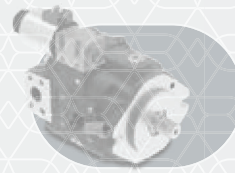
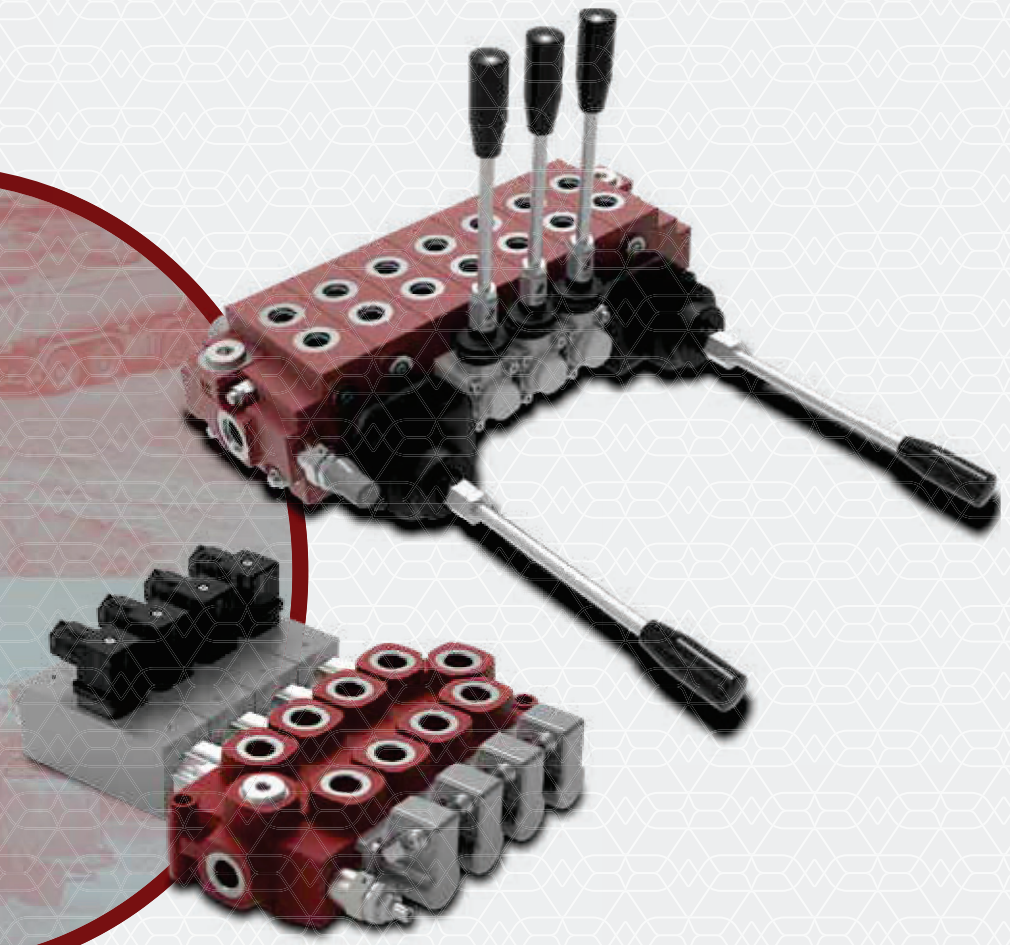
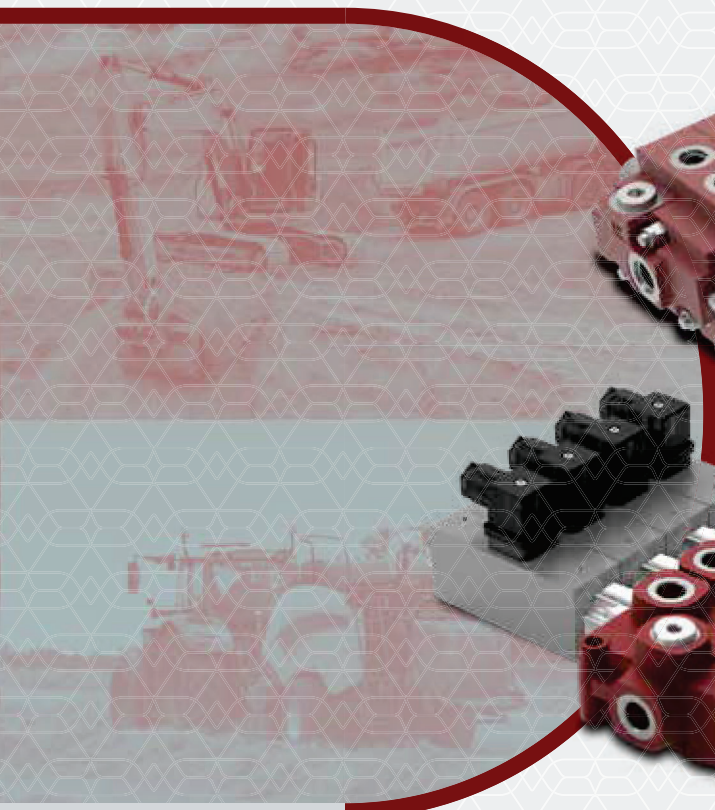


Monoblock and Sectional control valves range
Q series, GMV15, GSV50



DIRECTIONAL VALVES

Features

Simple, compact and heavy duty designed monoblock/sectional valves from 1 to 10 sections

- Available with parallel, tandem or series circuit.
- For open and closed center hydraulic systems, optional carry-over port.
- Working sections with and without port valves arrangement.
- Available with manual, pneumatic, electropneumatic, hydraulic, direct solenoid and electrohydraulic on-off controls.

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.

4th edition November 2024

Content

Monoblock directional control valves

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- **GMV15** page 19
- **Q25 - Q45** page 31
- **Q75 - Q95** page 63

Sectional directional control valves

- **Q30 - Q50** page 89
- **GSV50** page 139
- **Q80** page 183
- **Q130** page 221

• Accessories

- Coils and connectors page 257

• Installation and Maintenance

- Main rules page 260



Q35

Monoblock directional valve

- Simple, compact and heavy duty designed monoblock valve
- Only one section for open center hydraulic systems
- Only mechanical controls available

Working conditions

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

Nominal flow rating	40 l/min - (10.6 Us gpm)	
Max. pressure	300 bar (4300 psi)	
Max. back pressure on outlet T port (*)	25 bar (360 psi)	
Number sections	1	
Internal leakage A(B)⇒T	$\Delta p = 100 \text{ bar (1450 psi)}$	5 cm ³ /min (0.30 in ³ /min)
Fluid	Mineral oil	
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt
Max. contamination level	16/14/12 - ISO 4406 - NAS1638 class 6	
Ambient temperature	from -20°C to 50°C - from -4 °F to 122 °F	

NOTE - For different conditions please contact our Sales Department.

(*): On request max back pressure allowable is 180 bar (2610 psi)

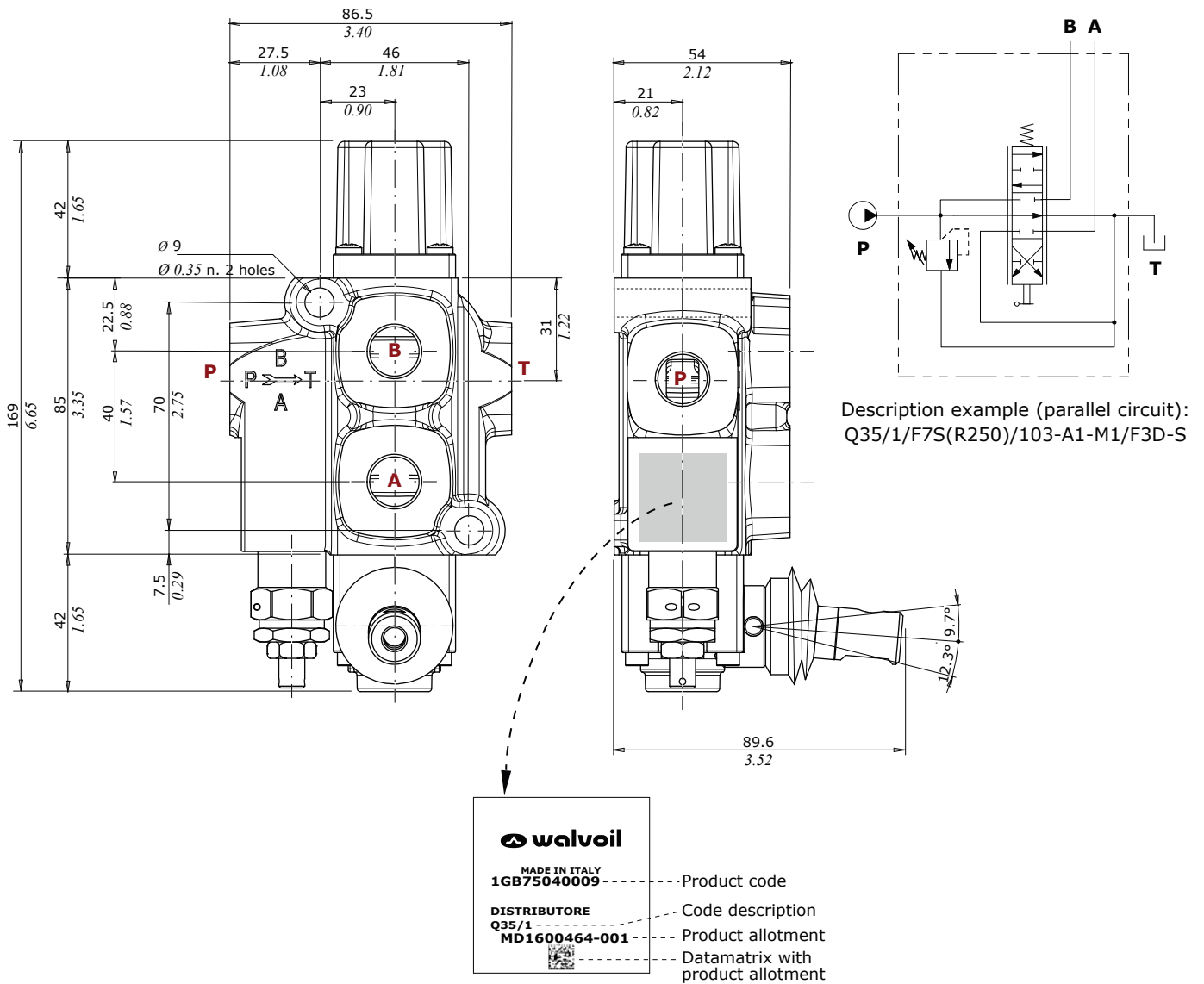
REFERENCE STANDARD

	BSP	UN-UNF
THREAD ACCORDING TO	ISO 228/1	ISO 263
	BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	11926
	SAE	J11926
	DIN	3852-2 shape X or Y

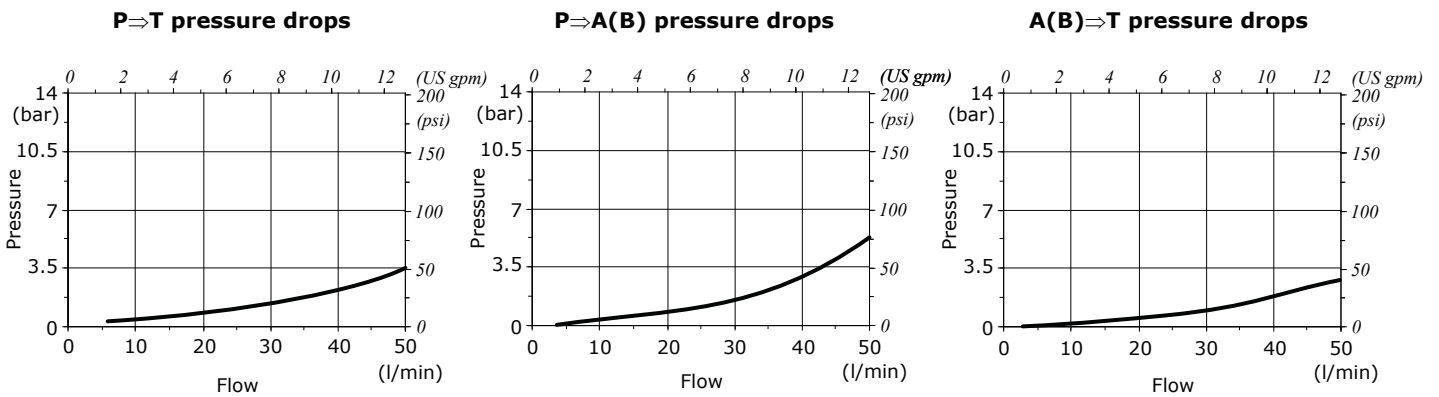
PORT THREADING

PORTS	BSP	UN-UNF
P Inlet	G 3/8	3/4-16 (SAE 8)
A and B ports	G 3/8	3/4-16 (SAE 8)
T Outlet	G 3/8	3/4-16 (SAE 8)

Dimensional data and hydraulic circuit



Performance data



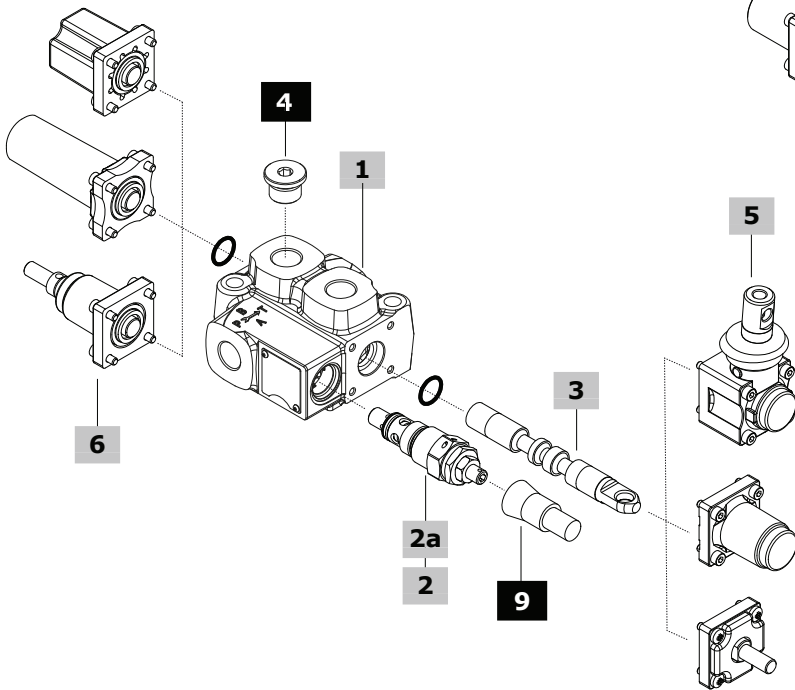
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

Parts ordering codes

Mechanical control valve configuration example

valve setting (bar)
Q35 / 1 / F7S (R250) / 103 - A1 - M1 / F3D - S

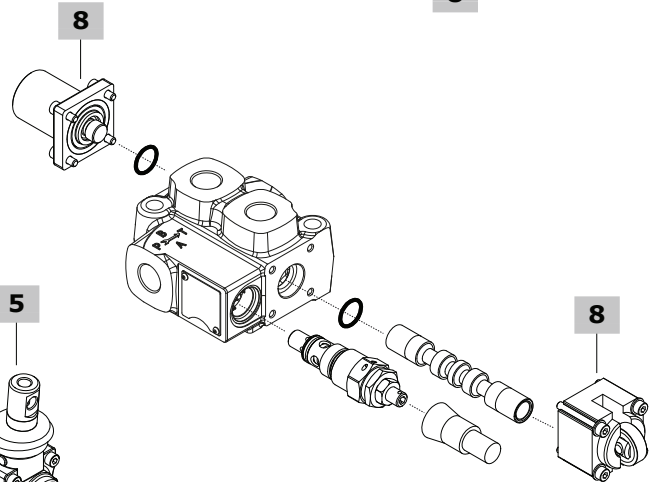
1 2 2a 3 5 6 open center aluminium controls
 N. of section



C2/C3 complete mechanical controls valve configuration example

Q35 / 1 / F7S (R250) / 103 - C3 / F3D - S

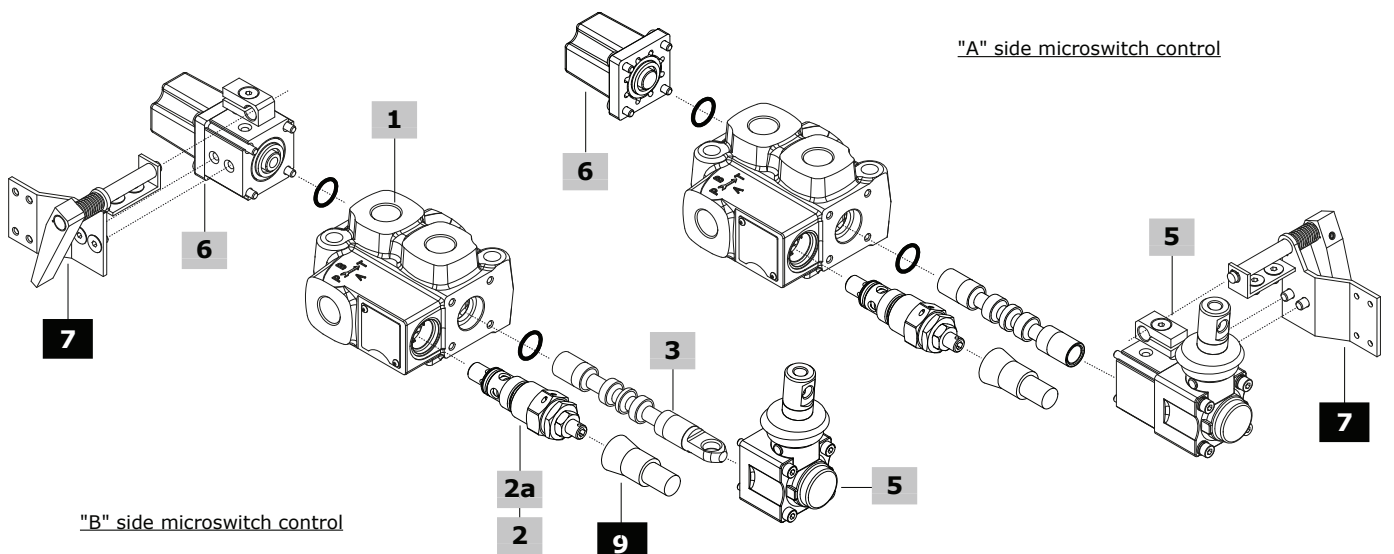
8



Microswitch control valve configuration example

valve setting (bar)
Q35 / 1 / F7S (R250) / 103 - A1 - M1-N1 / F3D - S **Q35 / 1 / F7S (R250) / 103 - N1-A1 - M1 / F3D - S**

1 2 2a 3 5 6 open center aluminium controls 5 6
 N. of section



Parts ordering codes

1 Body kit*

The code are referred to sections with O-ring seals
 TYPE CODE DESCRIPTION
Q35/1 5KC0600127954 1 section

2 Inlet configuration* **page 9**

TYPE DESCRIPTION
F7S With pressure relief valve
F8S Without valves (pressure relief valve plugged port)

2a Main pressure relief valve **page 9**

TYPE: **B** CODE: 700035205000000
 DESCRIPTION: VLP35S valve, setting range 10-100 bar (145-1450 psi)
 TYPE: **N** CODE: 700035105000000
 DESCRIPTION: VLP35S valve, setting range 101-200 bar (1460-2900 psi)
 TYPE: **R** CODE: 700035305000000
 DESCRIPTION: VLP35S valve, setting range 201-380 bar (2910-5500 psi)
 TYPE: **-** CODE: 060002788899
 DESCRIPTION: Without valves (pressure relief valve plugged port)

3 Spool **page 10**

TYPE CODE DESCRIPTION
Standard spools
103 KR35103 Double acting, A and B closed in neutral pos.
 KR35103N As previous one, negative overlap
111 KR35111 Double acting, A and B to tank in neutral pos.
101 KR35101-102 Single acting on port A.
 G3/8 plug is required, see #4
102 KR35101-102 Single acting on port B.
 G3/8 plug is required, see #4

Special spools for cam, microswitch controls and other leverless controls

103 3CUG2800600 Double acting, A and B closed in neutral pos.
111 3CUG2807300 Double acting, A and B to tank in neutral pos.

