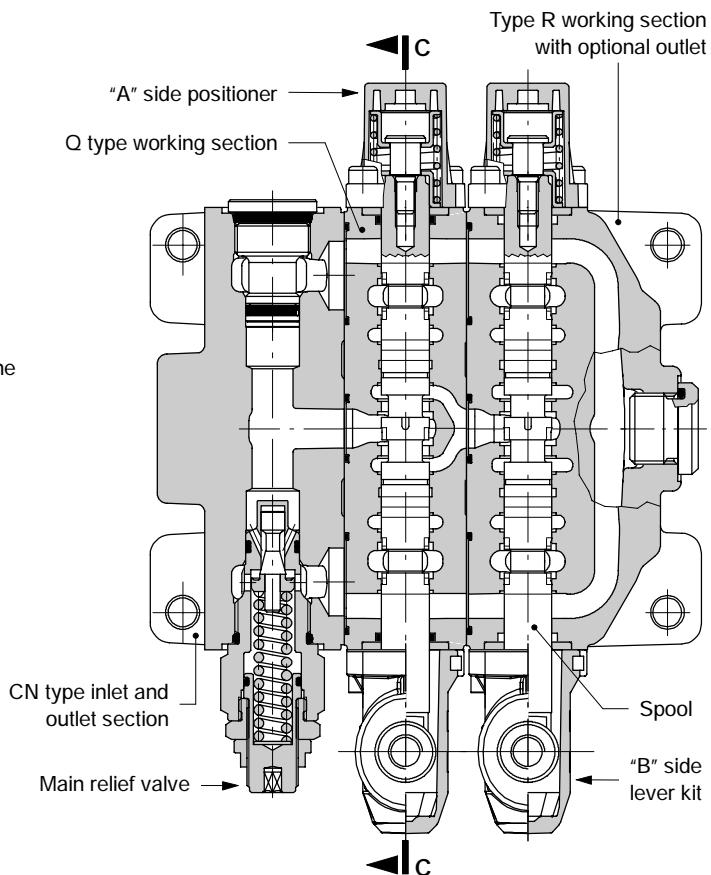
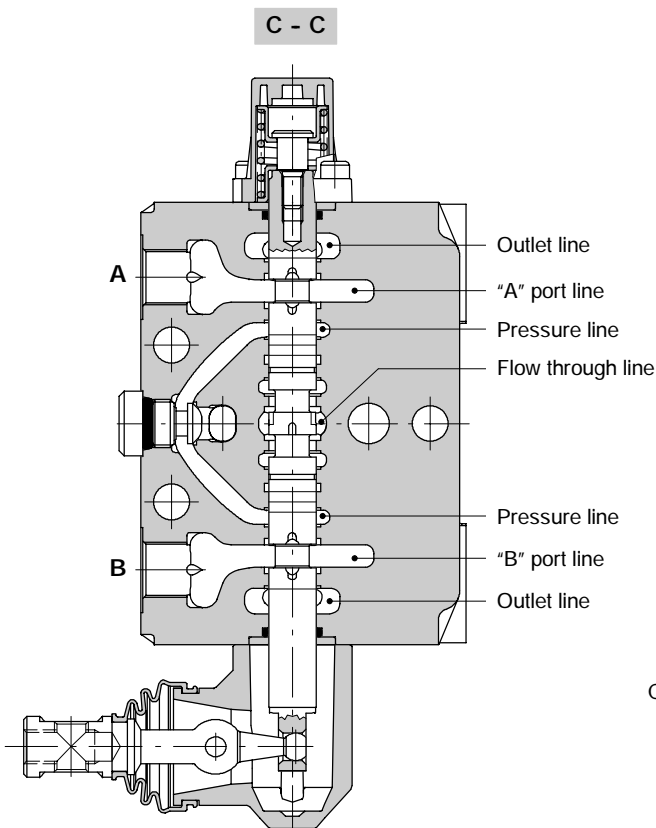
TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SDS100/1	127.2	5.01	106.5	4.19	8.1	17.9
SDS100/2	163.2	6.43	142.5	5.61	11	24.3
SDS100/3	199.2	7.84	178.5	7.03	13.9	30.6
SDS100/4	235.2	9.26	214.5	8.44	16.8	37
SDS100/5	271.2	10.68	250.5	9.86	20.4	45

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SDS100/6	307.2	12.09	286.5	11.28	23.3	51.4
SDS100/7	343.2	13.51	322.5	12.70	26.2	57.8
SDS100/8	379.2	14.93	358.5	14.11	29.1	64.2
SDS100/9	415.2	16.35	394.5	15.53	32	70.5
SDS100/10	551.2	21.7	430.5	16.95	34.9	76.9

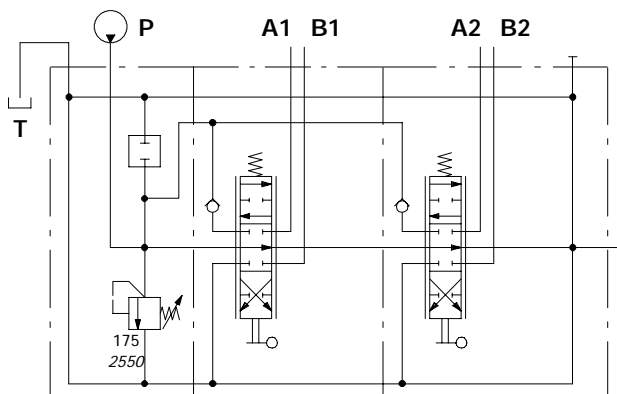
Hydraulic circuit

Parallel circuit

The following pictures show the directional valve with upper inlet and outlet and mechanical control.



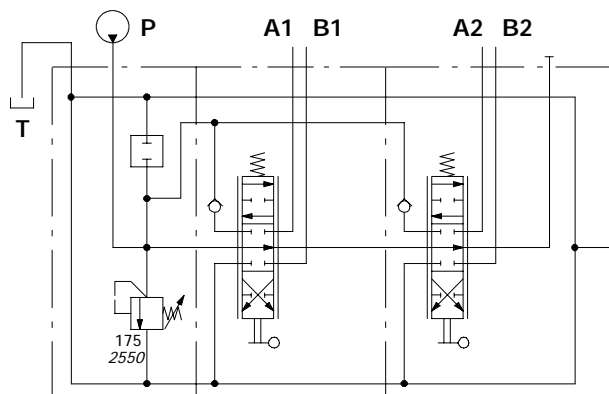
Open centre circuit



Description example:

SDS100/2/CN(TVG3-175)/Q-101-8L/RQ-101-8L-F

Closed centre circuit

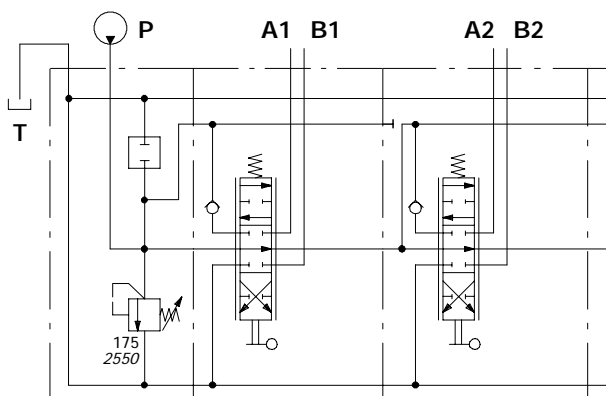


Description example:

SDS100/2/CN(TVG3-175)/Q-101-8L/RQ-101-8L-AEK

Tandem circuit

On standard working section

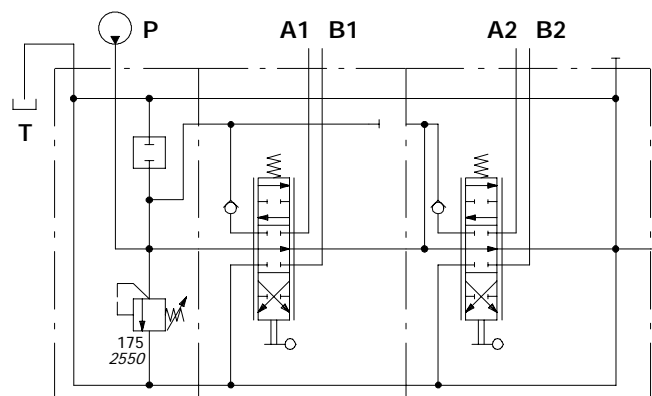


Description example:

SDS100/2/CN(TVG3-175)/Q-101-8L/SQ-101-8L/..

On working section with optional outlet

Special QR or PR section upstream the optional outlet section is required (see page 22).



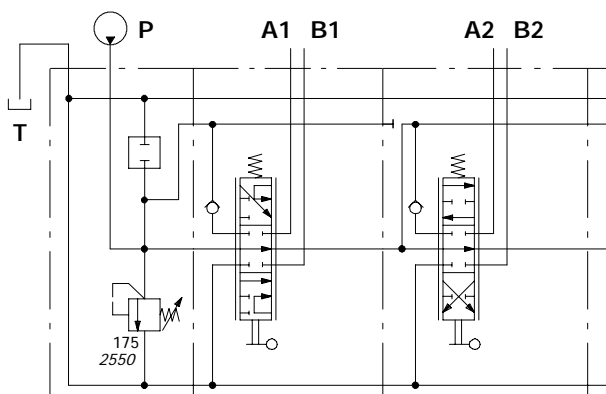
Description example:

SDS100/2/CN(TVG3-175)/QR-101-8L/RQS-101-8L-F

Series circuit

On standard working section

Obtainable with a parallel section with a series spool 1S01 or 2S01 (see page 26) and a series-parallel (tandem) section downstream.

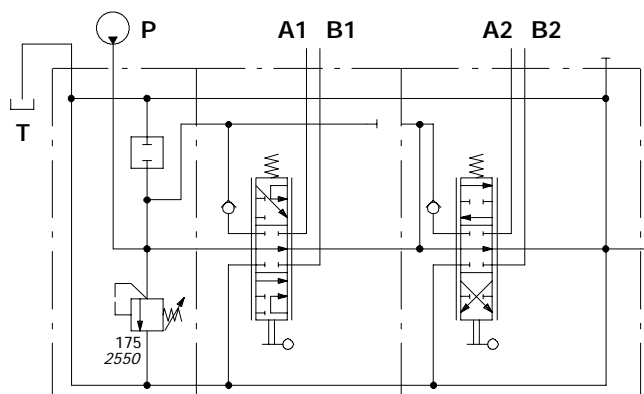


Description example:

SDS100/2/CN(TVG3-175)/Q-1S01-8L/SQ-101-8L/..

On working section with optional outlet

Obtainable with a QR or PR section (see page 22) with a series spool 1S01 or 2S01 (see page 26) and a optional outlet section with series-parallel (tandem) circuit downstream.



Description example:

SDS100/2/CN(TVG3-175)/QR-1S01-8L/RQS-101-8L-F

Ordering codes

Description example for standard configuration:

SDS100 / 3 / CN(TVG3-175) / Q-101-8L / EI2(TG3-125) / Q-101-8L / RQ-101-8L-F

nr. of working sections

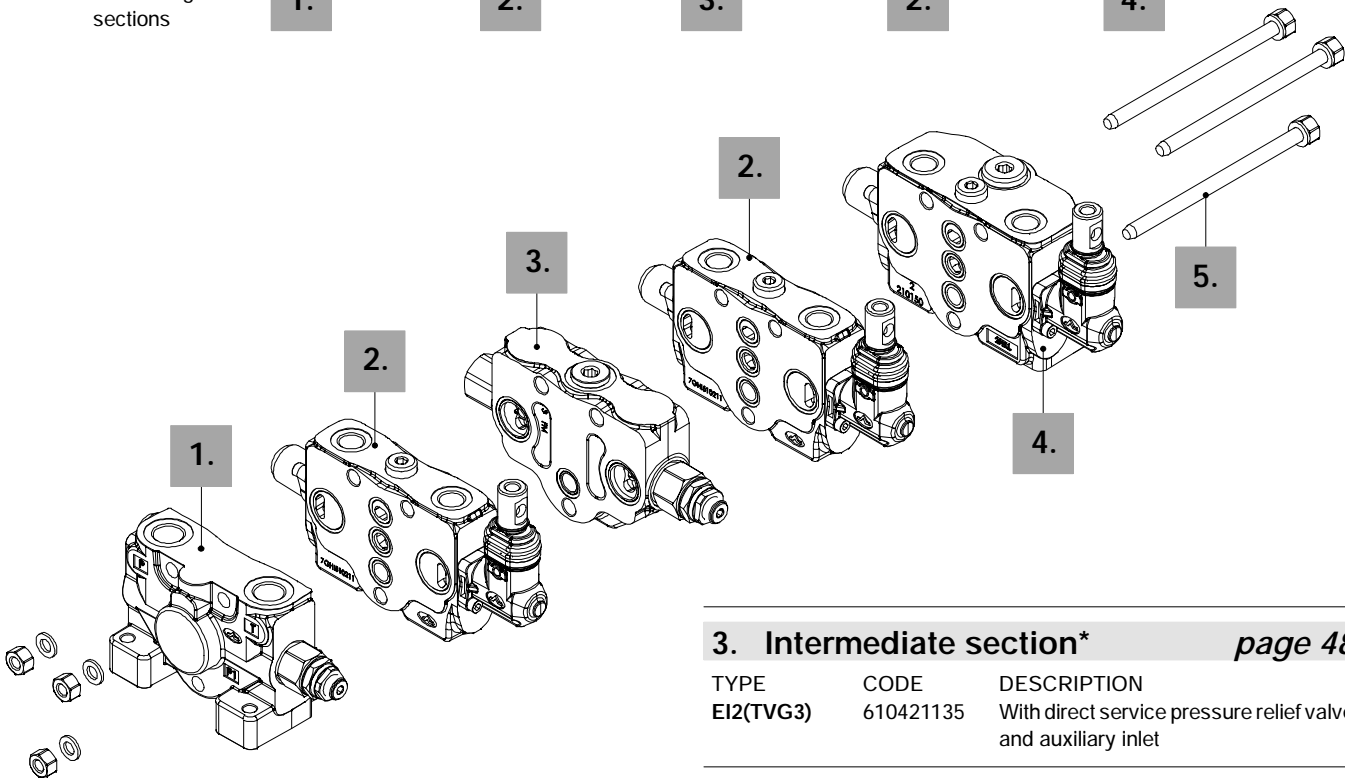
1.

2.

3.

2.

4.



1. Complete inlet section* *page 14*

TYPE	CODE	DESCRIPTION
CN(TVG3-175)	610201001	Section with upper inlet and outlet and pressure relief valve
CN(SV)	610201002	Section with upper inlet and outlet and valve seat plugged

2. Complete working section* *page 18*

TYPE	CODE	DESCRIPTION
Q-101-8L	610151000	Parallel circuit, double acting spool with spring return and lever control
P-101-8L.UTUT	610101000	As previous with port valves prearrangement
SQ-101-8L	610121001	Tandem circuit, double acting spool with spring return and lever control
QR-101-8L	610151005	As previous to be couple with RQS or RPS sections
SP-101-8L.UTUT	610121000	Tandem circuit, double acting spool with spring return, lever control and port valves prearrangement
PR-101-8L.UTUT	610101008	As previous to be couple with RQS or RPS sections

3. Intermediate section* *page 48*

TYPE	CODE	DESCRIPTION
EI2(TVG3)	610421135	With direct service pressure relief valve and auxiliary inlet

4. Section with optional outlet* *page 50*

TYPE	CODE	DESCRIPTION
RQ-101-8L-F	610351001	Parallel circuit
RP-101-8L.UTUT-F	610301001	Parallel circuit with port valves prearrangement
RQ-101-8L-AE	610351002	Parallel circuit with carry-over
RP-101-8L.UTUT-AE	610301002	Parallel circuit with port valves prearrangement and carry-over
RQS-101-8L-F	610321002	Tandem circuit
RPS-101-8L.UTUT-F	610321001	Tandem circuit with port valves prearrangement

5. Assembling kit

CODE	DIRECTIONAL VALVE
5TIR110123	Tie rod kit for 1 section valve
5TIR110160	Tie rod kit for 2 sections valve
5TIR110195	Tie rod kit for 3 sections valve
5TIR110235	Tie rod kit for 4 sections valve
5TIR110267	Tie rod kit for 5 sections valve
5TIR110304	Tie rod kit for 6 sections valve
5TIR110340	Tie rod kit for 7 sections valve
5TIR110375	Tie rod kit for 8 sections valve
5TIR110411	Tie rod kit for 9 sections valve
5TIR110449	Tie rod kit for 10 sections valve

NOTE (*) - Items are referred to **BSP** threads.

Description example for configuration with 2 inlet section and mid return manifold:

SDS100 / 2 / CN(TVG3-175) / Q-101-8L / CS1 / Q-101-8L / BN(TVG3-175)

nr. of working sections

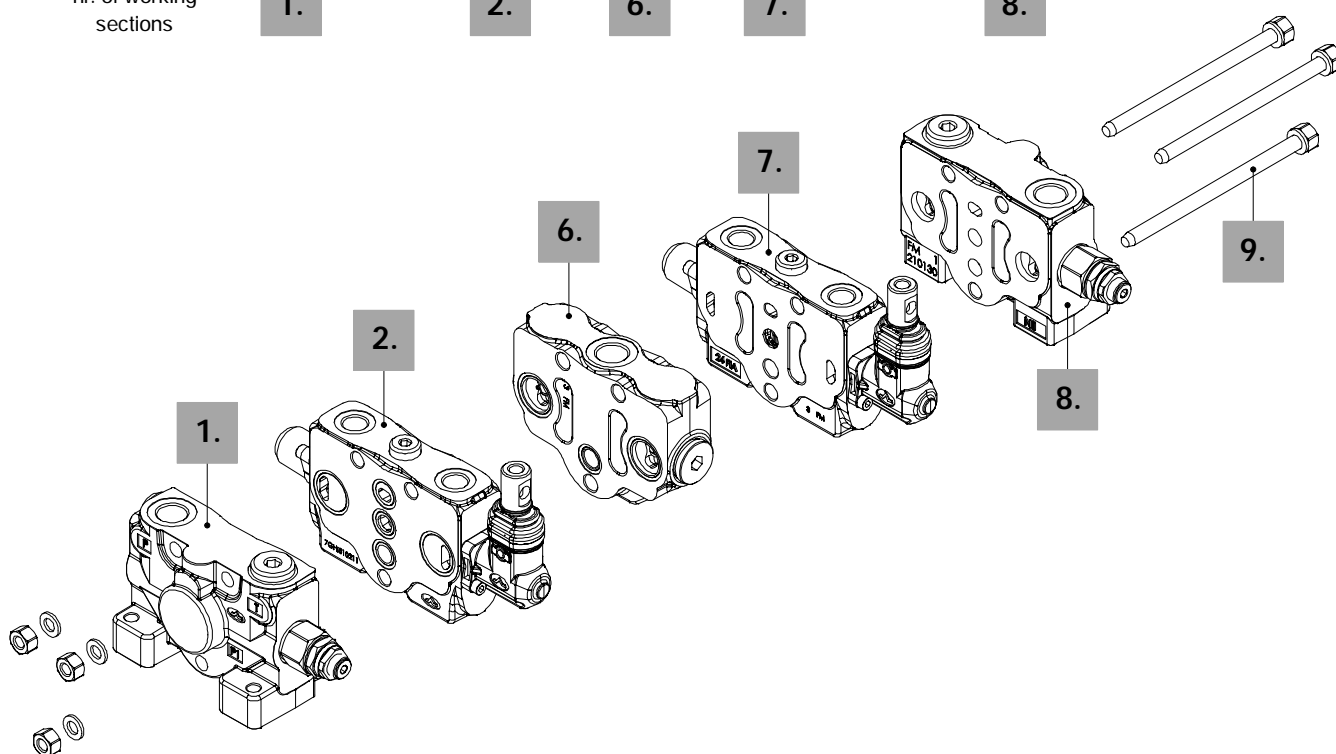
1.

2.

6.

7.

8.



6. Return manifold* pag. 49

TYPE	CODE	DESCRIPTION
CS1	610400010	Mid return manifold

7. Complete right inlet working section*

TYPE	CODE	DESCRIPTION
ED-Q-101-8L	610151004	Parallel circuit, double acting spool with spring return and lever control
ED-P-101-8L.UTUT	610101007	As previous with port valves prearrangement
ED-SQ-101-8L	610121008	Tandem circuit, double acting spool with spring return and lever control
ED-SP-101-8L.UTUT	610121009	As previous with port valves prearrangement

8. Complete right inlet section*

TYPE	CODE	DESCRIPTION
BN(TVG3-175)	610201006	Section with upper inlet and outlet and pressure relief valve
BN(SV)	610201007	Section with upper inlet and outlet and valve seat plugged

9. Assembling kit with for valve with CS1

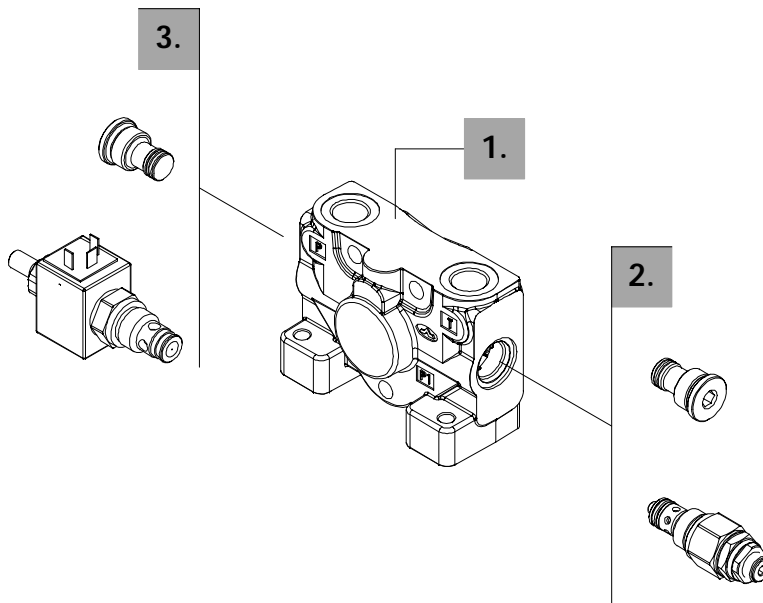
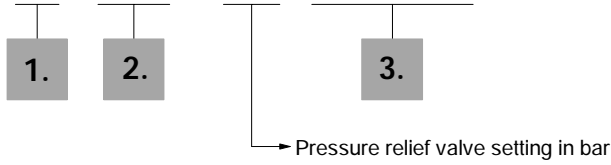
CODE	DIRECTIONAL VALVE
5TIR110195	Tie rod kit for 2 section valve + manifold
5TIR110235	Tie rod kit for 3 section valve + manifold
5TIR110267	Tie rod kit for 4 section valve + manifold
5TIR110304	Tie rod kit for 5 section valve + manifold
5TIR110340	Tie rod kit for 6 section valve + manifold
5TIR110375	Tie rod kit for 7 section valve + manifold
5TIR110411	Tie rod kit for 8 section valve + manifold
5TIR110449	Tie rod kit for 9 section valve + manifold
5TIR110484	Tie rod kit for 10 section valve + manifold

NOTE (*) - Items are referred to **BSP** thread; sections and covers for right inlet are different from the standard (see ref. 1 e 2) because of different components assembling

Inlet and outlet section

Description example:

FE SDS100 / CN (TVG3 - 175) ELT-12VDC *



1. Section body * page 15

TYPE	CODE	DESCRIPTION
CN	3FIA107300	Standard configuration
CNM	3FIA107301	With pressure gauge prearrangement
CNL	3FIA107304	With side inlet

2. Inlet relief options page 16

Standard setting is referred to 10 l/min flow.

TYPE	CODE	DESCRIPTION
<u>VMD100/1: direct pressure relief valve type T (standard)</u>		
(TVG2-80)	X196121081	Range 63 to 100 bar / 900 to 1450 psi standard setting 80 bar / 1160 psi
(TVG3-175)	X196121176	Range 100 to 200 bar / 1450 to 2900 psi standard setting 175 bar / 2550 psi
(TVG4-220)	X196121220	Range 200 to 300 bar / 2900 to 4350 psi standard setting 220 bar / 3200 psi

SV XTAP526360 Pressure relief valve blanking plug

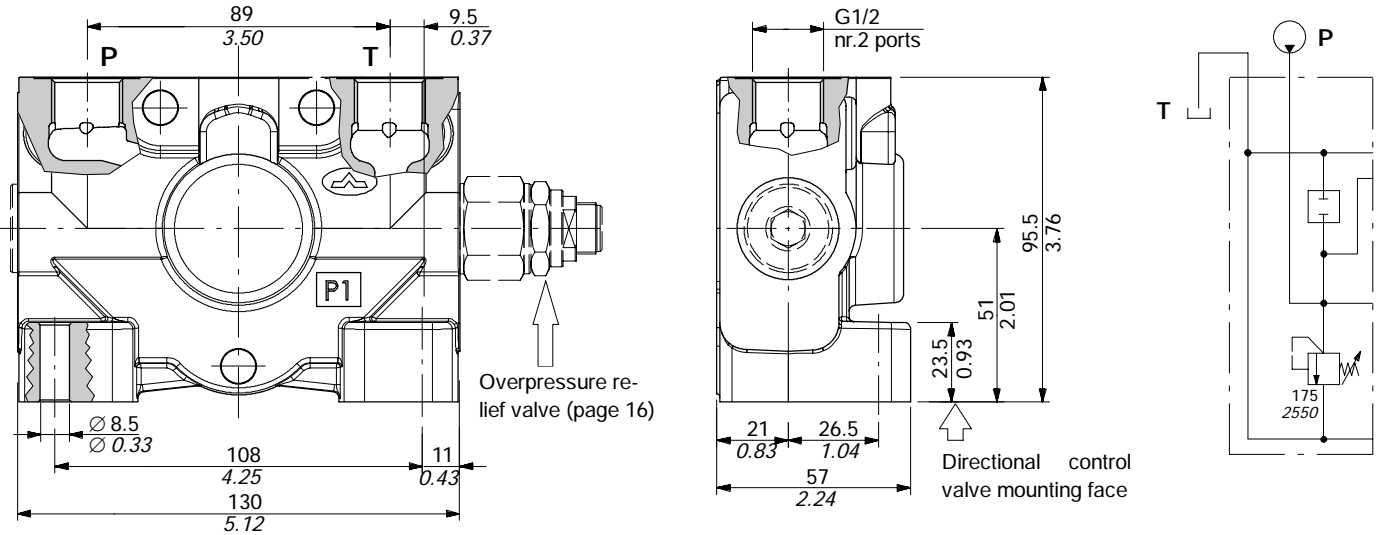
3. Inlet valve options page 17

TYPE	CODE	DESCRIPTION
ELT	5CAR407320	12 VDC solenoid operated unloader valve
	5CAR407325	24 VDC solenoid operated unloader valve
SV	XTAP526360	Valve blanking plug: in valve description the word SV must be omitted because standard

NOTE (*) - Items are referred to BSP thread.

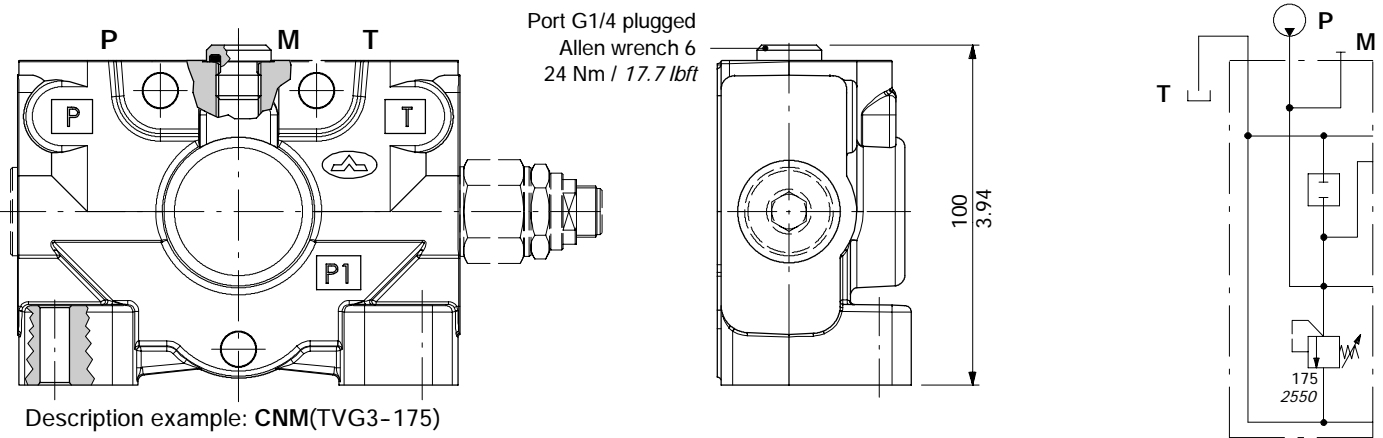
Section body and hydraulic circuit

CN standard configuration



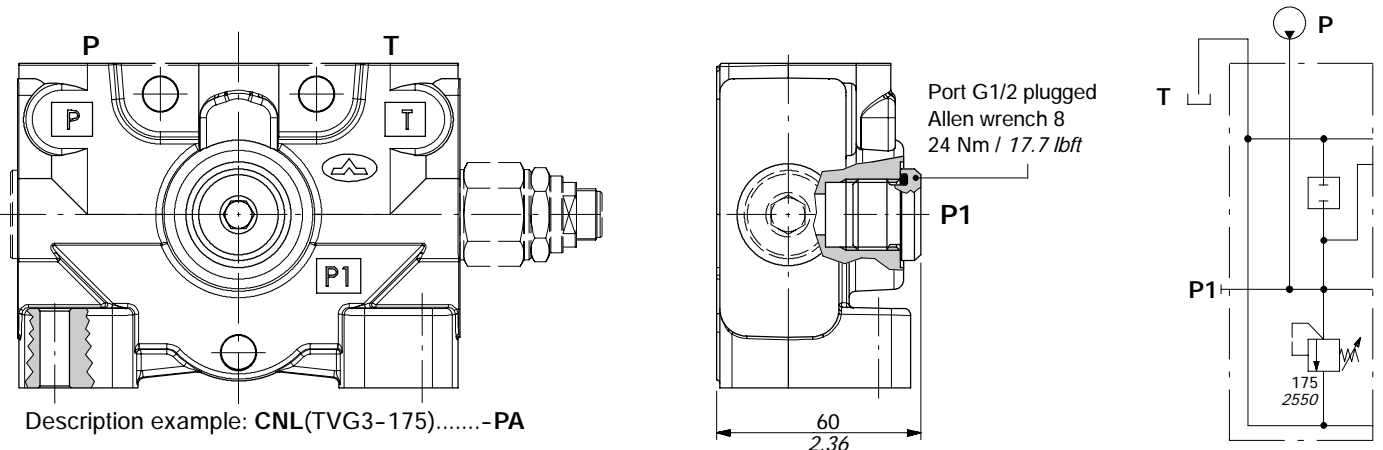
Description example: CN(TVG3-175)

CNM configuration: with pressure gauge prearrangement



Description example: CNM(TVG3-175)

CNL configuration: with side inlet



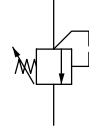
Description example: CNL(TVG3-175).....-PA

Inlet relief options

Direct pressure relief valve

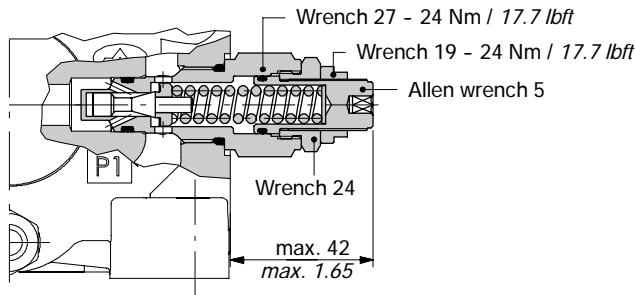
VMD100 (TV G 3 - 175)

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

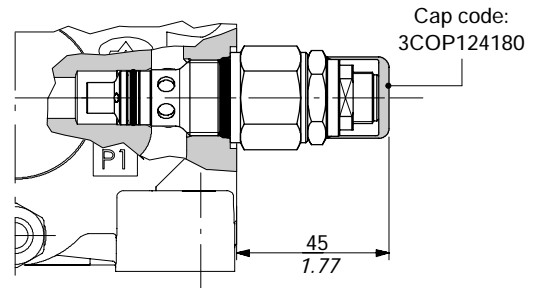


Adjustment type

G: with screw

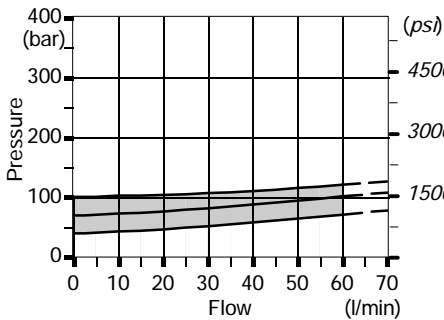


Z: with tamper proof cap

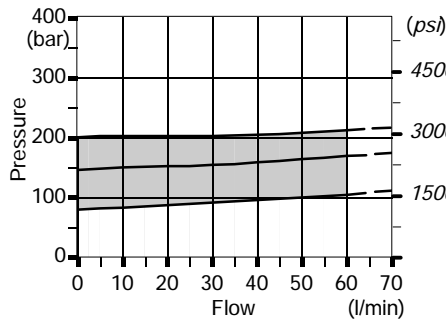


Performance data

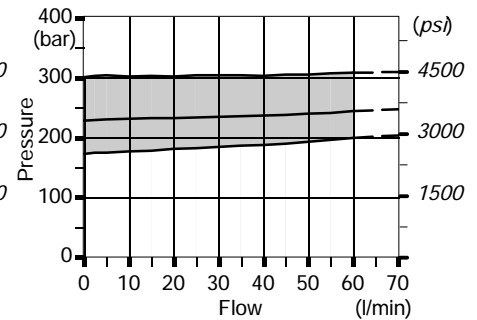
Spring nr. 2 (green band)



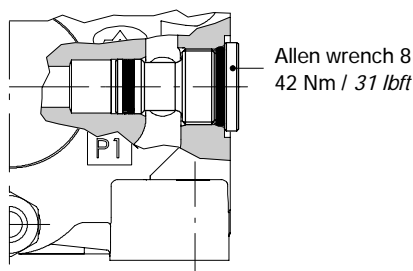
Spring nr. 3 (blue band)



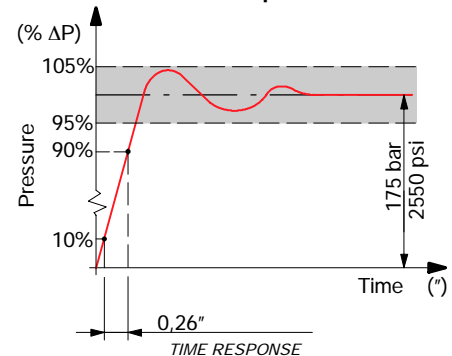
Spring nr. 4 (red band)



SV: relief valve blanking plug

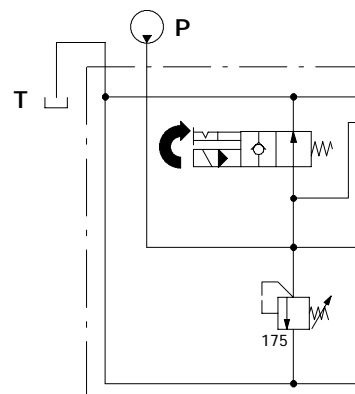
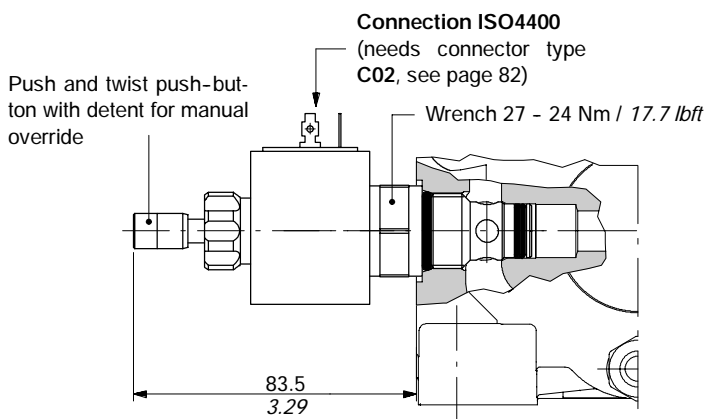


Time response



ELT solenoid operated unloader valve

Configuration with emergency lock.