4 Plug for single acting spool*

TYPE CODE DESCRIPTION
 - 060002792199 G3/8 plug

5 A side control **page 11**

TYPE CODE DESCRIPTION

For standard spools

With lever control:

A1 03600A1-A2 M8 thread plastic lever box
A2 03600A1-A2 As A1 type, with lever box rotated 180°
A1/10 03610A1-A2/10 M8 thread aluminium lever box
A2/10 03610A1-A2/10 As A1/10 type, with lever box rotated 180°
A1/PM 03610A1-A2/PM M10 thread aluminium lever box
A2/PM 03610A1-A2/PM As A1/PM type, with lever box rotated 180°
A1/PMP 03610A1-A2/PMP M10 thread plastic lever box
A2/PMP 03610A1-A2/PMP As A1/PMP type, with lever box rotated 180°

With safety lever control:

A1/S⁽¹⁾ 03624A1-A2/S M8 thread aluminium lever box
A2/S⁽¹⁾ 03624A1-A2/S As A1/S type, with lever box rotated 180°

Without lever control:

A8 03622A8/03 Flexible cable control arrangement

For types 103 and 111 special spools

With spool position microswitch:

Note: to complete the control you must use the assembly kit at #7

N1-A1 03641N1-A1/A2 Micro operation in pos. 1 and 2, with lever box
N1A-A1 03642N1A-A1/A2 Micro operation in pos. 1, with lever box
N1B-A1 03643N1BA1/A2L Micro operation in pos. 2, with lever box
N1-A3 03648N1-A3L Micro operation in pos. 1 and 2, without lever with cap
N1A-A3 03648N1A-A3L Micro operation in pos. 1, without lever with cap
N1B-A3 03648N1B-A3L Micro operation in pos. 2, without lever with cap

5 A side control (cont.) **page 11**

TYPE CODE DESCRIPTION

For types 103 and 111 special spools

Without lever control:

A3 03614A3 Without lever, with cap
 03614A3/03 As previous one, with aluminium cap
A4 03617A4 M8 male thread external pin with flange
 03617A4/03 As previous one, with aluminium flange
A5⁽²⁾ 03619A5 Flange with spherical spool end

6 B side control **page 15**

TYPE CODE DESCRIPTION

With spring return:

M1 03730M1 3 pos., spring return in neutral position
 03730M1/03 As previous one, with aluminium cap
M1-U1 03701M1-U1 As M1 type, with M8 male thread external pin
M2 03732M2 2 pos. (0-1), spring return in neutral position
 03732M2/03 As previous one, with aluminium cap
M2-U1 03702M2-U1 As M2 type, with M8 male thread external pin
M3 03733M3 2 pos. (0-2), spring return in neutral position
 03733M3/03 As previous one, with aluminium cap
M3-U1 03703M3-U1 As M3 type, with M8 male thread external pin
M4-U1 03704M4-U11-2 2 pos. (1-2), spring return in pos. 1, with M8 male thread external pin

With flexible cable control arrangement:

M1-U2 03715M1-U2 3 pos., spring return in neutral position
M2-U2 03716M2-U2 2 pos. (0-1), spring return in neutral position

With detent:

R1 03741R1 3 pos., detent in position 1
 03741R1/03 As previous one, with aluminium cap
R2 03742R2 3 pos., detent in position 2
 03742R2/03 As previous one, with aluminium cap
R3 03743R3 3 pos., detent in all position
 03743R3/03 As previous one, with aluminium cap

With spool position microswitch:

Note: to complete the control you must use the assembly kit at #7

M1-N1 03766M1-N1 3 pos., micro operation in pos. 1 and 2, spring return in neutral position
M1-N1A 03767M1-N1AL As M1-N1 type, micro operation in pos. 1
M1-N1B 03768M1-N1BL As M1-N1 type, micro operation in pos. 2
M2-N1 03769M2-N1L 2 pos. (0-1), spring return in neutral position
M3-N1 03772M3-N1L 2 pos. (0-2), spring return in neutral position

7 Microswitch assembling kit

CODE DESCRIPTION
 03650N1-01 Kit for 1 section

8 Complete controls A+B sides **page 18**

TYPE CODE DESCRIPTION

For types 103 and 111 special spools

C2 03792C2-C3 Cam control from position 1 to 2
C3 03792C2-C3 Cam control from position 2 to 1

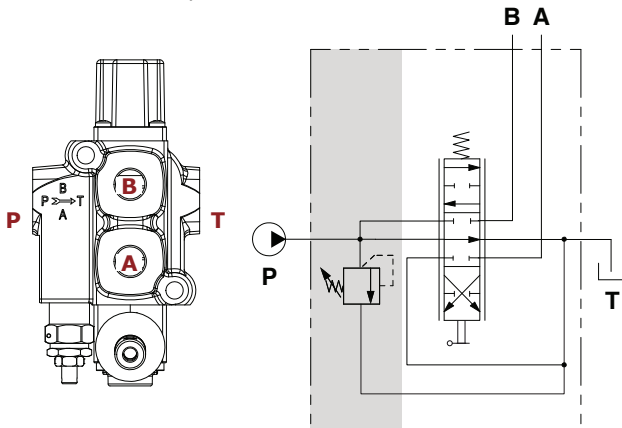
9 Accessory

TYPE CODE DESCRIPTION
 - 4COP120420 Antitamper cap for pressure relief valve

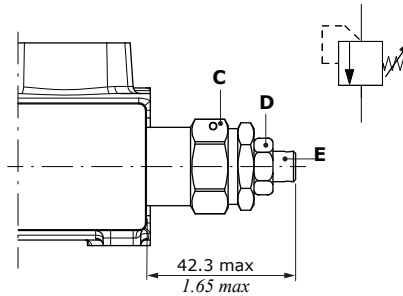
(*): Codes are referred to **BSP** thread
 (1): Always complete with lever knob
 (2): To be assembled only with M4 control

Main pressure relief valve

F7S configuration
With pressure relief valve



Main pressure relief valve

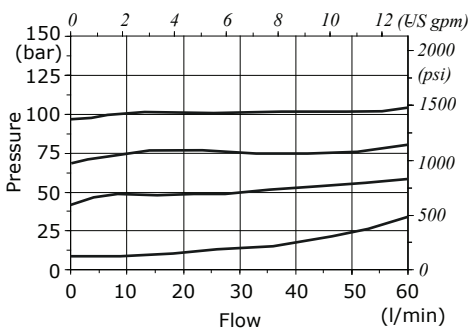


Wrenches and tightening torques

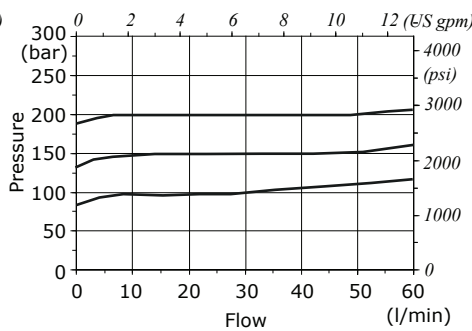
- C = wrench 22 - 42 Nm (30.9 lbft)
- D = wrench 13 - 24 Nm (17.7 lbft)
- E = allen wrench 4

Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

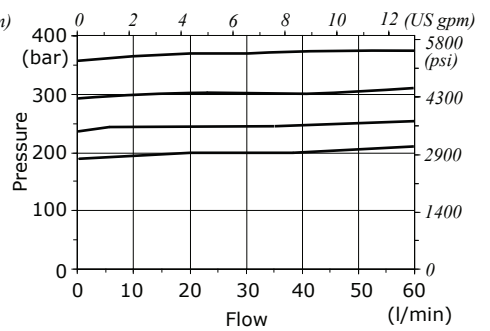
Setting example (B type spring)



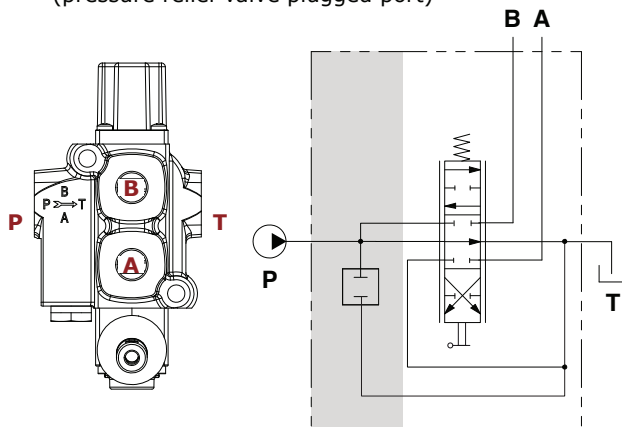
Setting example (N type spring)



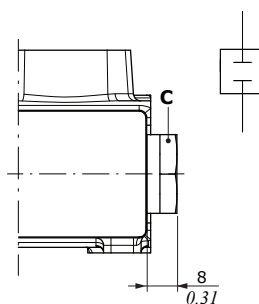
Setting example (R type spring)



F8S configuration
Without valves
(pressure relief valve plugged port)



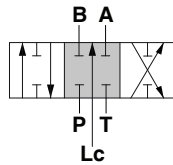
Relief valve blanking plug



Spool

103 type
A and B closed
in neutral position

2 **0** 1

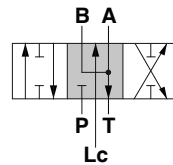


Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

111 type
A and B to tank
in neutral position

2 **0** 1

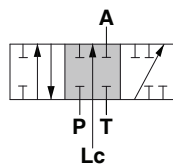


Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

101 type
Single acting on A,
B plugged

2 **0** 1

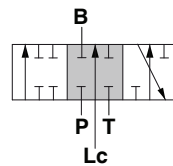


Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

102 type
Single acting on B,
A plugged

2 **0** 1



Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

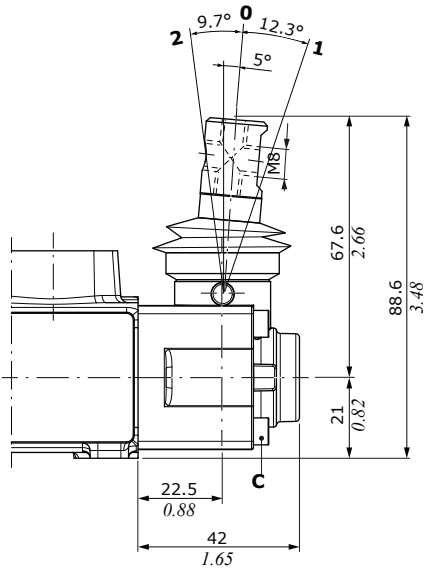
A side controls

Mechanical controls

With lever control

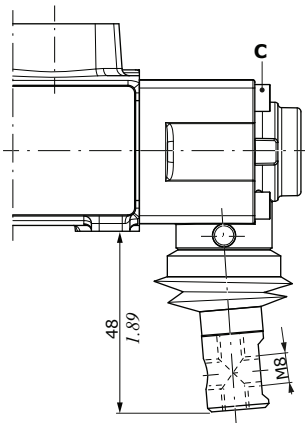
A1 type

M8 thread plastic lever box



A2 type

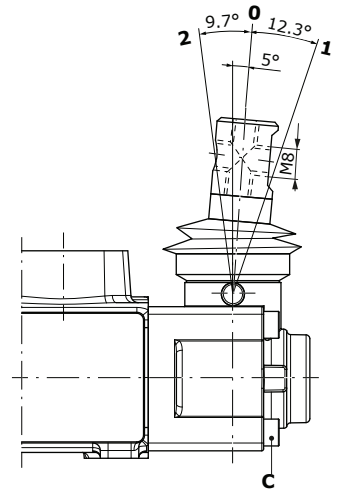
As A1 type, rotated 180°



A1/10 type

M8 thread aluminium lever box. Dimensions are the same of A1 type

A2/10 type
As A1/10 type, rotated 180°

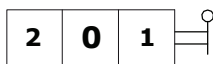


A1/PM type

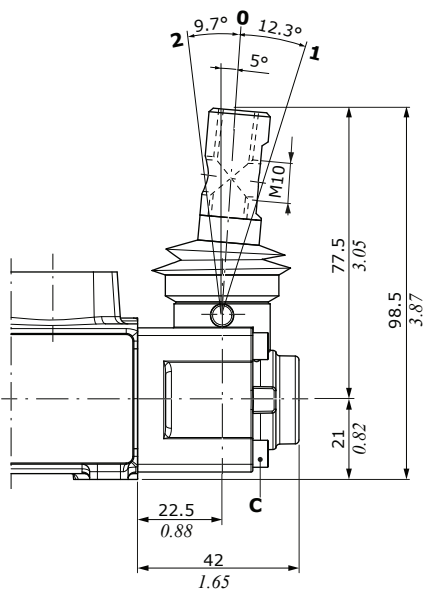
M10 thread plastic lever box.

Dimensions are the same of A1/PM type

A2/PM type
As A1/PM type, rotated 180°

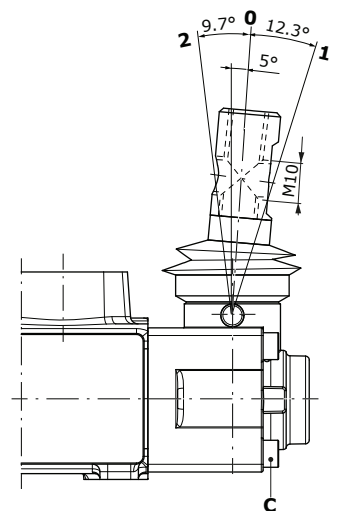
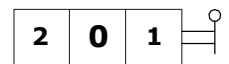
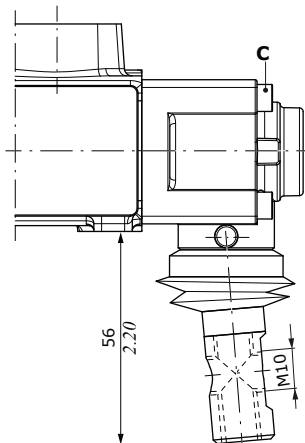
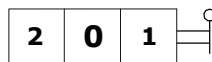


M10 thread aluminium lever box



A2/PM type

As A1/PM type, rotated 180°



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf_t)

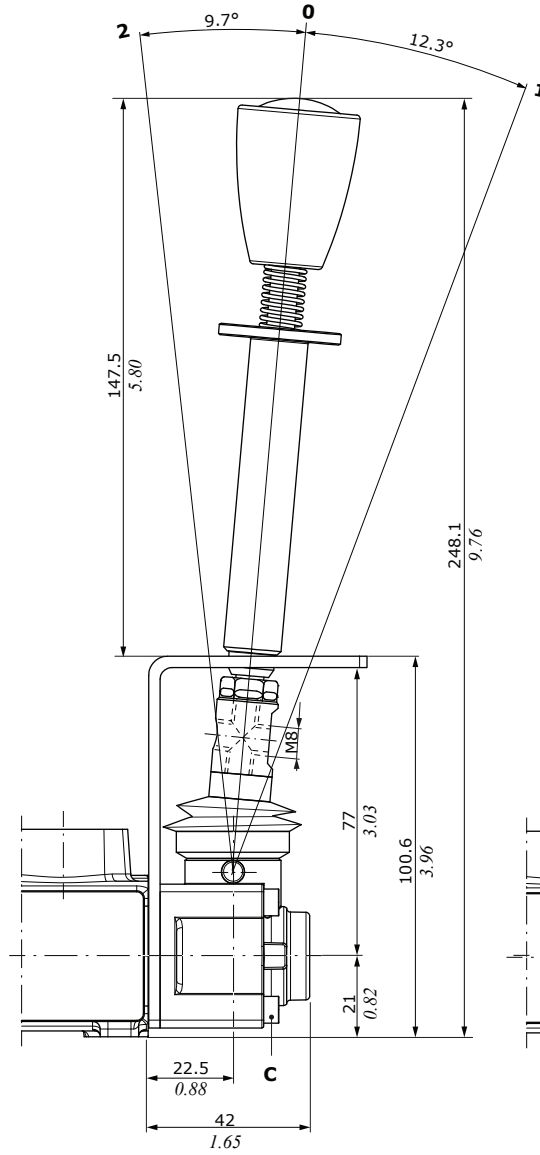
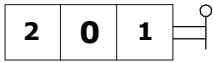
A side controls

Mechanical controls

With safety lever control

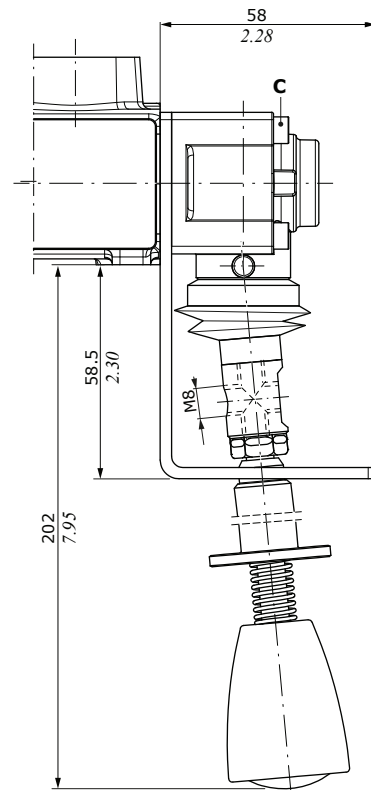
A1/S type

M8 thread, aluminium lever box



A2/S type

As A1/S type, rotated 180°



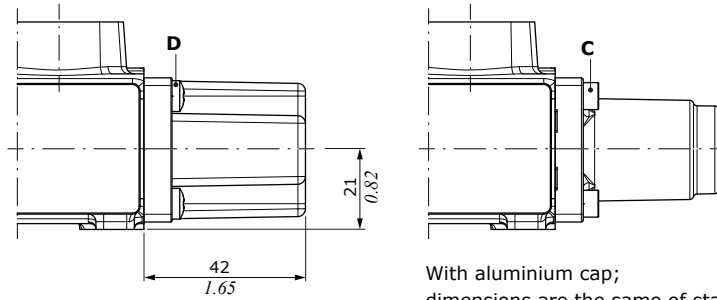
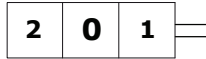
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)

Mechanical controls

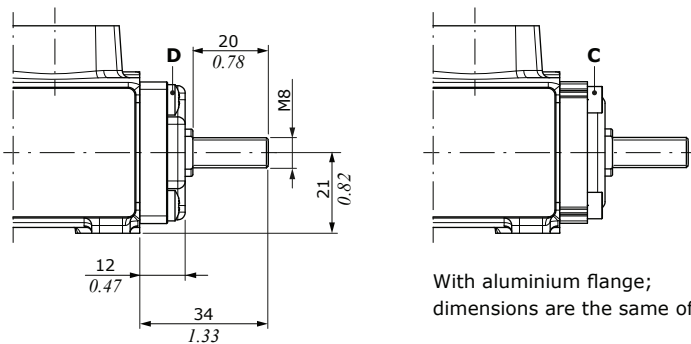
Without lever control

A3 type
With cap.
Available with aluminium cap



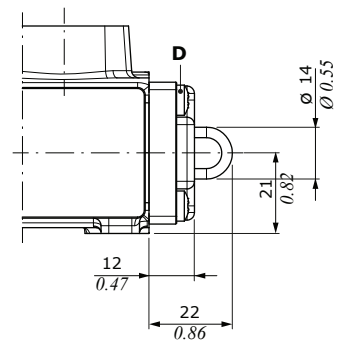
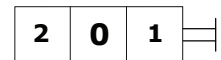
With aluminium cap;
dimensions are the same of standard type

A4 type
M8 male thread external pin with flange.
Available with aluminium flange



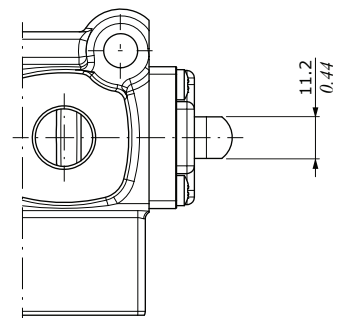
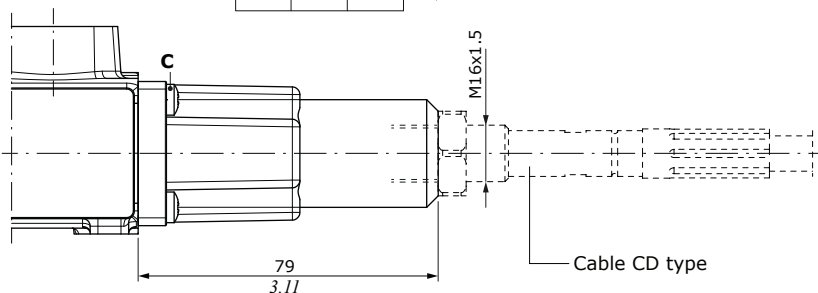
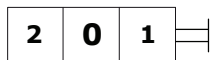
With aluminium flange;
dimensions are the same of standard type

A5 type
Flange with spherical pool end



With flexible cable control arrangement

A8 type
With flexible cable control
arrangement



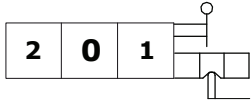
Wrenches and tightening torques
C = allen wrench 3 - 3 Nm (2.2 lbf_t)
D = cross-head - 3 Nm (2.2 lbf_t)

A side controls

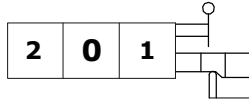
Spool position microswitch

With lever control

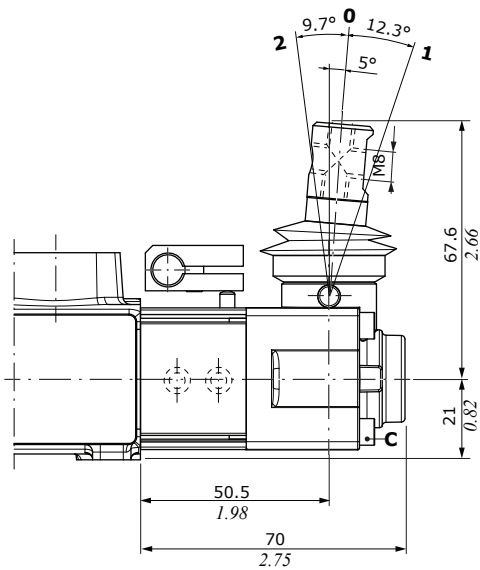
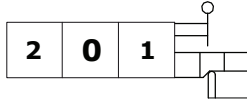
N1-A1 type
Micro operation
in position 1 and 2



N1A-A1 type
Micro operation in
position 1

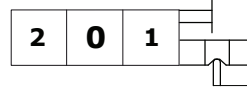


N1B-A1 type
Micro operation in
position 2



Without lever control, with cap

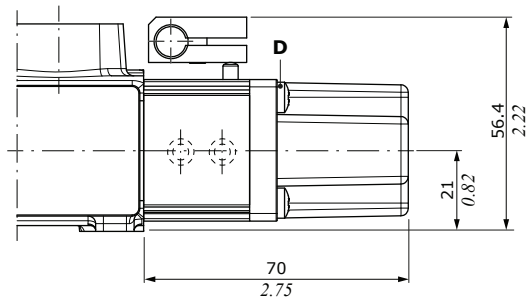
N1-A3 type
Micro operation
in position 1 and 2



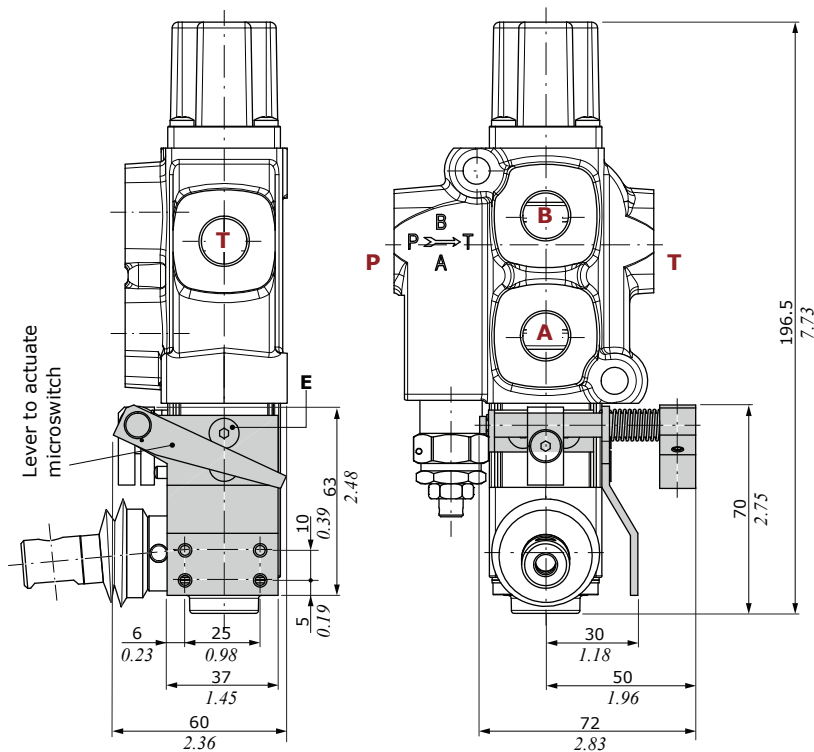
N1A-A3 type
Micro operation in
position 1



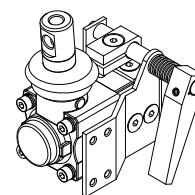
N1B-A3 type
Micro operation in
position 2



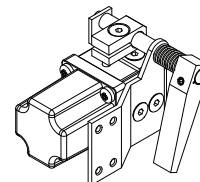
Microswitch assembly kit for 1 working section (N1-A1 type)



with lever box



with cap



Wrenches and tightening torques

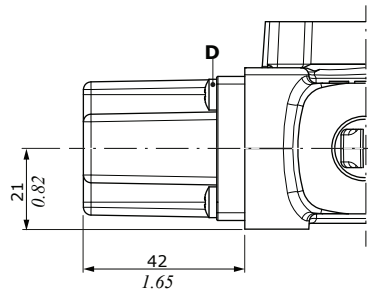
- C = allen wrench 3 - 3 Nm (2.2 lbf^t)
- D = cross-head - 3 Nm (2.2 lbf^t)
- E = allen wrench 3 - 6.6 Nm (4.8 lbf^t)

Mechanical controls

With spring return control

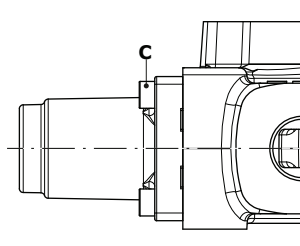
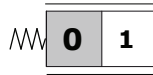
M1 type

3 position, spring return in neutral position.
Available with aluminium cap



M2 type

2 position (0-1), spring return in neutral position.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

M3 type

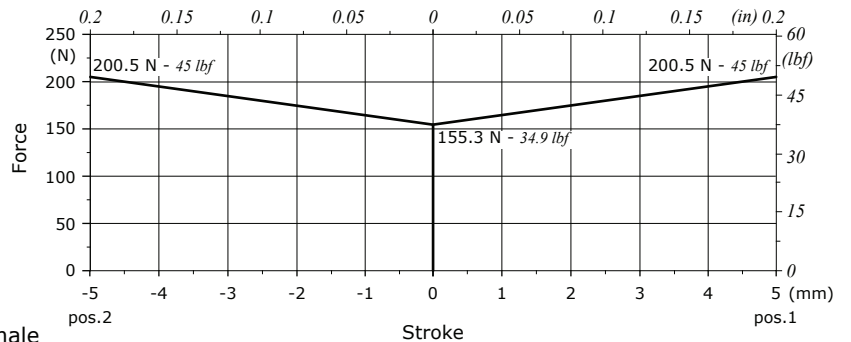
2 position (0-2), spring return in neutral position.
Available with aluminium cap



Wrenches and tightening torques

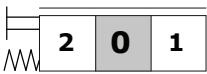
C = allen wrench 3 - 3 Nm (2.2 lbf)
D = cross-head - 3 Nm (2.2 lbf)

M1 control type - Force vs. Stroke diagram



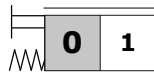
M1/U1 type

As M1 type, with M8 male thread external pin



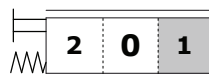
M2/U1 type

As M2 type, with M8 male thread external pin



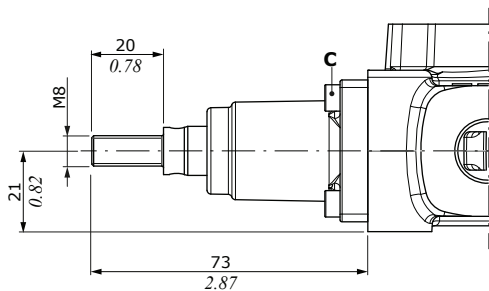
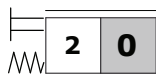
M4/U1 type

2 position (1-2), spring return in pos. 1, with M8 male thread external pin



M3/U1 type

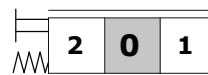
As M3 type, with M8 male thread external pin



With flexible cable control arrangement

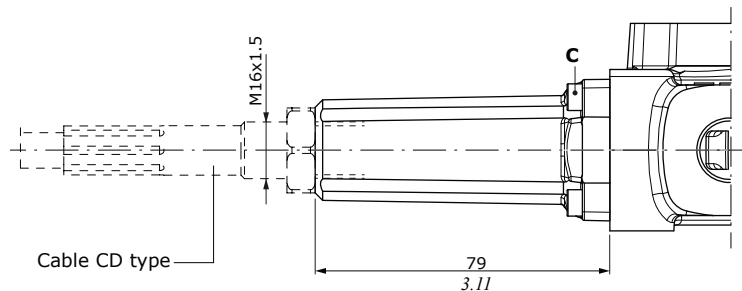
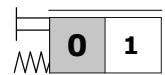
M1/U2 type

3 position, spring return in neutral position



M2/U2 type

2 position (0-1), spring return in neutral position



B side controls

Mechanical controls

With detent control

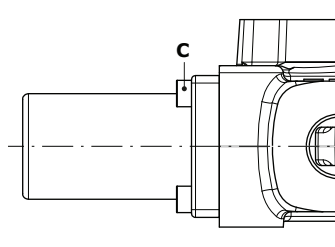
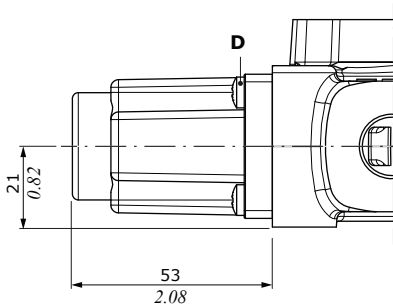
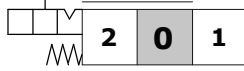
R1 type

3 position, detent in position 1.
Available with aluminium cap

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)

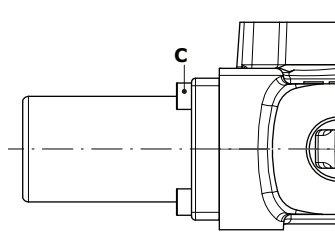
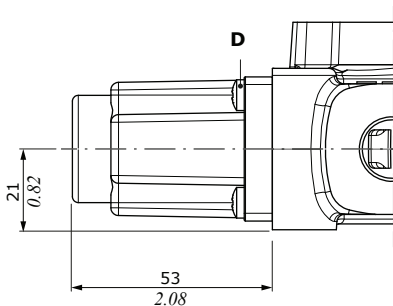
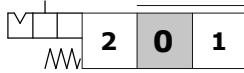
D = cross-head - 3 Nm (2.2 lbf^t)



With aluminium cap;
dimensions are the same of standard type

R2 type

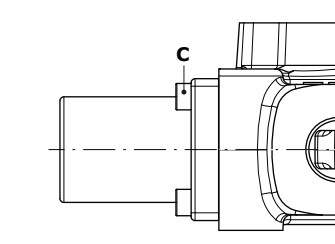
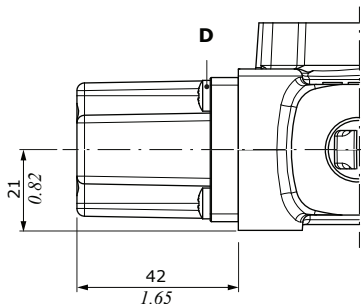
3 position, detent in position 2.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

R3 type

3 position, detent in all position.
Available with aluminium cap

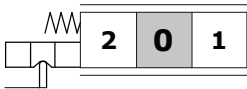


With aluminium cap;
dimensions are the same of standard type

Spool position microswitch

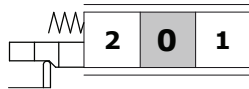
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position



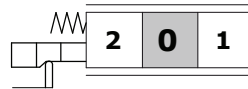
M1-N1A type

3 position, micro operation in position 1



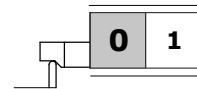
M1-N1B type

3 position, micro operation in position 2



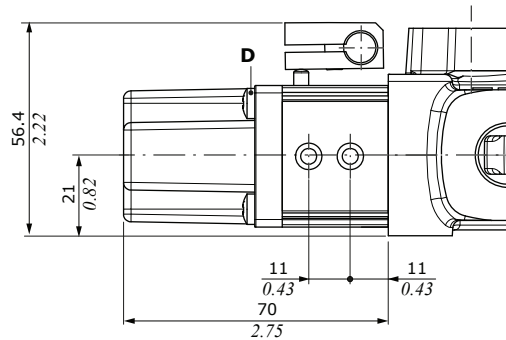
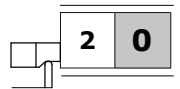
M2-N1 type