Description example:
CN(TVG3-175)ELT-12VDC

Operating features

Internal leakage excited position . . . : 75 cm³/min a 100 bar
4.45 in³/min at 1450 psi

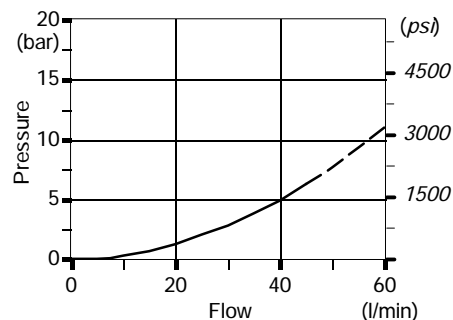
Solenoid operating features

Nominal voltage : 12 VDC 24 VDC
 Nominal voltage tolerance : ±10%
 Power rating : 19 W
 Nominal current : 1,58 A 0,81 A
 Resistance : 7,6 Ω 29,5 Ω
 Coil insulation : Class F
 Duty cycle : 100%

Coil ordering codes

CODE	DESCRIPTION
2X4311012	12VDC voltage
2X4311024	24VDC voltage

Pressure drop curve

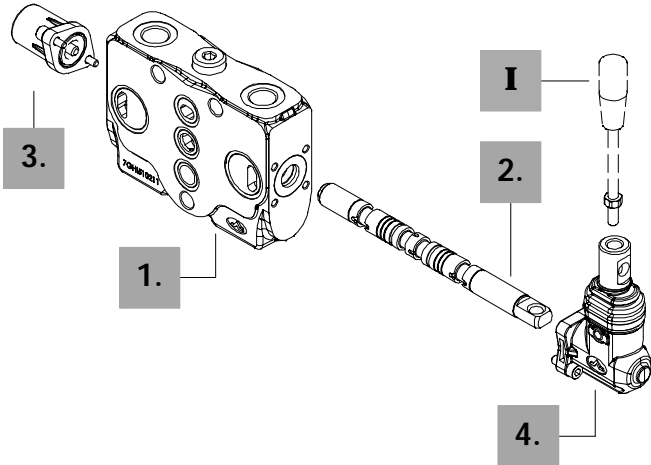
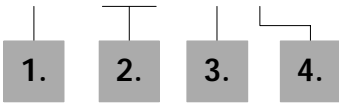


SDS100

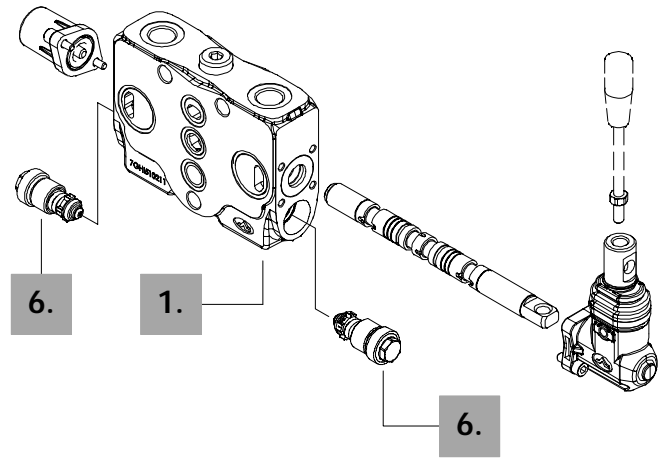
Working section

Description example:

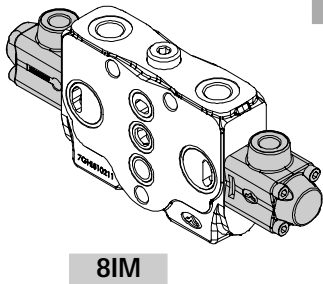
EL SDS100 / Q - 101 - 8 L *



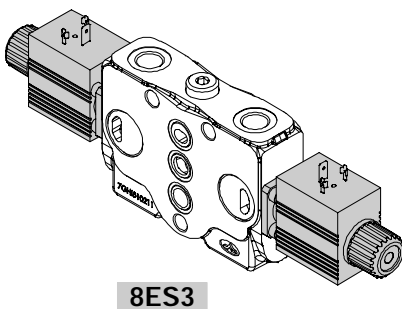
Port valve setting in bar ←
EL SDS100 / P - 101 - 8 L . U100 U100 *



EL SDS100 / Q - I112 - 8IM



EL SDS100 / Q - S112 - 8ES3-12VDC



1. Working sections kit* page 20

Include body, seals, rings and load check valve.

TYPE	CODE	DESCRIPTION
Q	5EL1073010	Parallel circuit without port valves prearrangement
P	5EL1073000	Parallel circuit with port valves prearrangement
SQ	5EL3073010	Tandem circuit without port valves prearrangement
QR	5EL1573090	As previous for section type RQS or RPS
SP	5EL3073000	Tandem circuit with port valves prearrangement
PR	5EL1573095	As previous for section type RQS or RPS
<u>Sections kit for special spools</u>		
Q5	5EL1073210	Parallel circuit and floating prearrangement: for spool type 501
P5	5EL1073200	As previous with port valves prearrangement: for spool type 501

NOTE (*) - Items are referred to **BSP** thread.

2. Spools *page 23*

If not specified otherwise, the spool are from 20 to 40 l/min flow

TYPE	CODE	DESCRIPTION
102	3CU6210110	Double acting, 3 positions, with A and B closed in neutral position; for flow up to 20 l/min
101	3CU6210100	As previous, from 20 to 40 l/min flow
109	3CU6210202	As previous, from 40 to 60 l/min flow
201	3CU6225130	Double acting, 3 positions, with A and B open to tank in neutral position
2H01	3CU6225100	Double acting, 3 positions, with A and B partially open to tank in neutral position
1S02	3CU6212100	Double acting, 3 positions, with A and B closed in neutral position, for series circuit
2S01	3CU6226130	Double acting, 3 positions, with A and B open to tank in neutral position, for series circuit
301	3CU6231100	Single acting in A, 3 positions, B plugged: needs G3/8 plug
401	3CU6235100	Single acting in B, 3 positions, A plugged: needs G3/8 plug

Specials spools for standard positioners kit *page 27*

801	3CU6242100	Double acting, 3 positions, regenerative in 2 nd positions with spool out
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Specials spools for particular positioners kit *pag. 28*

501	3CU6242111	Double acting, 4 positions, floating in 4 th positions with spool in
-----	------------	---

3. "A" side spool positioners *page 30*

TYPE	CODE	DESCRIPTION
7FT	5V07407000	With friction and neutral position sensor
8	5V08107000	With spring return in neutral position
8D	5V08107200	As type 8 and pin with M6 female thread for dual control
8F2	5V08107100	With spring return in neutral position and adjustable flow limiter
8TL	5V08107310	As type 8 and pin control for flexible cable operation
9B	5V09207000	With detent in position 1 and spring return in neutral position
10B	5V10207000	With detent in position 2 and spring return in neutral position
11B	5V11207000	With detent in position 1 and 2, spring return in neutral position
8K	5V08707112	As type 8 with 12 VDC spool solenoid lock device
	5V08707124	As type 8 with 24 VDC spool solenoid lock device
8RM2	5V08107590	With spring return in neutral position and 12VDC electromagnetic detent in pos. 2
8MG3(NO)	5V08107660	With spring return in neutral position and operation with microswitch in pos. 1 and 2
8PP	5V08107700	Proportional pneumatic kit
8EP3	5V08107735	ON/OFF 12 VDC electro-pneumatic kit
	5V08107740	ON/OFF 24 VDC electro-pneumatic kit

Particular positioners kit for special spools *page 29*

TYPE	CODE	DESCRIPTION
13	5V13307000	4 positions with spring return in neutral, detent in 4 th position: for spool type 501
13F	5V13507000	4 positions with spring return in neutral: for spool type 501

4. "B" side options *page 36*

TYPE	CODE	DESCRIPTION
L	5LEV107000	Standard lever box
LF1	5LEV107100	Lever box with adjustable flow limiter in pos. 1
SLP	5COP107010	Without lever box, with dust-proof plate
SLC	5COP207000	Without lever box, with endcap.
LCA1-4	5CLO207010	Joystick lever for 2 sections operation: configurations type 1 and 4
LCA2-3	5CLO207011	Joystick lever for 2 sections operation: configurations type 1 and 4

5. Complete controls *page 40*

They need particular sections or spools, please see the related page.

TYPE	CODE	DESCRIPTION
8ES	--	ON/OFF electric control kit: available single or double acting operation
8IM	5IDR207300	Proportional hydraulic control
13IM	5IDR207350	4 positions proportional hydraulic control

6. Port valves *page 46*

Standard setting is referred to 10 l/min flow.

TYPE	CODE	DESCRIPTION
<u>Fixed setting antishock with prefill valve</u>		
U025	5KIT330025	Setting 25 bar / 360 psi
U040	5KIT330040	Setting 40 bar / 580 psi
U050	5KIT330050	Setting 50 bar / 725 psi
U063	5KIT330063	Setting 63 bar / 900 psi
U080	5KIT330080	Setting 80 bar / 1160 psi
U100	5KIT330100	Setting 100 bar / 1450 psi
U125	5KIT330125	Setting 125 bar / 1800 psi
U140	5KIT330140	Setting 140 bar / 2030 psi
U150	5KIT330150	Setting 150 bar / 2180 psi
U160	5KIT330160	Setting 160 bar / 2320 psi
U175	5KIT330175	Setting 175 bar / 2550 psi
U190	5KIT330190	Setting 190 bar / 2750 psi
U200	5KIT330200	Setting 203 bar / 2900 psi
U210	5KIT330210	Setting 210 bar / 3050 psi
U230	5KIT330230	Setting 233 bar / 3380 psi
U250	5KIT330250	Setting 250 bar / 3600 psi
U270	5KIT330270	Setting 270 bar / 3900 psi
U280	5KIT330280	Setting 280 bar / 4050 psi
U300	5KIT330300	Setting 300 bar / 4350 psi
U320	5KIT330320	Setting 320 bar / 4650 psi
U340	5KIT330340	Setting 340 bar / 4950 psi
C	5KIT410000	Anticavitation valve
UT	XTAP522440	Port valve blanking plug

I Optional hand levers

TYPE	CODE	DESCRIPTION
AL01/M8x120	170011012	For L lever box: height 120 mm / 4.72 in
AL08/M12x150	170013115	For joystick LCB: height 150 mm / 5.91 in

Working section

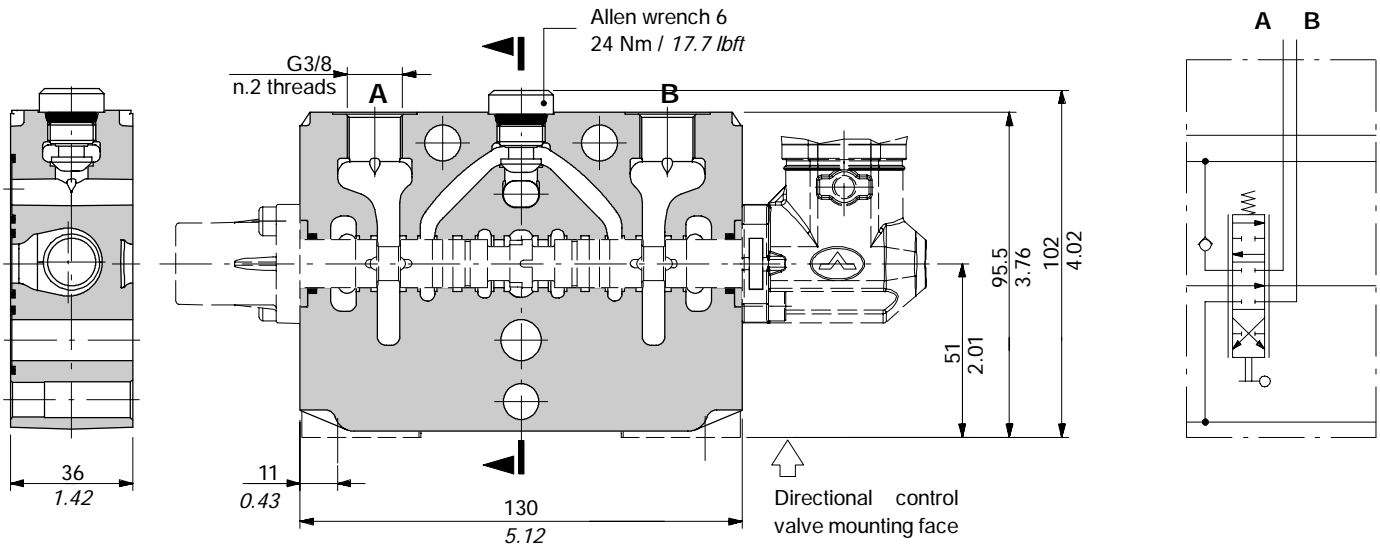
Section kit and hydraulic circuit

Parallel or tandem circuits are available: for series circuit see page 11.

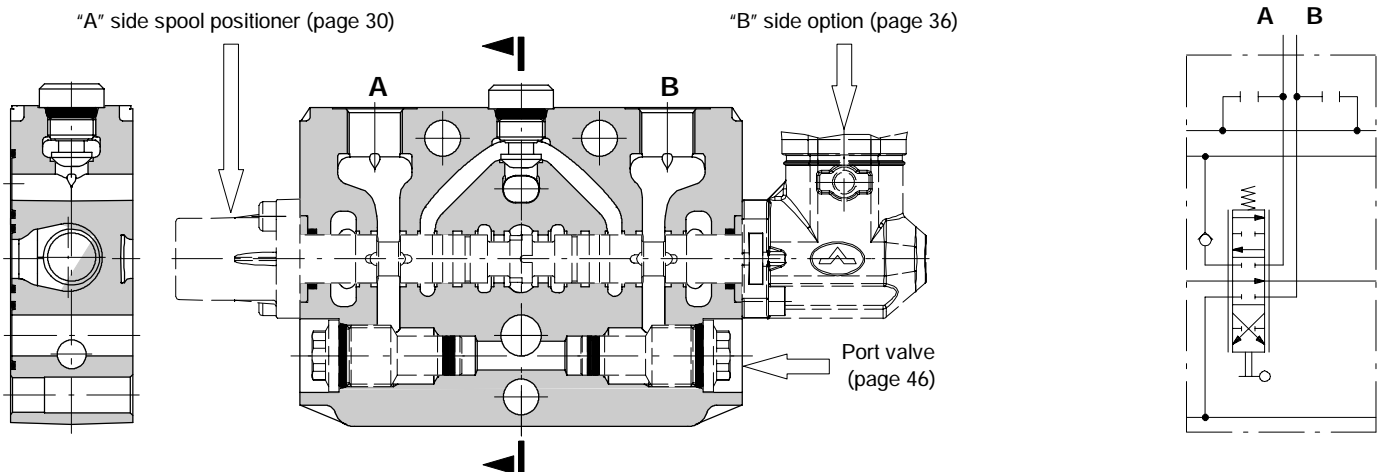
All sections can be fitted with or without port valves prearrangement.

Parallel circuit

Section type Q without port valves prearrangement



Section type P with port valves prearrangement

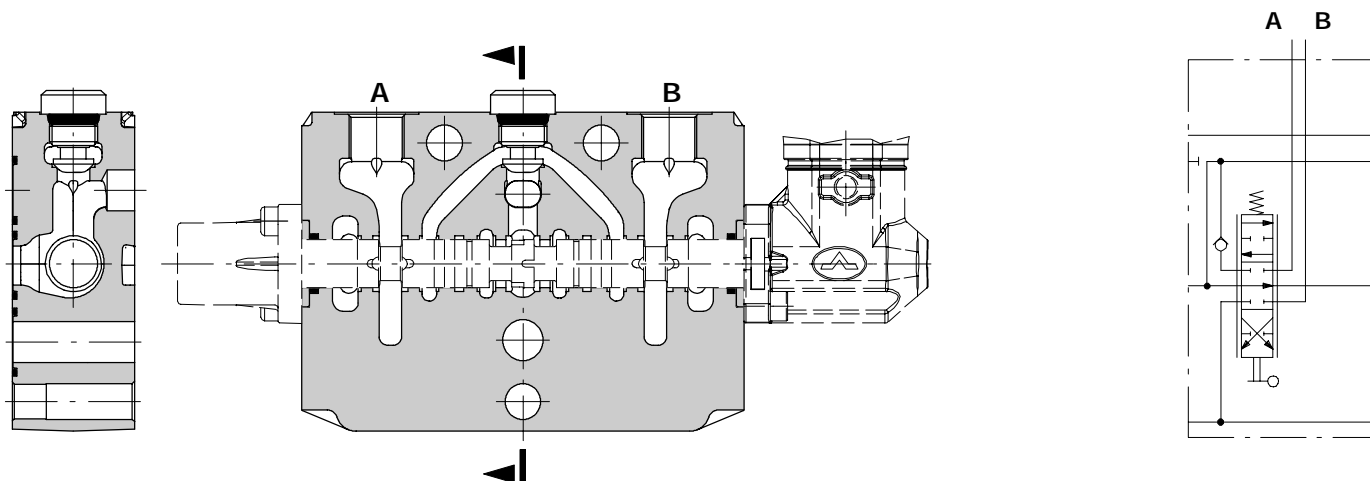


Section kit and hydraulic circuit

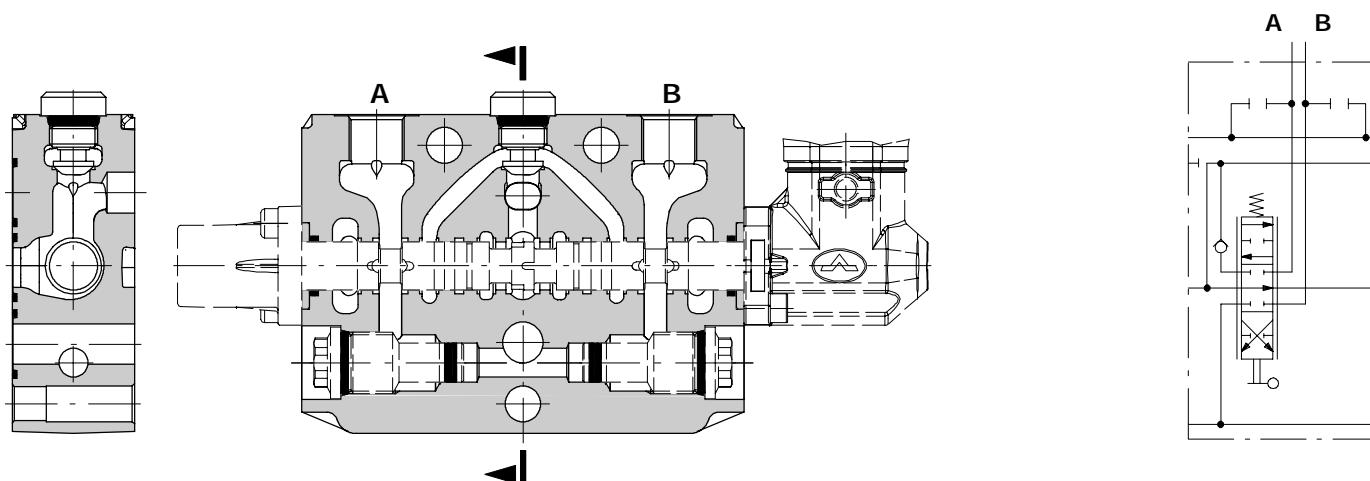
Tandem circuit

Dimensions are the same of parallel circuit section.

Section type SQ without port valves prearrangement



Section type SP with port valves prearrangement



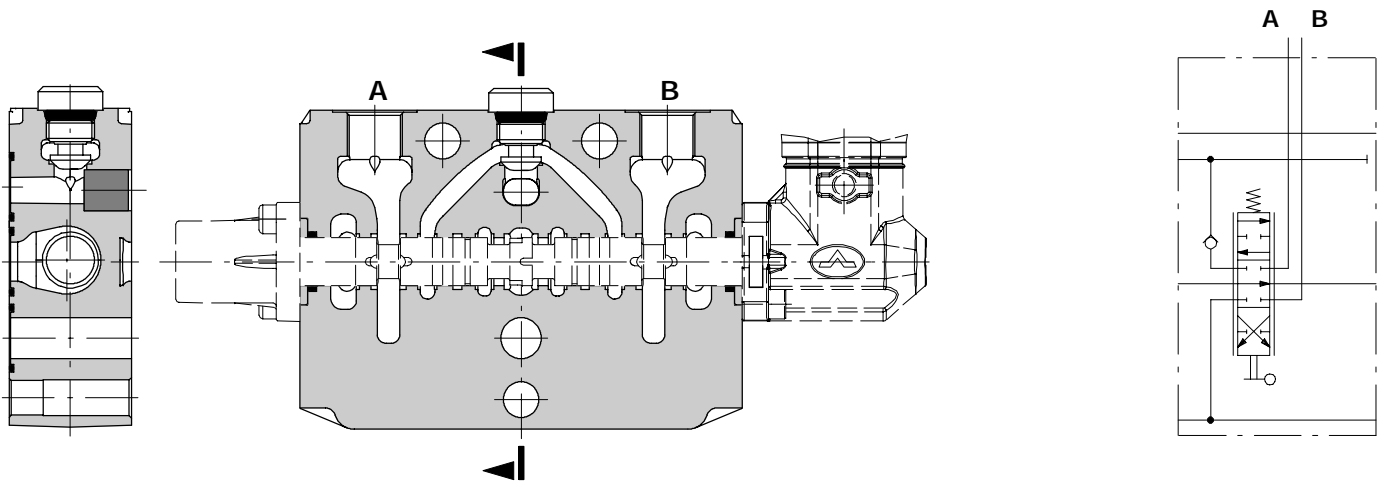
Working section

Section kit and hydraulic circuit

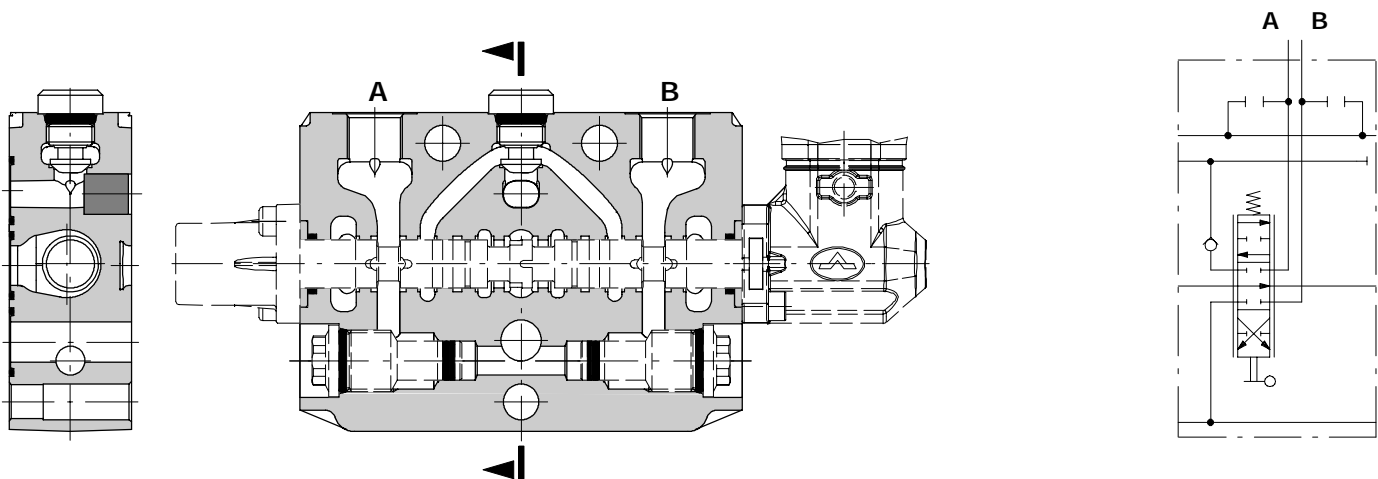
Special circuit

Used to get series and tandem circuits with RQS or SQS optional outlet sections (see pages 11 and 52); dimensions are the same as parallel section.

Section type QR without port valves prearrangement

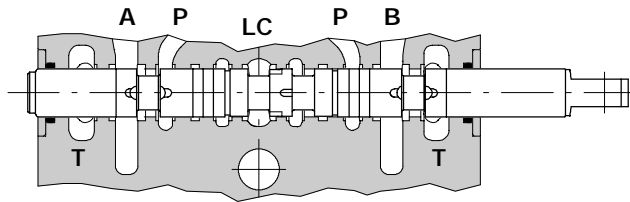


Section type PR with port valves prearrangement



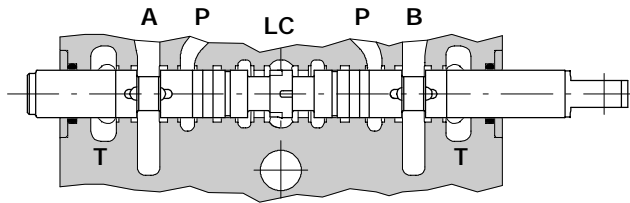
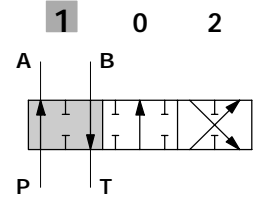
Type 101

From 20 to 40 l/min flow.

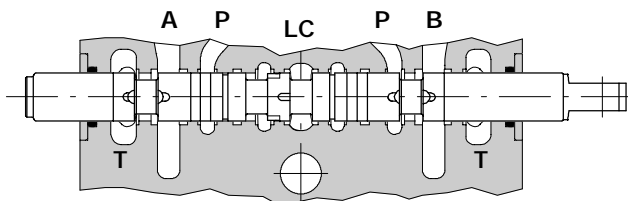
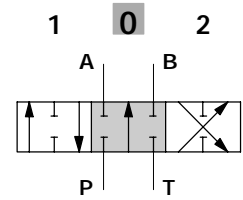


P → A B → T

▶ stroke + 6.5 mm
+ 0.26 in

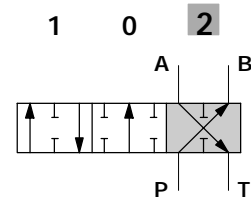


P-A-B-T closed, with flow through line (LC) open



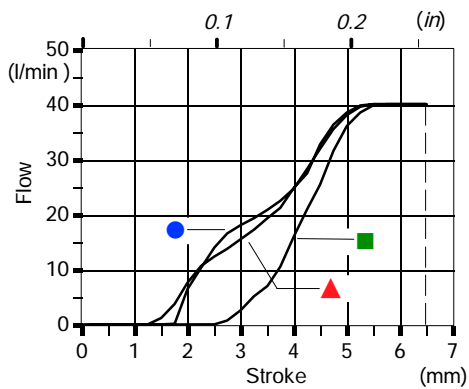
P → B A → T

◀ stroke - 6.5 mm
- 0.26 in



Performance data

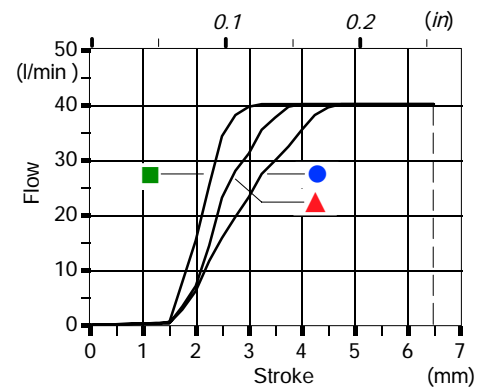
Spool metering P → A(B)



Q_{in} = 40 l/min

- P_(on ports) = 63 bar / 900 psi
- ▲ P_(on ports) = 100 bar / 1450 psi
- P_(on ports) = 250 bar / 2900 psi

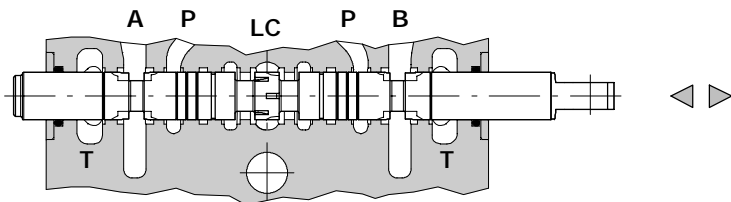
Spool metering A(B) → T



Spools

Type 102

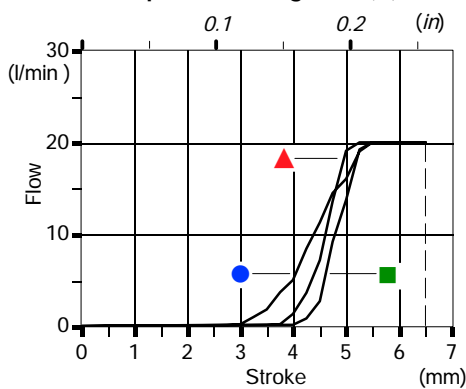
Up to 20 l/min flow.



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

Performance data

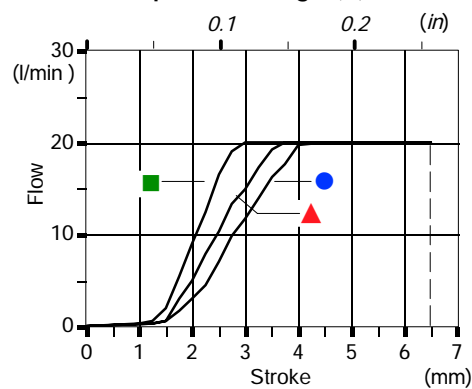
Spool metering P→A(B)



Q_{in} = 20 l/min

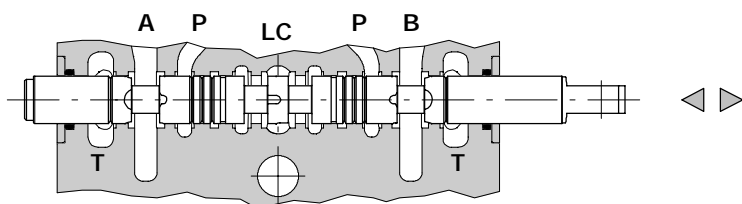
- P_(on ports) = 63 bar / 900 psi
- ▲ P_(on ports) = 100 bar / 1450 psi
- P_(on ports) = 250 bar / 2900 psi

Spool metering A(B)→T



Type 109

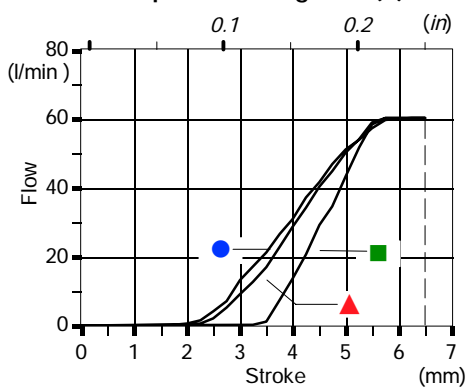
From 40 to 60 l/min flow.



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

Performance data

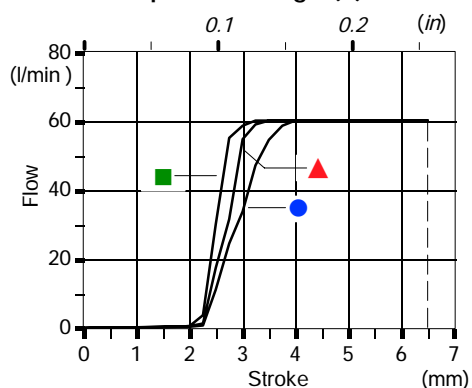
Spool metering P→A(B)



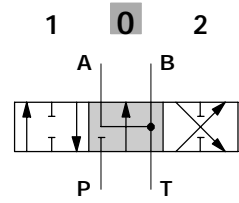
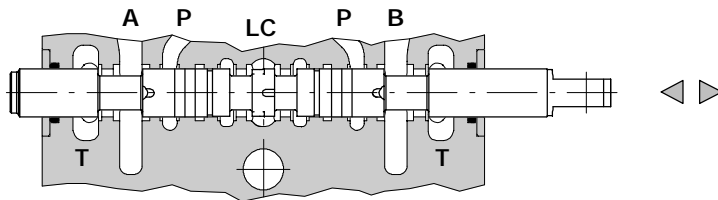
Q_{in} = 60 l/min

- P_(on ports) = 63 bar / 900 psi
- ▲ P_(on ports) = 100 bar / 1450 psi
- P_(on ports) = 250 bar / 2900 psi

Spool metering A(B)→T

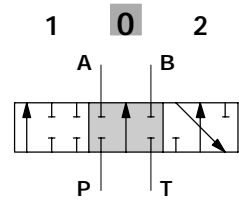
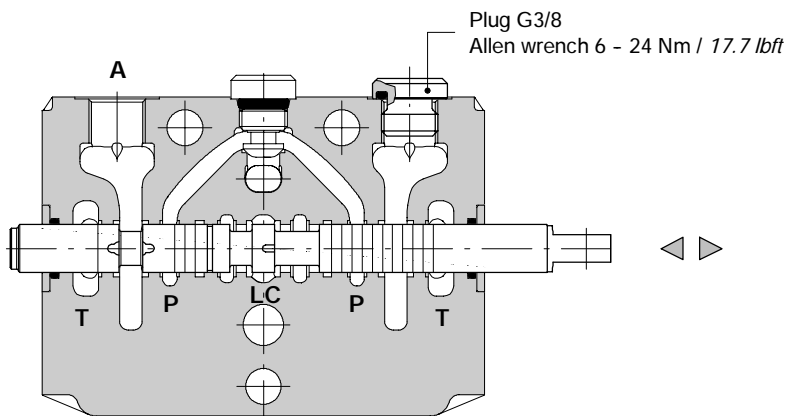


Type 201



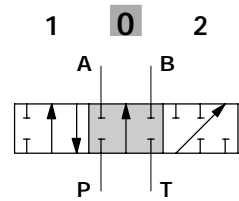
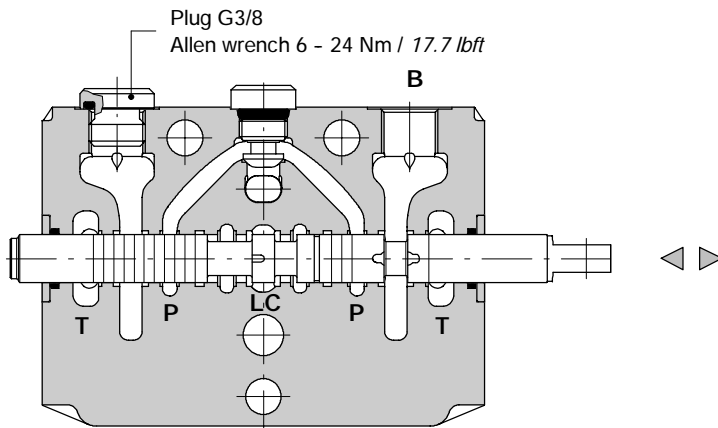
P closed, A-B to tank, with flow through line (LC) open

Type 301



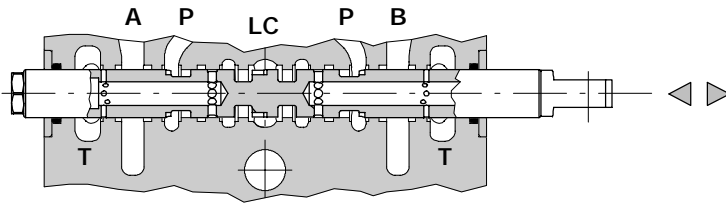
P-A-B closed, with flow through line (LC) open

Type 401

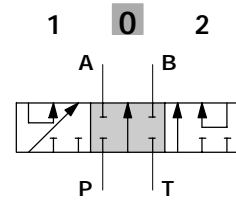


P-A-B closed, with flow through line (LC) open

Type 1S02



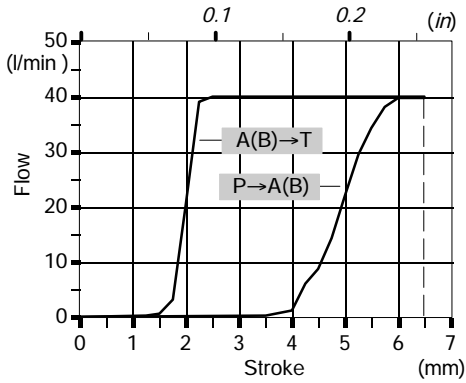
P-A-B-T closed, with flow through line (LC) open



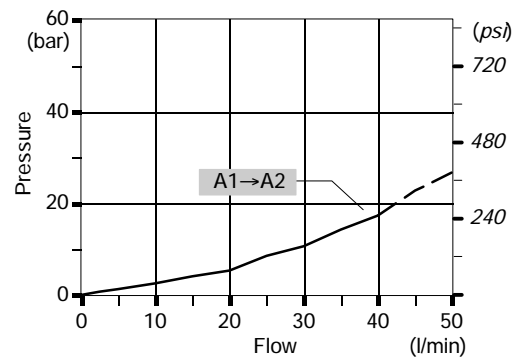
Performance data

Spool metering

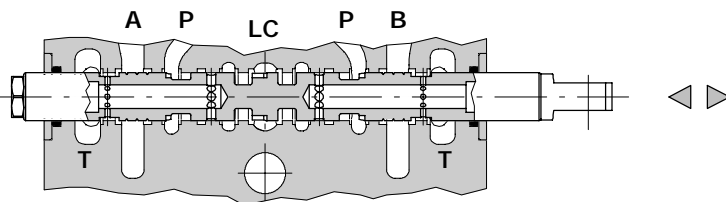
$Q_{in} = 40 \text{ l/min}$ / $P_{(on ports)} = 100 \text{ bar} - 1450 \text{ psi}$



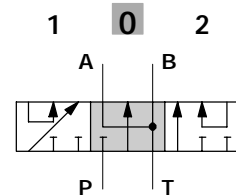
Pressure drop on series connection



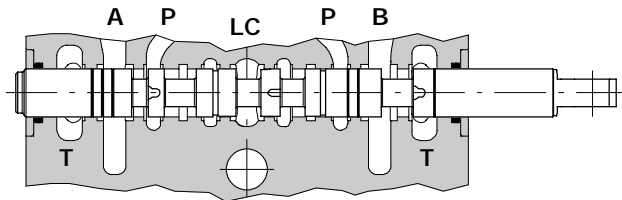
Type 2S01



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

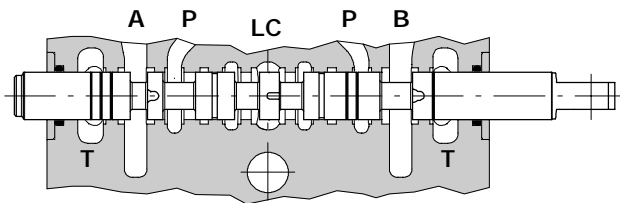
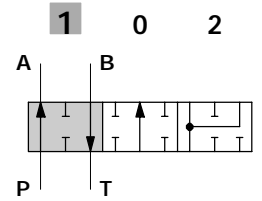


Type 801

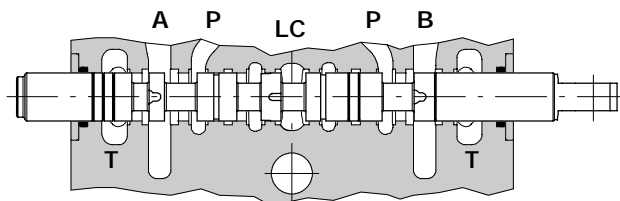
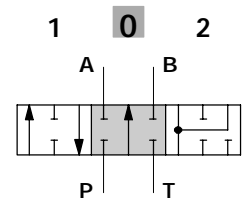


P → A B → T

▶ stroke + 6.5 mm
+ 0.26 in

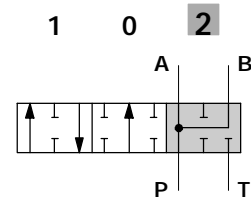


P-A-B-T closed, with flow through line (LC) open



P+B → A (regenerative)

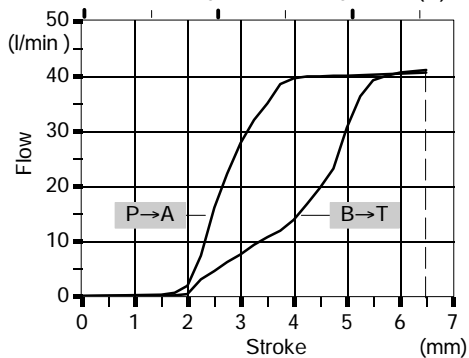
◀ stroke - 6.5 mm
- 0.26 in



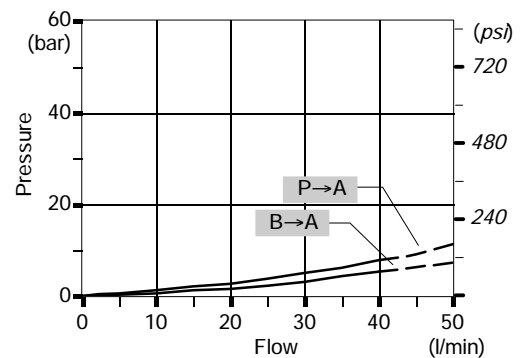
Performance data

Spool metering

Q_{in} = 40 l/min / P_(on ports) = 100 bar / 1450 psi
0.1 0.2 (in)



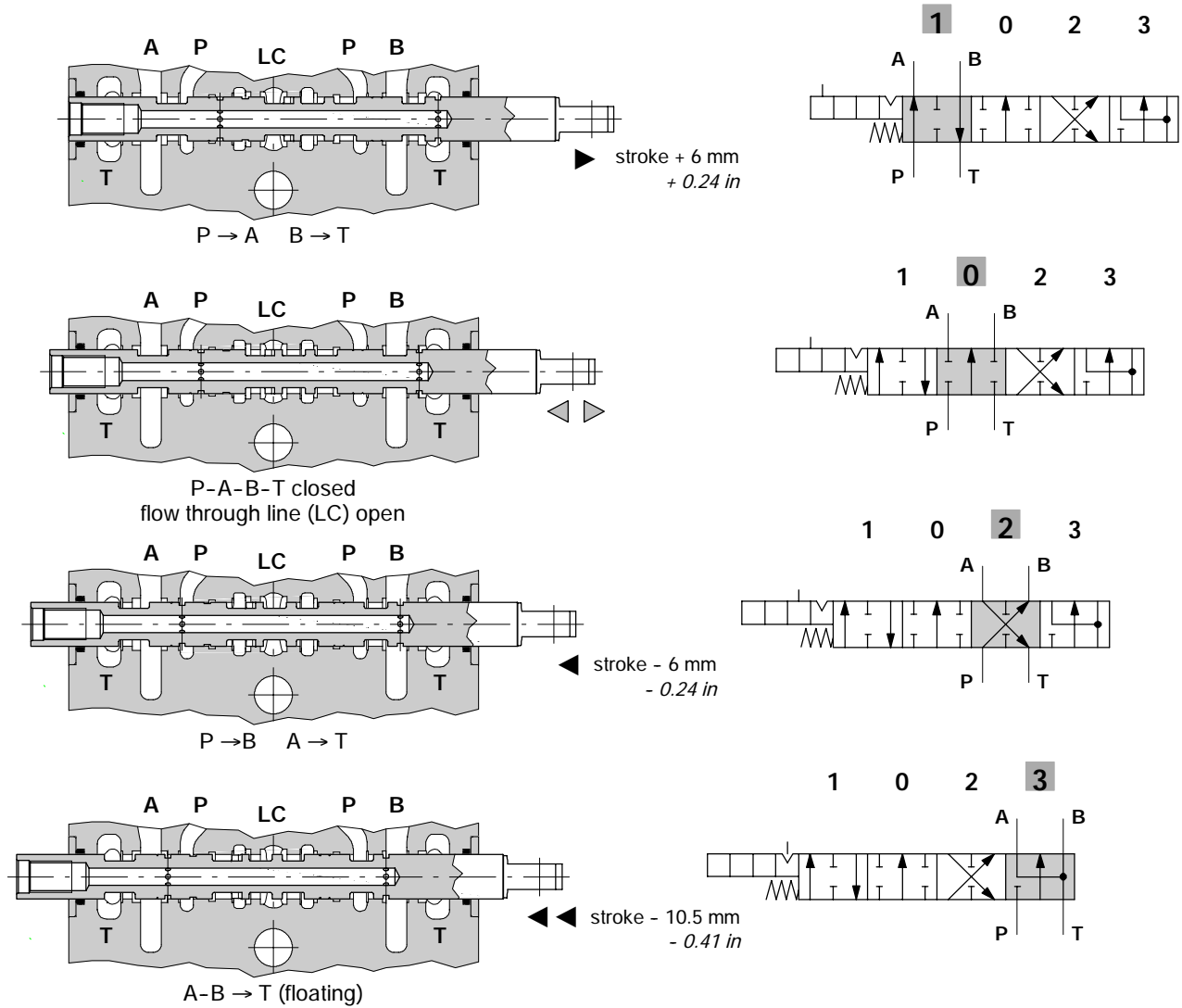
Pressure drop in position 2 (last section)



Type 501

Q5 - P5 section or RQ5 - RP5 optional outlet section required, contact Sales Dpt. for further information.