2 position (0-1), spring return in neutral position



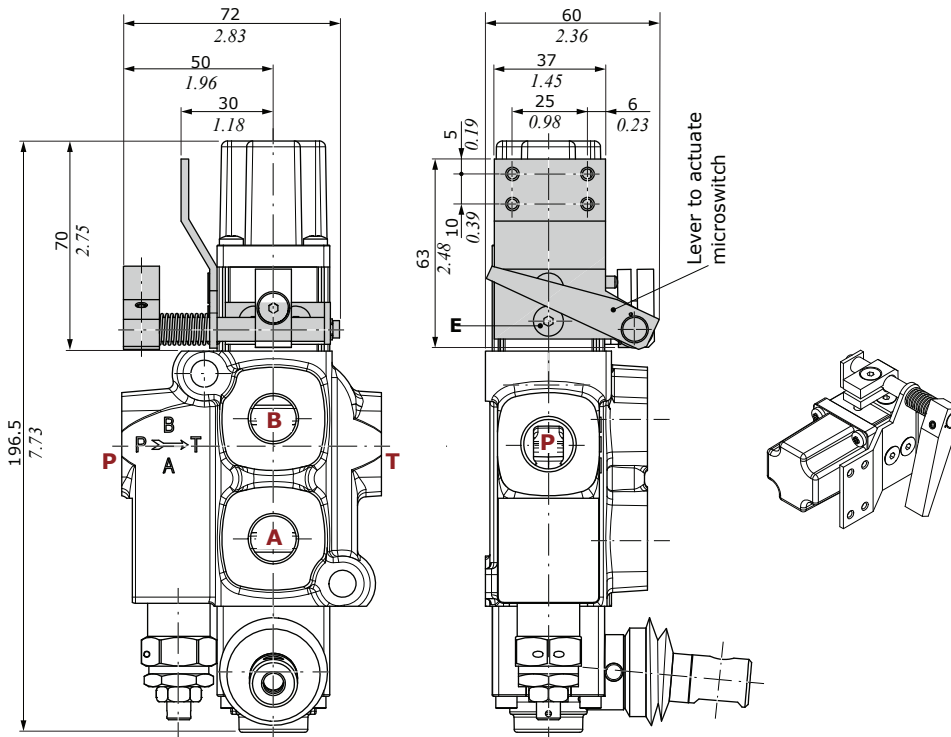
M3-N1 type

2 position (0-2), spring return in neutral position



Wrenches and tightening torques
 D = cross-head - 3 Nm (2.2 lbft)
 E = allen wrench 3 - 6.6 Nm (4.8 lbft)

Microswitch assembly kit for 1 working section (M1-N1 type)

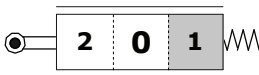


A+B side controls

With cam control

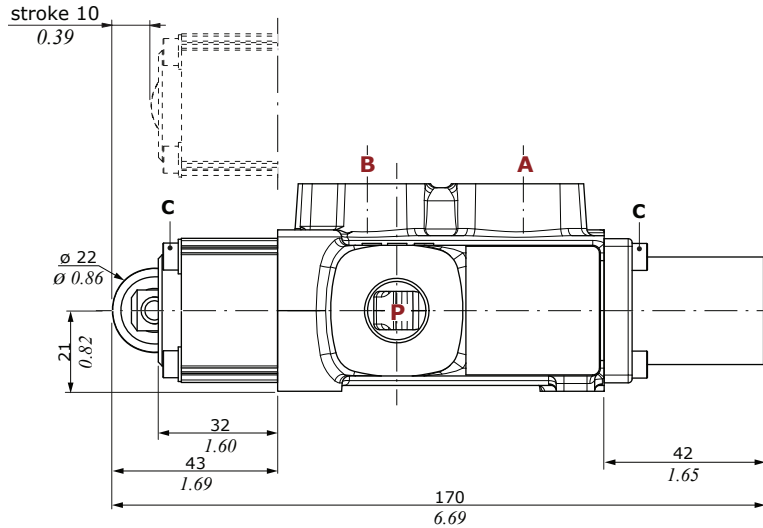
C2 type

From position 1 to position 2,
spring return in position 1



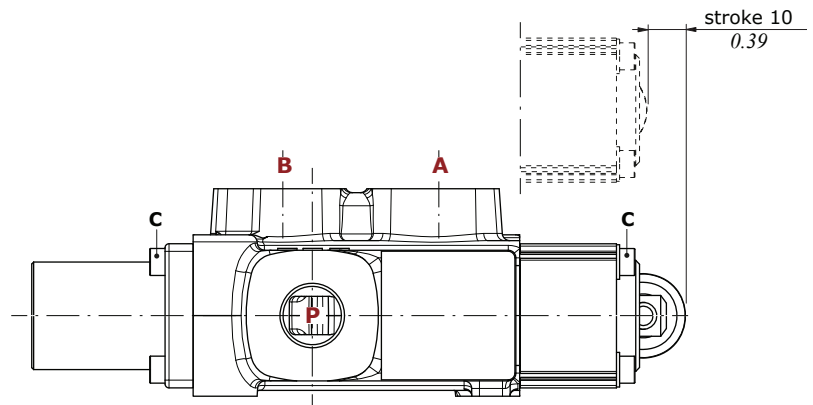
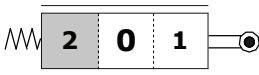
Wrenches and tightening torques

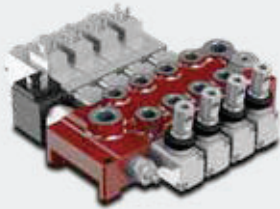
C = allen wrench 3 - 3 Nm (2.2 lbf^t)



C3 type

From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type





GMV15

Monoblock directional valve

- Simple, compact and heavy duty designed monoblock valve
- From 2 to 4 sections
- For open and closed center hydraulic systems, optional carry over port
- Mechanical or direct solenoid controls

Working conditions

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

Nominal flow rating	15 l/min - (4 Us gpm)	
Max. pressure	280 bar (4060 psi)	
Max. back pressure on outlet T port	25 bar (360 psi)	
Number sections	from 2 to 4	
Internal leakage A(B)⇒T	$\Delta p = 100 \text{ bar (1450 psi)}$	max. 5 cm ³ /min (0.30 in ³ /min)
Fluid	Mineral oil	
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt
Max. contamination level	16/14/12 - ISO 4406 - NAS 1638 class 6	
Ambient temperature	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F

NOTE - For different conditions please contact our Sales Department.

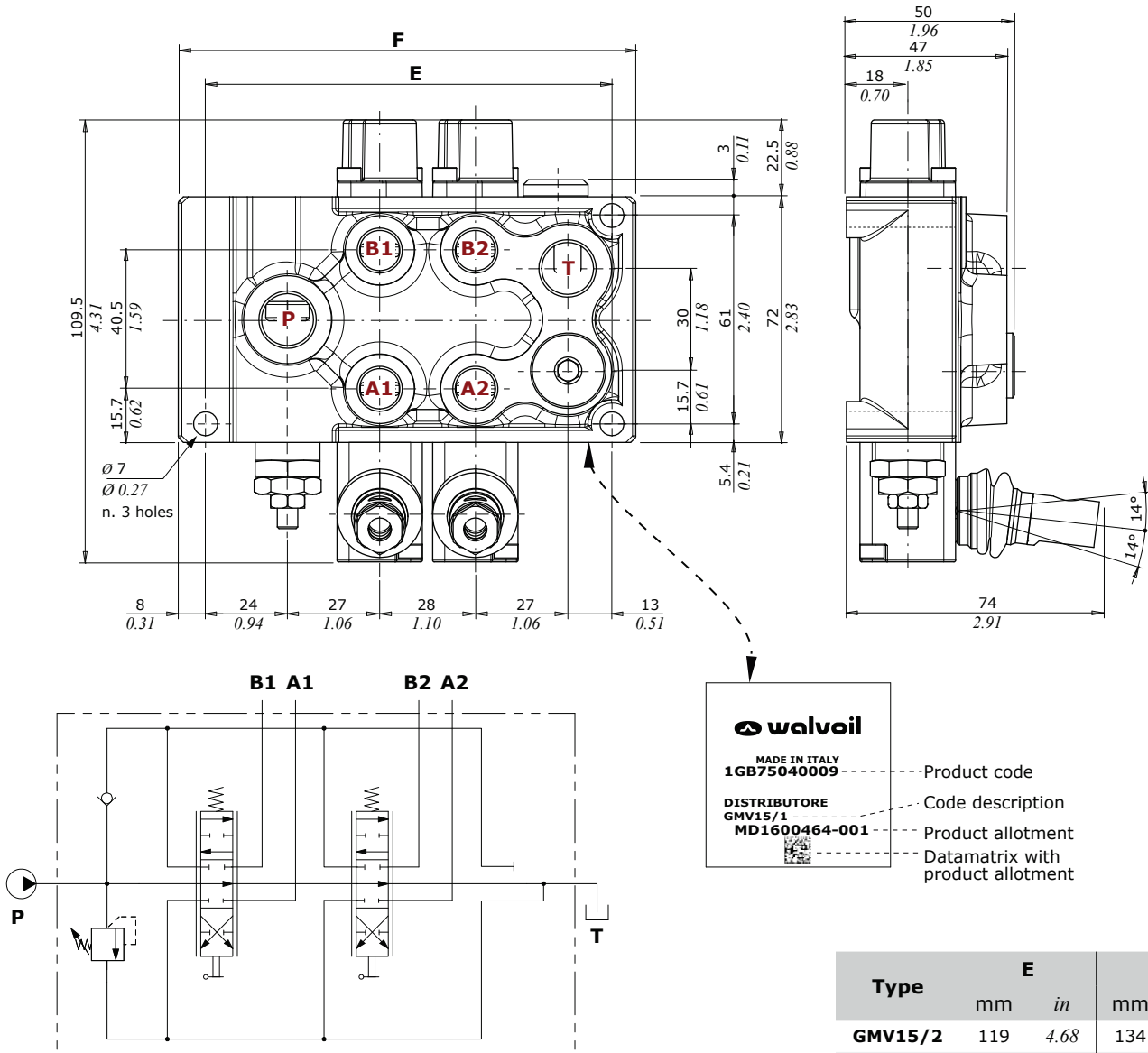
REFERENCE STANDARD

		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926
	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING

PORTS	BSP	UN-UNF
P Inlet	G 3/8	3/4-16 (SAE 8)
A and B ports	G 1/4	9/16-18 (SAE 6)
T Outlet	G 3/8	3/4-16 (SAE 8)
Lc port (Carry-over)	G 3/8	3/4-16 (SAE 8)

Dimensional data and hydraulic circuit

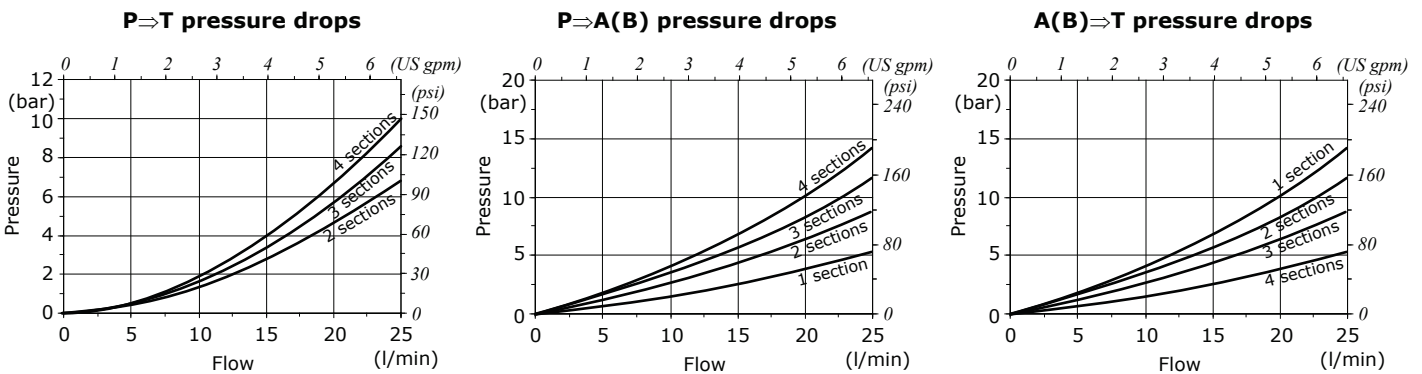


walvoil
 MADE IN ITALY
1GB75040009 --- Product code
 DISTRIBUTORE
 GMV15/1 --- Code description
MD1600464-001 --- Product allotment
 --- Datamatrix with product allotment

Type	E		F	
	mm	in	mm	in
GMV15/2	119	4.68	134	5.27
GMV15/3	147	5.78	162	6.37
GMV15/4	175	6.89	190	7.48

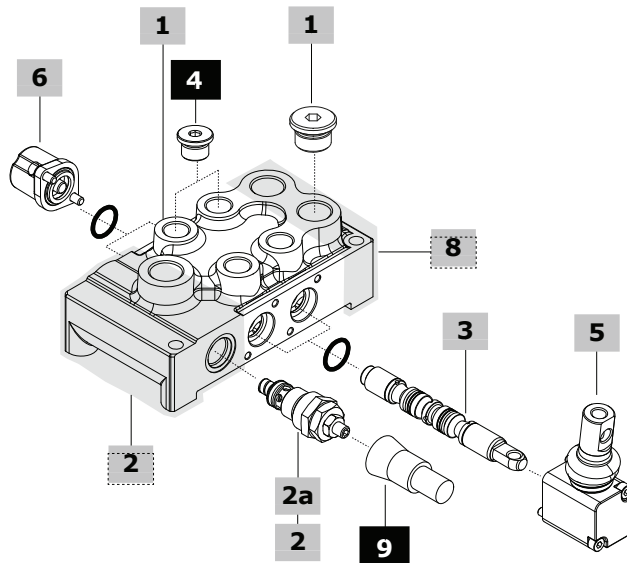
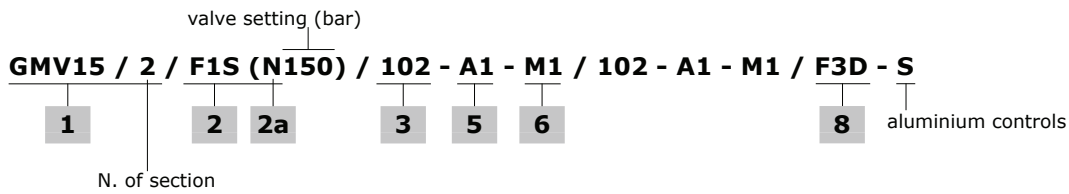
Description example (parallel circuit):
 GMV15/2/F1S(N150)/103-A1-M1/103-A1-M1/F3D-S

Performance data

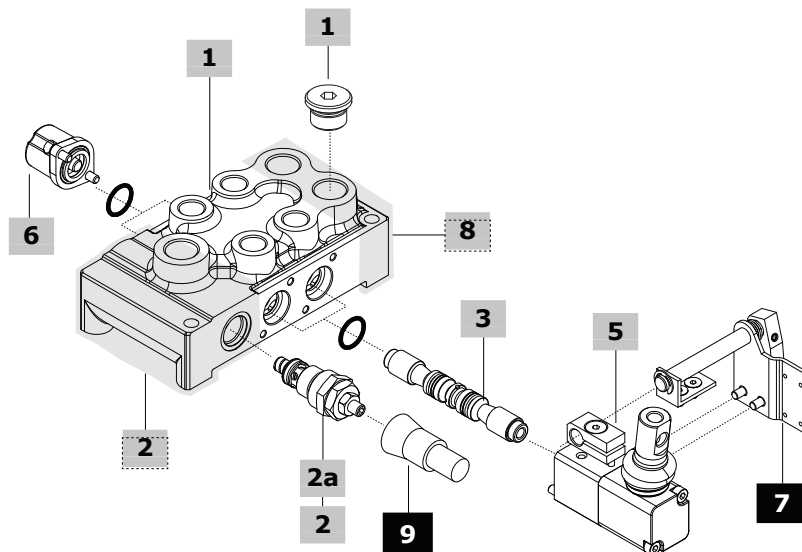
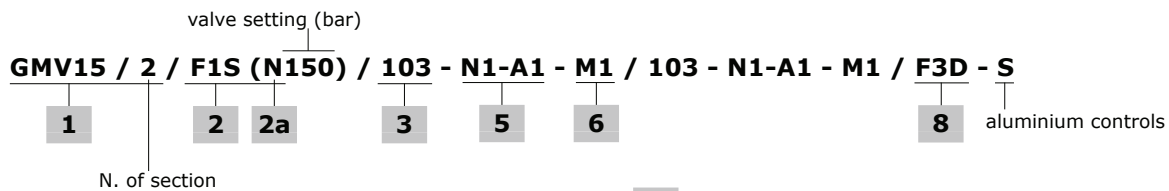


NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

Mechanical control valve configuration example



Microswitch control valve configuration example



Parts ordering codes

1 Body kit*

The codes are referred to sections with O-ring seals

TYPE	CODE	DESCRIPTION
GMV15/2	5KC0600131995	2 sections
GMV15/3	5KC0600132000	3 sections
GMV15/4	5KC0600132004	4 sections

2 Inlet configuration* page 24

TYPE	DESCRIPTION
F1S	With load check and pressure relief valve
F2S	With load check valve
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)

2a Main pressure relief valve page 24

TYPE: B	CODE: 700015200000000
DESCRIPTION: VLP15S valve, setting range 10-100 bar (145-1450 psi)	
TYPE: N	CODE: 700015100000000
DESCRIPTION: VLP15S valve, setting range 101-280 bar (1460-4050 psi)	
TYPE: -	CODE: 060003199099
DESCRIPTION: Relief valve blanking plug	

3 Spool page 25

TYPE	CODE	DESCRIPTION
Standard spools		
103	060103206599	Double acting, A and B closed in neutral position
111	KR15111RN	Double acting, A and B to tank in neutral position, negative overlap
101	KR15101-102	Single acting on port A. G1/4 plug is required, see #4
102	KR15101-102	Single acting on port B. G1/4 plug is required, see #4
116	KR15116-126	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	KR15116-126	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control
Special spool for microswitch control		
111	060103286899	Double acting, A and B to tank in neutral position

4 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	060002930399	G1/4 plug

5 A side control page 26

TYPE	CODE	DESCRIPTION
For standard spools		
<u>With lever control:</u>		
A1	01610A1-A2/10	M8 thread aluminium lever box
A2	01610A1-A2/10	As A1 type, with lever box rotated 180°
A1/Z1	01610A1-2/10Z1	M8 thread aluminium lever box for 116 spool type
A2/Z1	01610A1-2/10Z1	As A1/Z1 type, with lever box rotated 180°
For type 111 special spool		
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #7		
N1-A1	01641N1-A1/A2	Micro operation in pos. 1 and 2

6 B side control page 28

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	01530M1	3 pos., spring return in neutral position
<u>With detent:</u>		
R1	01741R1	3 pos., detent in position 1
R2	01742R2	3 pos., detent in position 2
R3	01743R3	3 pos., detent in all position
R4	01744R4	2 pos., detent in position 0-1
R5	01745R5	2 pos., detent in position 0-2
R8	01748R8	4 pos., detent in 4 th position, for 116 type spool
R10/Z1	01750R10/Z1	4 pos., detent in 4 th position, for 126 type spool

7 Microswitch assembling kit

CODE	DESCRIPTION
01650N1-2	Kit for 2 section
01650N1-3	Kit for 3 section
01650N1-4	Kit for 4 section

8 Outlet configuration* page 30

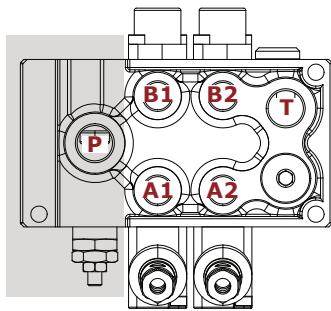
TYPE	DESCRIPTION
F3D	Open center configuration: n. 1 G3/8 plug code 060002792199; n. 1 G1/4 plug code 060002930399
F6D	Carry-over configuration: n. 1 G1/8 conical plug code 251001; n. 1 G1/4 plug code 060002930399
F16D	Closed center configuration: n. 1 G1/8 conical plug code 251001; n. 1 G3/8 plug code 060002792199; n. 1 G1/4 plug code 060002930399

9 Accessory

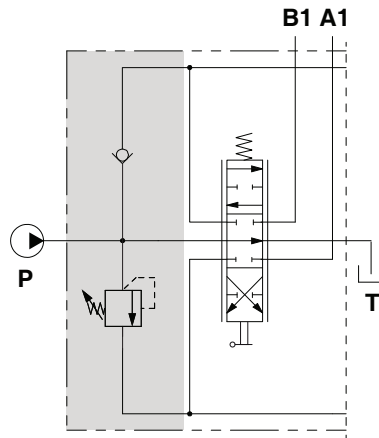
TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

(*): Codes are referred to **BSP** thread

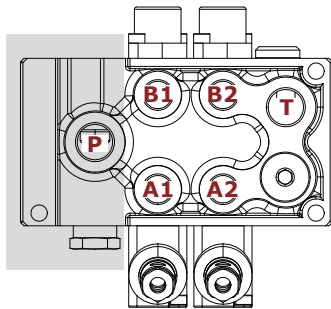
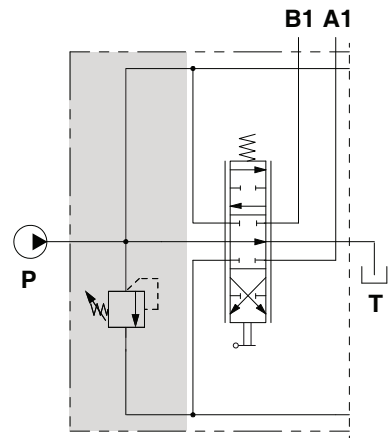
Inlet configuration



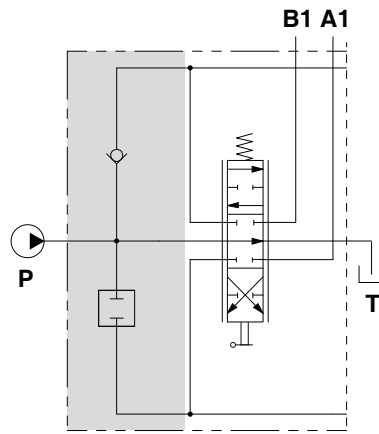
F1S configuration
With load check and pressure relief valve



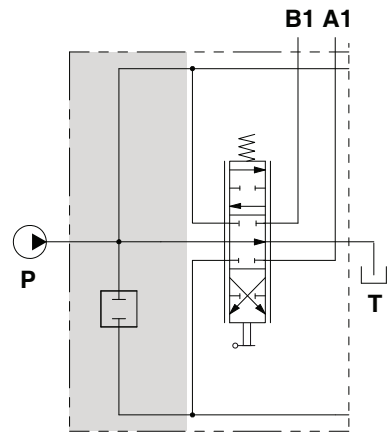
F7S configuration
With pressure relief valve



F2S configuration
With load check valve

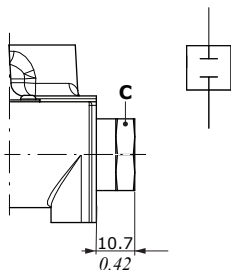


F8S configuration
Without valves
(pressure relief valve plugged port)

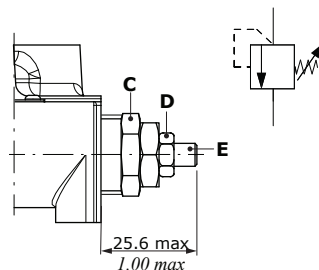


Main pressure relief valve

Relief valve blanking plug



Main pressure relief valve



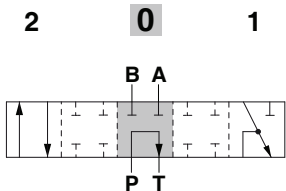
Wrenches and tightening torques

- C = wrench 19 - 24 Nm (17.7 lbf)
- D = wrench 10 - 6 Nm (4.42 lbf)
- E = allen wrench 3

Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 280 - from 1460 to 4050

103 type

A and B closed in neutral position

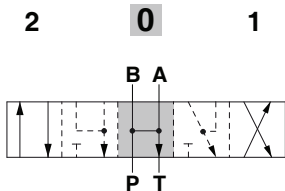


Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 4 mm (- 0.15 in)

111 type

A and B to tank in neutral position

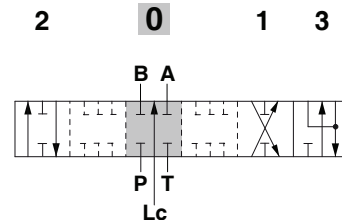


Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 4 mm (- 0.15 in)

116 type

With floating in the 4th position (spool in)

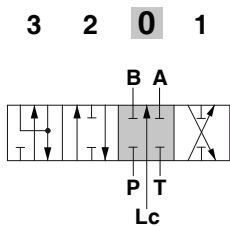


Stroke

Position 1: - 3 mm (- 0.11 in)
Position 2: + 4 mm (+ 0.15 in)
Position 3: - 6 mm (- 0.23 in)

126 type

With floating in the 4th position (spool out)

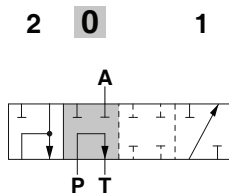


Stroke

Position 1: + 3 mm (+ 0.11 in)
Position 2: - 4 mm (- 0.15 in)
Position 3: + 6 mm (+ 0.23 in)

101 type

Single acting on A, B plugged

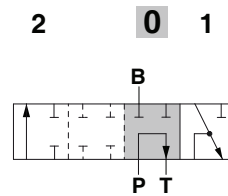


Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 4 mm (- 0.15 in)

102 type

Single acting on B, A plugged



Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 4 mm (- 0.15 in)

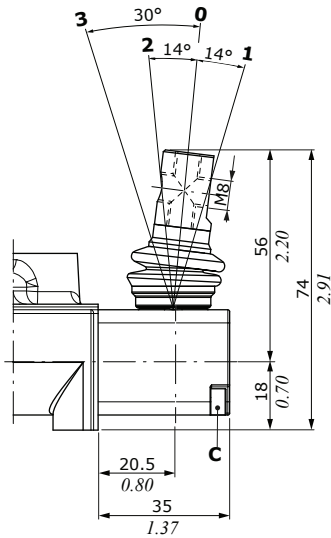
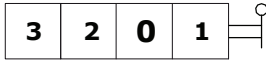
A side controls

Mechanical controls

With lever control

A1 type

M8 thread aluminium lever box

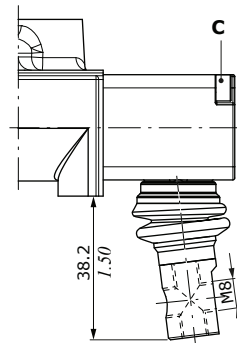
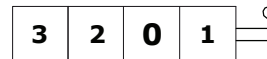


Wrenches and tightening torques

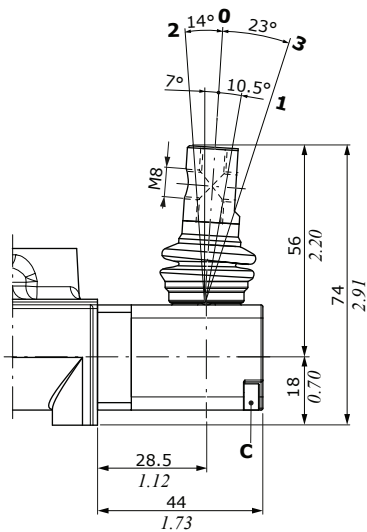
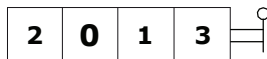
C = allen wrench 3 - 3 Nm (2.2 lbf^t)

A2 type

As A1 type, rotated 180°

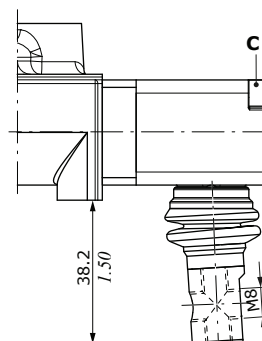
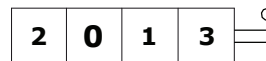


A1/Z1 type
M8 thread,
for 116 floating spool type



A2/Z1 type

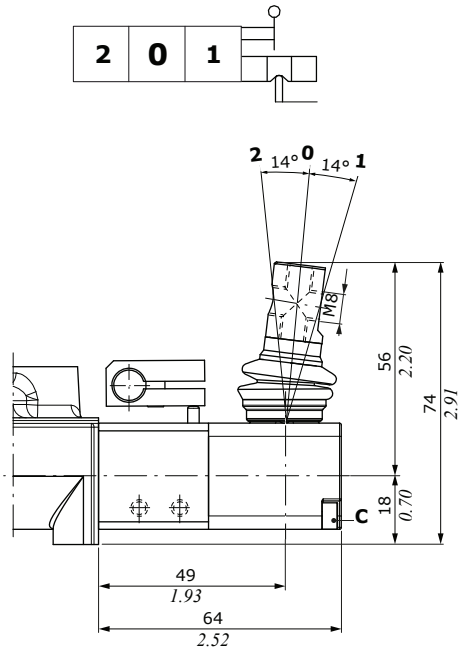
As A1/Z1 type, rotated 180°



Spool position microswitch

N1-A1 type

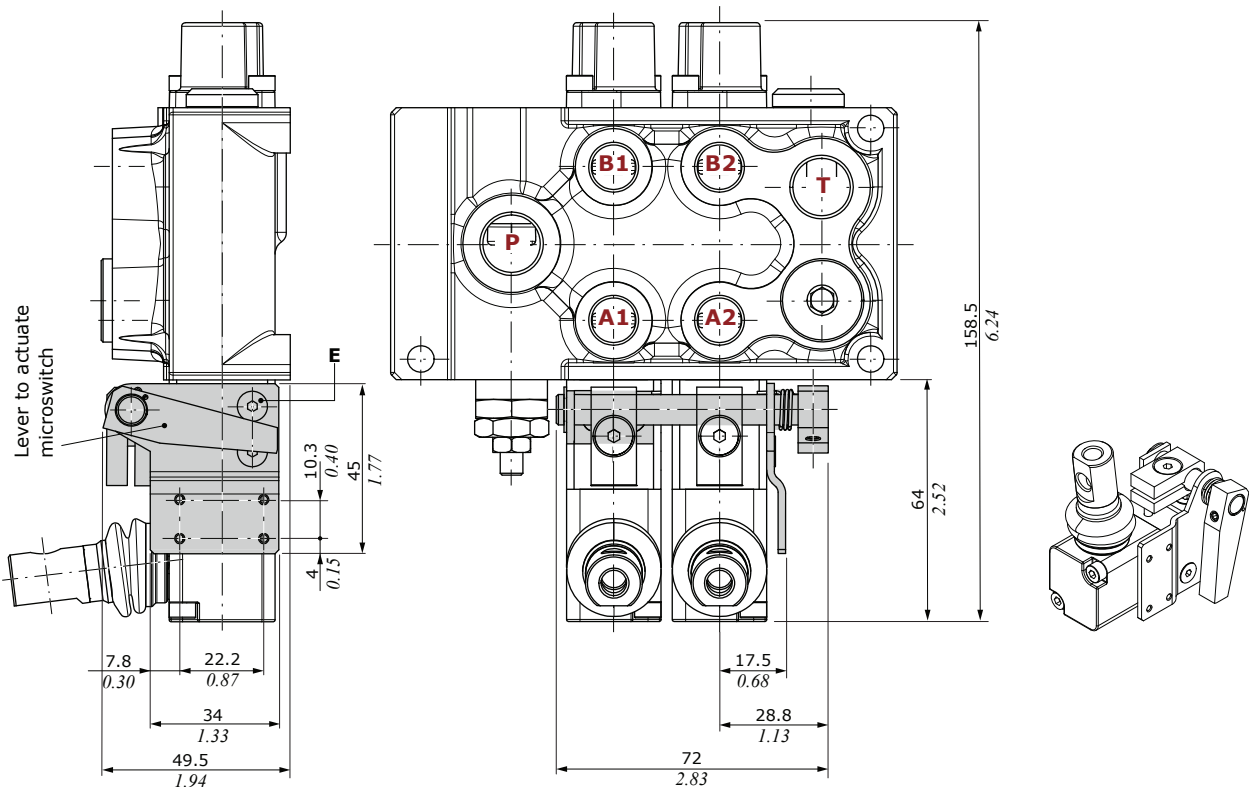
Micro operation in position 1 and 2



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)
 E = allen wrench 3 - 6.6 Nm (4.8 lbf)

Microswitch assembly kit for 2 working sections (N1-A1 type)



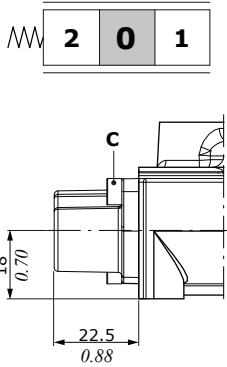
B side controls

Mechanical controls

With spring return control

M1 type

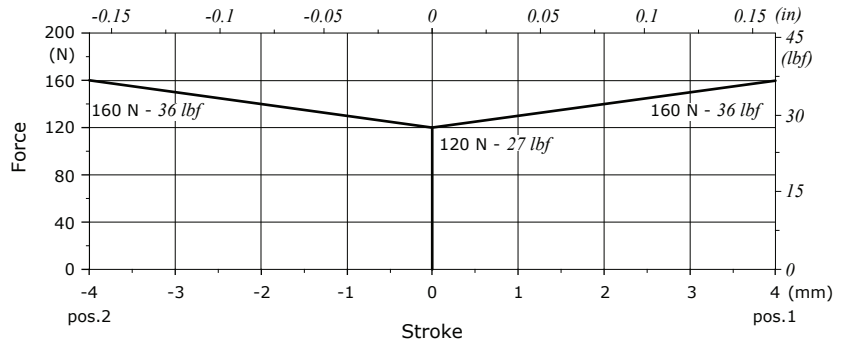
3 position, spring return in neutral position



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)

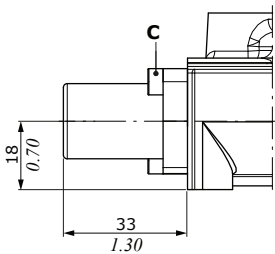
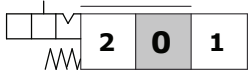
M1 control type - Force vs. Stroke diagram



With detent control

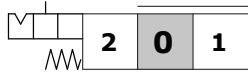
R1 type

3 position, detent in position 1



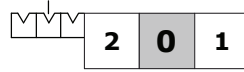
R2 type

3 position, detent in position 2



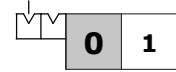
R3 type

3 position, detent in all position

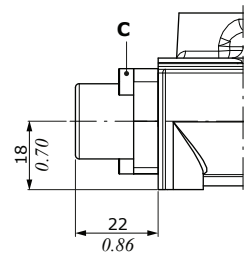
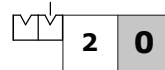


R4 type

2 position, detent in position 0-1

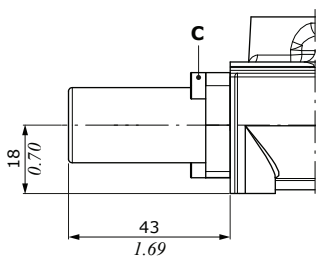
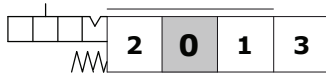


R5 type
2 position, detent in position 0-2



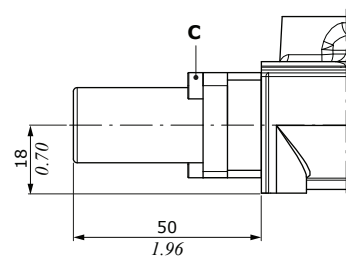
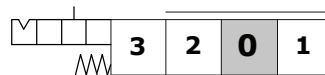
R8 type