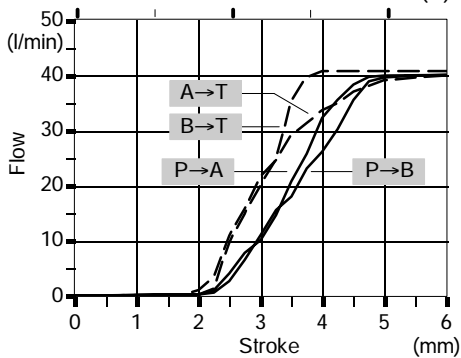
To be combined with 13 (5V13307000) or 13F (5V13507000) spool positioners.



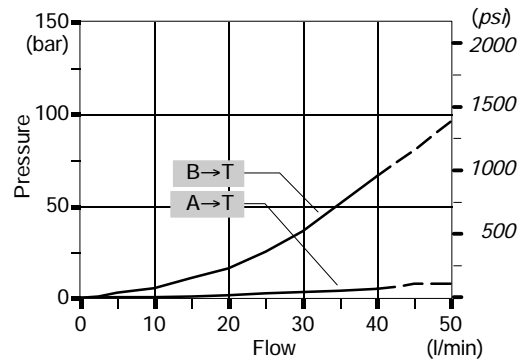
Performance data

Spool metering

$Q_{in} = 40 \text{ l/min} / P_{(on ports)} = 100 \text{ bar} / 1450 \text{ psi}$
0.1 0.2 (in)



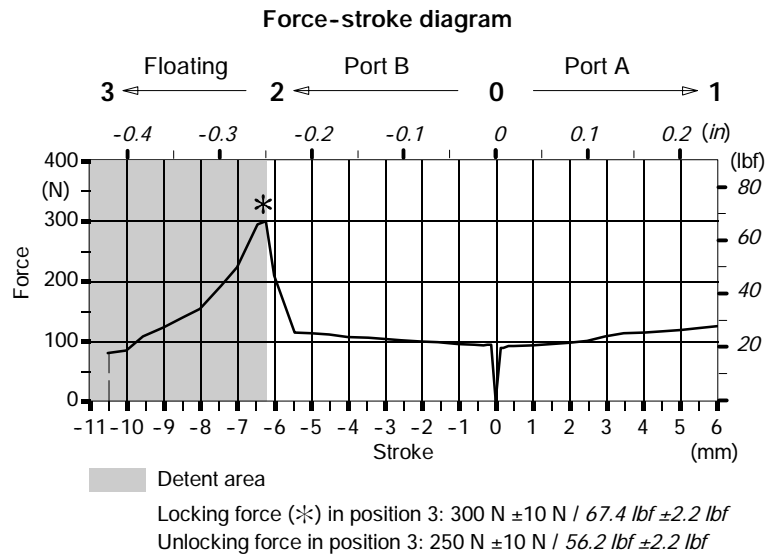
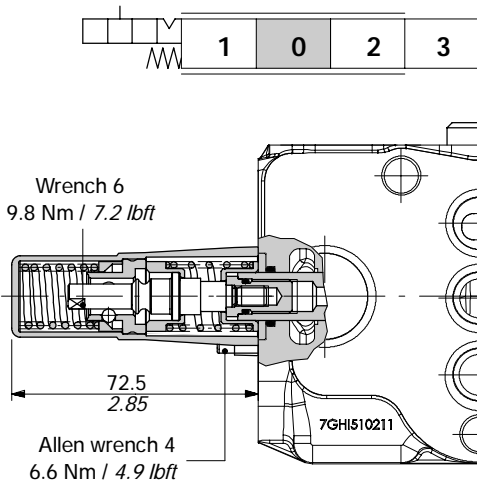
Pressure drop in position 3 (last section)



Type 501: positioners kit

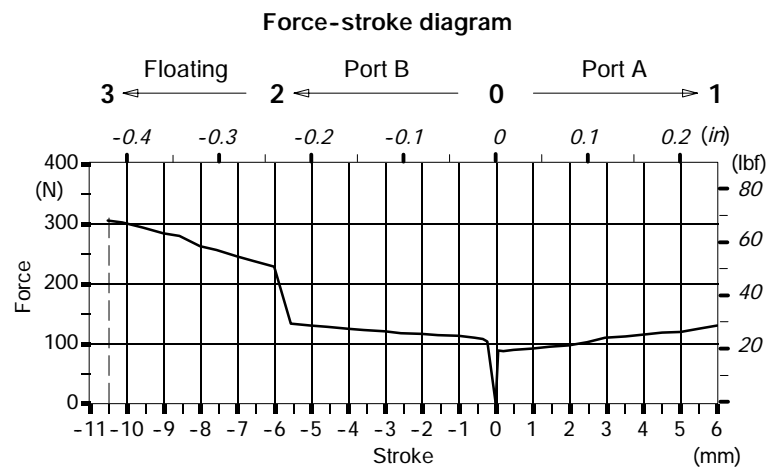
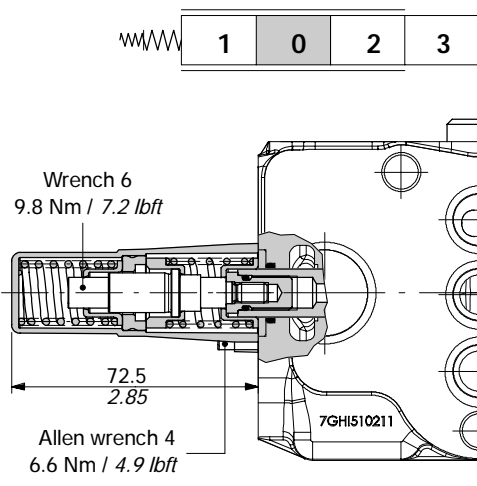
Type 13

With detent in position 3 (floating) and spring return to neutral from either directions



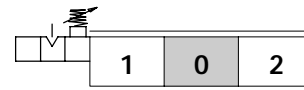
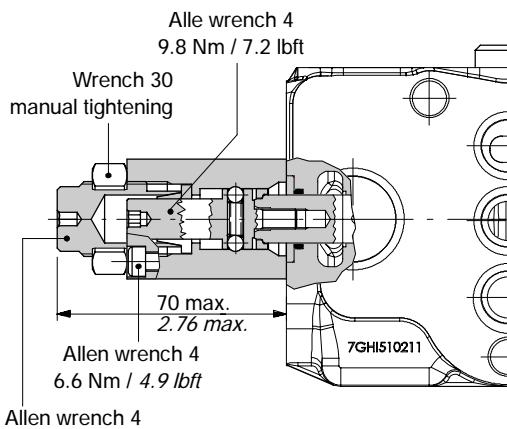
Type 13F

With additional spring in position 3 (floating) and spring return to neutral from either directions.



"A" side spool positioners

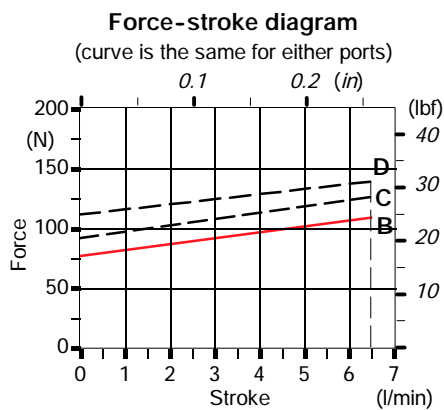
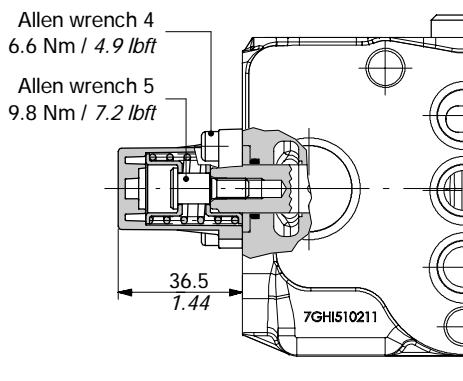
With friction type 7FT



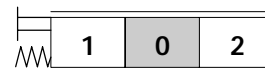
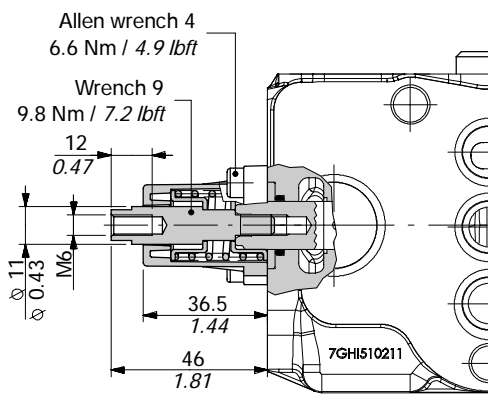
Spring return in neutral position

Type 8

It's standard configured with spring type B (see diagram); it's also available with heavier springs type C (8MC codice: 5V08207000) or type D (8MD codice: 5V08307000).



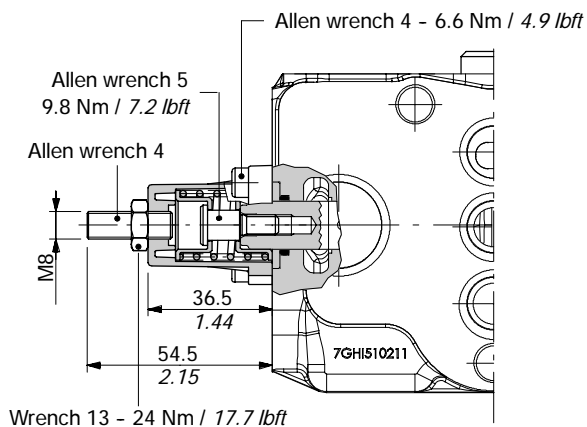
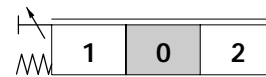
Type 8D



Spring return in neutral position

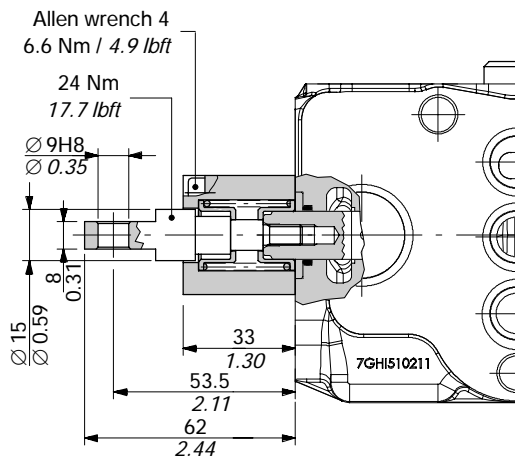
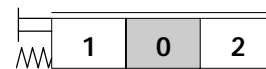
Type 8F2

With spool stroke adjustment in position 2 (P→B).



Type 8TL

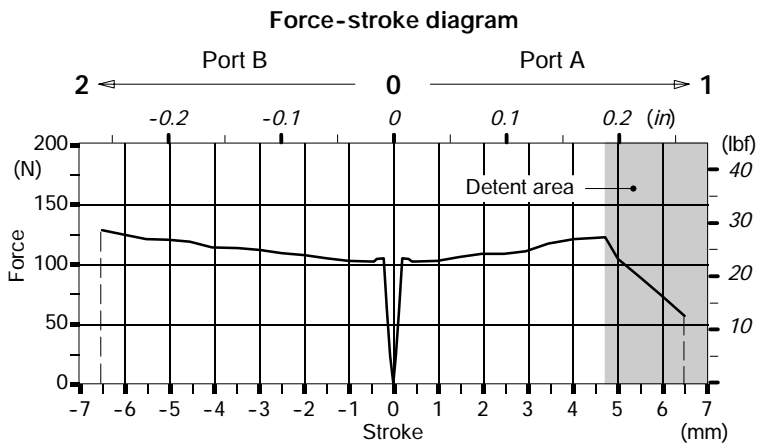
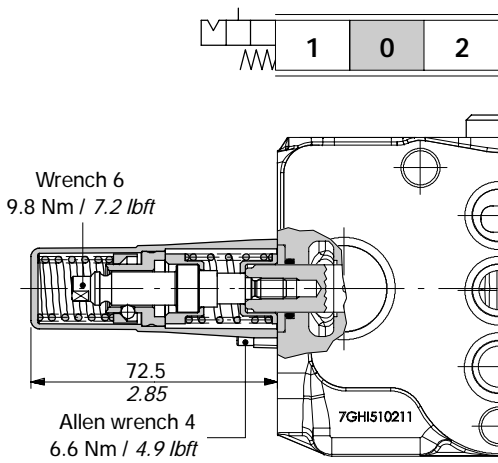
For connect the kit 8TL to flexible cable always ask the kit CP50 codE 5TEL405005.



"A" side spool positioners

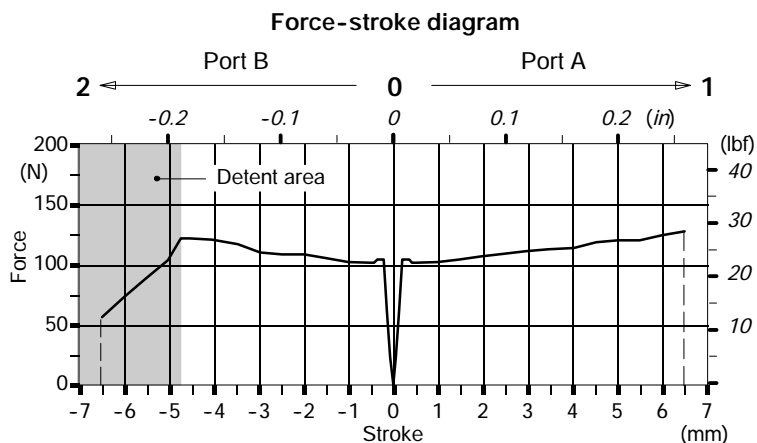
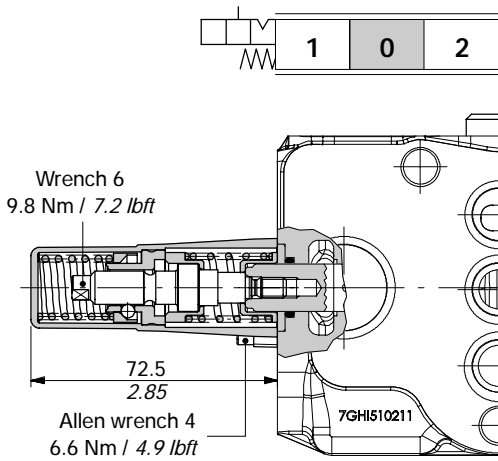
With detent and spring return to neutral position from either directions

Type 9B



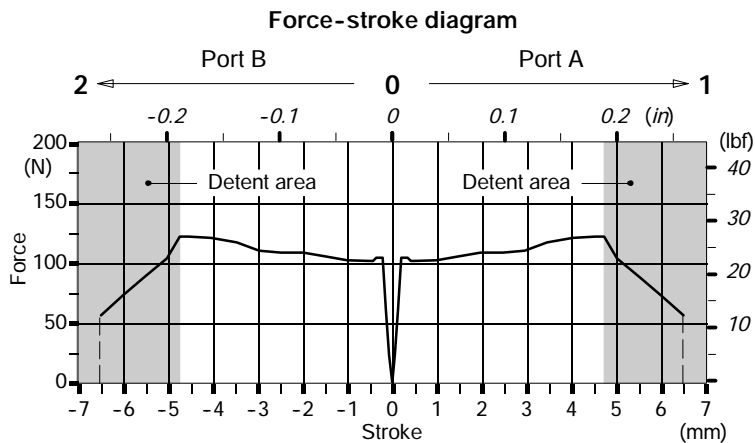
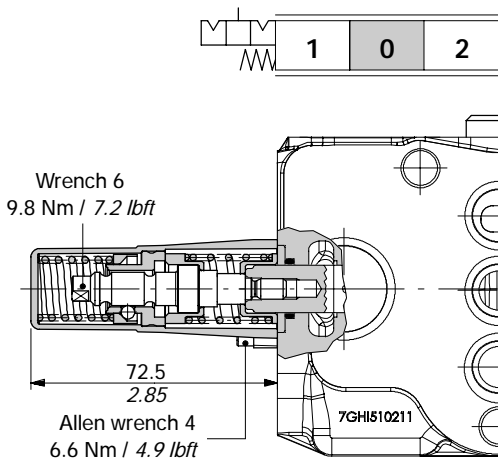
Unlocking force from position 1: $160\text{ N} \pm 10\text{ N} / 36\text{ lbf} \pm 2.2\text{ lbf}$

Type 10B



Unlocking force from position 2: $160\text{ N} \pm 10\text{ N} / 36\text{ lbf} \pm 2.2\text{ lbf}$

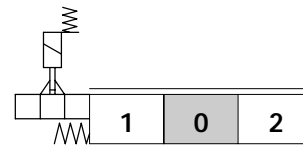
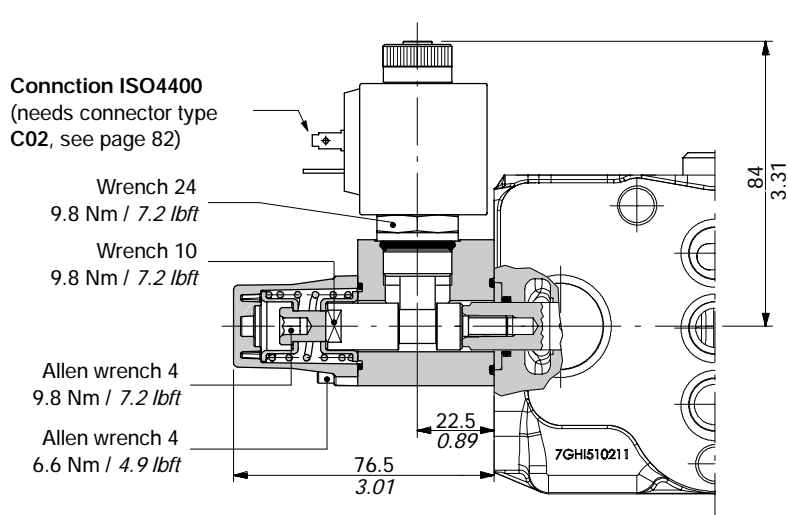
Type 11B



Unlocking force from positions 1 and 2: $160\text{ N} \pm 10\text{ N} / 36\text{ lbf} \pm 2.2\text{ lbf}$

Solenoid lock device type 8K

With spring return and spool electromechanical lock in neutral position; when coil is feeded the spool can be moved.



Coil and actuator ordering codes

CODE	DESCRIPTION
2X4300012	Coil 12 VDC
2X4300024	Coil 24 VDC
4SOL810000	Lock actuator

Optional coil

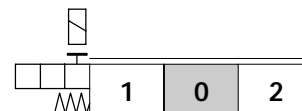
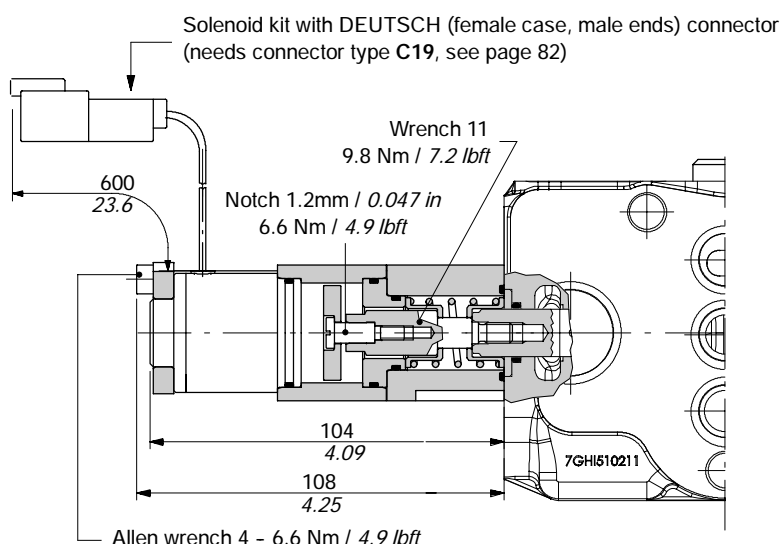
- CODE: YSOL300013
DESCRIPTION: 12VDC coil with PACKARD "M-PACK" connector: cable+connector total length = 634 mm / 25 in. Needs code 5CON130030 connector (see page 82)
- CODE: 2X4300014
DESCRIPTION: 12VDC coil with integrated DEUTSCH connector. Needs code 5CON130030 connector (vedi pag. 82)

Solenoid operating features

Nominal voltage	: 12 VDC / 24 VDC
Power rating	: 18 W
Duty cycle	: 100%
Insulation	: class F (VDE0580)
Core stroke	: 3.5 mm / 0.14 in

Electromagnetic detent type 8RM2

With electromagnetic detent in position 2 and spring return to neutral position.



Electromagnet ordering codes

With DEUTSCH connector	
CODE	DESCRIPTION
YSOL532455	12 VDC solenoid
YSOL532456	24 VDC solenoid

Optional electromagnet

- CODE: YSOL532451
DESCRIPTION: 12VDC electromagnet with PACKARD "M-PACK" connector: cable+connector total length = 374 mm / 14.7 in. Needs C20 connector (see page 82)
- CODE: YSOL532452
DESCRIPTION: 12VDC electromagnet with AMP "FASTON" connector: cable+connector total length = 200mm / 7.87 in. Needs C21 connector (see page 82).

Electromagnet operating features

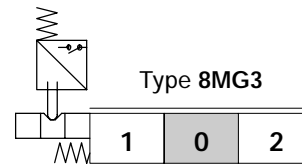
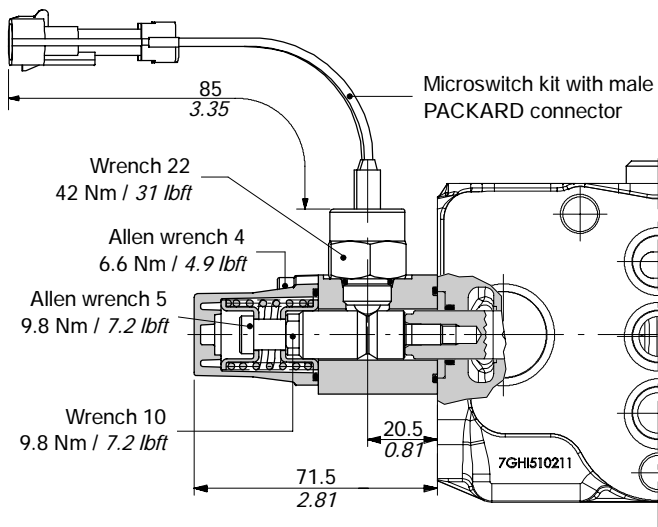
Nominal voltage	: 12 VDC ± 10%
Power rating	: 5.5 W
Resistance (20 °C)	: 26.2 Ohm
Min unlocking force	: 220 N / 49.5 lbf
Duty cycle	: 100%

"A" side positioners kit

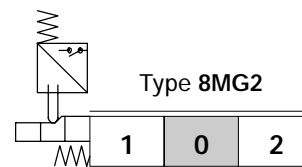
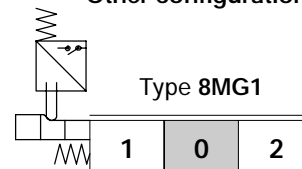
With microswitch type 8MG3(NO)

With spring return in neutral position and microswitch operated in both directions.

Also available **8MG1(NO)** configuration, code **5V08107670** (microswitch operated in position 1) and **8MG2(NO)** configuration, code **5V08107680** (microswitch operated in position 2); dimensions are the same of 8MG3 configuration.



Other configurations



Microswitches ordering codes

The microswitch+connector kit can be order separately and it's also available with normally closed (NC) configuration.

CODE DESCRIPTION

4MIC730 **NO** microswitch kit with **male** PACKARD connector:
needs female connector type **C07**

4MIC740 **NC** microswitch kit with **female** PACKARD connector:
needs male connector type **C17**

For connector see page 82.

Microswitch operating features

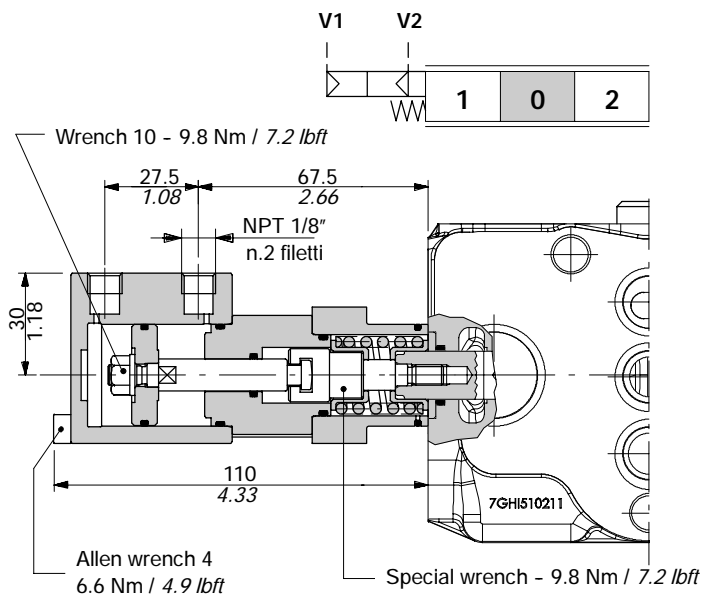
Mechanical life : 5x10⁵ operations

Electrical life (resistive load) . . . : 10⁵ oper. - 7A / 13,5VDC

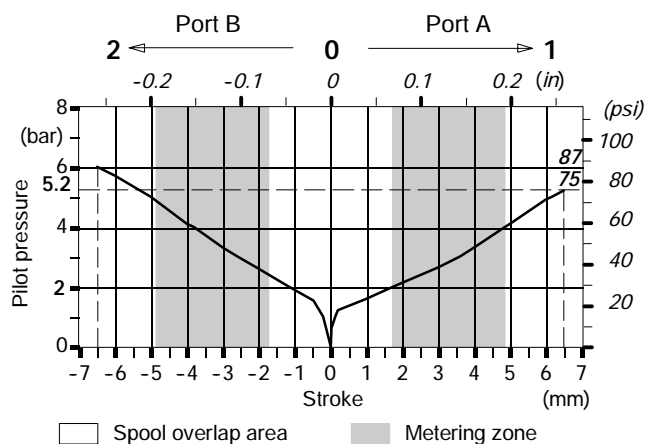
: 5x10⁴ oper. - 10A / 12VDC

: 5x10⁴ oper. - 3A / 28VDC

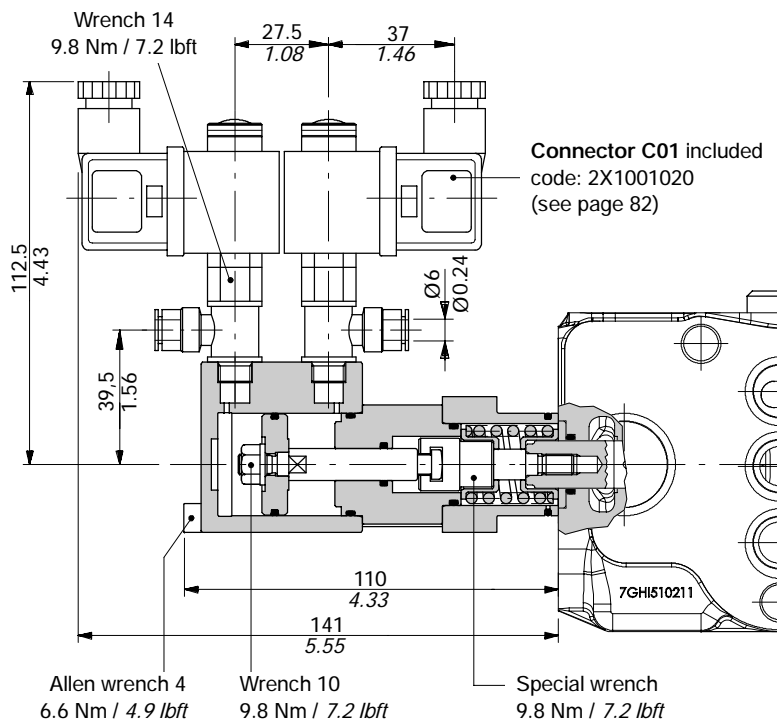
Proportional pneumatic control type 8PP



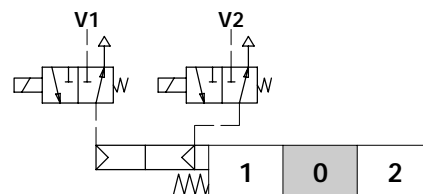
Pilot pressure - stroke diagram
Pilot pressure min 7 bar / 102 psi - max 10 bar / 145 psi



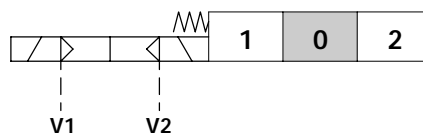
ON/OFF electro-pneumatic control type 8EP3



Scheme



Scheme ISO 1219



Operating features

Pilot pressure : 6 bar - 87 psi
(max.10 bar - 145psi)

Solenoid operating features

Nominal voltage tolerance : ±10%
Power rating : 8 W
Duty cycle : 100%

Solenoid valve ordering codes (with connector)

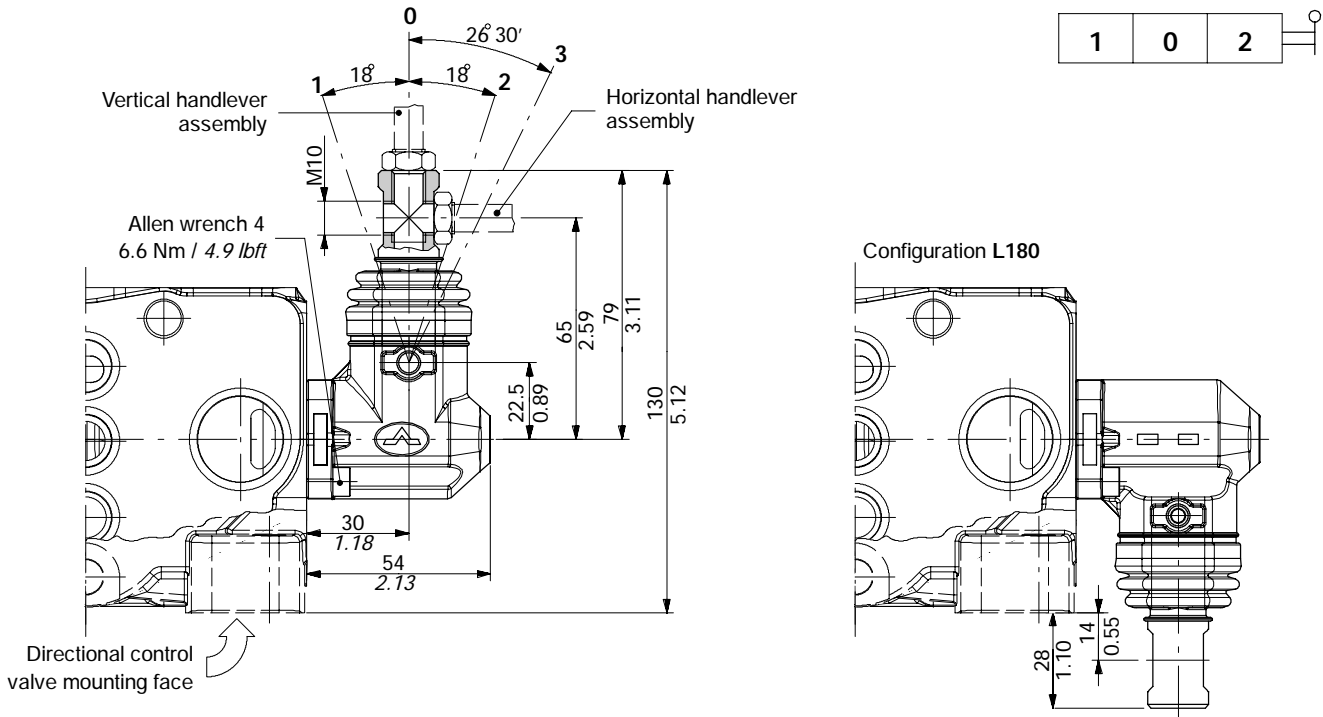
CODE	DESCRIPTION
5X4001012	Nominal voltage 12VDC
5X4001024	Nominal voltage 24VDC

"B" side options

Lever control

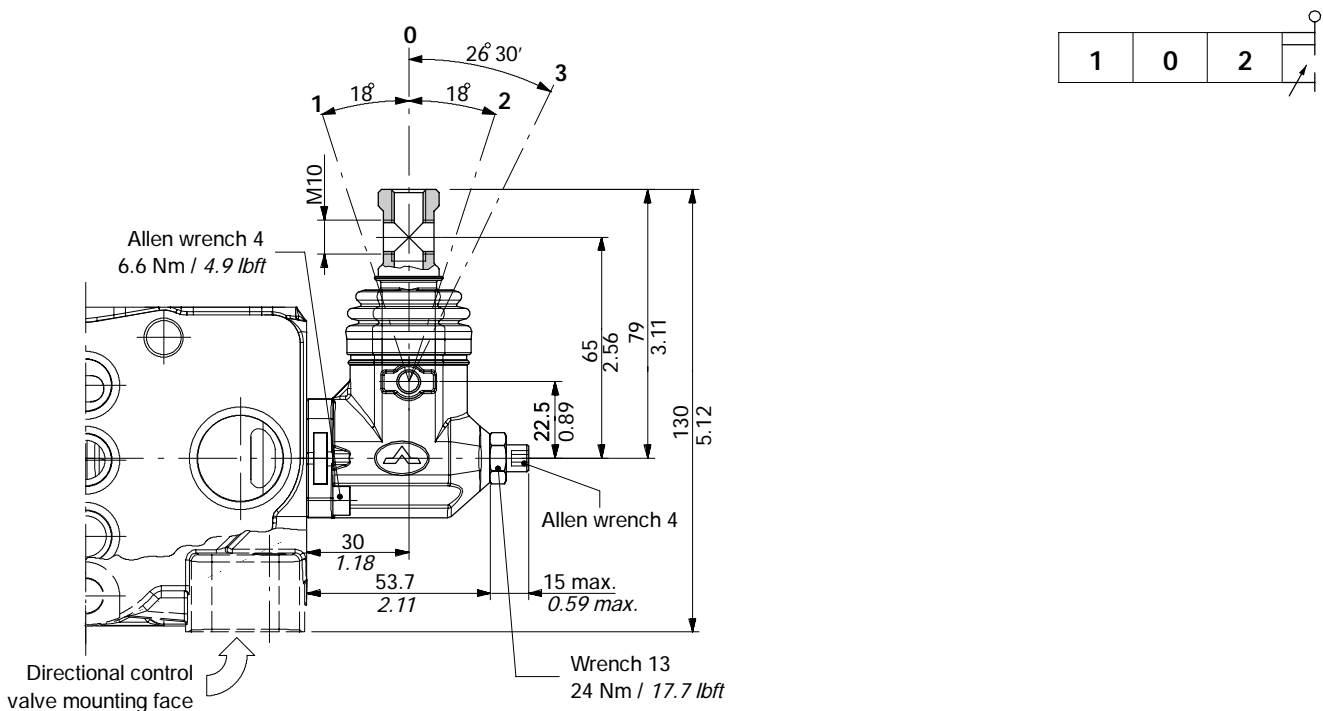
Type L

Zama (zinc alloy) lever pivot box with protective rubber bellow; it can be rotated 180° (configuration L180).