4 position, detent in 4th position, for 116 floating spool type



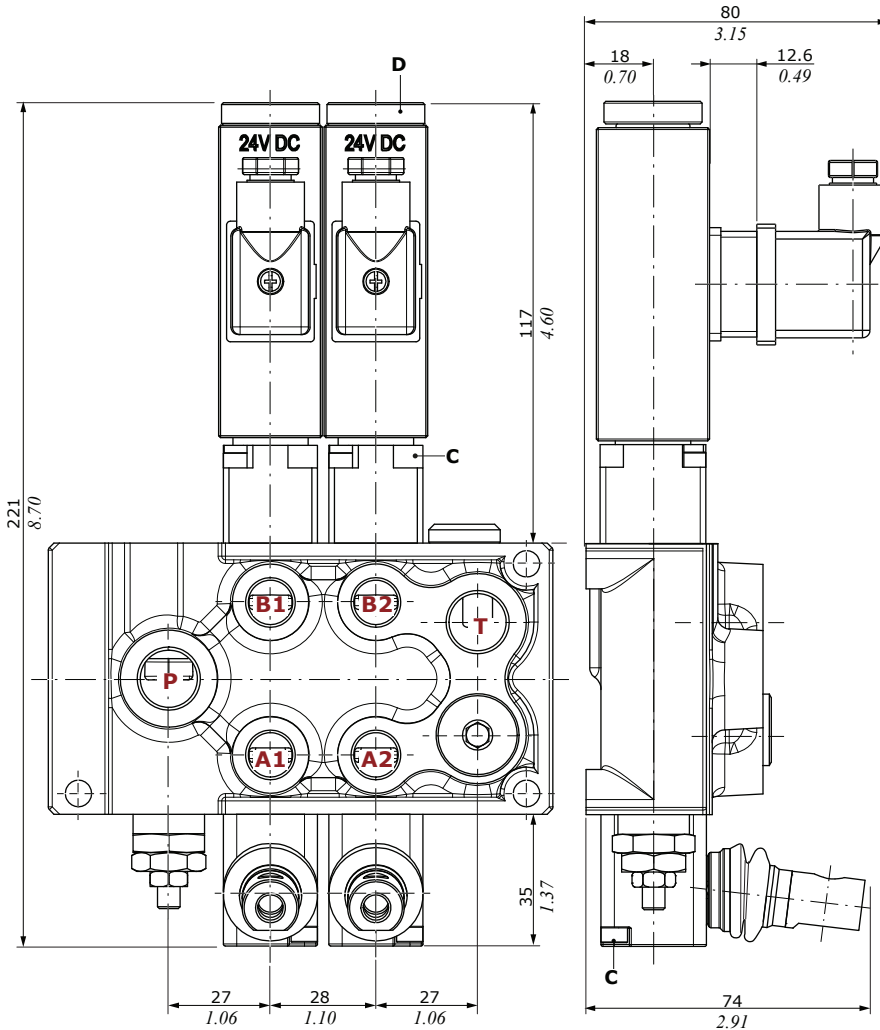
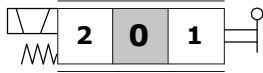
R10/Z1 type

4 position, detent in 4th position, for 126 floating spool type



Direct solenoid controls

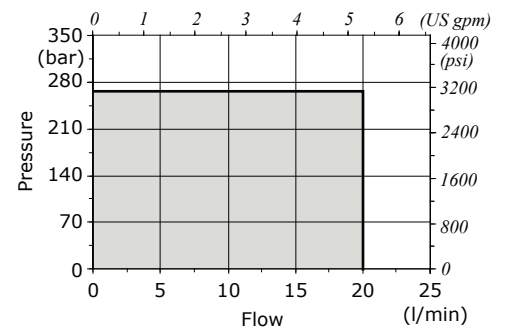
D41 type: ON/OFF one side



D41 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	33 W
Insulance	Class H
Weather protection	IP65

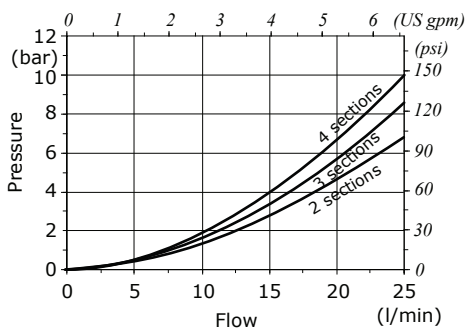
Connector type: ISO4400 2P+T-PG9

Dynamic conditions

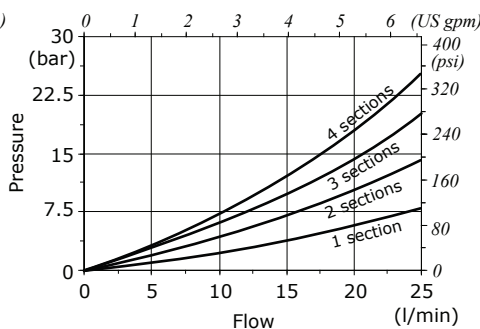


Wrenches and tightening torques
 C = allen wrench 3 - 3 Nm (2.2 lbf_t)
 D = manual tightening - 6.6 Nm (4.8 lbf_t)

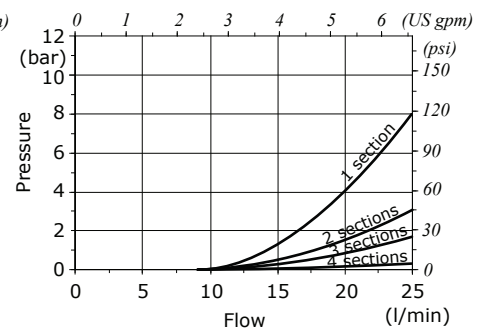
P⇒T pressure drops



P⇒A(B) pressure drops

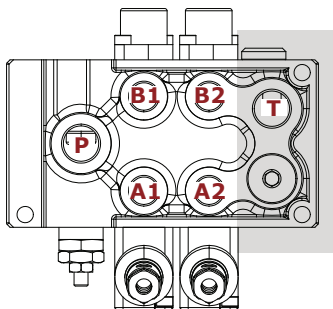
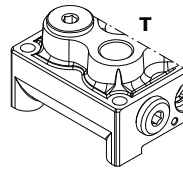
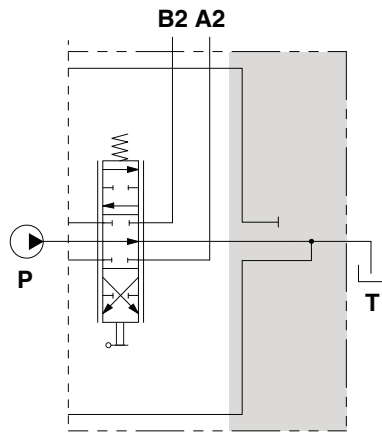


A(B)⇒T pressure drops

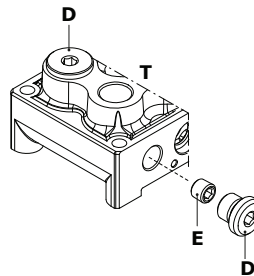
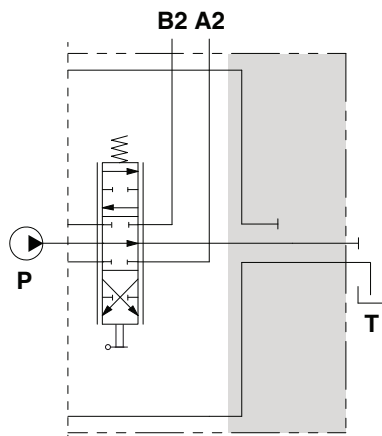


Outlet configuration

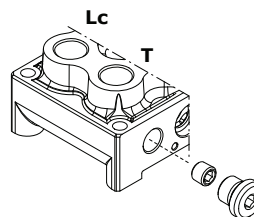
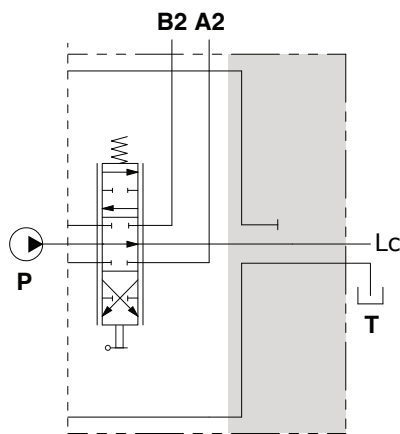
F3D configuration
Open center configuration



F16D configuration
Closed center configuration



F6D configuration
Carry-over configuration



Wrenches and tightening torques
D = allen wrench 6 - 24 Nm (17.7 lbft)
E = allen wrench 6 - 9.8 Nm (7.22 lbft)



Q25 - Q45

Monoblock directional valves

- Simple, compact and heavy duty designed monoblock valve
- From 1 to 8 sections
- For open and closed center hydraulic systems, optional carry over port
- Mechanical, pneumatic, electropneumatic, hydraulic and direct solenoid controls

Working conditions

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

		Q25	Q45
Nominal flow rating		30 l/min - (8 Us gpm)	50 l/min - (13.2 Us gpm)
Max. pressure	from 1 up to 2 sections		
	3 sections		max. 300 bar (4350 psi)
	from 4 up to 8 sections		
Max. back pressure on outlet T port (*)			25 bar (360 psi)
Number sections			from 1 to 8
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)		4 cm ³ /min (0.24 in ³ /min)
Fluid			Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F	
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt	
Max. contamination level		16/14/12 - ISO 4406 - NAS1638 class 6	
Ambient temperature	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F	
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F	

NOTE - For different conditions please contact our Sales Department.

(*): On request for 1 or 2 section monoblock valve only, max back pressure allowable is 180 bar (2610 psi)

REFERENCE STANDARD

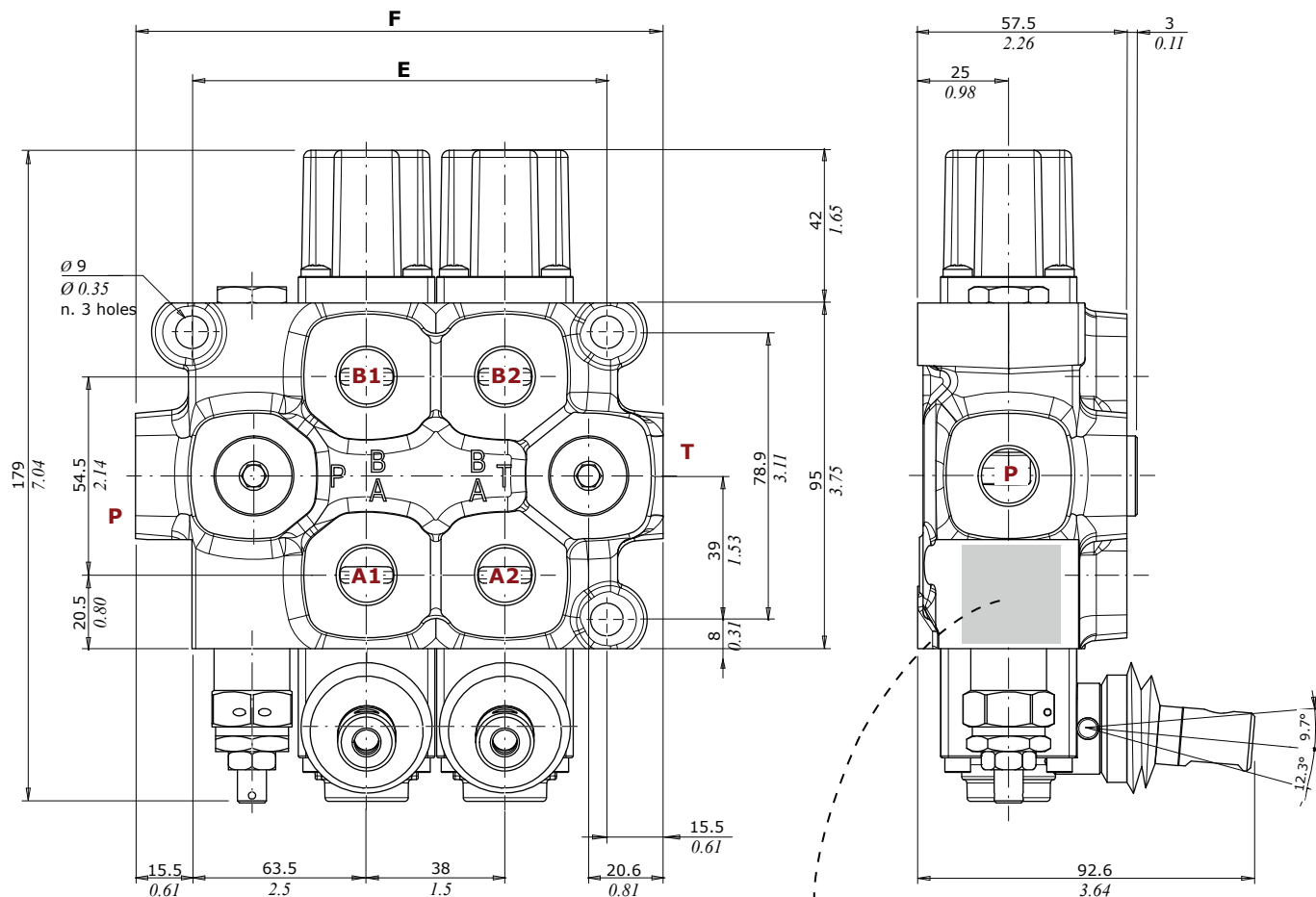
		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
	ISO	1179	11926
CAVITY DIMENSION ACCORDING TO	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING

PORTS	Q25		Q45	
	BSP	UN-UNF	BSP	UN-UNF
P Inlet	G 3/8	9/16-18 (SAE 6)	G 1/2	3/4-16 (SAE 8)
P1 Inlet	G 3/8	9/16-18 (SAE 6)	G 1/2	3/4-16 (SAE 8)
A and B ports	G 3/8	9/16-18 (SAE 6)	G 1/2	3/4-16 (SAE 8)
T Outlet	G 1/2	7/8-14 (SAE 10)	G 1/2	7/8-14 (SAE 10)
T1 Outlet	G 3/8	9/16-18 (SAE 6)	G 1/2	3/4-16 (SAE 8)
Lc port (Carry-over plug - T port)	G 3/8	3/4-16 (SAE 8)	G 1/2	3/4-16 (SAE 8)
Hydraulic controls	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

The Q25 and Q45 monoblock valves, have same dimensions but different threads. See port threading on page 31. Drawing are referred to a Q25 monoblock valve.



walvoil

MADE IN ITALY
1GB75040009 ----- Product code

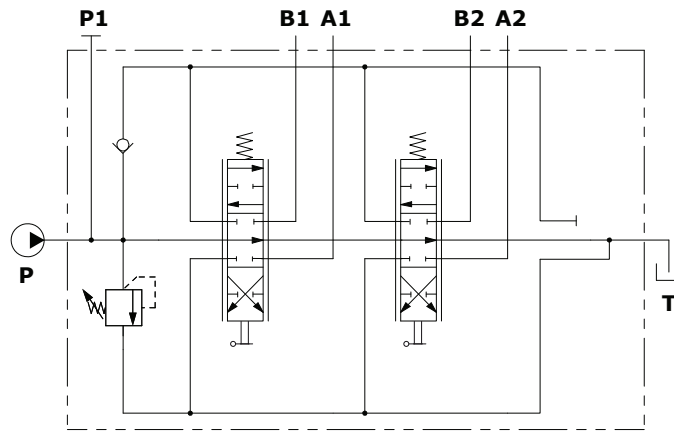
DISTRIBUTORE
Q25/2 ----- Code description

MD1600464-001 ----- Product allotment

----- Datamatrix with product allotment

Type	E		F	
	mm	in	mm	in
Q25/1 - Q45/1	76	2.99	107	4.21
Q25/2 - Q45/2	114	4.48	145	5.70
Q25/3 - Q45/3	152	5.98	183	7.2
Q25/4 - Q45/4	190	7.48	221	8.7
Q25/5 - Q45/5	228	8.97	259	10.19
Q25/6 - Q45/6	266	10.47	297	11.69
Q25/7 - Q45/7	304	11.96	335	13.18
Q25/8 - Q45/8	342	13.46	373	14.68

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

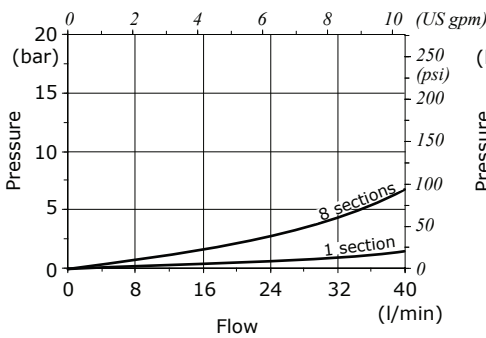


Description example (parallel circuit):
 Q25/2/F1S(N250)/103-A1-M1/103-A1-M1/F3D-S
 Q45/2/F1S(N250)/103-A1-M1/103-A1-M1/F3D-S

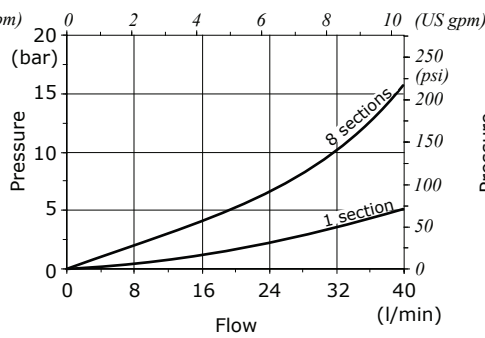
Performance data

Q25

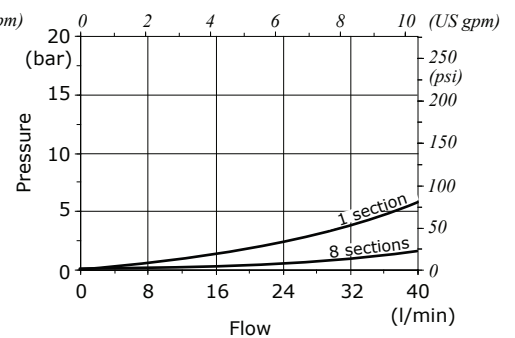
P⇒T pressure drops



P⇒A(B) pressure drops

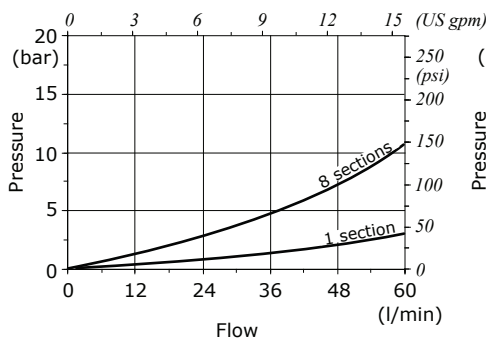


A(B)⇒T pressure drops

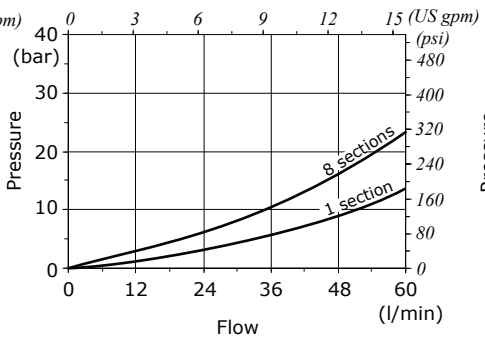


Q45

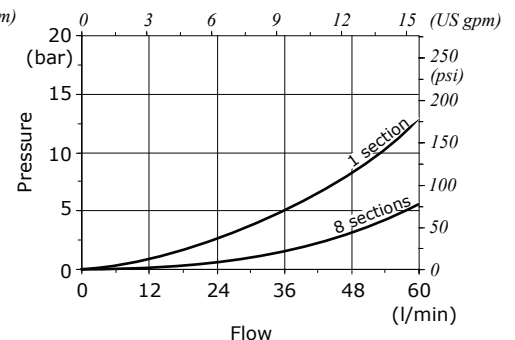
P⇒T pressure drops



P⇒A(B) pressure drops

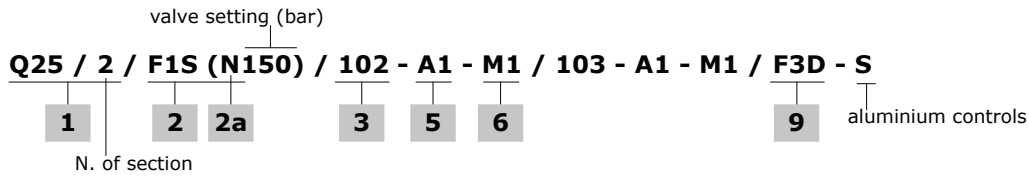


A(B)⇒T pressure drops



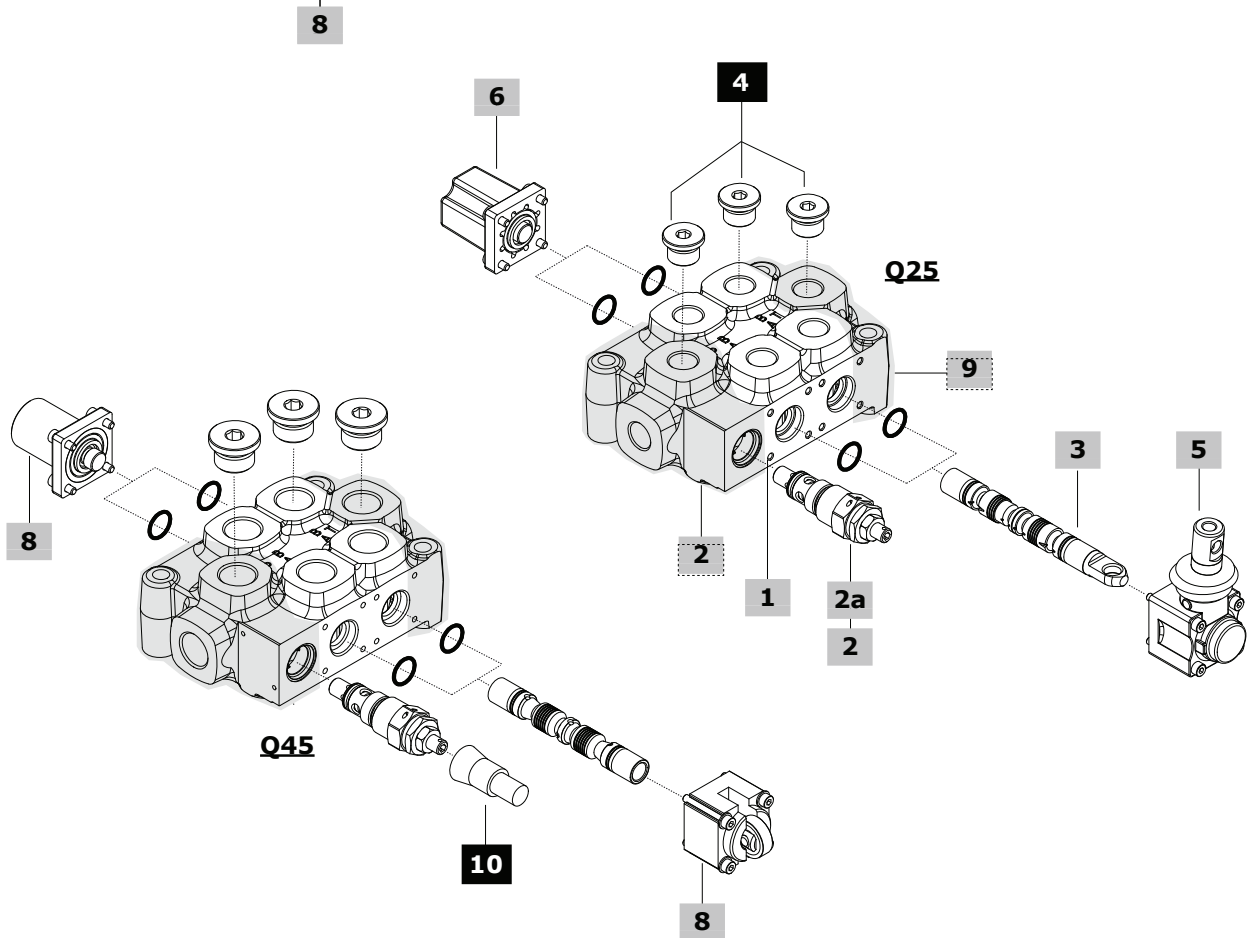
Parts ordering codes

Mechanical control valve configuration example



C2/C3 complete mechanical control valve configuration example

Q45 / 2 / F1S (N150) / 103 - C3 / 103 - C3 / F3D - S



Parts ordering codes

1 Body kit* page 40

The codes are referred to sections with O-ring seals

TYPE	CODE	DESCRIPTION
Q25/1	5KC0600127574	1 section
Q25/2	5KC0600127673	2 sections
Q25/3	5KC0600129552	3 sections
Q25/4	5KC0600129550	4 sections
Q25/5	5KC0600129551	5 sections
Q25/6	5KC0600129715	6 sections
Q25/7	5KC0600130905	7 sections
Q25/8	5KC0600131361	8 sections
Q45/1	5KC0600127973	1 section
Q45/2	5KC0600128051	2 sections
Q45/3	5KC0600129676	3 sections
Q45/4	5KC0600129677	4 sections
Q45/5	5KC0600129678	5 sections
Q45/6	5KC0600129876	6 sections
Q45/7	5KC0600131148	7 sections
Q45/8	5KC0600131620	8 sections

2 Inlet configuration* page 40

TYPE	DESCRIPTION
F1S	With load check and pressure relief valves
F2S	With load check valve
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)

Note: Inlet configurations require upper P port plugged: see #4

2a Main pressure relief valve page 41

TYPE: B	CODE: 700035205000000
DESCRIPTION: VLP35S valve, setting range 10-100 bar (145-1450 psi)	
TYPE: N	CODE: 700035105000000
DESCRIPTION: VLP35S valve, setting range 101-200 bar (1460-2900 psi)	
TYPE: R	CODE: 700035305000000
DESCRIPTION: VLP35S valve, setting range 201-380 bar (2910-5500 psi)	
TYPE: -	CODE: 060002788899
DESCRIPTION: Relief valve blanking plug	

3 Spool page 42

TYPE	CODE	DESCRIPTION
Standard spools		
103	060103179499	Double acting, A and B closed in neutral position
	3CUG3197800	As previous one, for kick-out control
106	KR30106	Double acting, for closed circuit
107	KR30107-108	Double acting, A to tank and B closed in neutral position
108	KR30107-108	Double acting, B to tank and A closed in neutral position
111	060103179599	Double acting, A and B to tank in neutral position
	KR30111K	As previous one, for kick-out control
114	KR30114	Double acting, A and B to tank in neutral position, for closed circuit
101	3CUG3218000	Single acting on port A (3)
102	3CUG3218001	Single acting on port B (3)
116	3CUG3179200	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	3CUG3179201	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control

Note (3): Q25 valve required G3/8 plug, see #4
Q45 valve required G1/2 plug, see #4

(*): Codes are referred to **BSP** thread
(¹): Always complete with lever knob
(²): To be assembled only with M4 control

3 Spool (cont.) page 42

TYPE	CODE	DESCRIPTION
Special spools for cam, microswitch controls and other leverless controls		
103	060103179099	Double acting, A and B closed in neutral position
111	060103179199	Double acting, A and B to tank in neutral position

4 Plug for single acting spool or P-T ports*

TYPE	CODE	DESCRIPTION
-	060002792199	G3/8 plug for Q25 valve
-	060002792099	G1/2 plug for Q45 valve

5 A side control page 43

TYPE	CODE	DESCRIPTION
For standard spools		
<i>With lever control:</i>		
A1	03600A1-A2	M8 thread plastic lever box
A2	03600A1-A2	As A1 type, with lever box rotated 180°
A1/10	03610A1-A2/10	M8 thread aluminium lever box
A2/10	03610A1-A2/10	As A1/10 type, with lever box rotated 180°
A1/06	03606A1-A2/06	Aluminium lever box with stroke limiter
A2/06	03606A1-A2/06	As A1/06 type, with lever box rotated 180°
A1/PM	03610A1-A2/PM	M10 thread aluminium lever box
A2/PM	03610A1-A2/PM	As A1/PM type, with lever box rotated 180°
A1/PMP	03610A1-A2/PMP	M10 thread plastic lever box
A2/PMP	03610A1-A2/PMP	As A1/PMP type, with lever box rotated 180°
A1/Z1	03610A1-A2/Z1	Plastic lever box for 116 spool type
A2/Z1	03610A1-A2/Z1	As A1/Z1 type, with lever box rotated 180°
<i>With safety lever control:</i>		
A1/S⁽¹⁾	03624A1-A2/S	M8 thread aluminium lever box
A2/S⁽¹⁾	03624A1-A2/S	As A1/S type, with lever box rotated 180°
<i>Without lever control:</i>		
A4/Z1	03617A4/Z1	M8 male thread external pin with flange, for 116 spool type
A6	03620A6	With flange
A6-H/Z1	03620A6-H/Z1SI	As A6 type, for 116 spool type
A8	03622A8	Flexible cable control arrangement
	03622A8/03	As previous one, with aluminium cap
A8/Z1	03622A8/Z1	As A8 type, for 116 spool type
<i>Joystick controls for 2 section operation:</i>		
A35/1	03640A35-12	Joystick 1 type
A35/2	03640A35-12	Joystick 2 type
A35/3	03640A35-34	Joystick 3 type
A35/4	03640A35-34	Joystick 4 type
For types 103 and 111 special spools		
<i>With spool position microswitch:</i>		
Note: to complete the control you must use the assembly kit at #7		
N1-A1	03641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
	03641N1-A1/10	As previous one, with aluminium lever box
N1A-A1	03642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	03643N1BA1/A2L	Micro operation in pos. 2, with lever box
N1-A3	03648N1-A3L	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	03648N1A-A3L	Micro operation in pos. 1, without lever with cap
N1B-A3	03648N1B-A3L	Micro operation in pos. 2, without lever with cap
<i>Without lever control:</i>		
A3	03614A3	Without lever, with cap
	03614A3/03	As previous one, with aluminium cap
A4	03617A4	M8 male thread external pin with flange
	03617A4/03	As previous one, with aluminium flange
A4/01	03617A4/01	M10 male thread external pin with flange
A5⁽²⁾	03619A5	Flange with spherical spool end
	03619A5/10	As previous one, with aluminium flange

Parts ordering codes

6 B side control page 51

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	03730M1	3 pos., spring return in neutral position
	03730M1/03	As previous one, with aluminium cap
M1-B1	03753M1-B1	As M1 type, with microswitch arrangement
	03753M1-B1/03	As previous one, with aluminium cap
M1/01	03730M1/01	As M1 type, for mechanical joystick
	03730M1/01/03	As previous one, with aluminium cap
M1/02	03730M1/02	As M1 type, with stroke limiter
M1-U1	03701M1-U1	As M1 type, with M8 male thread external pin
M2	03732M2	2 pos. (0-1), spring return in neutral position
	03732M2/03	As previous one, with aluminium cap
M2-U1	03702M2-U1	As M2 type, with M8 male thread external pin
M3	03733M3	2 pos. (0-2), spring return in neutral position
	03733M3/03	As previous one, with aluminium cap
M3-U1	03703M3-U1	As M3 type, with M8 male thread external pin
M4	03734M41-2/03	2 pos. (1-2), spring return in position 1
	03735M42-1/03	2 pos. (2-1), spring return in position 2
M4-U1	03704M4-U11-2	As M4 type (1-2), with M8 male thread external pin

With flexible cable control arrangement:

M1-U2	03715M1-U2	3 pos., spring return in neutral position
M2-U2	03716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	03717M3-U2	2 pos. (0-2), spring return in neutral position

With detent:

R1	03741R1	3 pos., detent in position 1
	03741R1/03	As previous one, with aluminium cap
R2	03742R2	3 pos., detent in position 2
	03742R2/03	As previous one, with aluminium cap
R3	03743R3	3 pos., detent in all position
	03743R3/03	As previous one, with aluminium cap
R4	03744R4	2 pos., detent in position 0-1
	03744R4/03	As previous one, with aluminium cap
R5	03745R5	2 pos., detent in position 0-2
	03745R5/03	As previous one, with aluminium cap
R6	03746R6	2 pos., detent in position 1-2
	03746R6/03	As previous one, with aluminium cap
R8	03748R8	4 pos., detent in 4 th pos., for 116 type spool
	03748R8/03	As previous one, with aluminium cap
R10/Z1	03750R10/Z1	4 pos., detent in 4 th pos., for 126 type spool
	03750R10/Z1/03	As previous one, with aluminium cap

With detent and kick out function:

R1K	03741R1K	3 pos., detent in position 1
	03741R1K/03	As previous one, with aluminium cap
R2K	03742R2K	3 pos., detent in position 2
	03742R2K/03	As previous one, with aluminium cap
R3K	08743R3K	3 pos., detent in all position
	03743R3K/03	As previous one, with aluminium cap

With spool position microswitch:

Note: To complete the control you must use the assembly kit at #7

M1-N1	03766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
	03766M1-N1/03	As previous one, with aluminium lever box
M1-N1A	03767M1-N1AL	As M1-N1 type, micro operation in pos. 1
	03767M1-N1AL/3	As previous one, with aluminium cap
M1-N1B	03768M1-N1BL	As M1-N1 type, micro operation in pos. 2
	03768M1-N1BL/3	As previous one, with aluminium cap
M2-N1	03769M2-N1L	2 pos. (0-1), spring return in neutral pos.
M3-N1	03772M3-N1L	2 pos. (0-2), spring return in neutral pos.

Pneumatic and electropneumatic controls:

P1NW	03661P1-NW	ON/OFF pneumatic control
P1NPW	03661P1-NPW	Proportional pneumatic control
D3W	03691D3-F-12DC	12 VDC, ON/OFF electropneumatic control
	03692D3-F-24DC	24 VDC, ON/OFF electropneumatic control

7 Microswitch assembling kit

CODE	DESCRIPTION
03650N1-01	Kit for 1 section
03650N1-02	Kit for 2 sections
03650N1-03	Kit for 3 sections
03650N1-04	Kit for 4 sections
03650N1-05	Kit for 5 sections
03650N1-06	Kit for 6 sections
03650N1-07	Kit for 7 sections
03650N1-08	Kit for 8 sections

8 Complete controls A+B sides page 57

For types 103 and 111 special spools

TYPE	CODE	DESCRIPTION
C2	03792C2-C3	Cam control from position 1 to 2
C3	03792C2-C3	Cam control from position 2 to 1

9 Outlet configuration* page 61

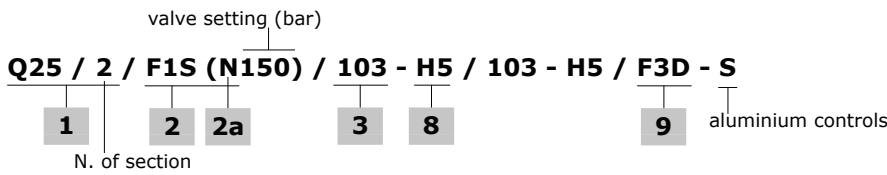
TYPE	DESCRIPTION
F3D	Open center configuration: for Q25 valve, n. 1 G3/8 plug code 060002792199, on T1 port; for Q45 valve, n. 1 G1/2 plug code 060002792099, on T1 port
F6D	Carry-over configuration: for Q25 valve, n. 1 G3/8 joint code 060002278399, on T port; for Q45 valve, n. 1 G1/2 joint code 060002564799, on T port
F16D	Closed center configuration: for Q25 valve, n. 1 G3/8 plug code 060002792199 on T1 port and n. 1 G3/8 joint code 060002530099, on T port; for Q45 valve, n. 1 G1/2 plug code 060002792099 on T1 port and n. 1 G1/2 joint code 060002997699, on T port