Type LF1

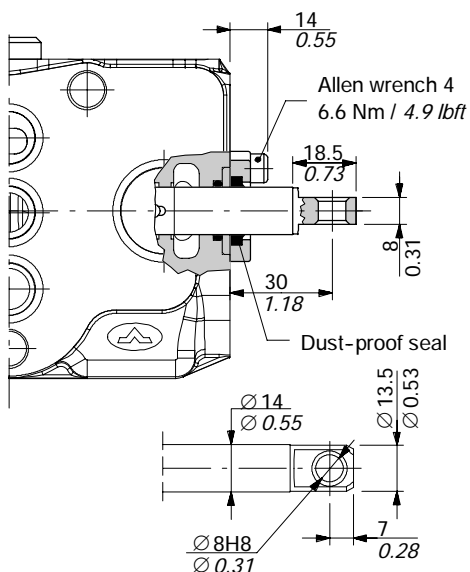
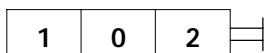
With spool stroke adjustment in position 1 (P→A); it can be rotated 180° (configuration LF1180).



Controls prearrangement

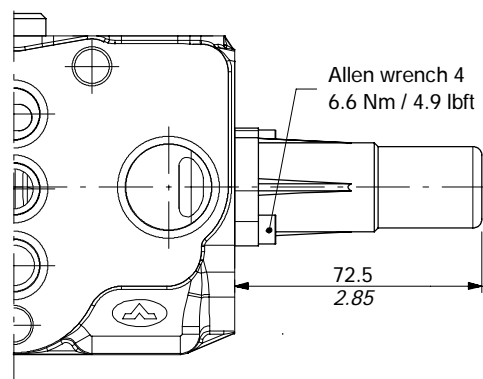
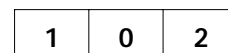
Type SLP

Mechanical control with dust-proof plate kit.



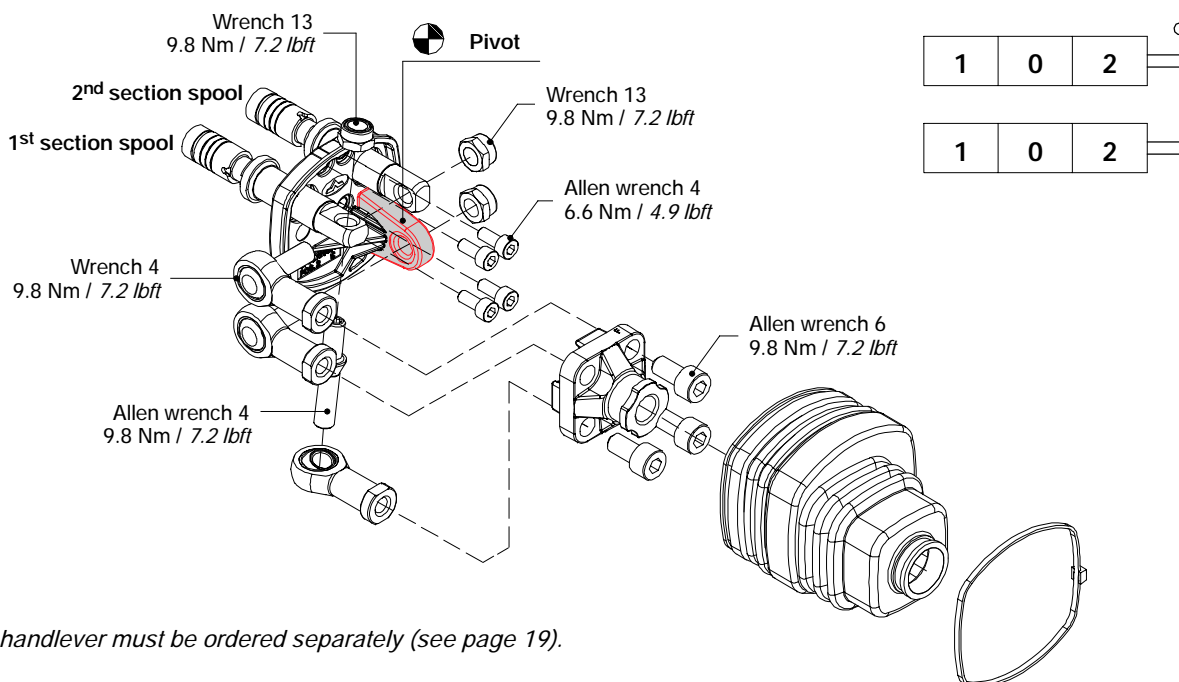
Type SLC

Protection cap usable with 8PP pneumatic or 8EP3 electro-control



Joystick type LCA

For 2 sections operation and available in two different configurations LCA1-4 e LCA2-3 for two assembling mode (see following pages).



NOTE - The handlever must be ordered separately (see page 19).

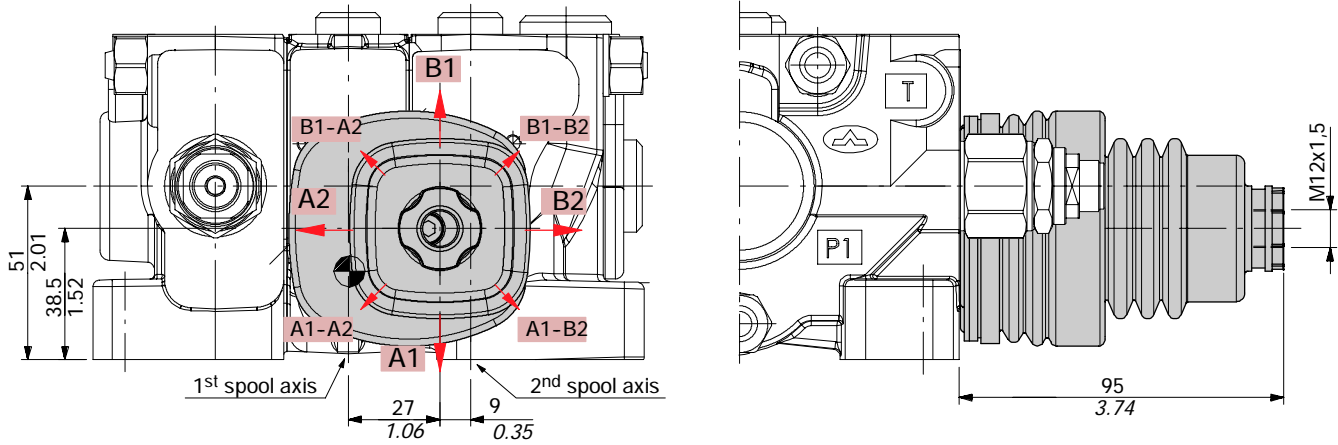
"B" side options

Joystick type LCA

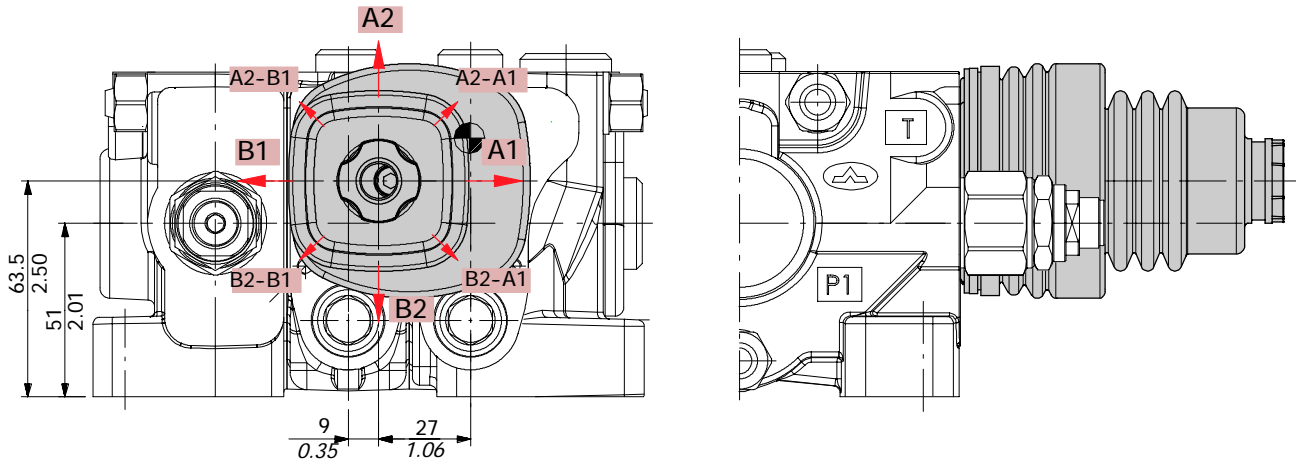
Configuration LCA1-4

LCA1 and LCA4 configurations can be obtained by rotating the flange/fulcrum block by 180°.

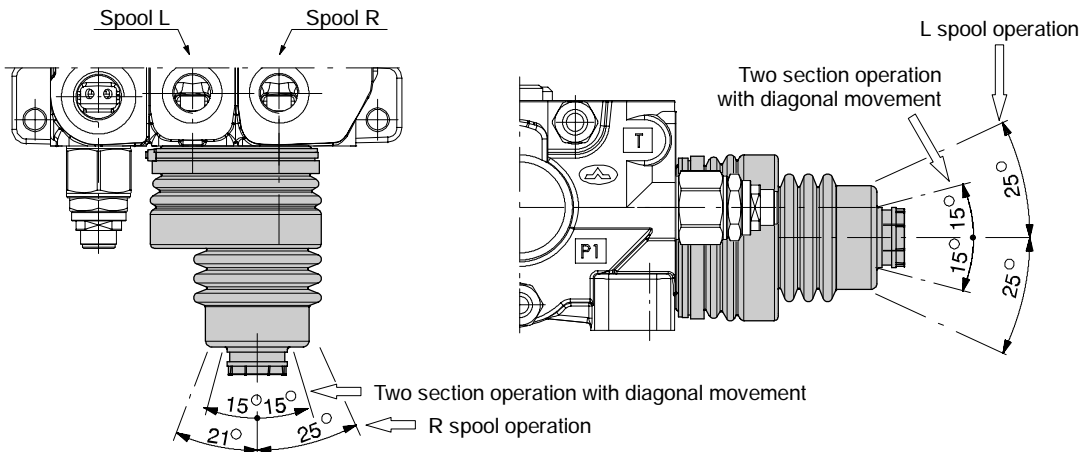
Assembling mode LCA1: pivot placed down on the left



Assembling mode LCA4: pivot placed above on the right



Operation angle

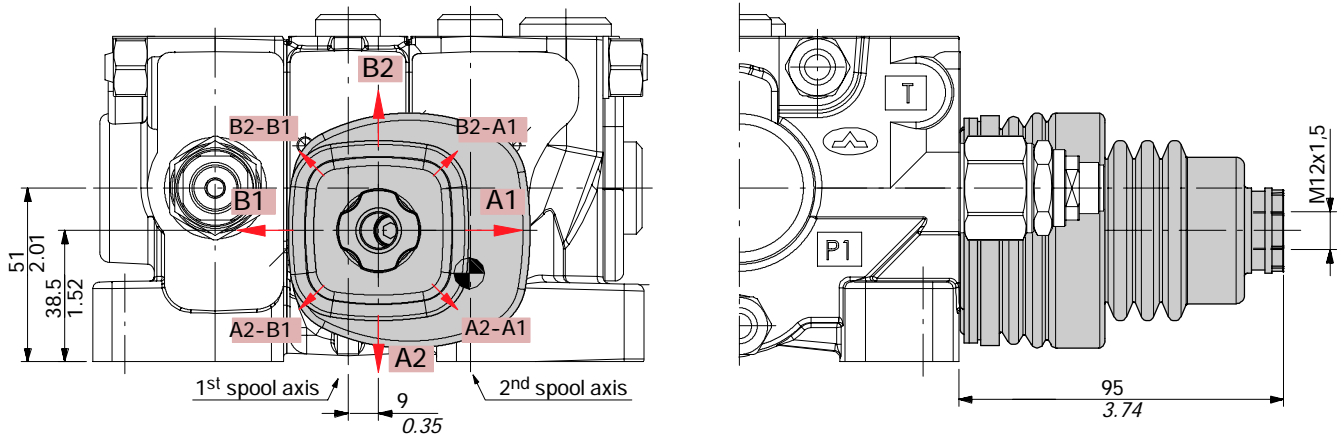


Joystick type LCA

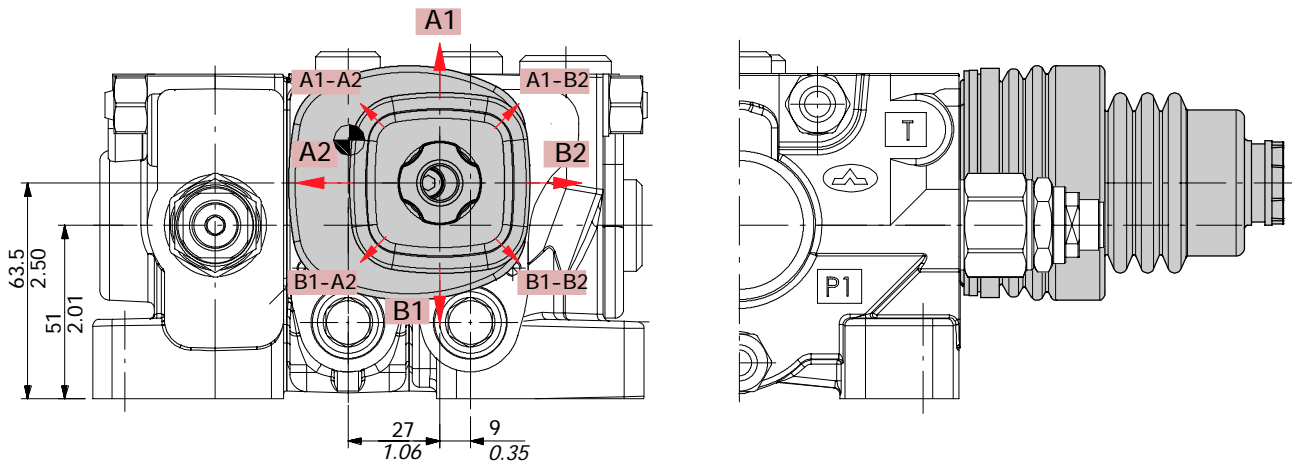
Configuration LCA2-3

LCA2 and LCA3 configurations can be obtained by rotating the flange/fulcrum block by 180°.

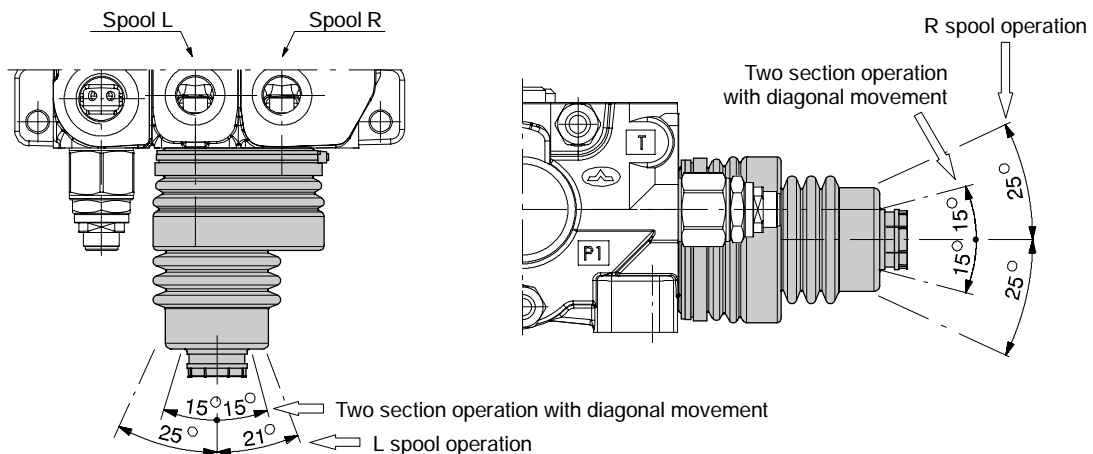
Assembling mode LCA2: pivot placed down on the right



Assembling mode LCA3: pivot placed above on the left



Operation angle



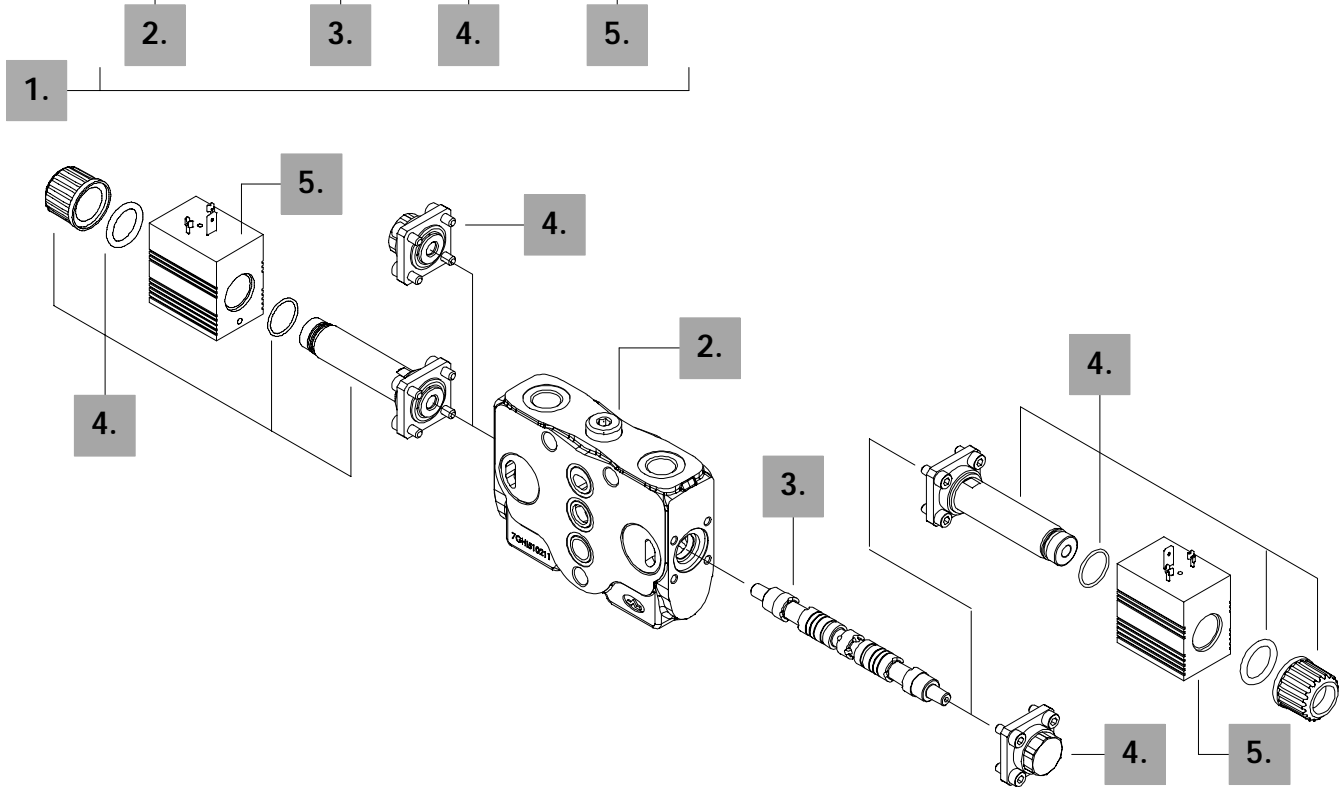
Complete controls

8ES solenoid control

Solenoid direct control with spring return to neutral position; it needs special spools and standard working section body (body kit without seals on spool).

Description example:

EL SDS100 / Q - S101 - 8ES3 - 24VDC *



1. Complete working section *

TYPE: Q-S101-8ES3-24VDC CODE: 610101002
DESCRIPTION: Parallel circuit with 3 positions double acting spool, ON/OFF solenoid control

TYPE: RQ-S101-8ES3-24VDC-F CODE: 610351004
DESCRIPTION: Working section with optional outlet fitted out previous
NOTE: for working sections codes with port valves prearrangement contact Sales Department.

2. Working section kit *

TYPE	CODE	DESCRIPTION
Q/IM-ES	5EL107301A	Parallel circuit
P/IM-ES	5EL107300A	Parallel circuit with port valves prearrangement
SQ/IM-ES	5EL307301A	Tandem circuit
SP/IM-ES	5EL307300A	Tandem circuit with port valves prearrangement
RQ/IM-ES	5FIA20731A	Section with optional outlet and parallel circuit
RP/IM-ES	5FIA20730A	As previous with valves prearrangement

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

3. Spool

TYPE	CODE	DESCRIPTION
S101	3CU6255550	Double acting, 3 positions with A and B closed in neutral position

4. Control kits

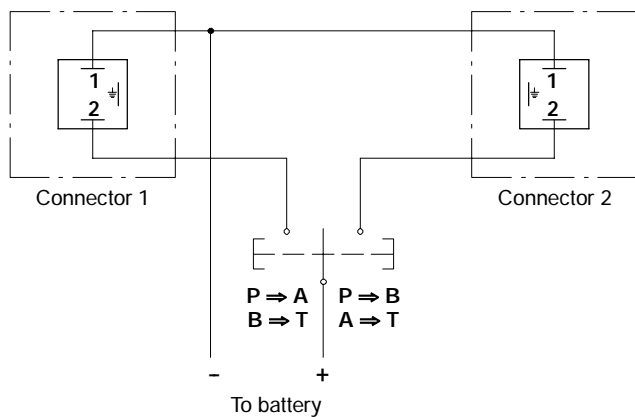
TYPE	CODE	DESCRIPTION
8ES1	5V08028	P→A, with spring return in neutral position
8ES2	5V08028	P→B, with spring return in neutral position
8ES3	5V08029	Double acting with spring return in neutral position

5. Coils

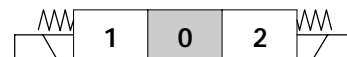
TYPE	CODE	DESCRIPTION
10,5VDC	4SOL512011	Nominal voltage 10,5VDC
12VDC	4SOL512012	Nominal voltage 12VDC
24VDC	4SOL512024	Nominal voltage 24VDC

8ES solenoid control

Electric wiring example



8ES3 kit
double acting



8ES1 kit
single acting on A



8ES2 kit
single acting on B



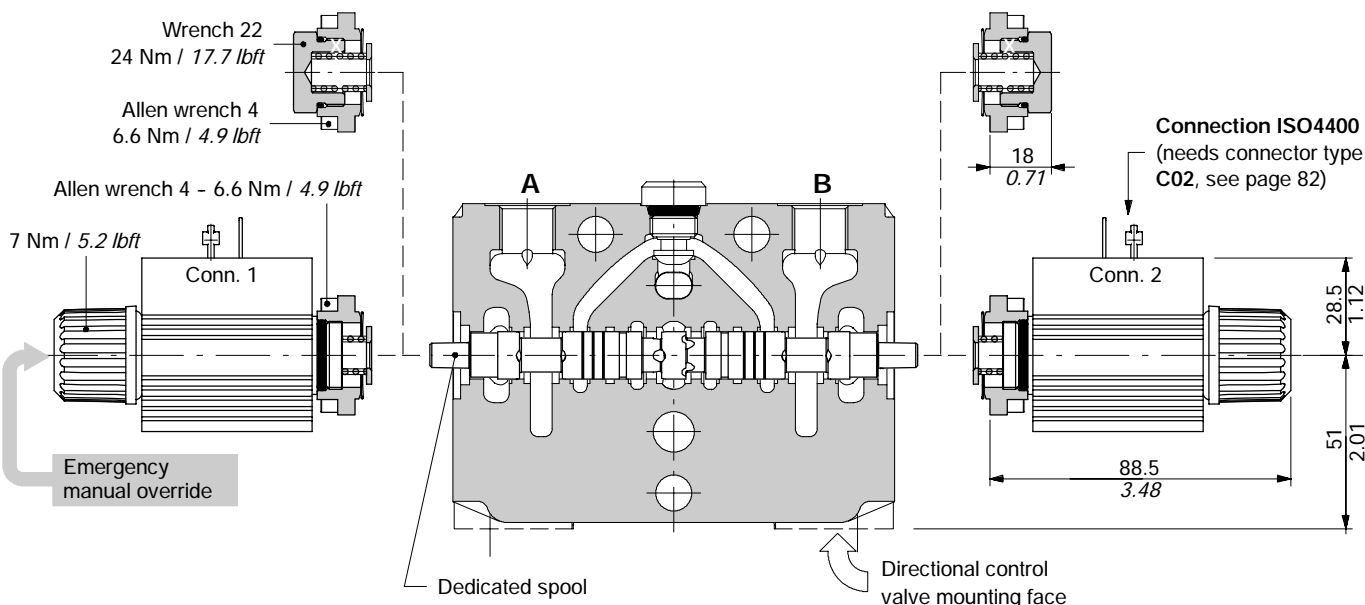
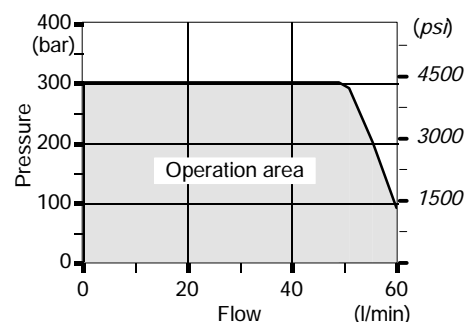
Operating features

Fuga interna A(B)→T
 (Δp = 100 bar / T = 40°C) : 10 cm³/min - 0.61 in³/min

Coil operating features

Nominal voltage tolerance : ±10%
 Power rating : 36 W
 Coil insulation : class H
 Duty cycle : 100%

Operating condition diagram



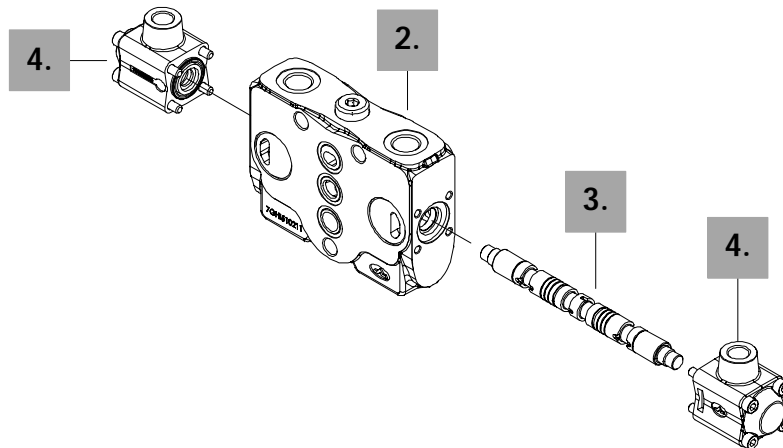
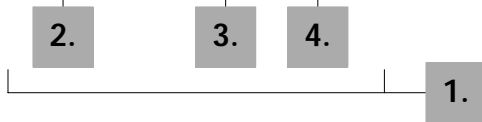
Complete controls

8IM proportional hydraulic control

It needs special spools and standard working section body (body kit without seals on spool).

Description example:

EL SDS100 / Q - I112 - 8IM *



1. Complete working section *

TYPE: Q-I112-8IM CODE: 610101003
 DESCRIPTION: Parallel circuit with 3 positions double acting spool, proportional hydraulic control
 TYPE: RQ-I112-8IM-F CODE: 610351005
 DESCRIPTION: Working section with optional outlet fitted out previous
 NOTE: for working sections codes with port valves prearrangement contact Sales Department.

2. Working section kit *

TYPE	CODE	DESCRIPTION
Q/IM-ES	5EL107301A	Parallel circuit
P/IM-ES	5EL107300A	Parallel circuit with port valves prearrangement
SQ/IM-ES	5EL307301A	Tandem circuit
SP/IM-ES	5EL307300A	Tandem circuit with port valves prearrangement
RQ/IM-ES	5FIA20731A	Section with optional outlet and parallel circuit
RP/IM-ES	5FIA20730A	As previous with valves prearrangement

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

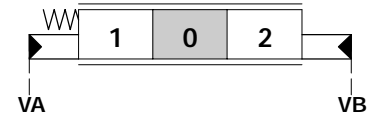
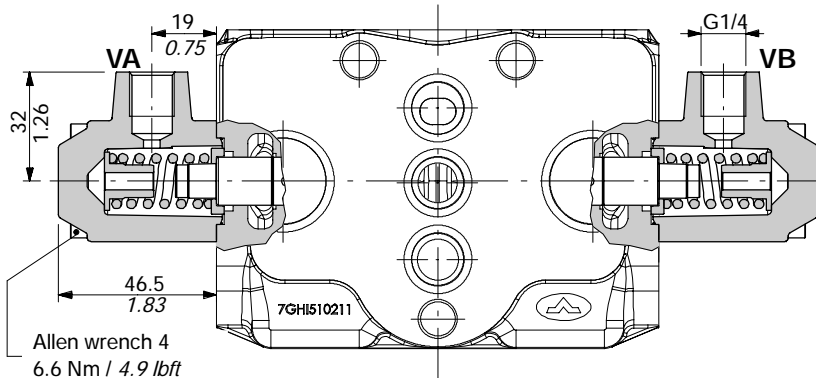
3. Spools

TYPE	CODE	DESCRIPTION
I118	3CU6410118	Double acting, 3 positions, with A and B closed in neutral position; for flow up to 20 l/min
I112	3CU6210420	As previous for flow from 20 to 40 l/min
I117	3CU6410117	As previous for flow from 40 to 60 l/min
I203	3CU6225420	Double acting, 3 positions, with A and B open to tank in neutral position; for flow from 20 to 40 l/min

4. Control kit

TYPE	CODE	DESCRIPTION
8IM	5IDR207300	Double sides proportional hydraulic control with spring return in neutral position

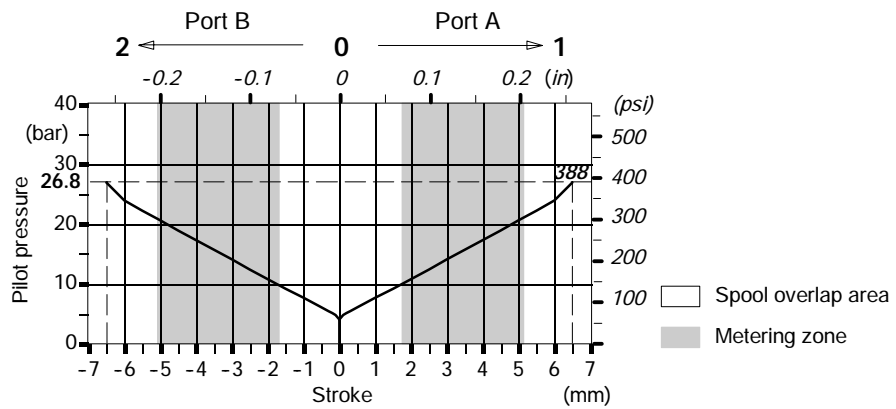
8IM proportional hydraulic control



Operating features

Max pilot pressure 70 bar / 1015 psi

Pilot pressure - stroke diagram

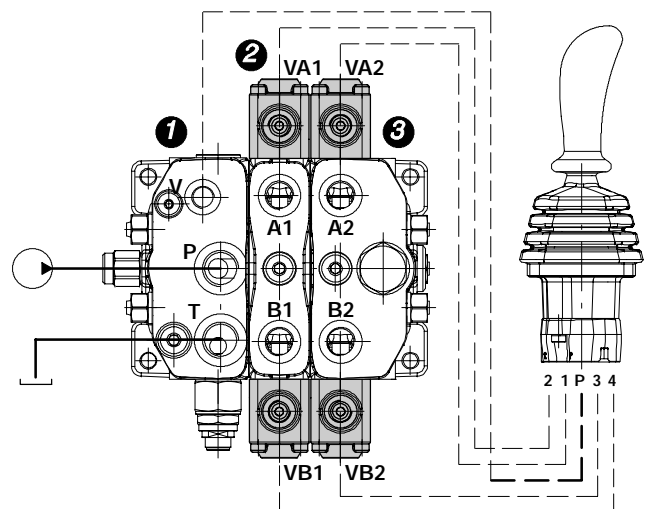
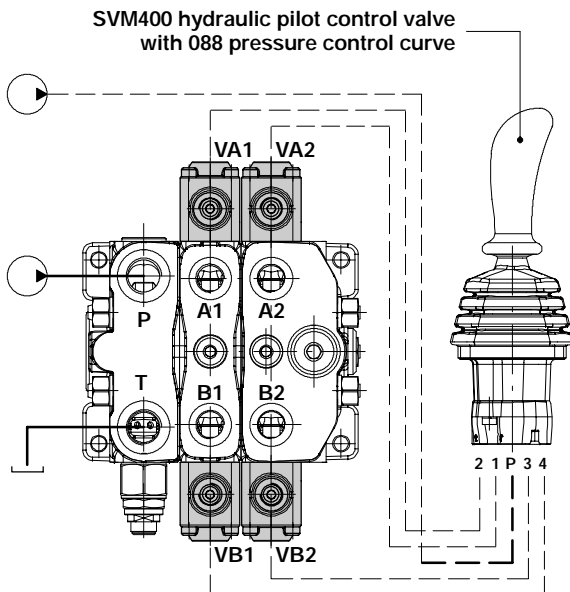


Connection example

Configuration for connection to the pilot valve with external pump (see previous page).

Configuration for direct connection from the directional control valve to the pilot valve.

- 1) CR inlet section with pressure reducing valve (see page 58)
- 2) PA or QA working section with pilot through and drain (see page 74)
- 3) RPA or RQA optional outlet working section with pilot through line closing and backpressure valve (see page 76).



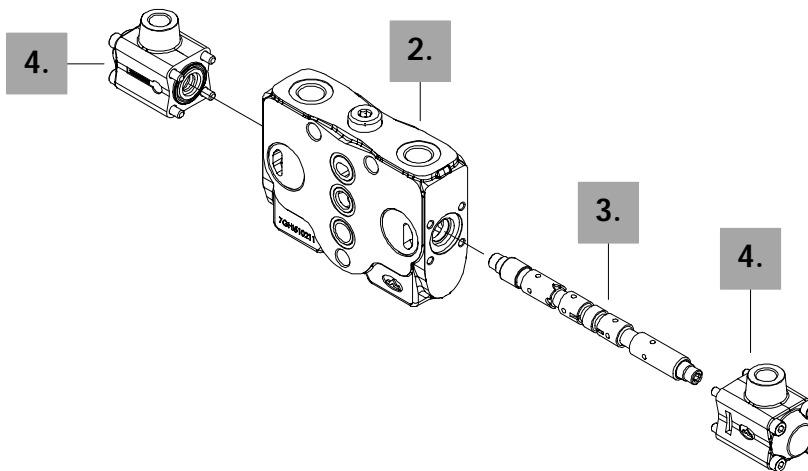
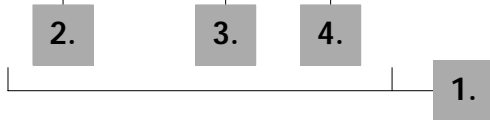
Complete controls

13IM proportional hydraulic control

It needs special spools and special working section body (body kit without seals on spool).

Description example:

EL SDS100 / Q - I501 - 13IM *



1. Complete working section *

TYPE: P5-I501-13IM.UTUT CODE: 610101600

DESCRIPTION: Parallel circuit with port valves prearrangement, 4 positions double acting spool, floating in 4th position with spool in, proportional hydraulic control

TYPE: RP5-I501-13IM.UTUT CODE: 610301600

DESCRIPTION: Working section with optional outlet fitted out previous

NOTE: for working sections codes without port valves prearrangement contact Sales Department.

2. Working section kit *

TYPE	CODE	DESCRIPTION
Q5/IM	5EL107321A	Parallel circuit
P5/IM	5EL107320A	Parallel circuit with port valves prearrangement
SQ5/IM	5EL307321A	Tandem circuit
SP5/IM	5EL307320A	Tandem circuit with port valves prearrangement
RQ5/IM	5FIA207315A	Optional outlet working section, with parallel circuit
RP5/IM	5FIA207305A	As previous with port valves prearrangement

3. Spools

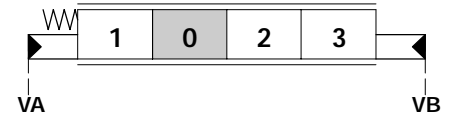
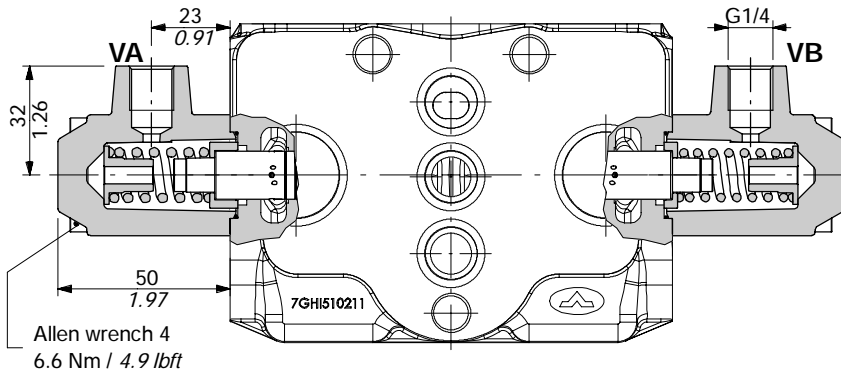
TYPE	CODE	DESCRIPTION
I503	3CU6442000	4 positions double acting spool, floating circuit in 4 th position with spool in, for flow from 20 to 40 l/min.

4. Control kit

TYPE	CODE	DESCRIPTION
13IM	5IDR207350	Double sides proportional hydraulic control with spring return in neutral position; for floating circuit spool

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

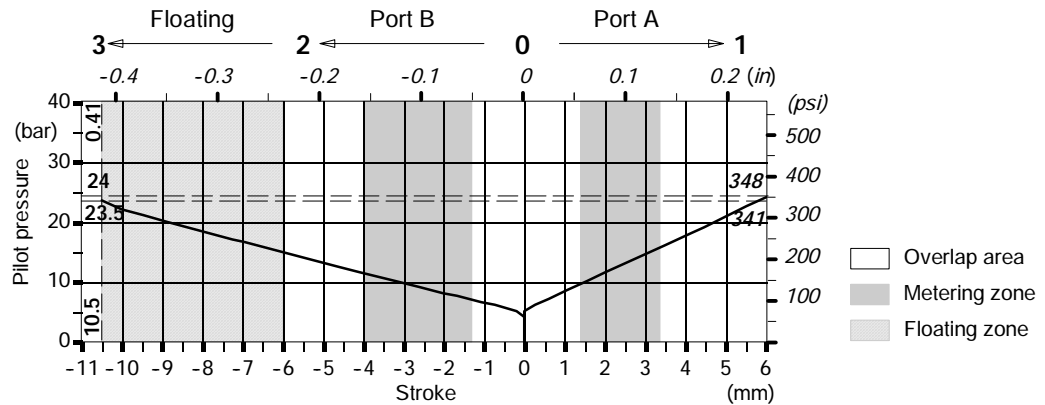
13IM proportional hydraulic control



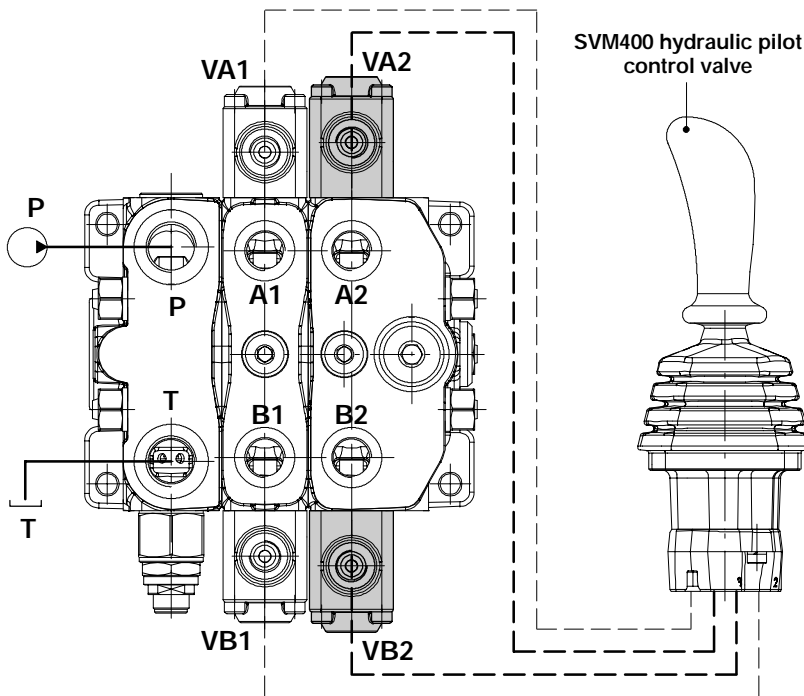
Operating features

Max pilot pressure : 70 bar / 1015 psi

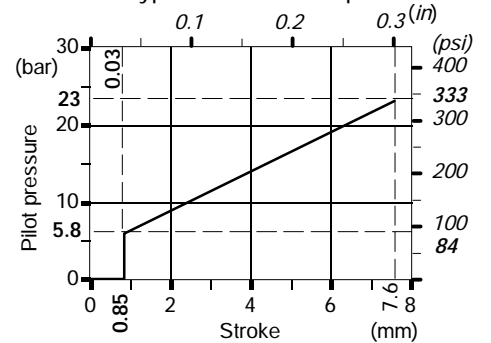
Pilot pressure - stroke diagram



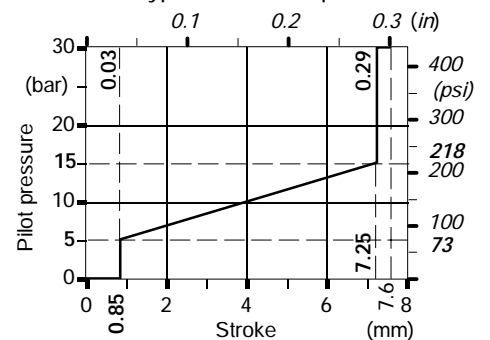
Connection example



Pressure control curve (port VA2)
type 135 without step



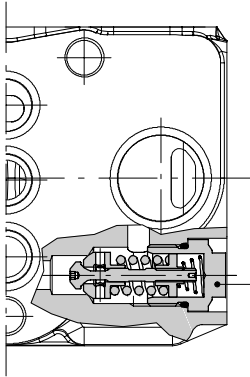
Pressure control curve (port VB2)
type 075 with step



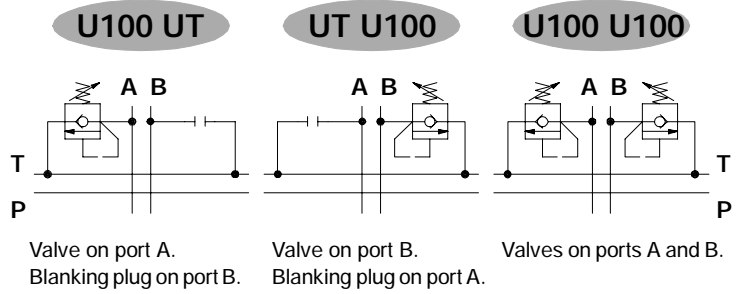
Antishock with prefill

U 100

Pressure setting in bar.



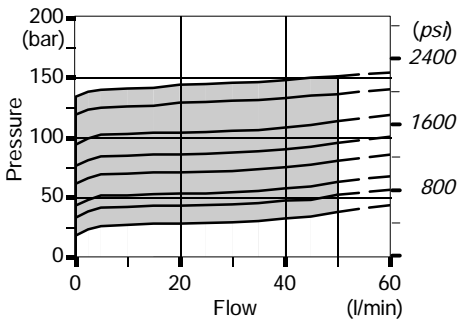
Wrench 13
24 Nm / 17.7 lbf



Performance data

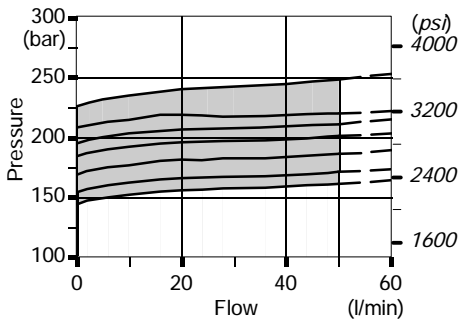
Pressure / flow diagram

(25-40-50-63-80-100-125-140 bar)
(360-580-725-900-1160-1450-1800-2030 psi)



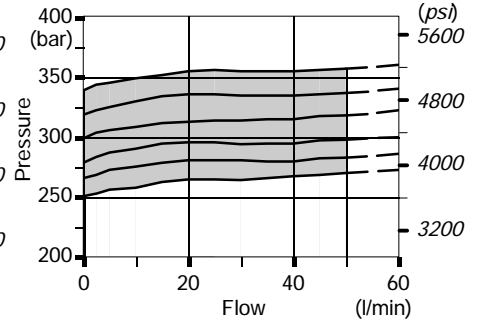
Pressure / flow diagram

(150-160-175-190-200-210-230 bar)
(2180-2320-2550-2750-2900-3050-3380 psi)

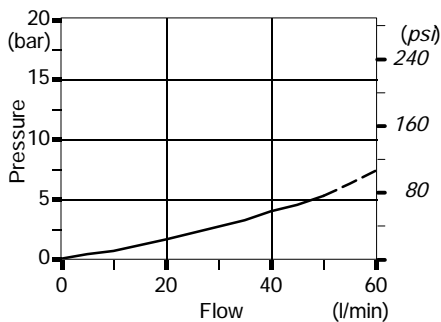


Pressure / flow diagram

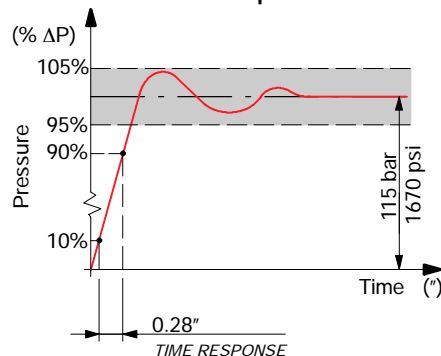
(250-270-280-300-320-340 bar)
(3600-3900-4050-4350-4650-4950 psi)



Pressure drop

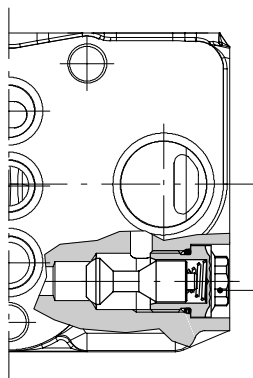


Time response

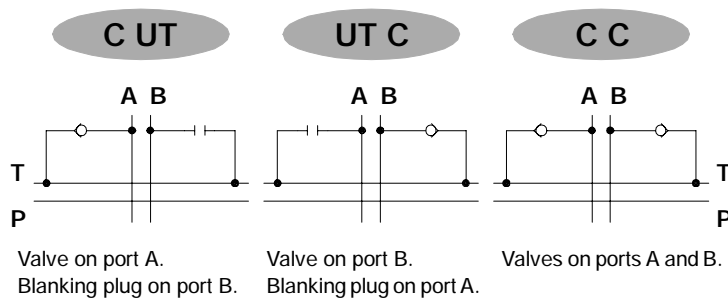


Anticavitation

C

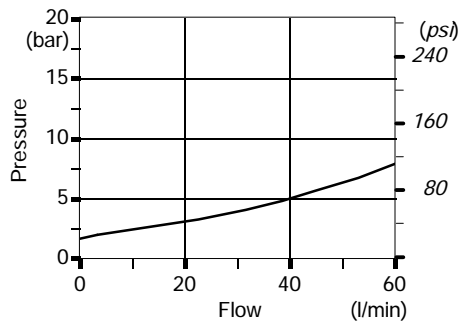


Wrench 13
24 Nm / 17.7 lbf



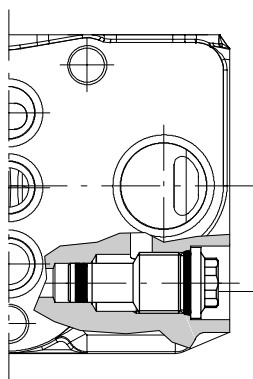
Performance data

Pressure drop

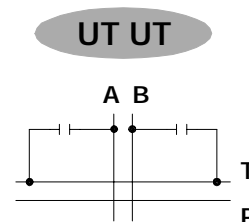


Valve blanking plug

UT

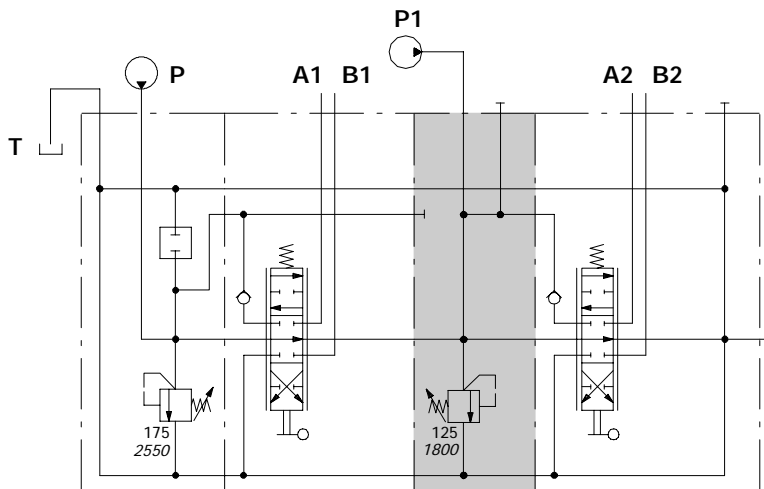
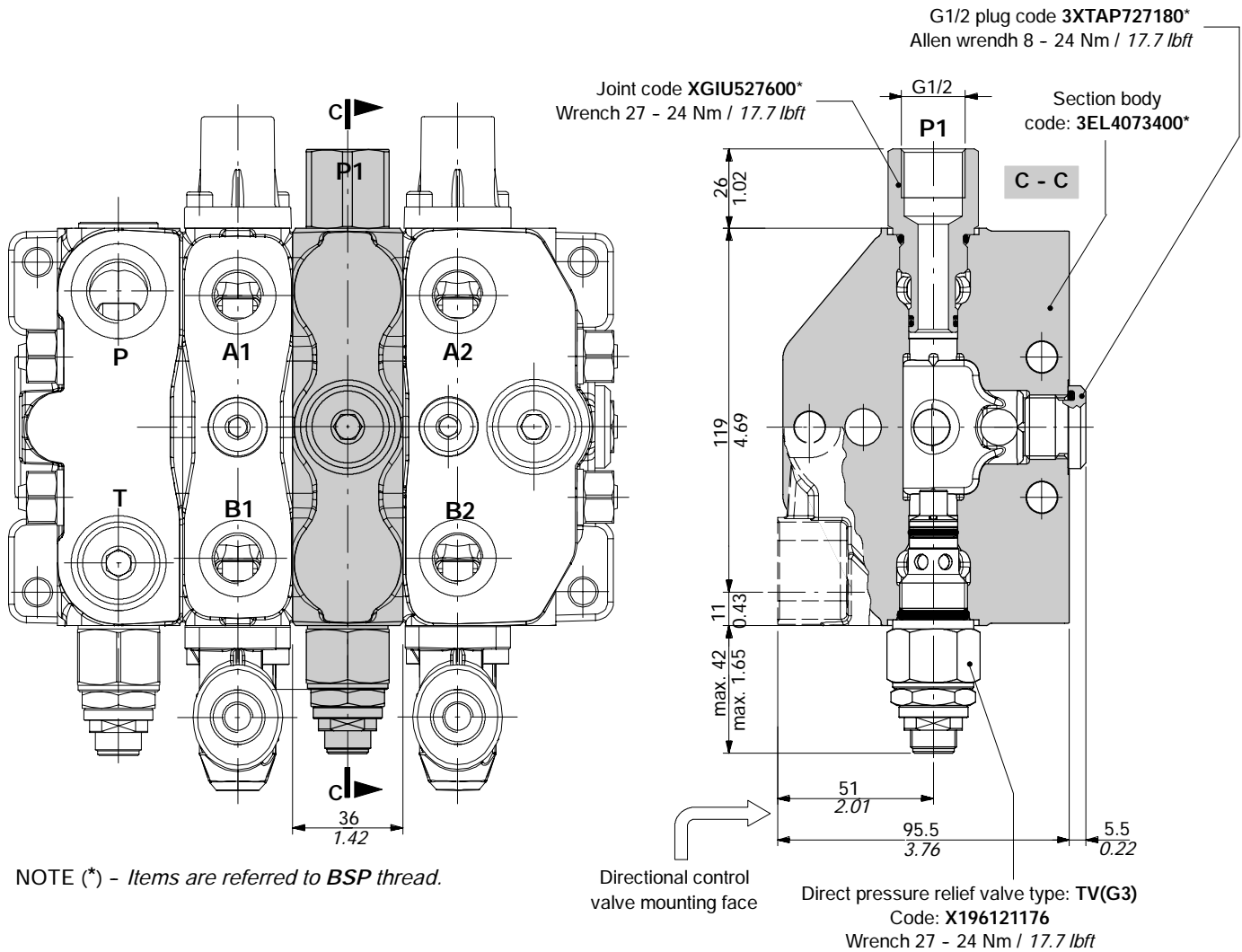


Wrench 13
24 Nm / 17.7 lbf



EI2 intermediate section

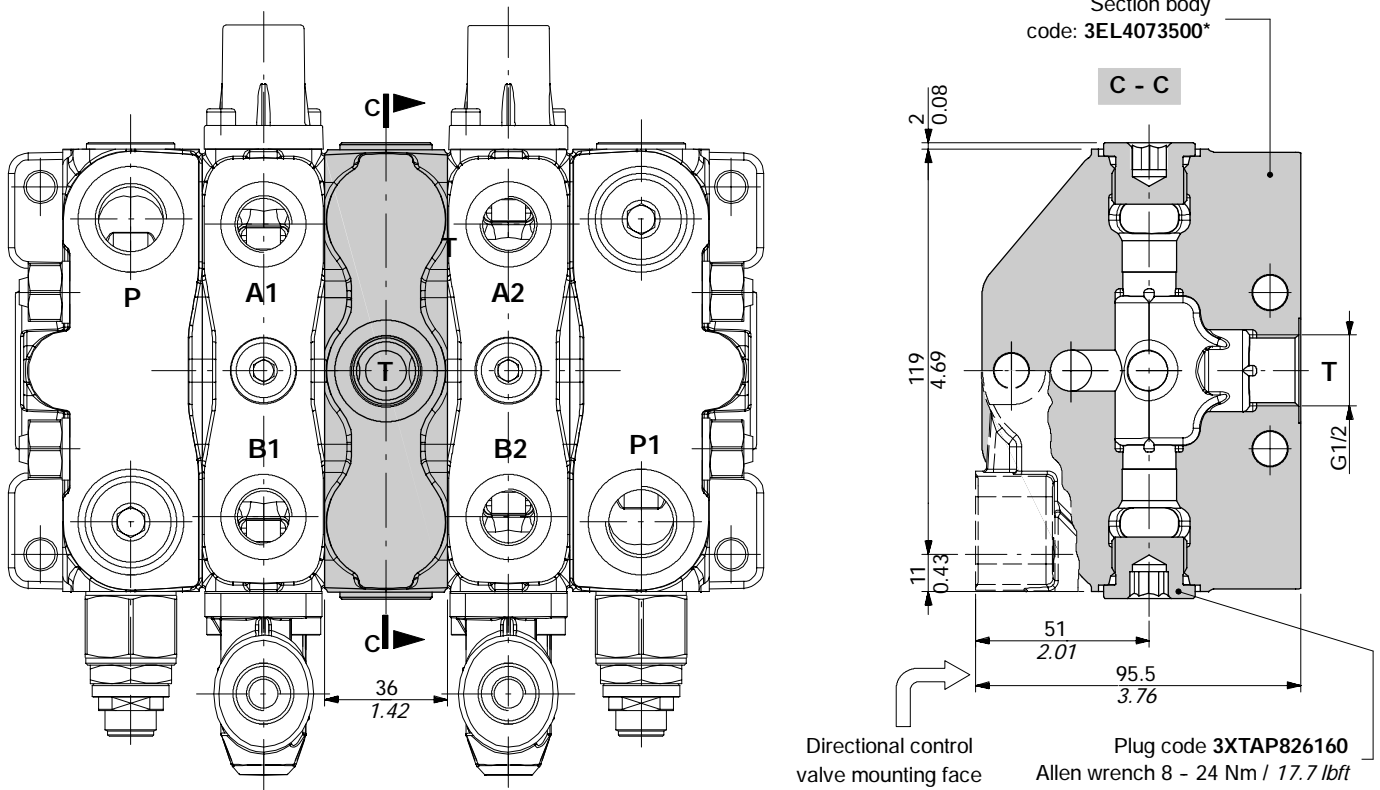
Section with service relief valve section and prearranged for a second inlet.



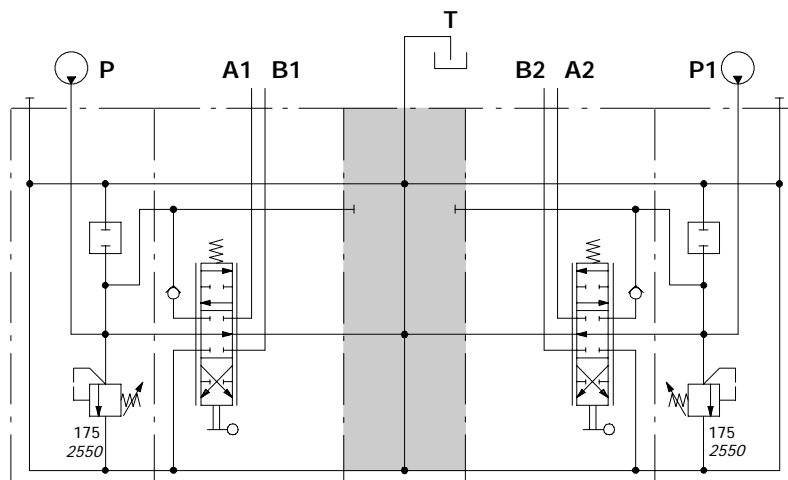
Description example:

SDS100/2/CN(TG3-175)/Q-101-8L/EI2(TVG3-125)/RQ-101-8L-F

Mid return manifold for directional valve with left and right inlet both; they allow 2 independent circuits with common outlet.



NOTE (*) - Items are referred to **BSP** thread.



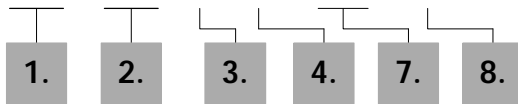
Description example:

SDS100/2/CN(TVG3-175)/Q-101-8L/CS1/Q-101-8L/BN(TVG3-175)

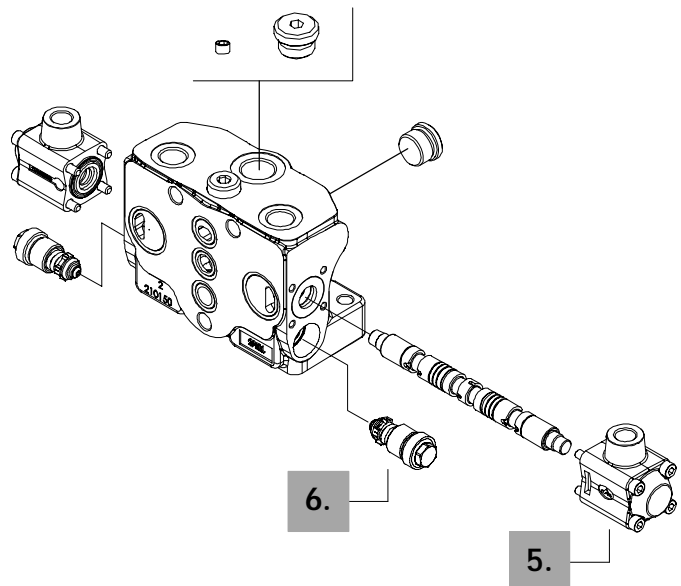
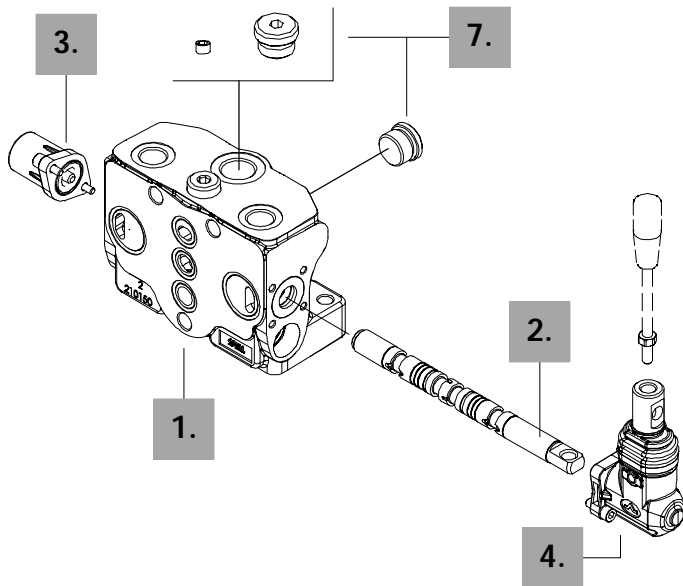
Section with optional outlet type R

Description example:

FS SDS100 / RQ - 101 - 8 L - AE - F *



FS SDS100 / RP - I112 - 8IM . UTUT - F *



1. Working section kit page 51

Include body, seals, rings and load check valve.

TYPE	CODE	DESCRIPTION
RQ	5FIA207310	Parallel circuit
RP	5FIA207300	Parallel circuit prearranged for port valves
RQS	5FIA207319	Tandem circuit
RPS	5FIA207309	Tandem circuit prearranged for port valves

Section kits for special spools

RQ5	5FIA207315A	Parallel circuit prearranged for floating circuit: for spool type 501
RP5	5FIA207305A	As previous prearranged for port valves: for spool type 501

2. Spools page 23

For list see page 19.

3. "A" side spool positioners page 30

For list see page 19.

4. "B" side options page 36

For list see page 19.

5. Complete controls page 40

For list see page 19.

6. Port valves page 46

For list see page 19.

7. Circuit options page 53

TYPE	CODE	DESCRIPTION
F	3XTAP727180	With side and upper outlet ports plugged (standard): nr.2 plugs
TL	3XTAP727180	With side outlet ports open: nr.1 plug
TA	3XTAP727180	With upper outlet port open: nr.1 plug
AE	4TAP314010	Upper carr-over port: nr. 1 plug
AEK	3XTAP727180 + 4TAP314010	Closed centre with side outlet port open: nr.1 plug for code type

NOTA (*) - Items are referred to BSP thread.

Section with optional outlet type R

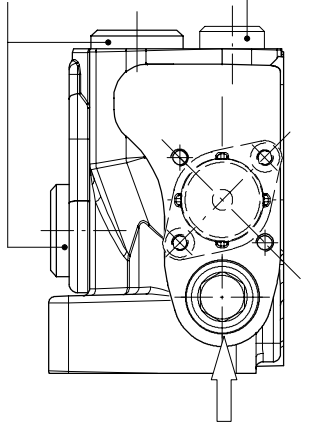
Section kit and hydraulic circuit

Configuration combining a working section with the closing flange to reduce dimensions.

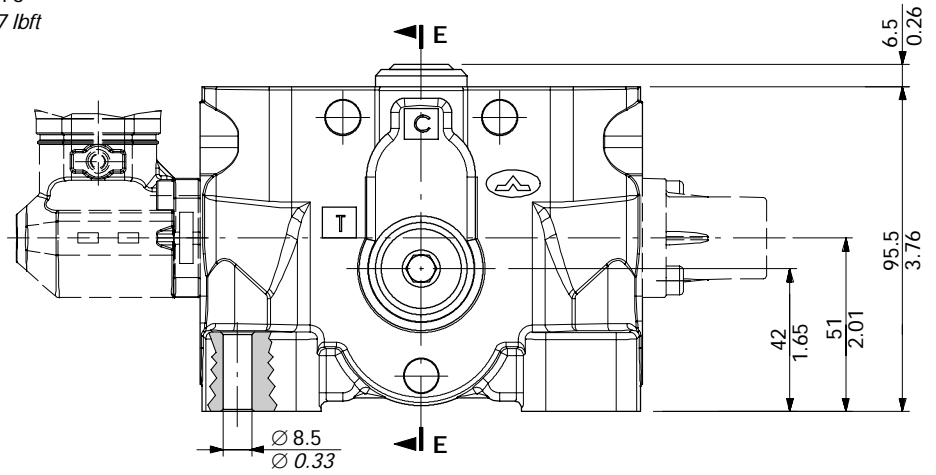
Below it's show a configuration with parallel circuit, port valves prearrangement, optional side and upper outlet ports plugged (F type)

G1/2 ports plugged
Allen wrench 8
24 Nm / 17.7 lbf

VR load check valve
Allen wrench 6
24 Nm / 17.7 lbf

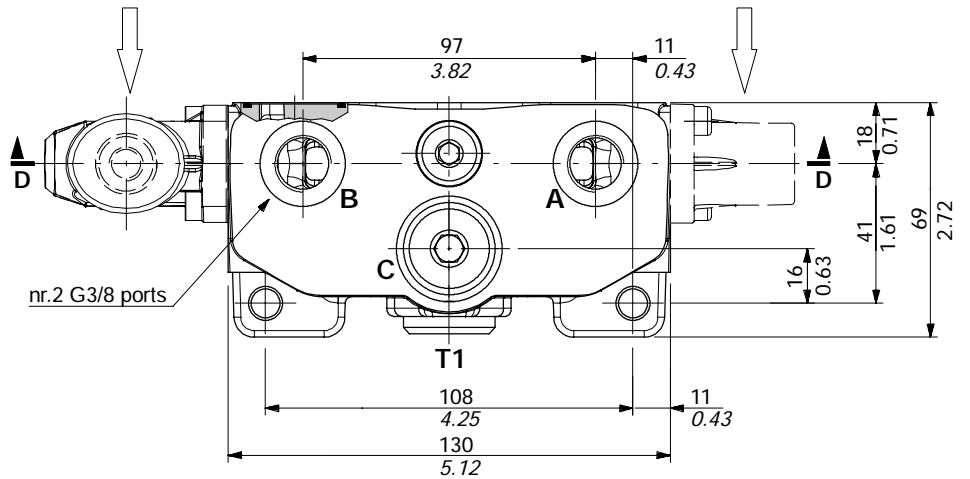


Port valves (page 46)



"B" side option (page 36)

"A" side spool positioner (page 30)

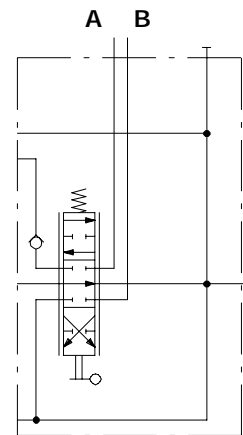
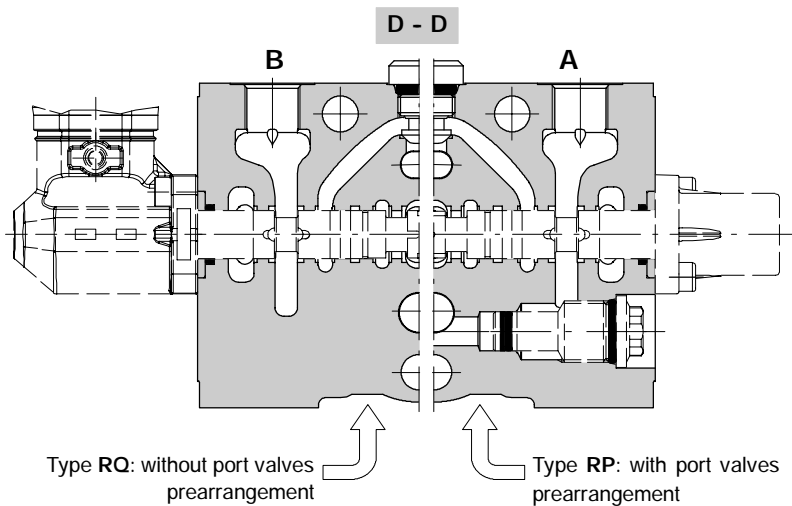


nr.2 G3/8 ports

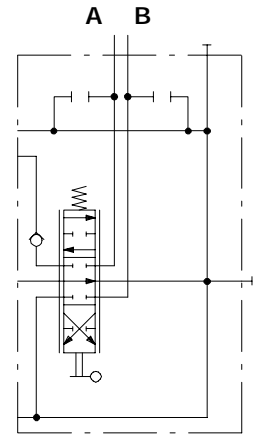
Section with optional outlet type R

Section kit and hydraulic circuit

Parallel circuit



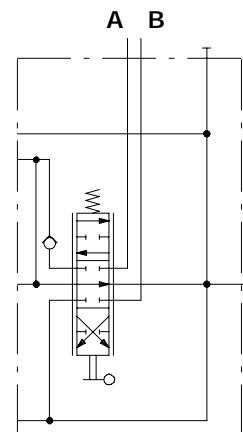
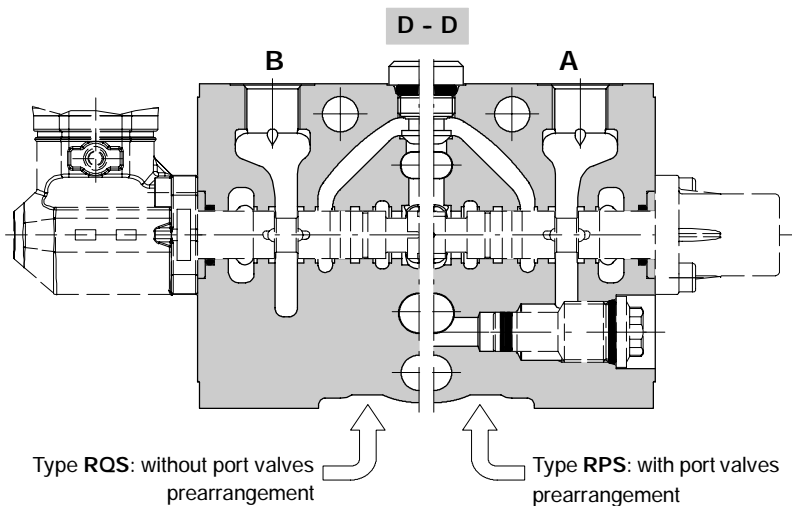
Description example:
RQ-101-8L-F



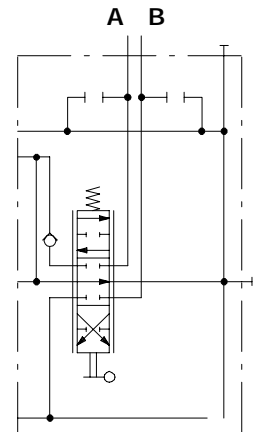
Description example:
RP-101-8L.UTUT-F

Tandem circuit

It's necessary to use QR or PR sections (see page 22).



Description example:
RQS-101-8L-F



Description example:
RPS-101-8L.UTUT-F

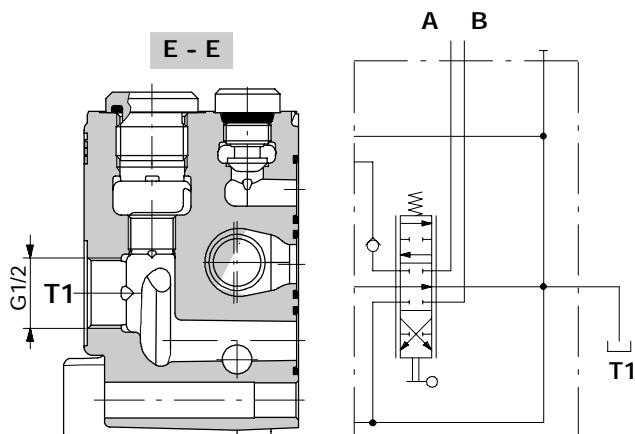
Section with optional outlet type R

Circuit options

For type F standard configuration see page 51.

TL configuration

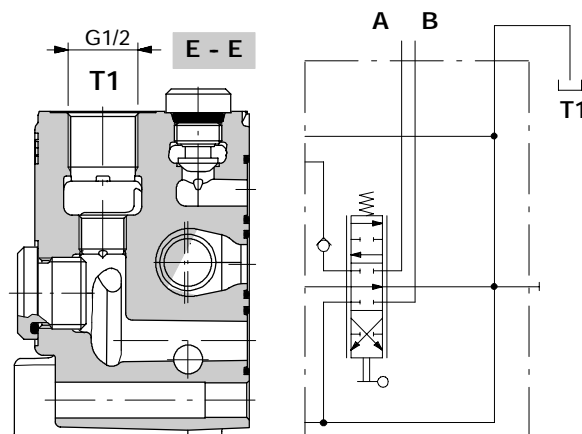
It's necessary to plug port T on inlet section.



Description example:
RQ-101-8L-TL

TA configuration

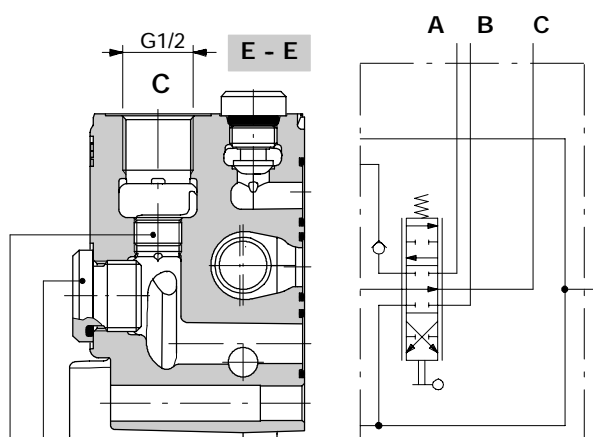
It's necessary to plug port T on inlet section.



Description example:
RQ-101-8L-TA

AE configuration (carry-over)

Outlet is on port T of inlet section.

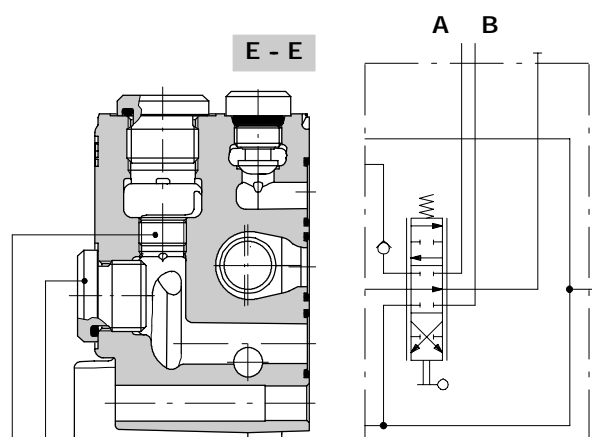


- Allen wrench 8
24 Nm / 17.7 lbf
- M14x1,5 DIN906 plug
Allen wrench 7
42 Nm / 31 lbf

Description example:
RQ-101-8L-AE

AEK configuration (closed centre)

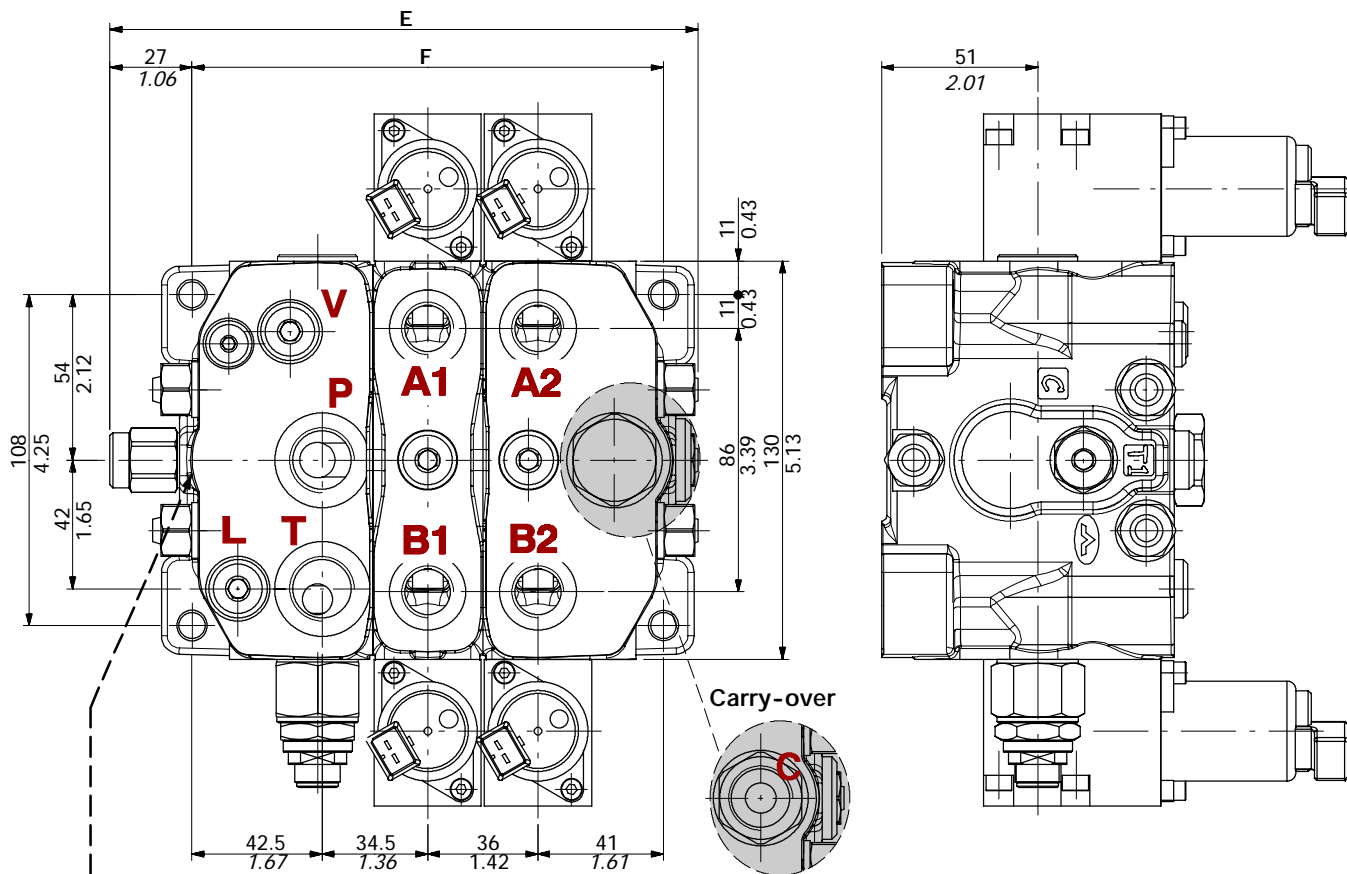
Outlet is on port T of inlet section.




- Allen wrench 8
24 Nm / 17.7 lbf
- M14x1,5 DIN906 plug
Allen wrench 7
42 Nm / 31 lbf

Description example:
RQ-101-8L-AEK

Dimensional data



 **WALVOIL**
 P0300001
 Code 111020000
 Ref.....
MADE IN ITALY

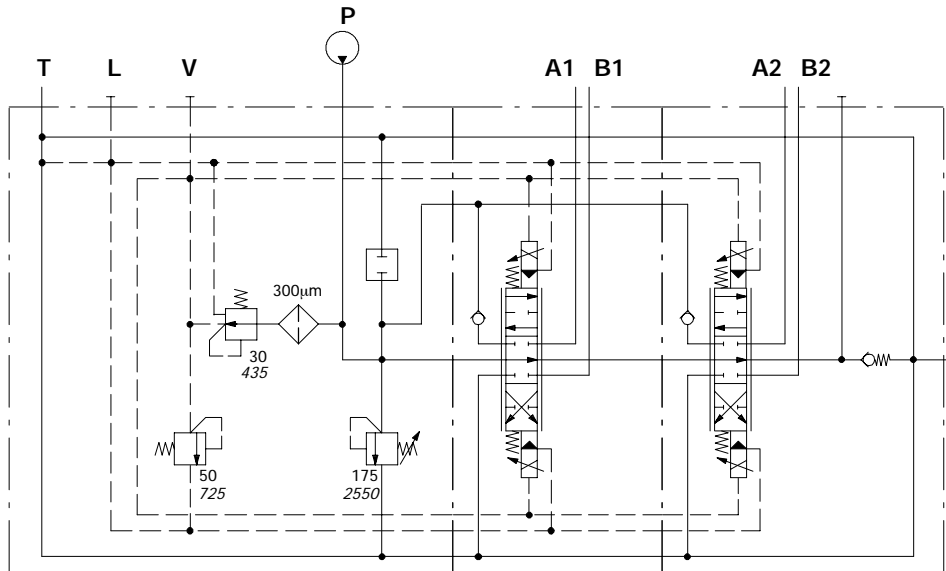
Production batch :
 P03 = production year (2003)
 00001 = progressive number
 Customer reference

NOTE - For dimensions of sections and controls, please see the related pages.

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SDS100/1	157	6.18	118	4.65	10.2	22.5
SDS100/2	193	7.60	154	6.06	13.8	30.4
SDS100/3	229	9.02	190	7.48	17.4	38.4
SDS100/4	265	10.43	226	8.90	21	46.3
SDS100/5	301	11.85	262	10.31	24.6	54.2

TYPE	E		F		Weight	
	mm	in	mm	in	kg	lb
SDS100/6	337	13.27	298	11.73	28.2	62.2
SDS100/7	373	14.69	334	13.15	31.8	70.1
SDS100/8	409	16.10	370	14.57	35.4	78
SDS100/9	445	17.52	406	15.98	39	86
SDS100/10	481	18.94	442	17.40	42.6	93.9

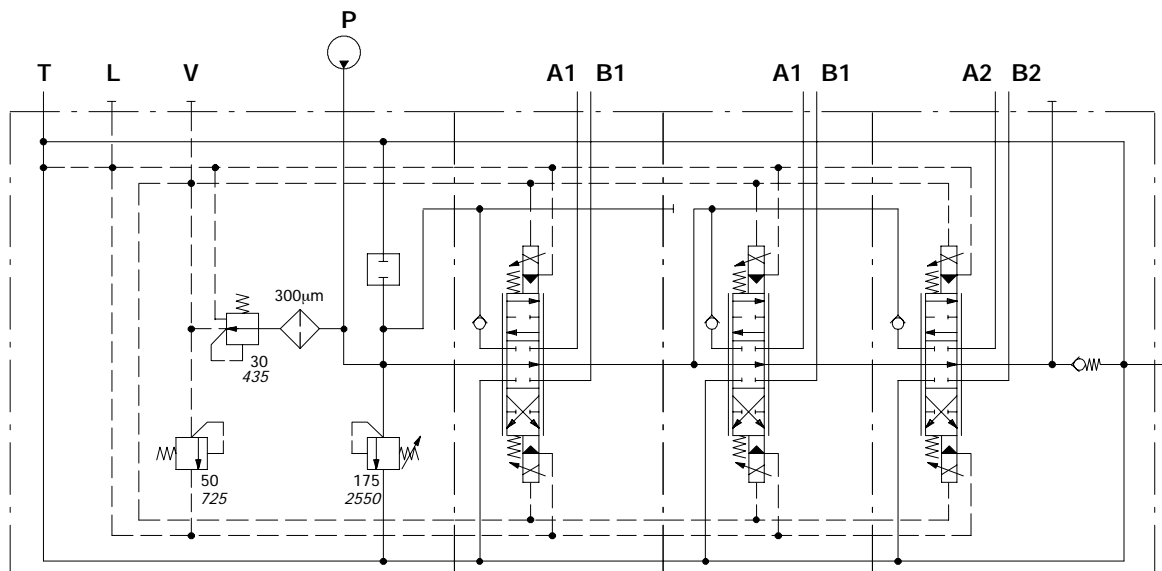
Parallel



Description example:

SDS100/3/CR(TVG3-175)/QE-E101-8EB3/RQE-E101-8EB3-VRC-F-12VDC

Tandem

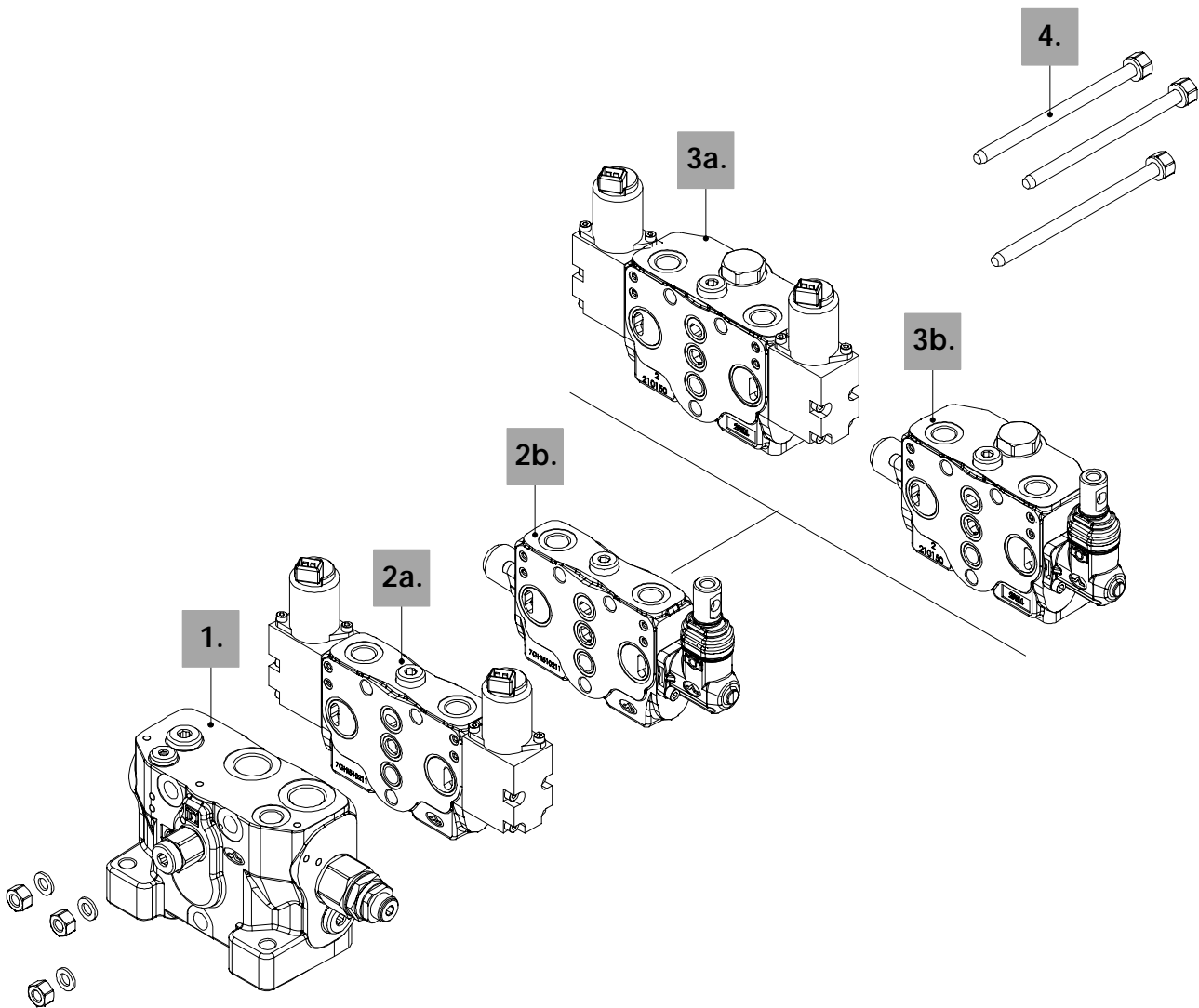
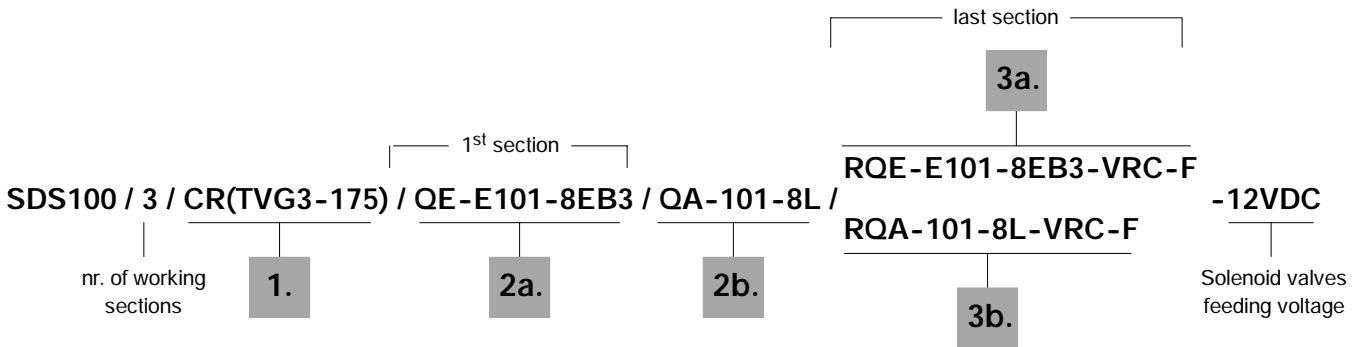


Description example:

SDS100/3/CR(TVG3-175)/QE-E101-8EB3/SQE-E101-8EB3/RQE-E101-8EB3-VRC-F-12VDC

Ordering codes

Description example:



1. Complete inlet section * page 58

TIPO	CODICE	DESCRIZIONE
CR(TVG3-175)	610201004	Fiancata con ingresso superiore e valvola di sovrappressione; pilotaggio e drenaggio interni
CR(SV)	610201005	Fiancata con sede valvola di sovrappressione tappata

With electro-hydraulic control**2a. Complete working section type E * page 62**

TYPE: QE-E101-8EB3-12VDC	CODE: 610151002	DESCRIPTION: Parallel circuit with double side electro-hydraulic control
TYPE: PE-E101-8EB3.UTUT-12VDC	CODE: 610101006	DESCRIPTION: Parallel circuit with double side electro-hydraulic control and port valves prearrangement
TYPE: SQE-E101-8EB3-12VDC	CODE: 610121006	DESCRIPTION: Tandem circuit with double side electro-hydraulic control
TYPE: SPE-E101-8EB3.UTUT-12VDC	CODE: 610121007	DESCRIPTION: Tandem circuit with double side electro-hydraulic control and port valves prearrangement

3a. Section with optional outlet type E * page 70

TYPE: RQE-E101-8EB3-VRC-F-12VDC	CODE: 610351006	DESCRIPTION: Parallel circuit with double side electrihydraulic control and backpressure valve
TYPE: RPE-E101-8EB3.UTUT-VRC-F-12VDC	CODE: 610301006	DESCRIPTION: As previous with port valves prearrangement

With mechanical controls**2b. Complete working section type A * page 74**

TYPE: QA-101-8L	CODE: 610153001	DESCRIPTION: Parallel circuit with lever control and spring return in neutral position
TYPE: PA-101-8L.UTUT	CODE: 610103001	DESCRIPTION: Parallel circuit with lever control and spring return in neutral position, prearranged for port valves
TYPE: SQA-101-8L	CODE: 610121010	DESCRIPTION: Tandem circuit with lever control and spring return in neutral position
TYPE: SPA-101-8L.UTUT	CODE: 610121011	DESCRIPTION: Tandem circuit with lever control and spring return in neutral position, prearranged for port valves

3b. Section with optional outlet type A * page 76

TYPE: RQA-101-8L-VRC-F	CODE: 610301008	DESCRIPTION: Parallel circuit with lever control and spring return in neutral position and backpressure valve
TYPE: RPA-101-8L.UTUT-VRC-F	CODE: 610301009	DESCRIPTION: As previous with port valves prearrangement

4. Assembling kit

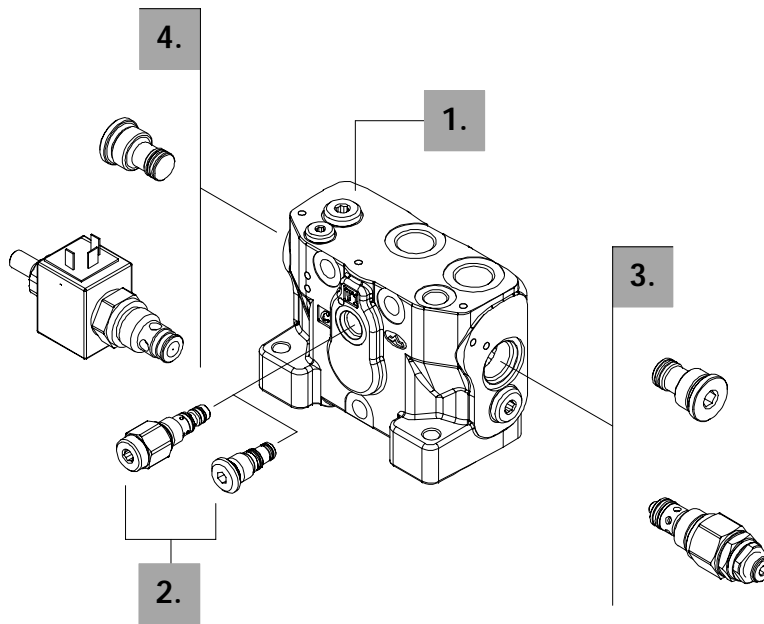
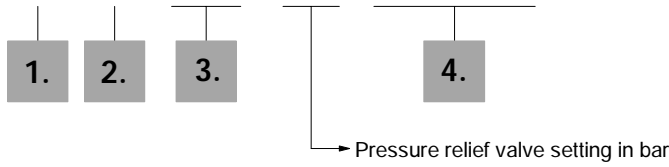
CODE	DIRECTIONAL VALVE
5TIR110145	Tie rod kit for 1 section valve
5TIR110179	Tie rod kit for 2 sections valve
5TIR110215	Tie rod kit for 3 sections valve
5TIR110252	Tie rod kit for 4 sections valve
5TIR110289	Tie rod kit for 5 sections valve
5TIR110323	Tie rod kit for 6 sections valve
5TIR110359	Tie rod kit for 7 sections valve
5TIR110397	Tie rod kit for 8 sections valve
5TIR110431	Tie rod kit for 9 sections valve
5TIR110467	Tie rod kit for 10 sections valve

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

Inlet and outlet section

Description example:

FE SDS100 / C R (TVG3 - 175) ELT-12VDC *



1. Section body kit * page 59

TYPE	CODE	DESCRIPTION
C	5FIA107303	Standard configuration

2. Pressure reducing valve page 59

TYPE	CODE	DESCRIPTION
R	X219740030	Pressure reducing valve
SR	XTAP519350	Valve blanking plug

3. Inlet relief options page 16

Standard setting is referred to 10 l/min flow.

TYPE	CODE	DESCRIPTION
<u>VMD100/1: direct pressure relief valve type T (standard)</u>		
(TVG2-80)	X196121081	Range 63 to 100 bar / 900 to 1450 psi standard setting 80 bar / 1160 psi
(TVG3-175)	X196121176	Range 100 to 200 bar / 1450 to 2900 psi standard setting 175 bar / 2550 psi
(TVG4-220)	X196121220	Range 200 to 300 bar / 2900 to 4350 psi standard setting 220 bar / 3200 psi

SV XTAP526360 Pressure relief valve blanking plug

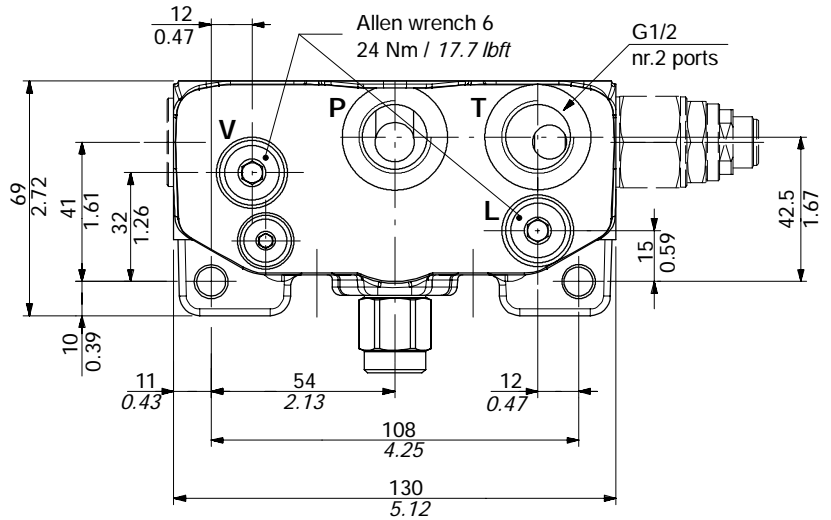
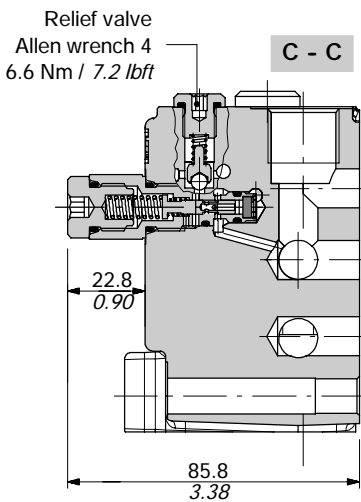
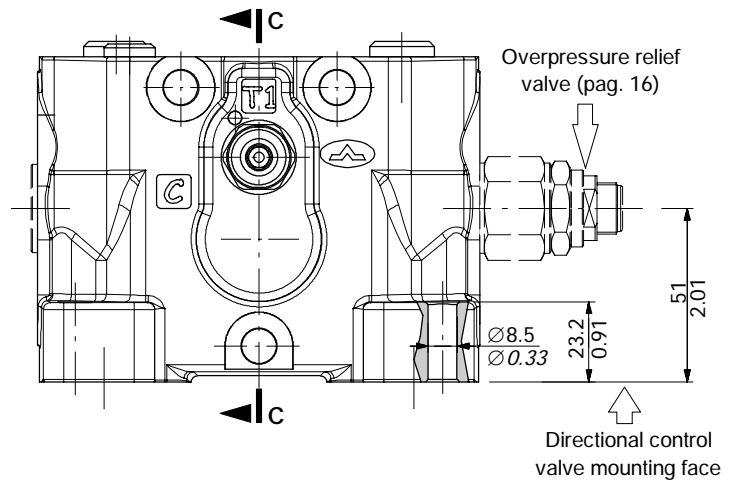
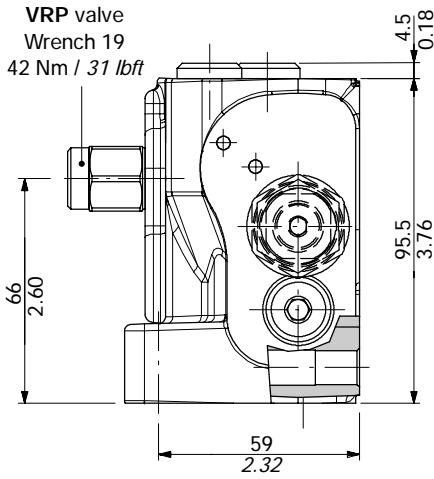
4. Inlet valve options page 17

TYPE	CODE	DESCRIPTION
ELT	5CAR407320	12 VDC solenoid operated unloader valve
	5CAR407325	24 VDC solenoid operated unloader valve
SV	XTAP526360	Valve blanking plug: in valve description the word SV must be omitted because standard

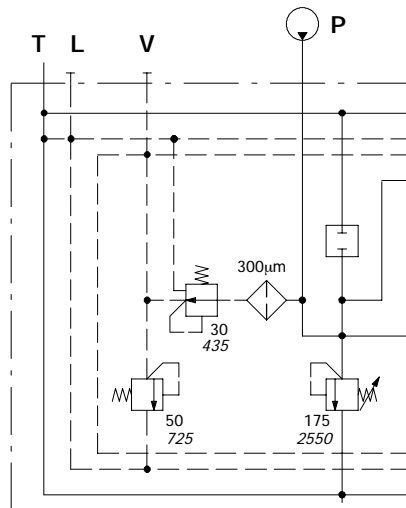
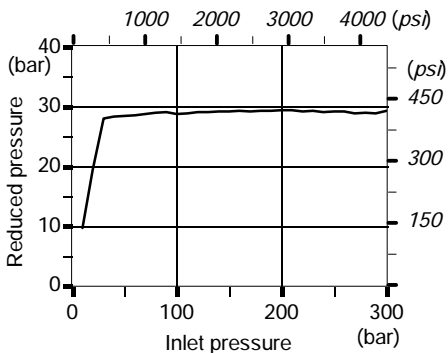
NOTE (*) - Codes are referred to **BSP** thread.

Section kit and hydraulic circuit

It's show standard configuration, with internal pilot and drain.



VRP pressure reducing valve performance curve



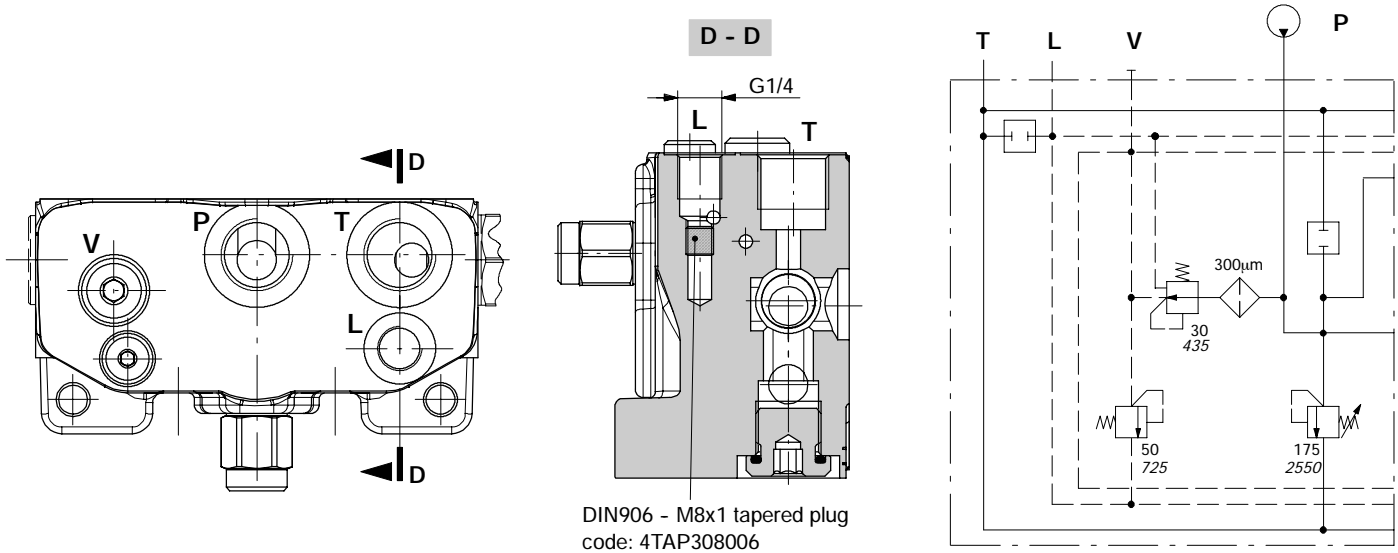
Description example: CR(TVG3-175)

Inlet and outlet section

Section kit and hydraulic circuit

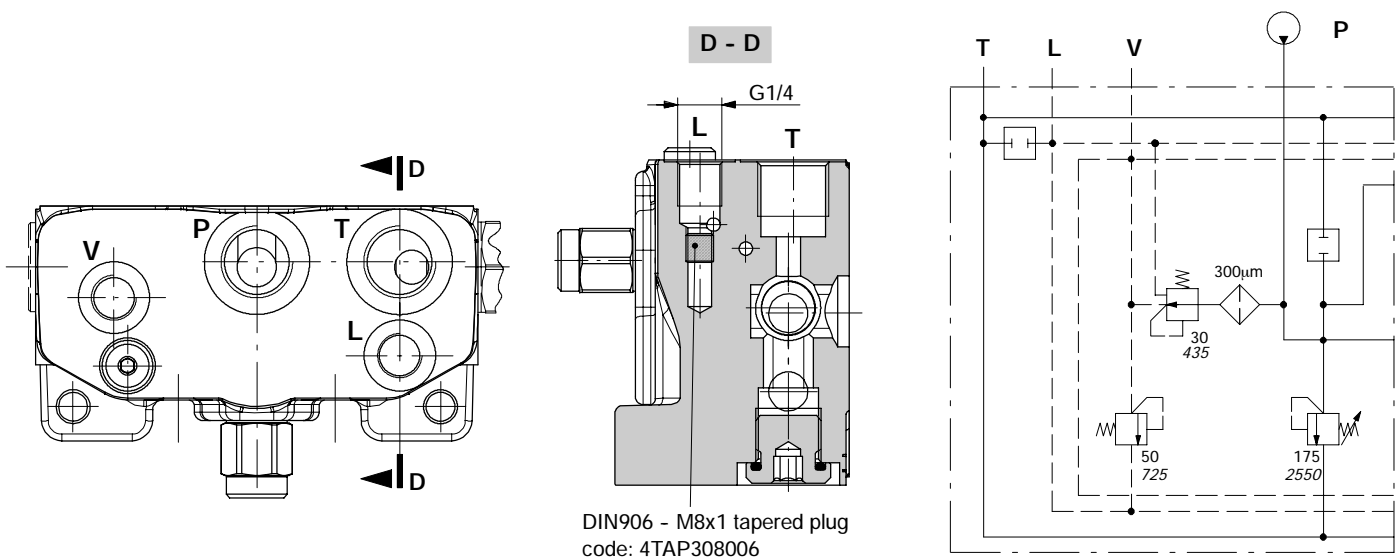
External drain configuration

Suggested configuration for valve with **8EB3LH** electro-hydraulic control: required to avoid that backpressure on return can influence the hysteresis of the control.



Description example:
CR(TVG3-175)....- NOTAP(L)

External pilot and drain configuration

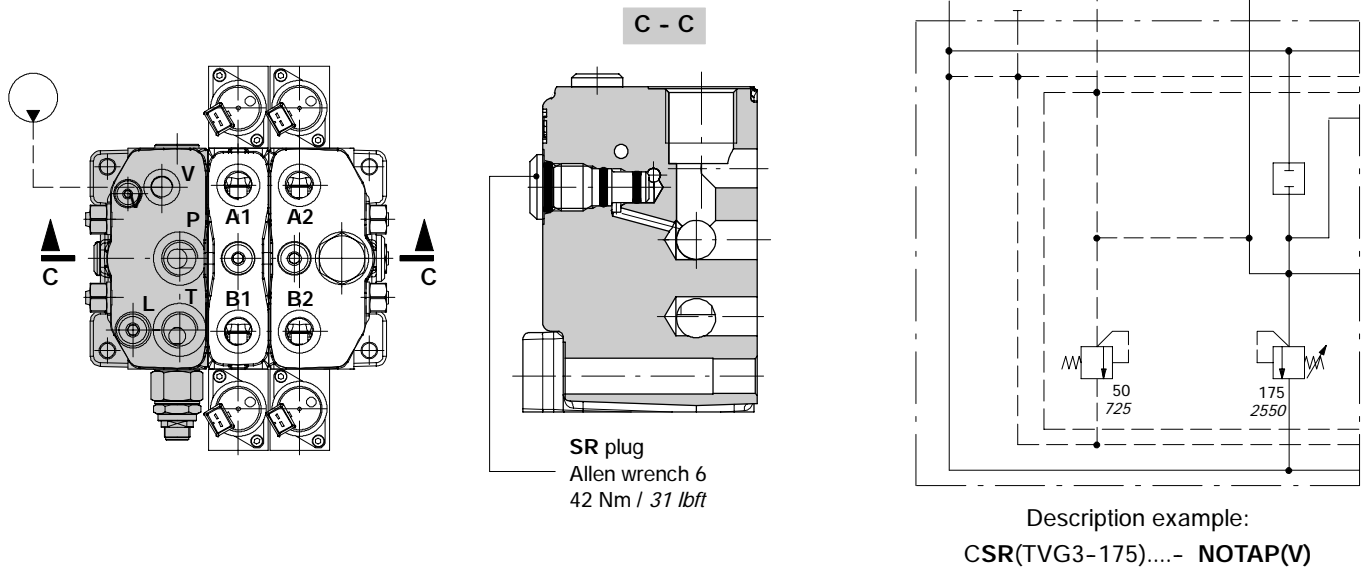


Description example:
CR(TVG3-175)....- NOTAP(VL)

Section kit and hydraulic circuit

Configuration without pressure reducing valve

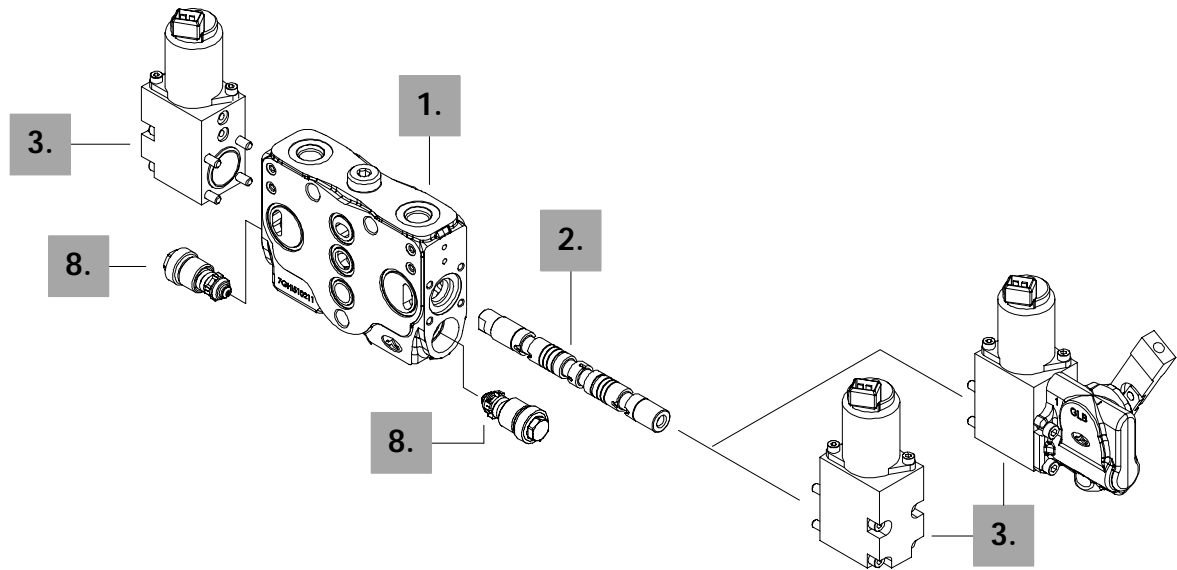
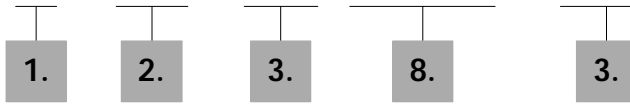
The electro-hydraulic control kit can be driven by connecting a pump ($Q= 5 \text{ l/min}$ and $P_{max}= 50 \text{ bar} / 725 \text{ psi}$) to the V port and replacing the pressure reducing valve with the appropriate plug (see page 59). Available with internal or external drain.



Working section type E

Description example:

EL SDS100 / PE - E101 - 8EB3 . U100U100 - 12VDC *



1. Working sections kit * *page 63*

Include body, seals and load check valve.

TYPE	CODE	DESCRIPTION
QE	5EL1073012	Parallel circuit without port valves prearrangement
PE	5EL1073002	Parallel circuit with port valves prearrangement
SQE	5EL3073012	Tandem circuit without port valves prearrangement
SPE	5EL3073002	Tandem circuit with port valves prearrangement

2. Spools *page 64*

If not specified otherwise, the spool are from 20 to 40 l/min flow

TYPE	CODE	DESCRIPTION
E102	3CU6710102	Double acting, 3 positions, with A and B closed in neutral position; for flow up to 20 l/min
E101	3CU6710000	As previous, from 20 to 40 l/min flow
E103	3CU6710103	As previous, from 40 to 60 l/min flow
E201	3CU6725000	Double acting, 3 positions, with A and B open to tank in neutral position
E301	3CU6731000	Single acting in A, 3 positions, B plugged: needs G3/8 plug

3. Electro-hydraulic controls *page 67*

TYPE	CODE	DESCRIPTION
8EB3	5IDR907312	12VDC double side proportional type with spring return to neutral position
	5IDR907324	As previous 24VDC
8EB3LH	5IDR907612	12VDC double side proportional type with spring return to neutral position and wet-type lever control
	5IDR907624	As previous 24VDC

8. Port valves *page 46*

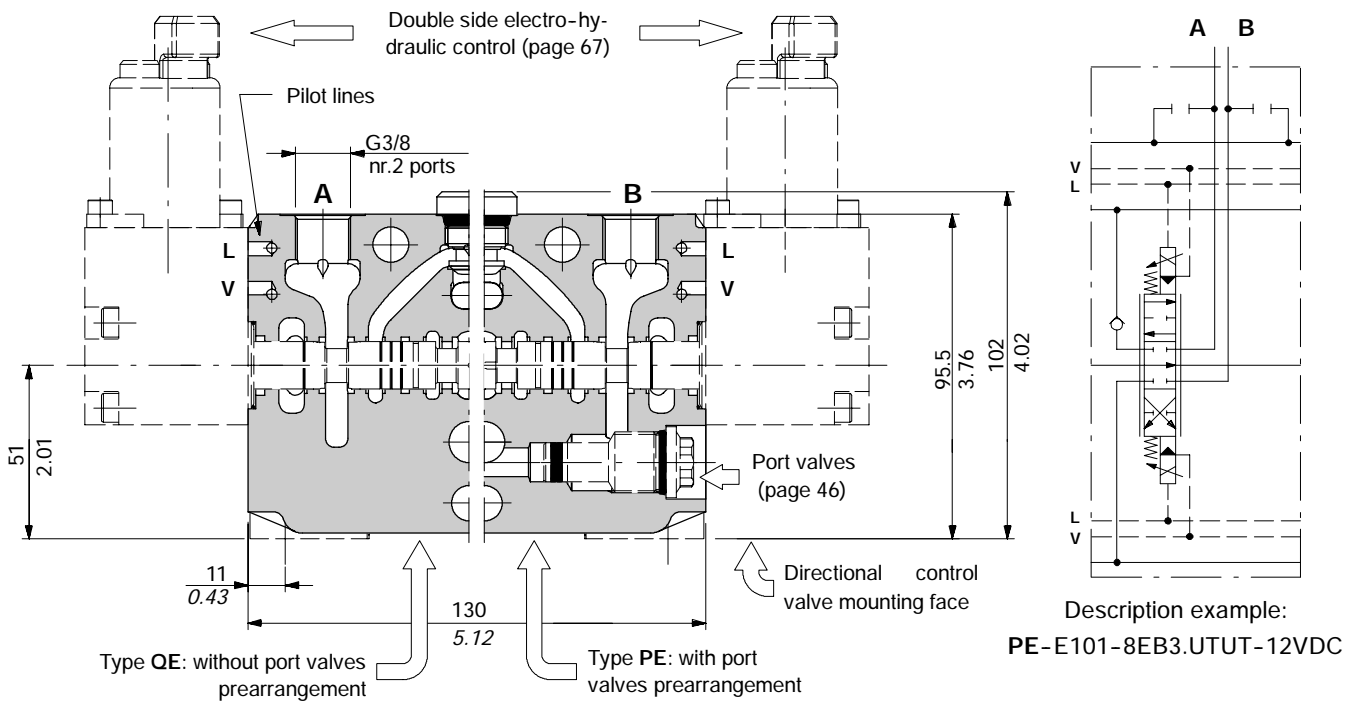
Fixed setting antishock with refill valves.

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

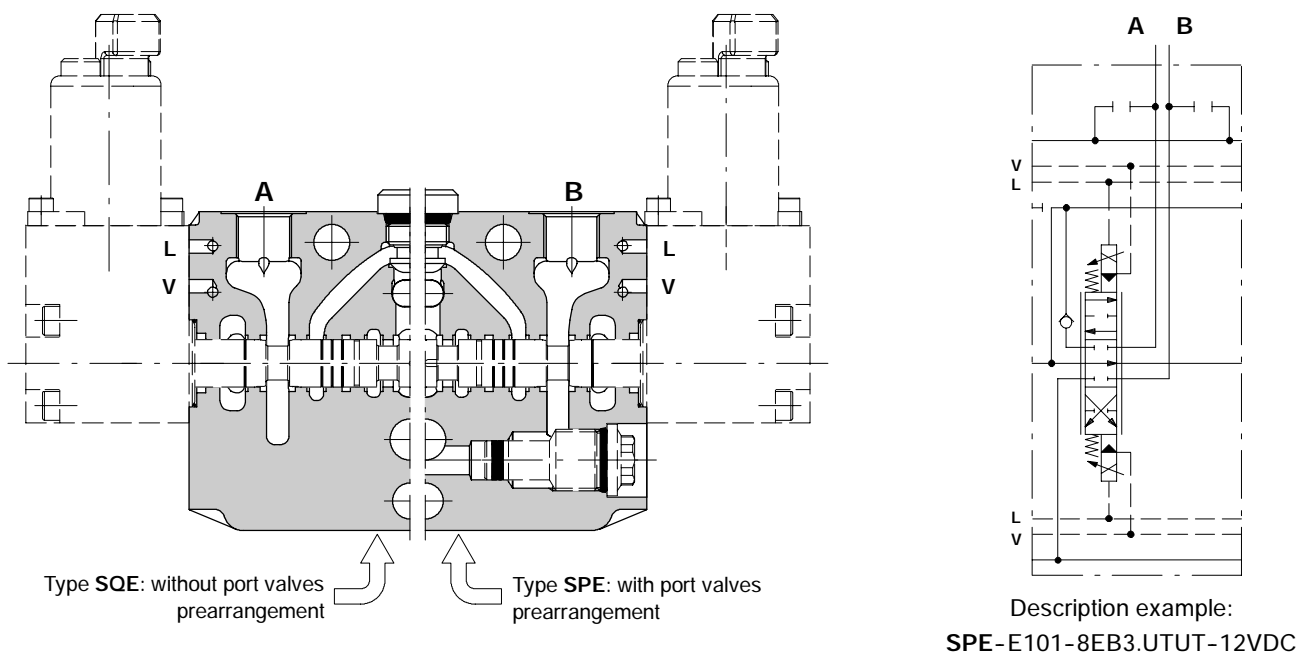
Section kit and hydraulic circuit

It can be supplied with parallel or tandem circuit; series circuit is obtained as related to page 11.
All sections are available with or without valves prearrangement

Parallel circuit



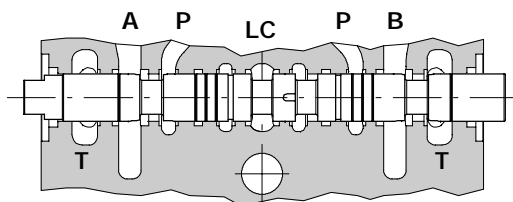
Tandem circuit



Working section type E

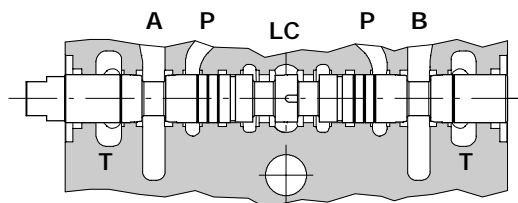
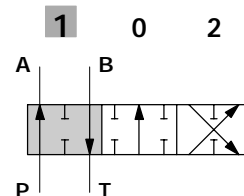
Spools

Type E101

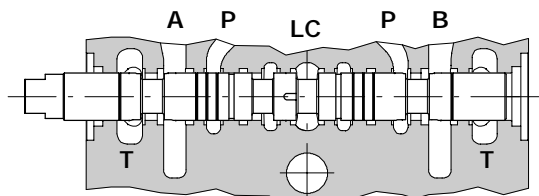
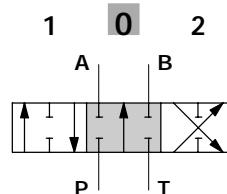


P → A B → T

▶ stroke + 6.5 mm
+ 0.26 in

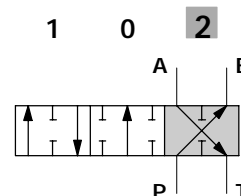


P-A-B-T closed, with flow through line (LC) open

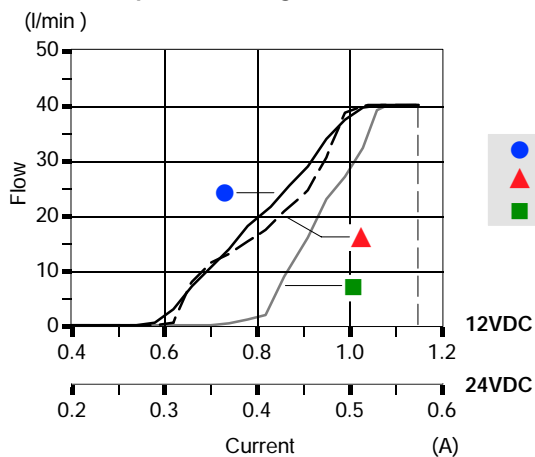


P → B A → T

◀ stroke - 6.5 mm
- 0.26 in



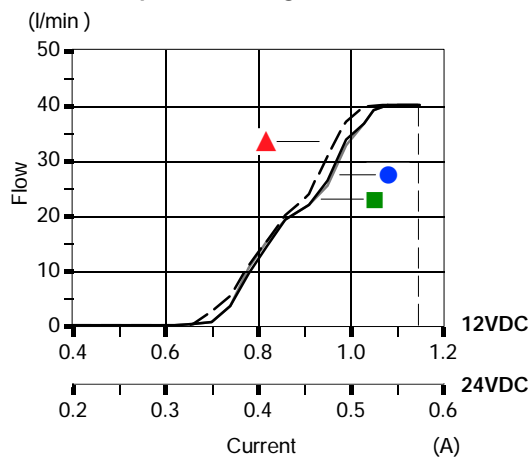
Spool metering P → A(B)



Q_{in} = 40 l/min

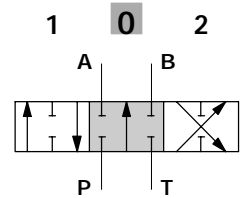
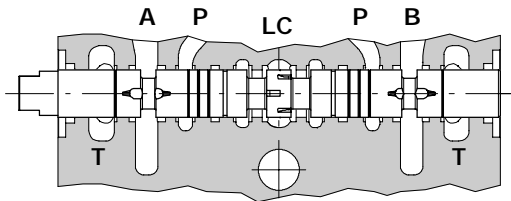
- P(on ports) = 63 bar / 900 psi
- ▲ P(on ports) = 100 bar / 1450 psi
- P(on ports) = 250 bar / 2900 psi

Spool metering A(B) → T



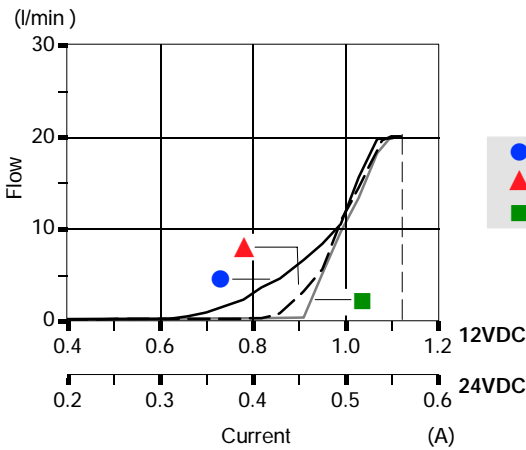
Spools

Type E102

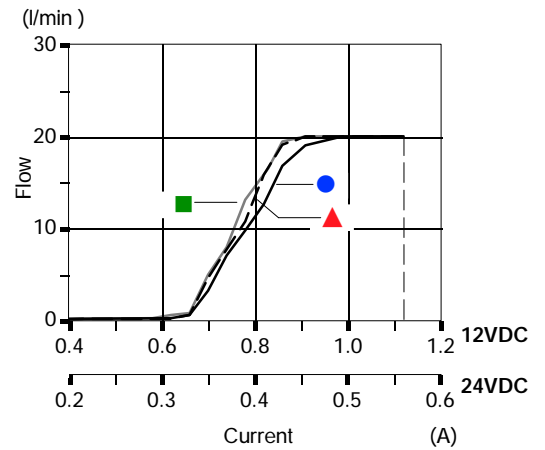


P-A-B-T closed, with flow through line (LC) open

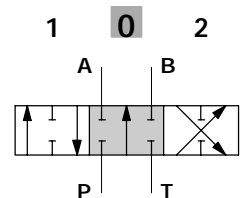
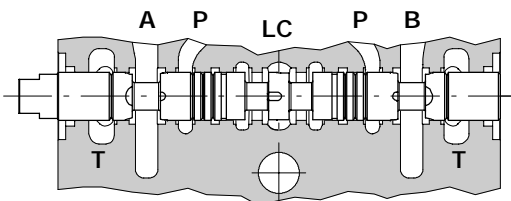
Spool metering P→A(B)



Spool metering A(B)→T

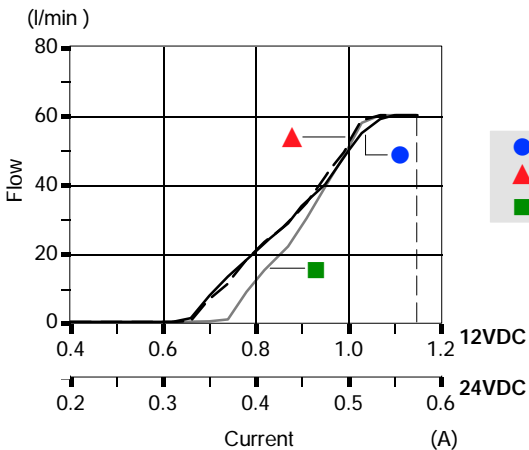


Type E103

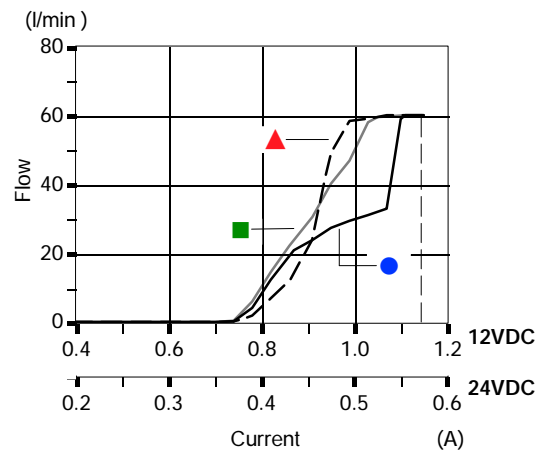


P-A-B-T closed, with flow through line (LC) open

Spool metering P→A(B)



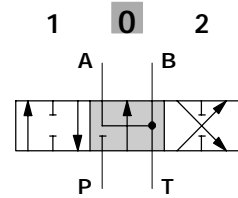
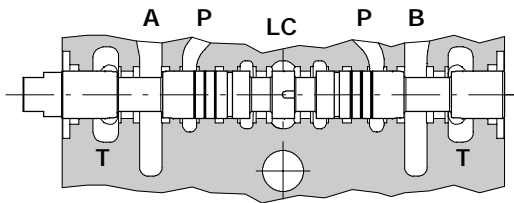
Spool metering A(B)→T



Working section type E

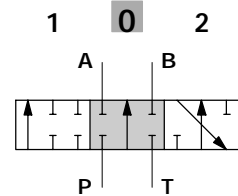
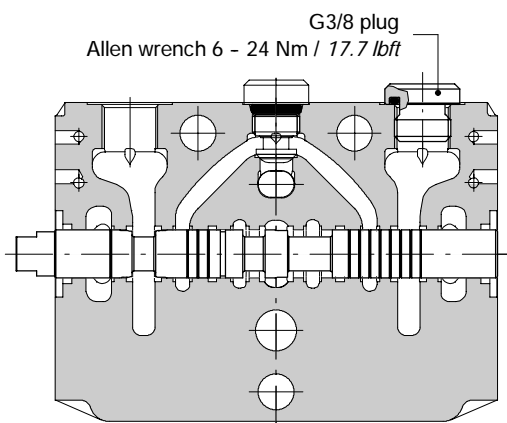
Spools

Type E201



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

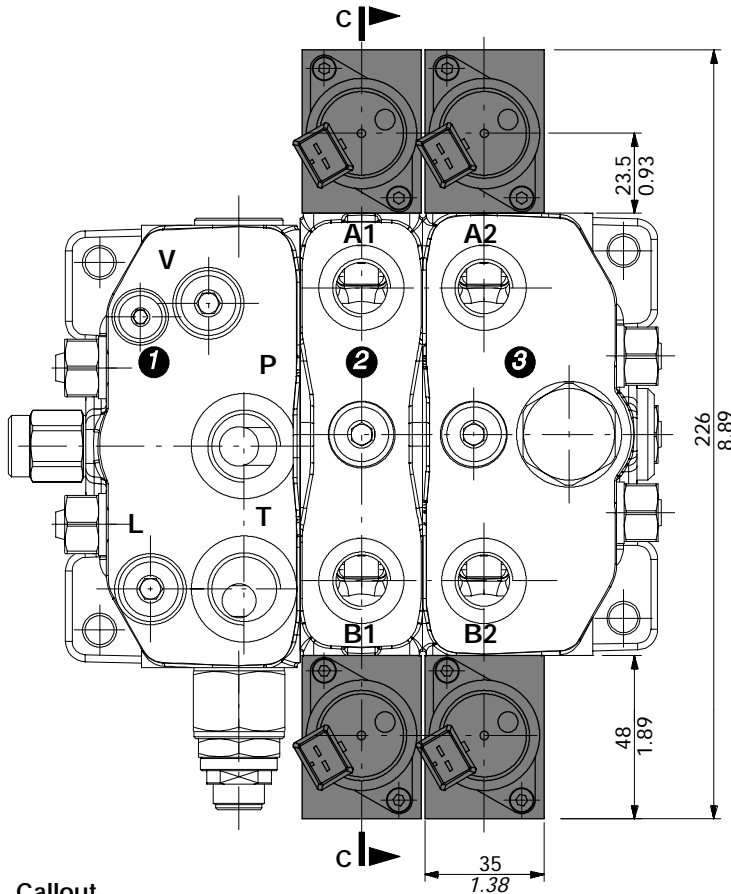
Type E301



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

8EB3 proportional electro-hydraulic control

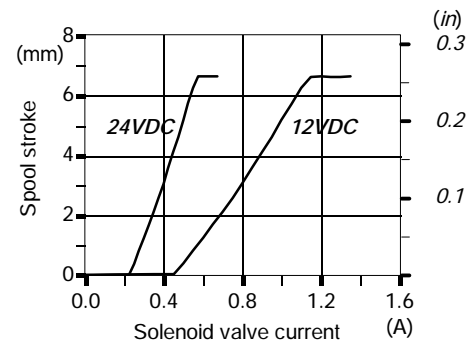
With spring return to neutral position.



Solenoid valves operating features

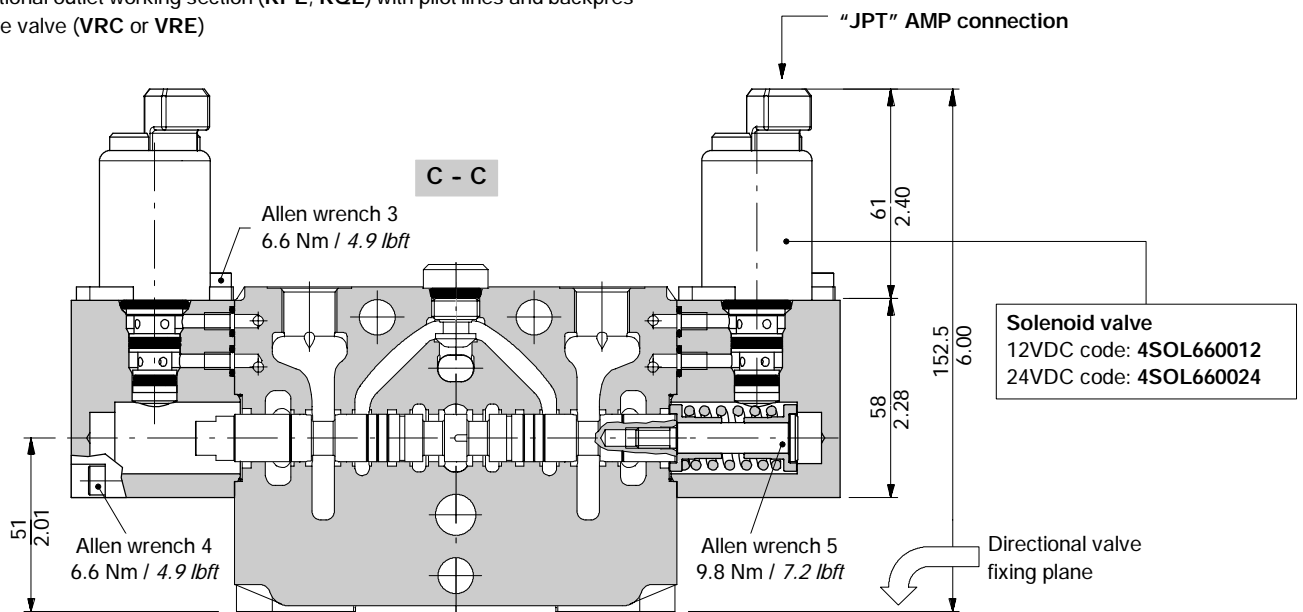
Pilot max. pressure	: 315 bar - 4600 psi
Min. feeding pressure	: 40 bar - 580 psi
Max. backpressure on drain	: 20 bar - 290 psi
Max. internal leakage	: 3 cm ³ /min - 0.18 in ³ /min
Max. hysteresis	: 13%
Nominal voltage	: 12 24 VDC ± 10%
Coil resistance (20 °C)	: 5.3 24 Ω
Nominal current	: 1.5 0.63 A
Duty cycle	: 100%
Operating frequency	: 125 Hz
Weather protection	: IP65

Current - stroke diagram



Callout

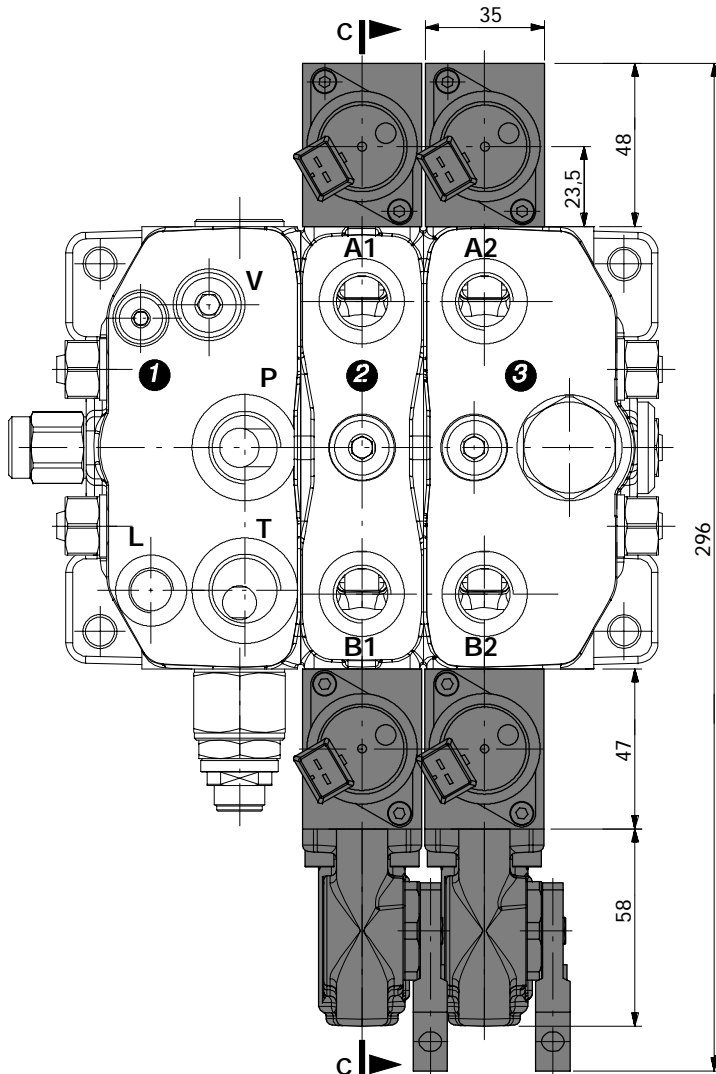
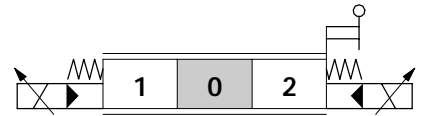
- 1) CR type inlet cover with pressure-reducing valve (VRP), internal pilot and drain
- 2) Working section (PE, QE....) with pilot lines
- 3) Optional outlet working section (RPE, RQE) with pilot lines and backpressure valve (VRC or VRE)



Working section type E20.

8EB3LH proportional electro-hydraulic control

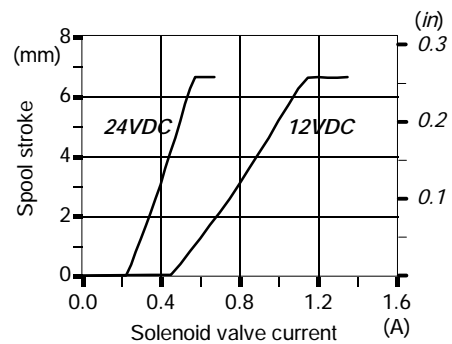
With spring return to neutral position and wet-type lever box.



Solenoid valves operating features

- Pilot max. pressure : 315 bar - 4600 psi
- Min. feeding pressure : 40 bar - 580 psi
- Max. backpressure on drain : 20 bar - 290 psi
- Max. internal leakage : 3 cm³/min - 0.18 in³/min
- Max. hysteresis : 13%
- Nominal voltage : 12 24 VDC ± 10%
- Coil resistance (20 °C) : 5.3 24 Ω
- Nominal current : 1.5 0.63 A
- Duty cycle : 100%
- Operating frequency : 125 Hz
- Weather protection : IP65

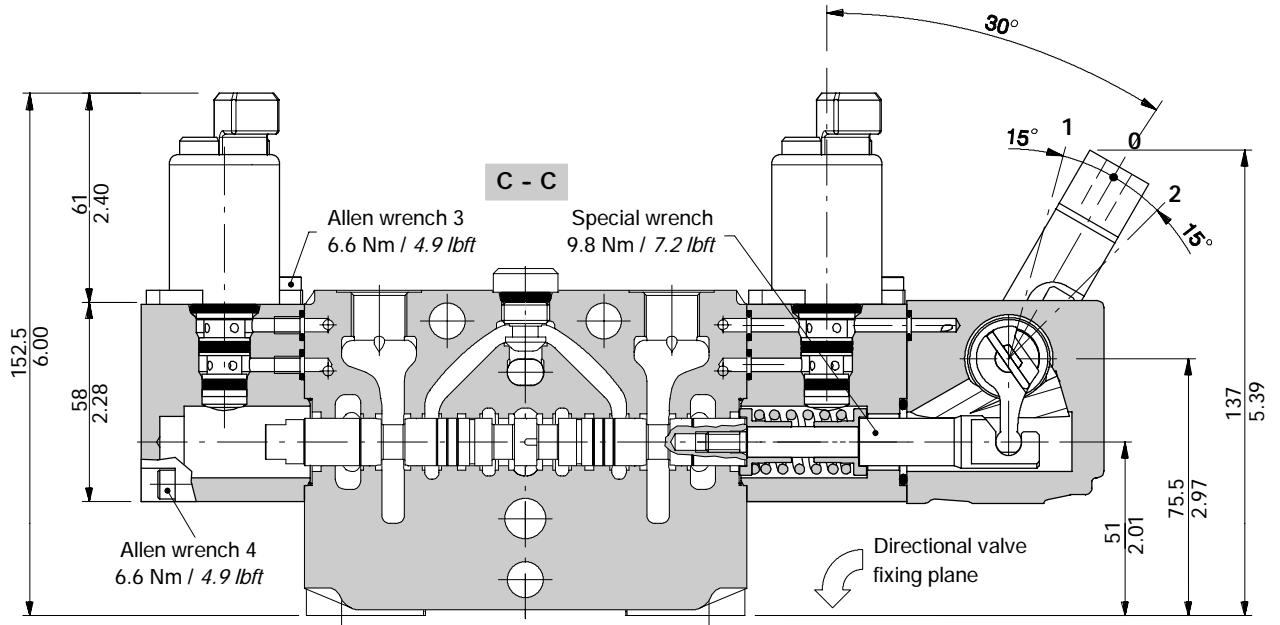
Current - stroke diagram



Callout

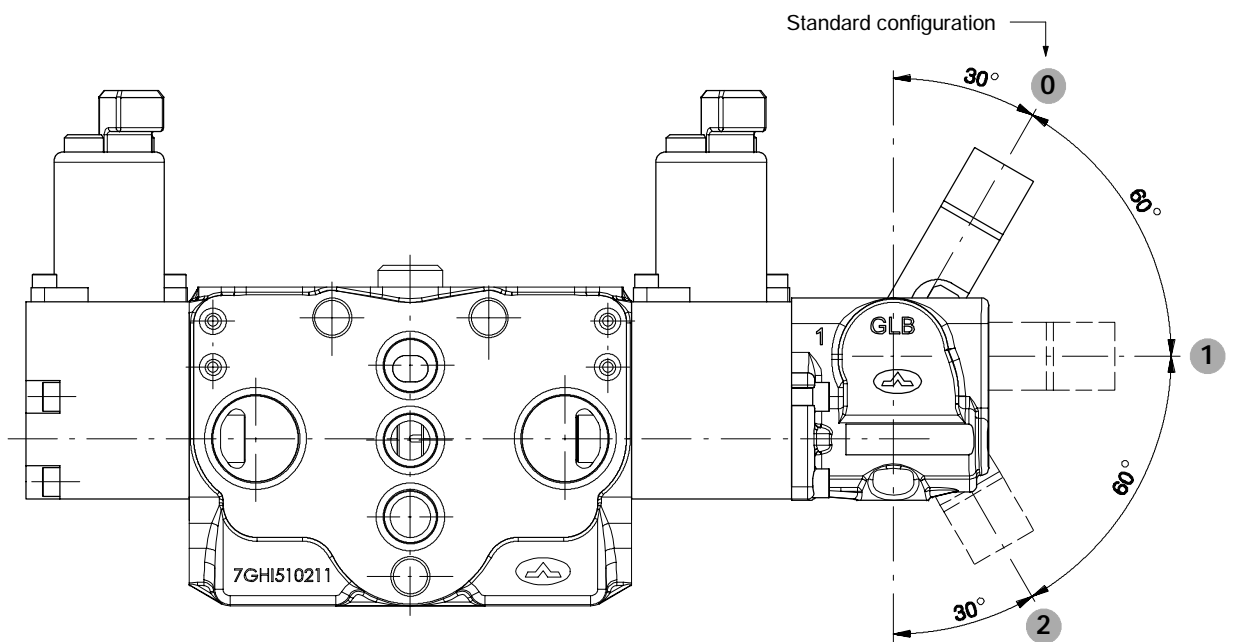
- 1) CR type inlet cover with pressure-reducing valve (VRP), internal pilot and external drain (suggested)
- 2) Working section (PE, QE....) with pilot lines
- 3) Optional outlet working section (RPE, RQE) with pilot lines and backpressure valve (VRC or VRE)

8EB3LH proportional electro-hydraulic control



Lever-holder configuration

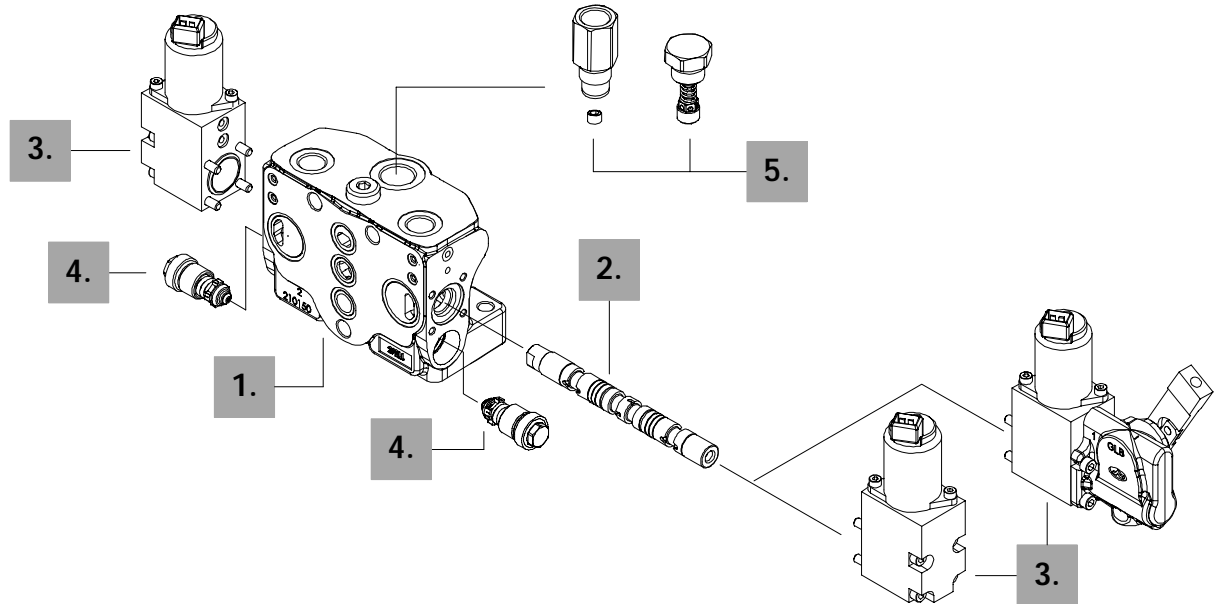
The control is supplied with lever-holder in standard configuration; different position must always specified (8EB3LH1 and 8EB3LH2).



Section with optional outlet type RE

Valve description:

EL SDS100 / RPE - E101 - 8EB3 . U100U100 - VRC - F - 12VDC *



1. Working section kit * page 71

Include body, seals and load check valve.

TYPE	CODE	DESCRIPTION
RQE	5FIA207312	Parallel circuit without port valves prearrangement
RPE	5FIA207302	Parallel circuit with port valves prearrangement

2. Spools page 64

If not specified otherwise, the spool are from 20 to 40 l/min flow

TYPE	CODE	DESCRIPTION
E102	3CU6710102	Double acting, 3 positions, with A and B closed in neutral position; for flow up to 20 l/min
E101	3CU6710000	As previous, from 20 to 40 l/min flow
E103	3CU6710103	As previous, from 40 to 60 l/min flow
E201	3CU6725000	Double acting, 3 positions, with A and B open to tank in neutral position
E301	3CU6731000	Single acting in A, 3 positions, B plugged: needs G3/8 plug

3. Electro-hydraulic controls page 67

TTYPE	CODE	DESCRIPTION
8EB3	5IDR907312	12VDC double side proportional type with spring return to neutral position
	5IDR907324	As previous 24VDC
8EB3LH	5IDR907612	12VDC double side proportional type with spring return to neutral position and wet-type lever control
	5IDR907624	As previous 24VDC

4. Port valves page 46

Fixed setting antishock with prefill valves.

5. Circuit options * page 73

TYPE	CODE	DESCRIPTION
VRC	5GIU511370	Backpressure valve
VRE	5GIU527590	Backpressure valve and carry-over: include M14x1.5 plug

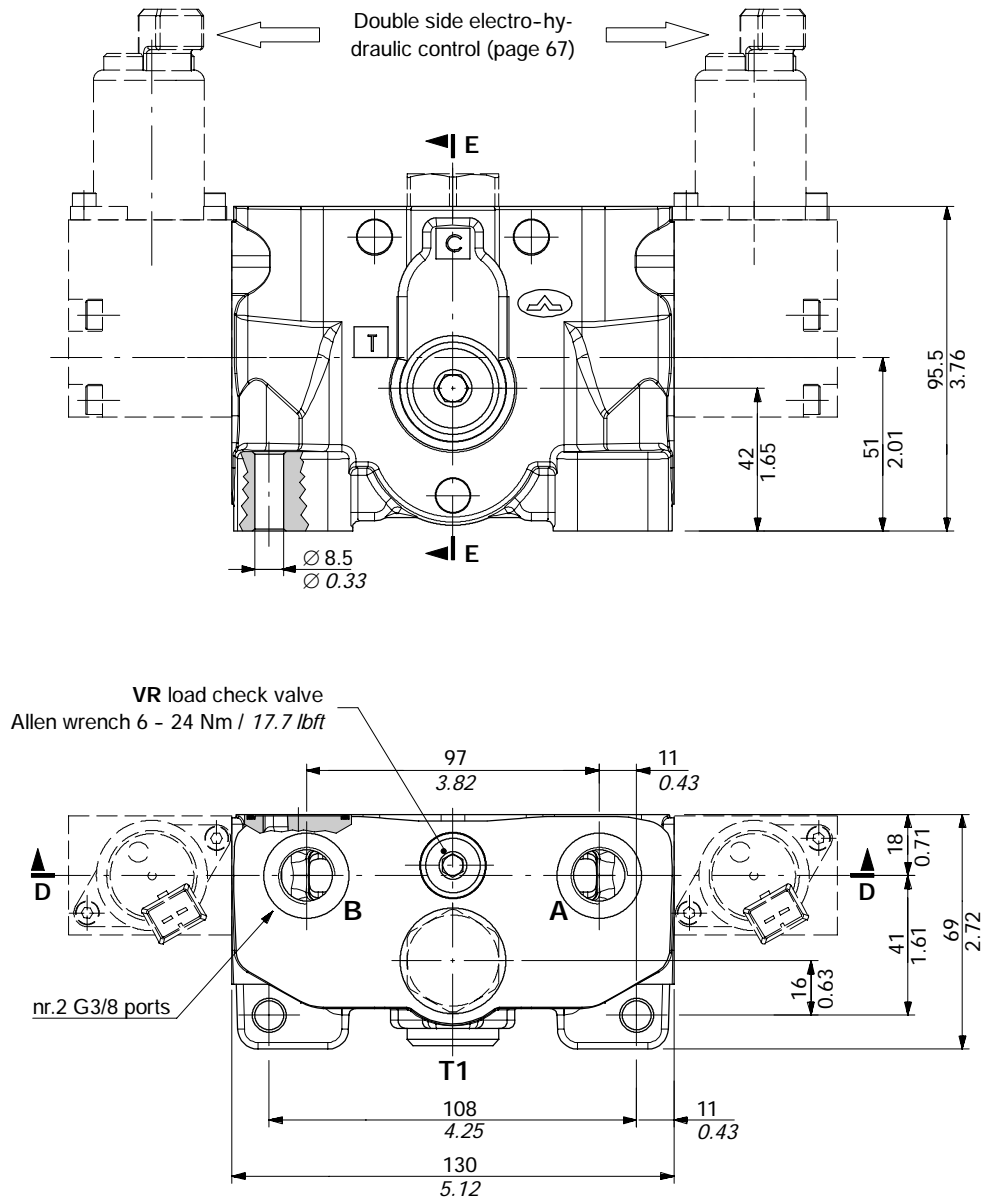
NOTE (*) - Codes are referred to **BSP** thread.

Section with optional outlet type RE

Section kit and hydraulic circuit

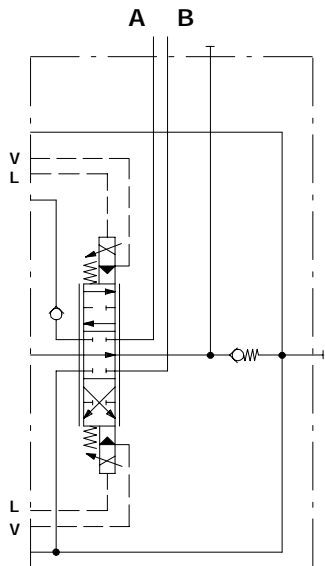
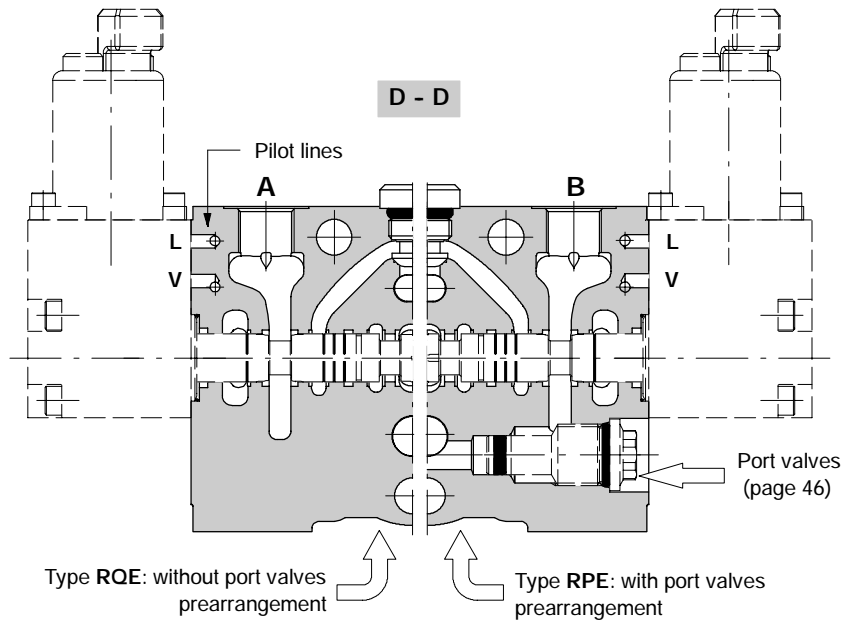
Configuration combining a working section with the closing flange to reduce dimensions.

Below it's show a configuration with parallel circuit, backpressure valve, optional side outlet port plugged (F type).

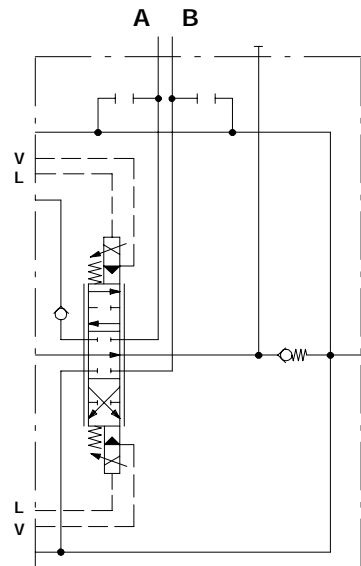


Section with optional outlet type RE

Section kit and hydraulic circuit



Description example:
RQE-E101-8EB3-VRC-F-12VDC

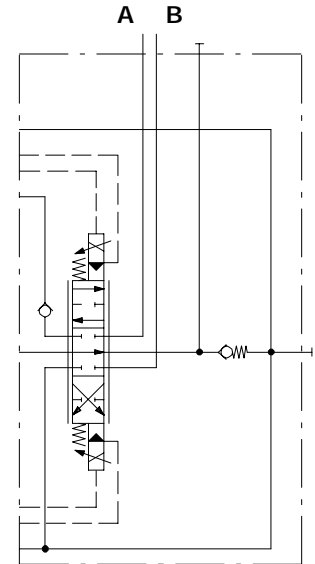
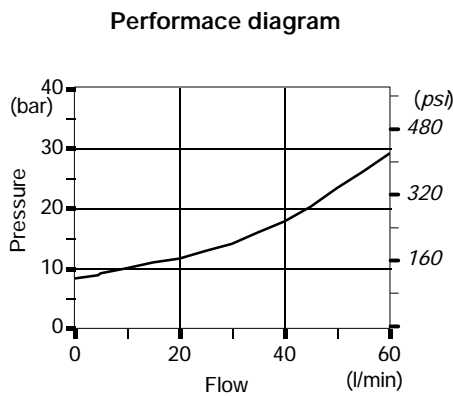
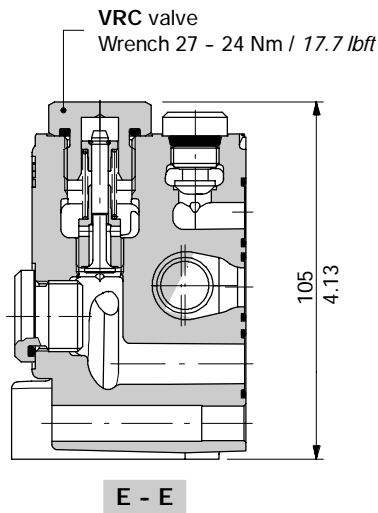


Description example:
RPE-E101-8EB3.UTUT-VRC-F-12VDC

Section with optional outlet type RE

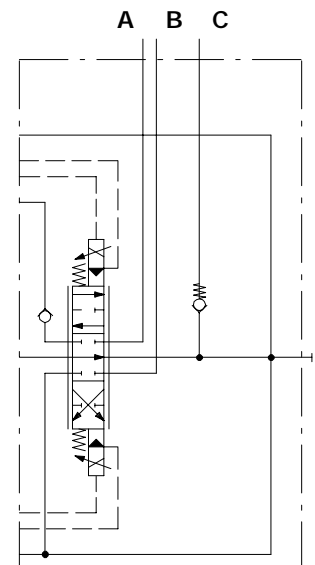
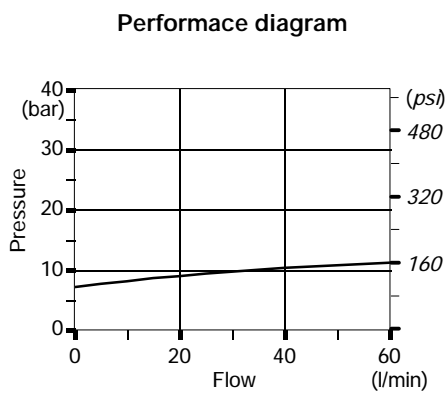
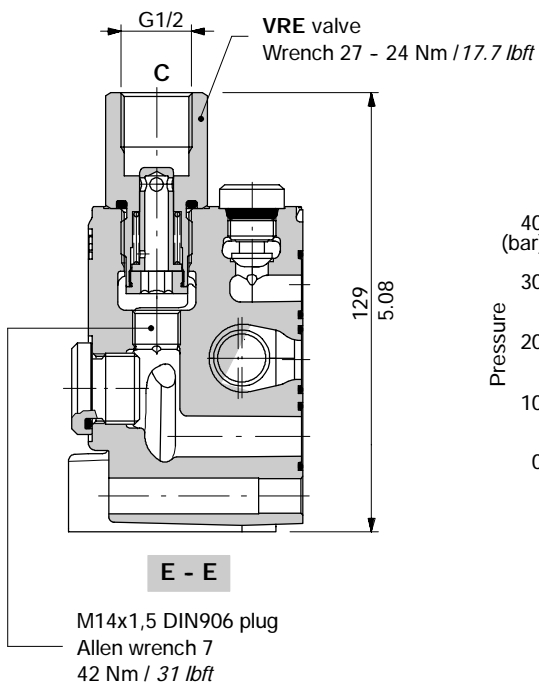
Circuit options

With VRC backpressure valve



Description example:
RQE-E101-8EB3-VRC-F-12VDC

With VRE backpressure valve (carry-over)



Description example:
RQE-E101-8EB3-VRE-F-12VDC

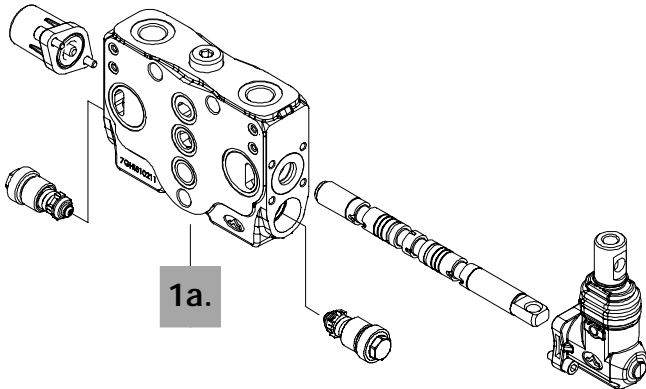
Working section type A

Description example:

EL SDS100 / PA - 101 - 8 L . U100 U100 *

1a.

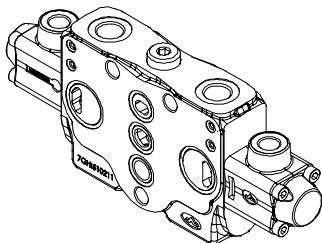
I



EL SDS100 / QA - I112 - 8IM

1b.

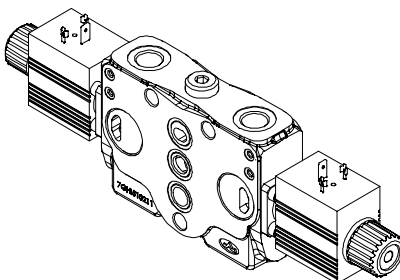
I



EL SDS100 / QA - S112 - 8ES3 - 12VDC

1b.

I



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

1a. Working section kit * page 75

For mechanical controls.

Include body, seals, rings and load check valve.

TYPE	CODE	DESCRIPTION
QA	5EL1073013	Parallel circuit without port valves prearrangement
PA	5EL1073003	Parallel circuit with port valves prearrangement
SQA	5EL3073013	Tandem circuit without port valves prearrangement
SPA	5EL3073003	Tandem circuit with port valves prearrangement

1b. Working section kit *

For proportional hydraulic and ON/OFF solenoid controls.

Include body, seals and load check valve.

TYPE	CODE	DESCRIPTION
QA/IM-ES	5EL1073013A	Parallel circuit without port valves prearrangement
PA/IM-ES	5EL1073003A	Parallel circuit with port valves prearrangement
SQA/IM-ES	5EL3073013A	Tandem circuit without port valves prearrangement
SPA/IM-ES	5EL3073003A	Tandem circuit with port valves prearrangement

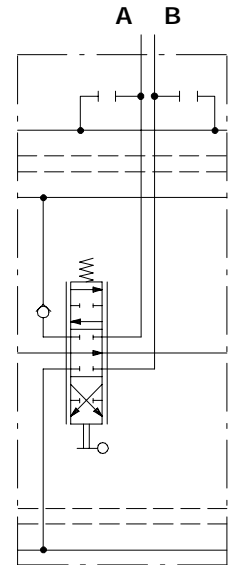
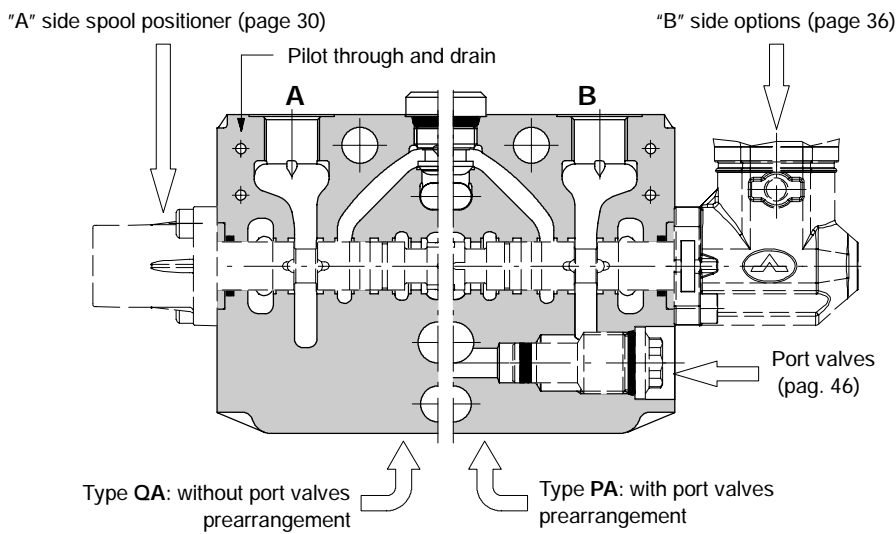
I Other options page 19

For complete list of spools, controls and port valves see page 19: available options are the same of directional valve with standard working section.

Section kit and hydraulic circuit

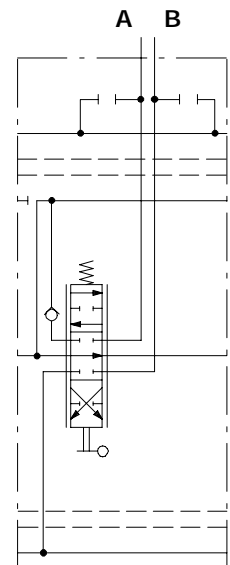
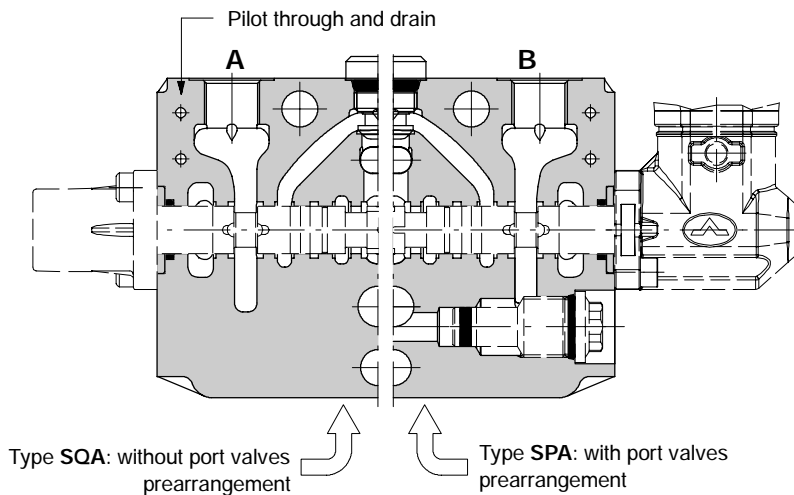
Sections with pilot lines for manual/mechanical control in electro-hydraulic valves.
Dimensions are the same as other sections.

Parallel circuit



Description example:
PA-101-8L.UTUT

Tandem circuit

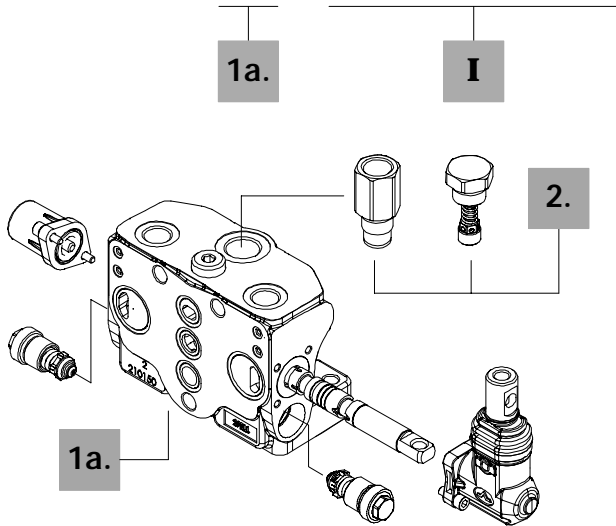


Description example:
SPA-101-8L.UTUT

Section with optional outlet type RA

Description example:

EL SDS100 / RPA - 101 - 8L . U100U100 - VRC - F *



1a. Working section kit * page 77

For mechanical controls.

Include body, seals, rings and load check valve.

TYPE	CODE	DESCRIPTION
RQA	5FIA207316	Parallel circuit without port valves prearrangement
RPA	5FIA207306	Parallel circuit with port valves prearrangement

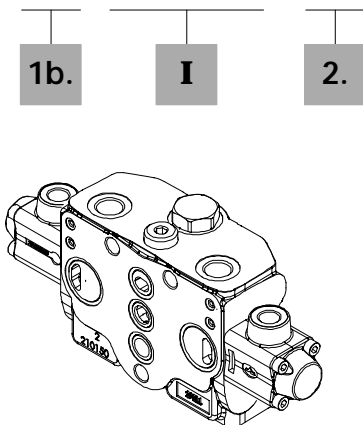
1b. Working section kit *

For proportional hydraulic and ON/OFF solenoid controls.

Include body, seals and load check valve.

TYPE	CODE	DESCRIPTION
RQA/IM-ES	5FIA207316A	Parallel circuit without port valves prearrangement
RPA/IM-ES	5FIA207306A	Parallel circuit with port valves prearrangement

EL SDS100 / QA - I112 - 8IM - VRC - F *



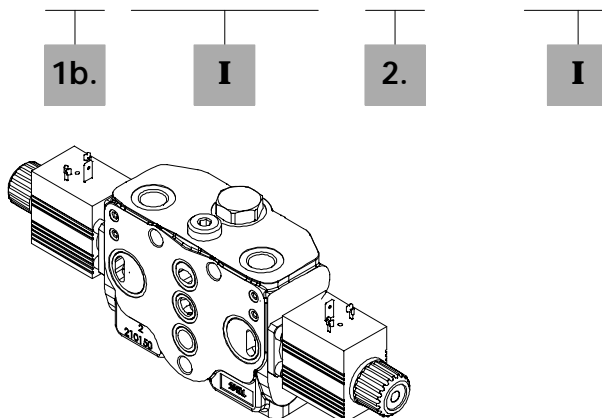
2. Circuit options * page 73

TYPE	CODE	DESCRIPTION
VRC	5GIU511370	Backpressure valve
VRE	X027700008	Backpressure valve and carry-over

I Other options page 19

For complete list of spools, controls and port valves see page 19: available options are the same of directional valve with standard working section.

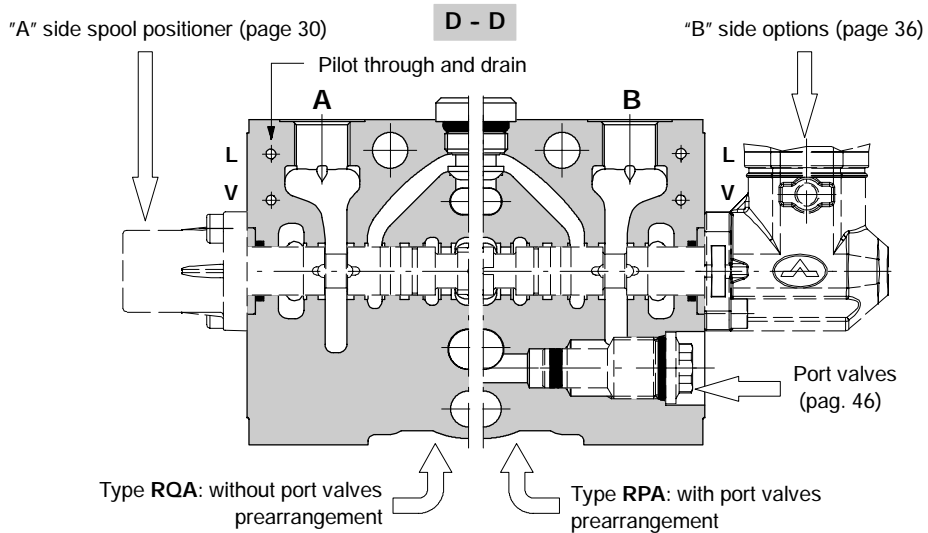
EL SDS100 / QA - S112 - 8ES3 - VRC - F - 12VDC *



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

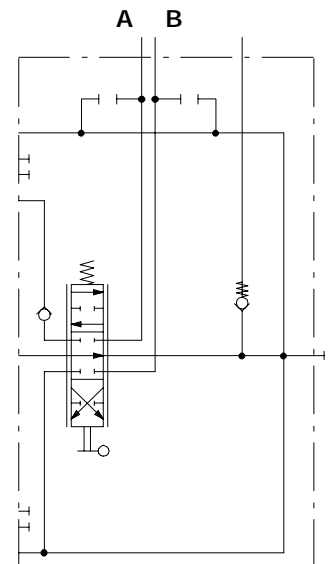
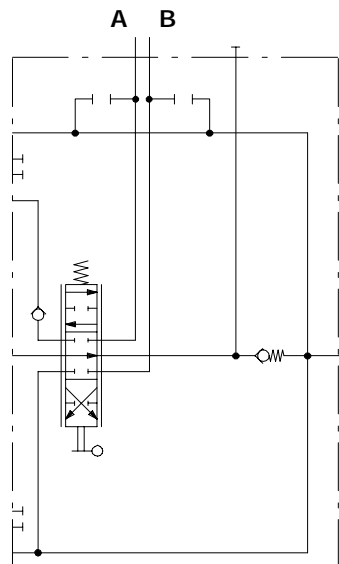
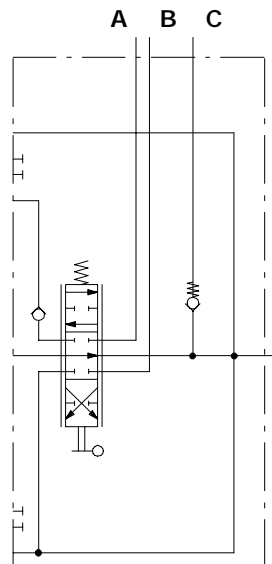
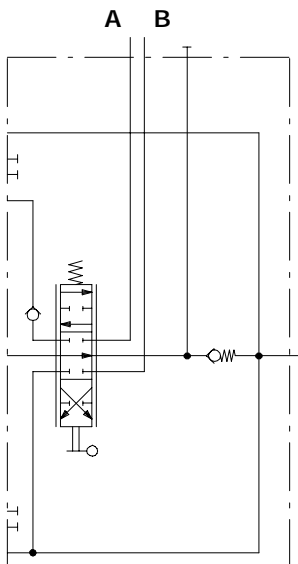
Section kit and hydraulic circuit

For dimensions and characteristics see section type RE at page 71.



Type RQA: without port valves prearrangement

Type RPA: with port valves prearrangement



Description example:
RQA-101-8L-VRC-F

Description example:
RQA-101-8L-VRE-F

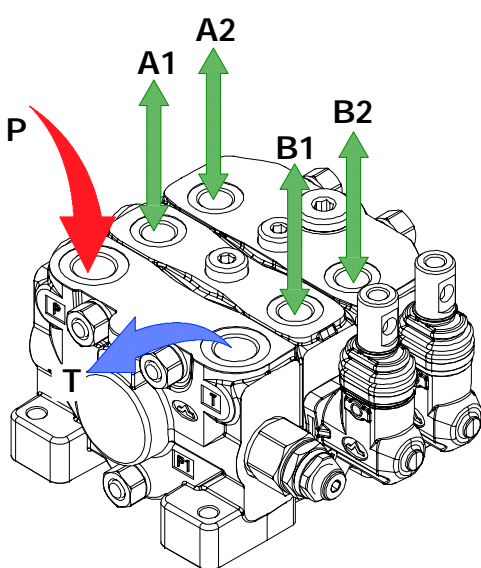
Description example:
RPA-101-8L.UTUT-VRC-F

Description example:
RPA-101-8L.UTUT-VRE-F

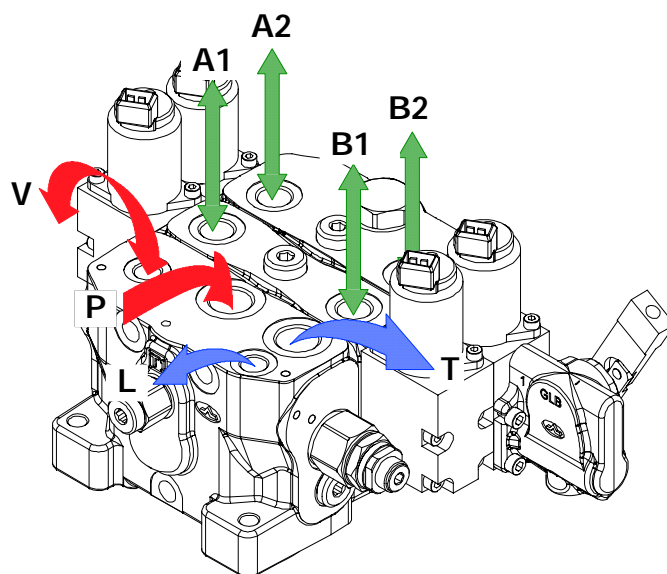
The SDS100 valve is assembled and tested as per the technical specification of this catalogue.

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.



SDS100/2/CN(TVG3-175)/Q-101-8L/RQ-101-8L-F



SDS100/2/CR(TVG3-175)/
QE-E101-8EB3/ROE-E101-8EB3LH-VRC-F-12VDC

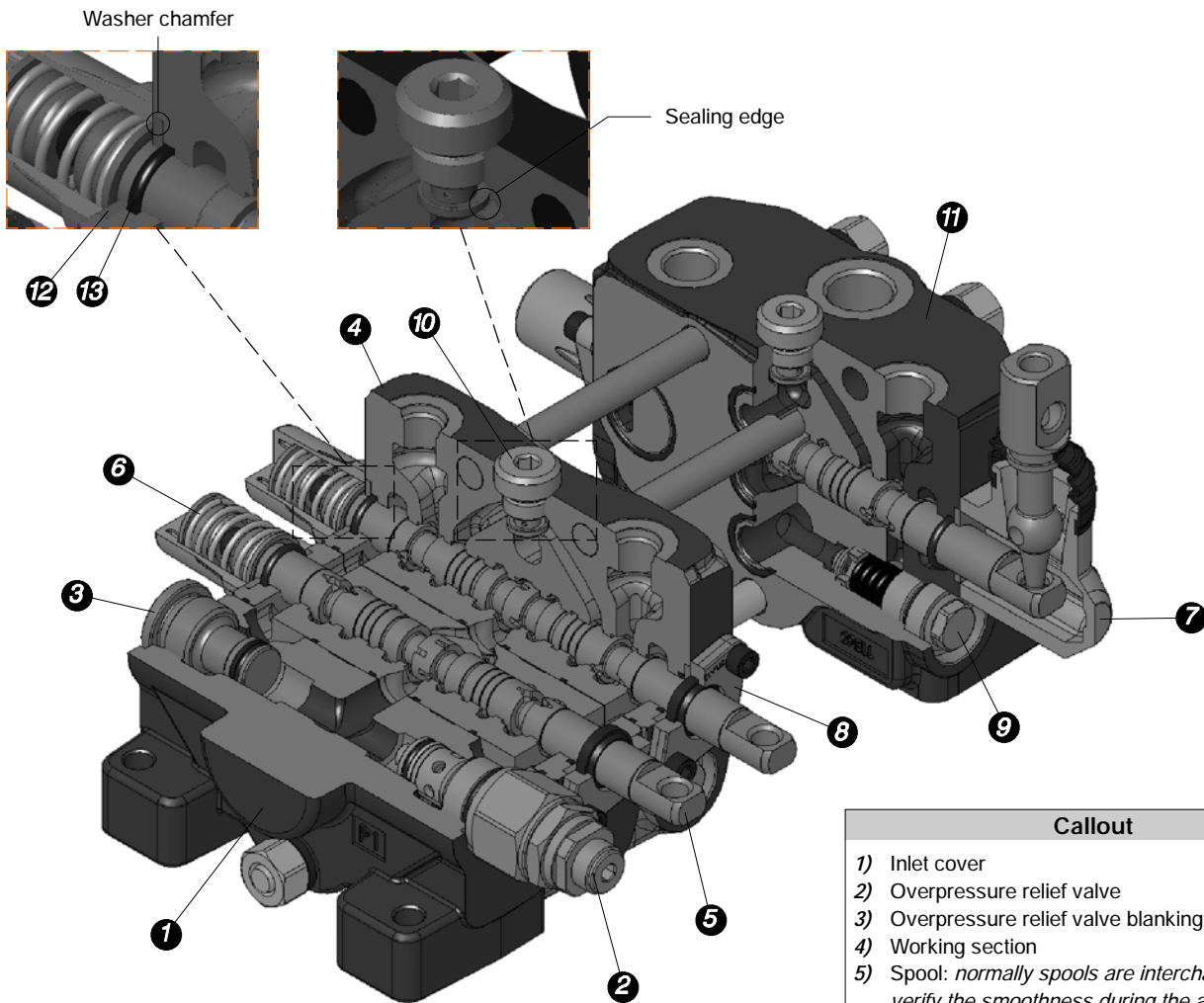
Fitting tightening torque - Nm / lbft

THREADS TYPE	P and C ports	A and B ports	T port	V and L ports
BSP (ISO 228/1)	G 1/2	G 3/8	G 1/2	G 1/4
With O-Ring seal	50 / 36.9	35 / 25.8	50 / 36.9	20 / 14.7
With copper washer	60 / 44.3	40 / 29.5	60 / 44.3	25 / 18.4
With steel and rubber washer	60 / 44.3	30 / 22.1	60 / 44.3	16 / 11.8
UN-UNF (ISO 11926-1)	7/8-14 (SAE 10)	3/4-16 (SAE 8)	7/8-14 (SAE 10)	9/16-18 (SAE 6)
With O-Ring seal	90 / 66.4	35 / 25.8	90 / 66.4	30 / 22.1

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

Mechanical control configuration.

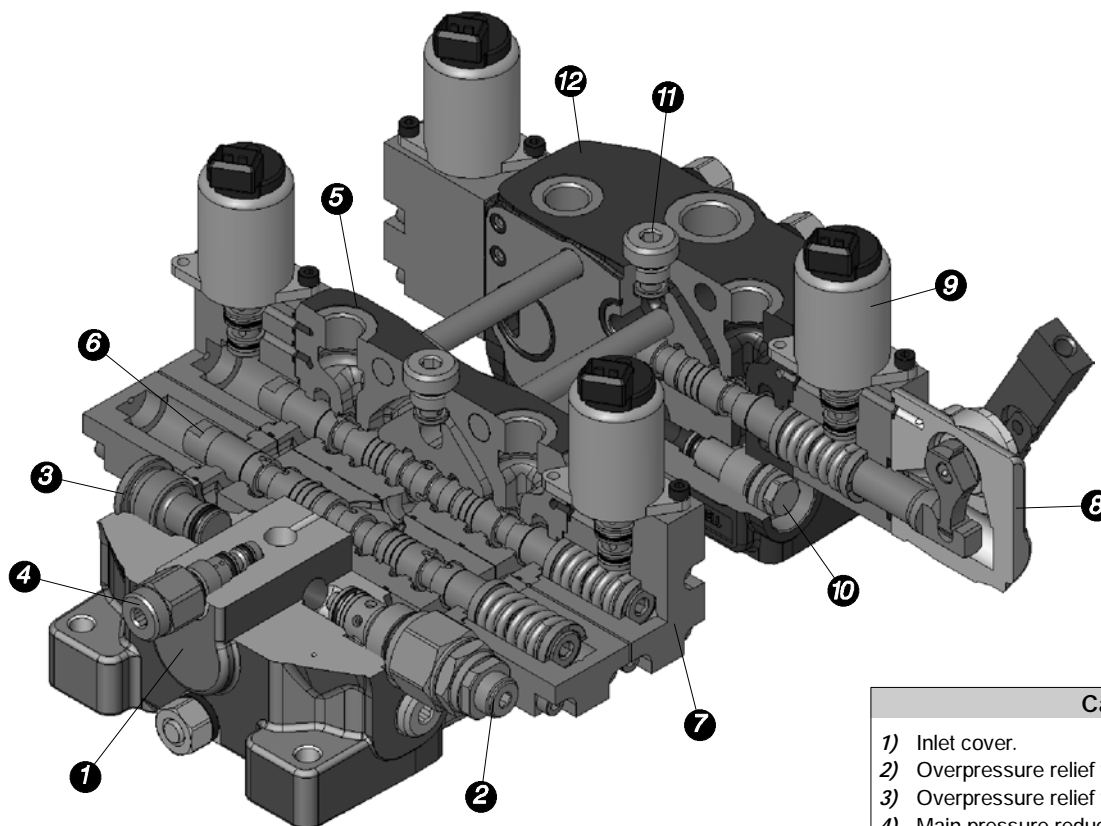


Callout	
1)	Inlet cover
2)	Overpressure relief valve
3)	Overpressure relief valve blanking plug
4)	Working section
5)	Spool: normally spools are interchangeable, verify the smoothness during the assembly
6)	"A" side spool positioner
7)	Lever pivot box
8)	Dust-proof flange
9)	Port valves
10)	Load check valve
11)	Working section with optional outlet
12)	Holding O-Ring washer code: 3ANE126020
13)	O-Ring seal 14.00x2 code: 4GUA114020

NOTE - All moving 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.	Locate the leakage and replace the seal.
Excessive internal leakage on A and B ports.	Increase clearance between spools and body due to high wear.	Replace the working section 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.

Electrohydraulic proportional control configuration.



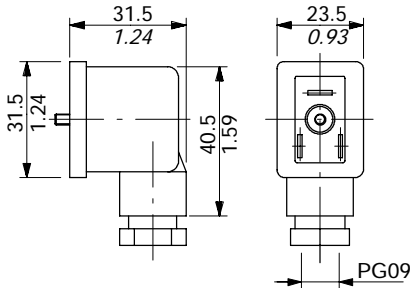
Callout	
1)	Inlet cover.
2)	Overpressure relief valve.
3)	Overpressure relief valve blanking plug.
4)	Main pressure reducing valve.
5)	Working section type E.
6)	Spool: <i>normally spools are interchangeable, verify the smoothness during the assembly.</i>
7)	8EB3 spool control.
8)	8EB3LH spool control.
9)	Pressure reducing valves.
10)	Port valve.
11)	Load check valve.
12)	Working section with optional outlet type RE, with backpressure valve.

Malfunction	Cause	Remedy
External leakage pivot box lever or control kit side.	Worn spool seal due to mechanical actuation or high back pressure.	Sostituire le guarnizioni usurate.
Excessive internal leakage on A and B ports.	Increase clearance between spools and body due to high wear.	Replace the working section 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.
	Pressure relief valve blocked open.	Remove and clean or replace the valve.
Inability to build pressure on A and B ports.	Low pump pressure and flow.	Check the pump and circuit.
	Current absence to pressure reducing solenoid valves.	Check the electric circuit.
	Low pilot circuit pressure.	Check the pilot circuit.

Connectors

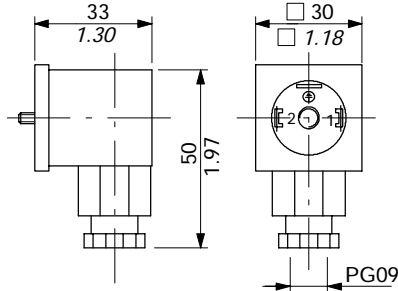
Type C01 code: 2X1001020

2P+T according to DIN43650



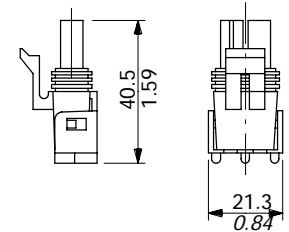
Type C02 code: 2X1001010

2P+T according to ISO4400 / DIN43650-A



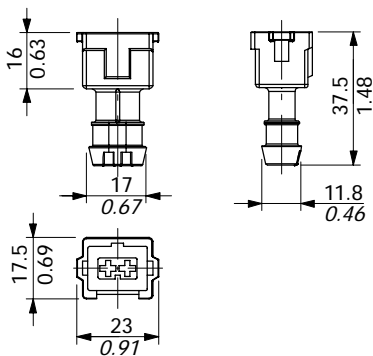
Type C07 code: 5CON001

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



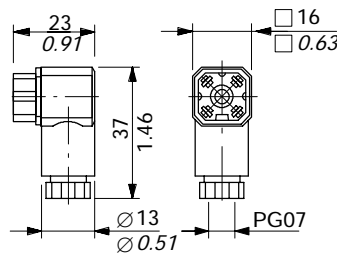
Type C08 code: 5CON003

2P female type AMP "Junior-Power-Timer"



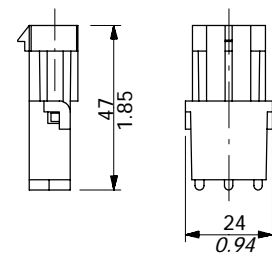
Type C11 code: 5CON006

4P according to VDE0660-0110



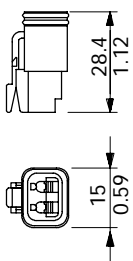
Type C17 code: 5CON005

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



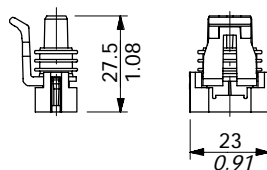
Type C19 code: 5CON007

2P, type Deutsch DT06-2S



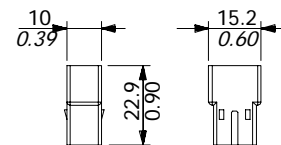
Type C20 code: 5CON017

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



Type C21 code: 5CON018

2P female case with male end type AMP "Fastin-Faston"



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	max. 3 mm / 0.118 in	IP65
C11	4P	50 VAC / 120 VDC	6 A	0.14-0.5 mm ² / 0.00022-0.00077 in ²	4-7.5 mm / 0.16-0.29 in	IP65
C17	2P	/	20 A	1-2 mm ² / 0.00155-0.0031 in ²	2.8-3.5 mm / 0.11-0.14 in	IP67
C19	2P	/	13 A	1-2 mm ² / 0.00155-0.0031 in ²	2.2-3.5 mm / 0.088-0.14 in	IP67
C20	2P	/	14 A	0.35-1 mm ² / 0.00054-0.00155 in ²	/	/
C21	2P	/	7A	0.3-0.8 mm ² / 0.00046-0.0012 in ²	2.2-3 mm / 0.087-0.118 in	/



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