10 Accessory

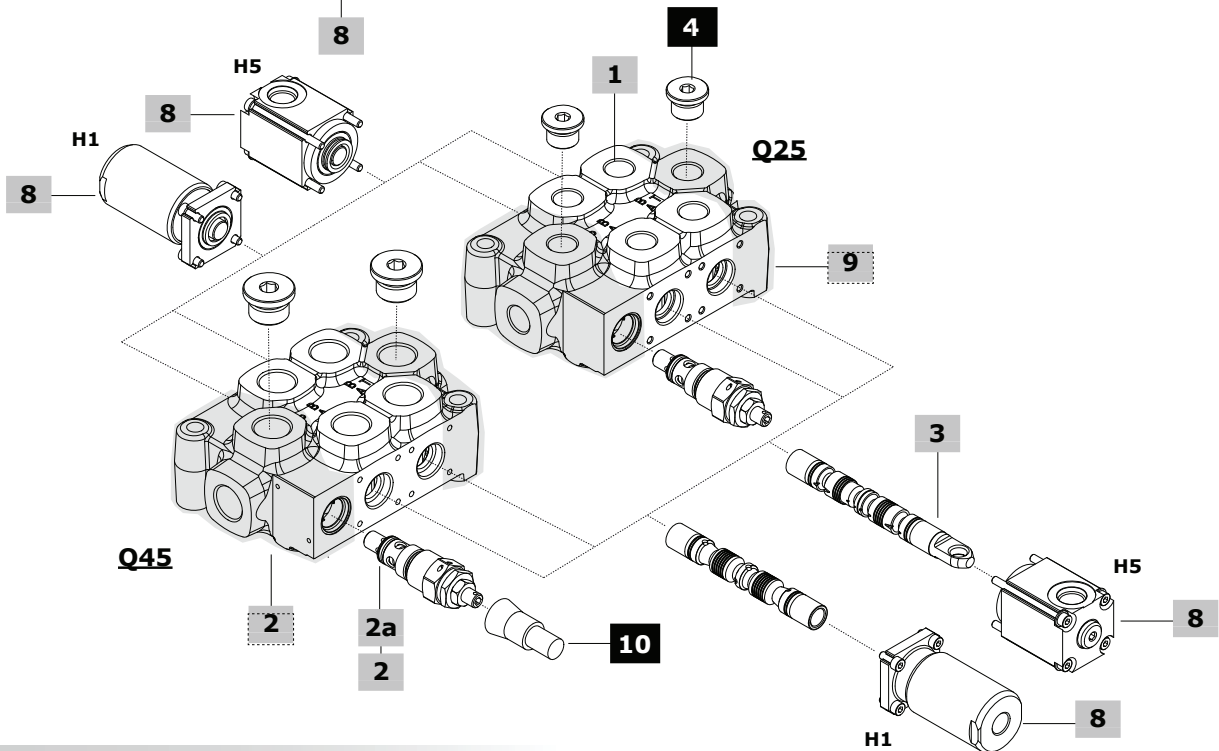
TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

(*): Codes are referred to **BSP** thread

Proportional hydraulic controls valve configuration example



Q45 / 2 / F1S (N150) / 103 - H1 / 103 - H1 / F3D - S



1 Body kit*

The body kits listed below are for **H5** hydraulic control.
H1 hydraulic control requires standard body: see #1, page 35

TYPE	CODE	DESCRIPTION
Q25/1	5KC0600127574A	1 section
Q25/2	5KC0600127673A	2 sections
Q25/3	5KC0600129552A	3 sections
Q25/4	5KC0600129550A	4 sections
Q25/5	5KC0600129551A	5 sections
Q25/6	5KC0600129715A	6 sections
Q25/7	5KC0600130905A	7 sections
Q25/8	5KC0600131361A	8 sections
Q45/1	5KC0600127973A	1 section
Q45/2	5KC0600128051A	2 sections
Q45/3	5KC0600129676A	3 sections
Q45/4	5KC0600129677A	4 sections
Q45/5	5KC0600129678A	5 sections
Q45/6	5KC0600129876A	6 sections
Q45/7	5KC0600131148A	7 sections
Q45/8	5KC0600131620A	8 sections

2 Inlet configuration* page 40

See #2, page 35

2a Main pressure relief valve page 41

See #2a, page 35

3 Spool page 42

TYPE	CODE	DESCRIPTION
For H5 hydraulic control		
103	060103179499	Double acting, A and B closed in neutral position
For H1 hydraulic control		
103	060103179099	Double acting, A and B closed in neutral position
111	060103179199	Double acting, A and B to tank in neutral position

4 Plug for P-T ports*

See #4, page 35

8 Hydraulic controls A+B sides* page 58

TYPE	CODE	DESCRIPTION
H5	03785H5	Low pressure proportional type, upper ports
H1	03779H1	High pressure proportional type, side ports

9 Outlet configuration* page 61

See #9, page 36

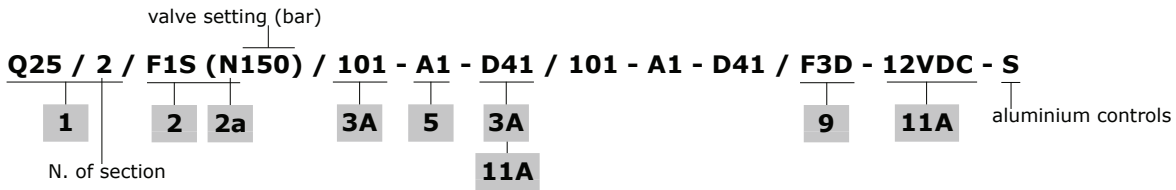
10 Accessory

See #10, page 36

(*): Codes are referred to **BSP** thread

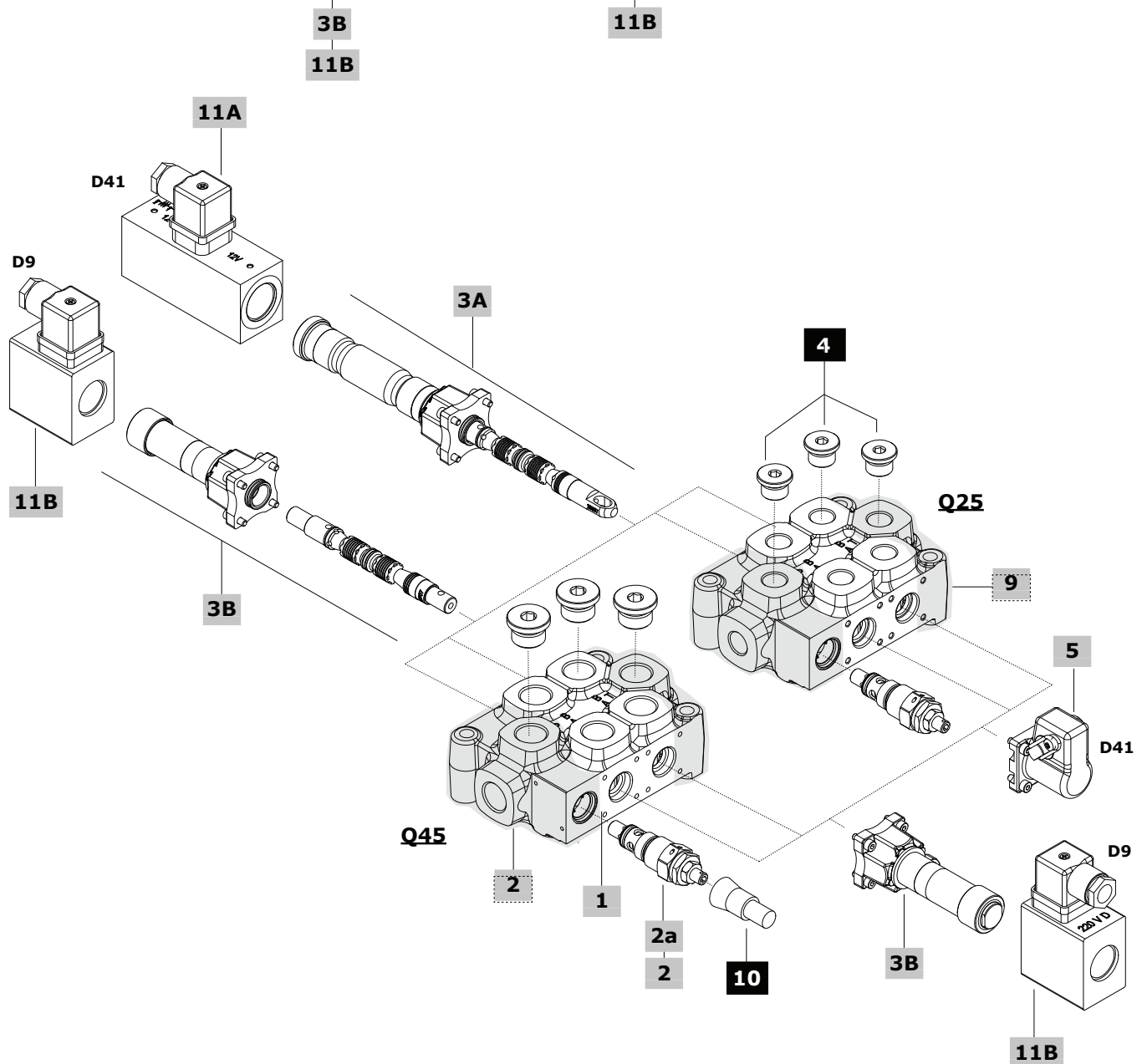
Parts ordering codes

One side - ON/OFF direct solenoid control valve configuration example



Two side - ON/OFF direct solenoid control valve configuration example

Q45 / 2 / F1S (N150) / 101 - D9 / 101 - D9 / F3D - 12VDC - S



1 Body kit* **page 40**

TYPE	CODE	DESCRIPTION
Q25/1	5KC0600127574A	1 section
Q25/2	5KC0600127673A	2 sections
Q25/3	5KC0600129552A	3 sections
Q25/4	5KC0600129550A	4 sections
Q25/5	5KC0600129551A	5 sections
Q25/6	5KC0600129715A	6 sections
Q25/7	5KC0600130905A	7 sections
Q25/8	5KC0600131361A	8 sections
<hr/>		
Q45/1	5KC0600127973A	1 section
Q45/2	5KC0600128051A	2 sections
Q45/3	5KC0600129676A	3 sections
Q45/4	5KC0600129677A	4 sections
Q45/5	5KC0600129678A	5 sections
Q45/6	5KC0600130905A	6 sections
Q45/7	5KC0600131148A	7 sections
Q45/8	5KC0600131620A	8 sections

2 Inlet configuration* **page 40**

See #2, page 35

2a Main pressure relief valve **page 41**

See #2a, page 35

3A D41 solenoid control **page 59**

One side solenoid control

For Q25 valve:

TYPE	CODE	DESCRIPTION
103	X060102889799	Tube assembly with double acting spool, A and B closed in neutral position
107	X060102938199	Tube assembly with double acting spool, A to tank and B closed in neutral position
108	X060102937199	Tube assembly with double acting spool, B to tank and A closed in neutral position
109	X060102952699	Tube assembly with single acting spool on port A, A to tank in neutral position. G3/8 plug is required, see #4
111	X060102894299	Tube assembly with double acting spool, A and B to tank in neutral position
101	X060102905099	Tube assembly with single acting spool on port A. G3/8 plug is required, see #4
102	X060102894199	Tube assembly with single acting spool on port B. G3/8 plug is required, see #4

For Q45 valve:

103	X060102889700	Tube assembly with double acting spool, A and B closed in neutral position
107	X060102938100	Tube assembly with double acting spool, A to tank and B closed in neutral position
108	X060102937100	Tube assembly with double acting spool, B to tank and A closed in neutral position
109	X060102952600	Tube assembly with single acting spool on port A, A to tank in neutral position. G1/2 plug is required, see #4
111	X060102894200	Tube assembly with double acting spool, A and B to tank in neutral position
101	X060102905000	Tube assembly with single acting spool on port A. G1/2 plug is required, see #4
102	X060102894100	Tube assembly with single acting spool on port B. G1/2 plug is required, see #4

3B D9 solenoid control **page 60**

Two side solenoid control

For Q25/Q45 valves:

TYPE	CODE	DESCRIPTION
101	X060103012699	Tube assembly with single acting spool on port A (1)
102	X060103012699	Tube assembly with single acting spool on port B (1)
103	X060102998299	Tube assembly with double acting spool, A and B closed in neutral position
108	X060103070799	Tube assembly with double acting spool, B to tank and A closed in neutral position
110	X060103037699	Tube assembly with single acting spool on port B, B to tank in neutral position (1)
111	X060103000499	Tube assembly with double acting spool, A and B to tank in neutral position

Note (1): Q25 valve required G3/8 plug, see #4
Q45 valve required G1/2 plug, see #4

4 Plug for single acting spool or P-T ports*

See #4, page 35

5 A side control for D41 **page 59**

TYPE	CODE	DESCRIPTION
A1	060003236899	M8 thread cast iron lever box
A2	060003236899	As A1 type, with lever box rotated 180°

9 Outlet configuration* **page 61**

See #9, page 36

10 Accessory

See #10, page 36

11A/B Coil **page 59**

D41 coil

For Q25 valve:

TYPE	CODE	DESCRIPTION
-	ZEB012	12 VDC ISO4400 coil
-	ZEB024	24 VDC ISO4400 coil

For Q45 valve:

-	4SLG111200	12 VDC ISO4400 coil
-	4SLG111400	24 VDC ISO4400 coil

D9 coil

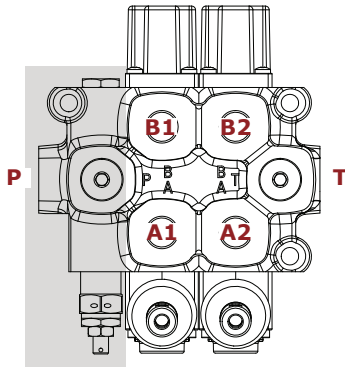
For Q25/Q45 valves:

-	ZDB212	12 VDC ISO4400 coil
-	ZDB224	24 VDC ISO4400 coil

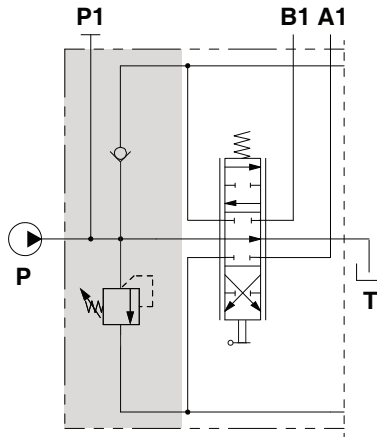
Note: The connector is included

(*): Codes are referred to **BSP** thread

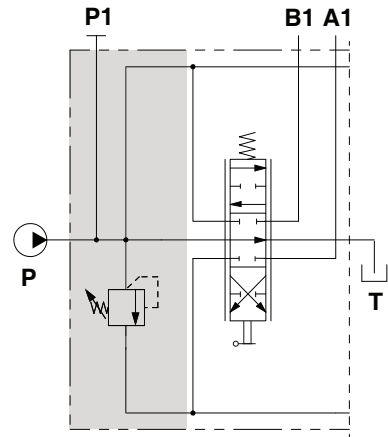
Inlet configuration



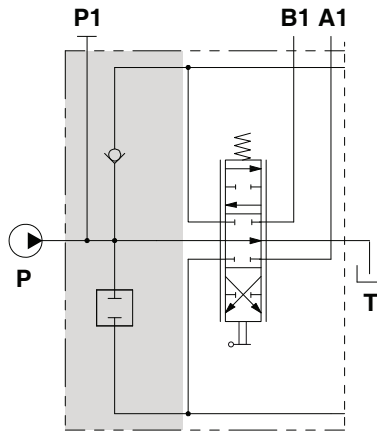
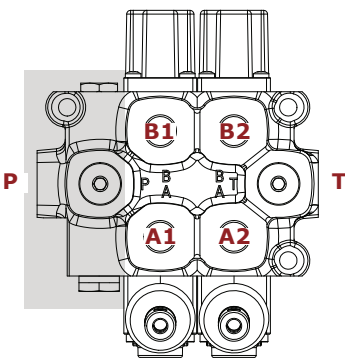
F1S configuration
With load check and pressure relief valve



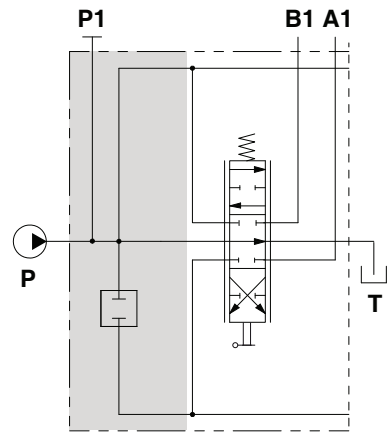
F7S configuration
With pressure relief valve



F2S configuration
With load check valve

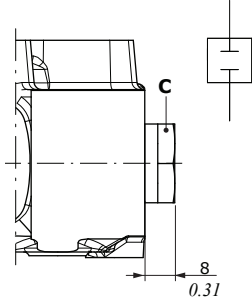


F8S configuration
Without valves
(pressure relief valve plugged port)

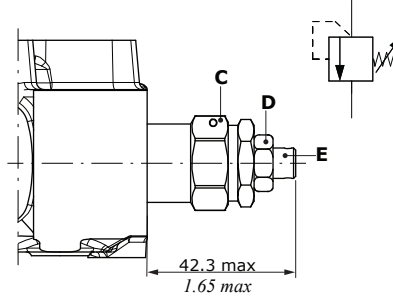


Main pressure relief valve

Relief valve blanking plug

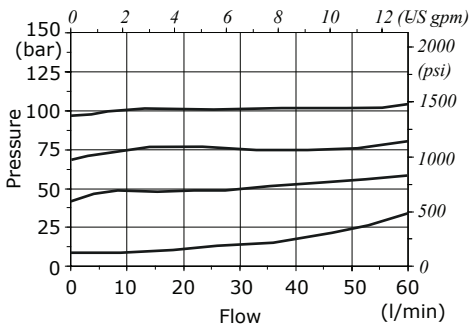


Main pressure relief valve

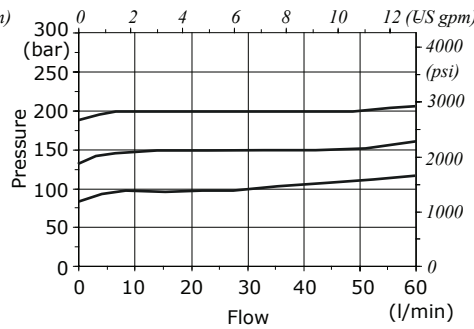


Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

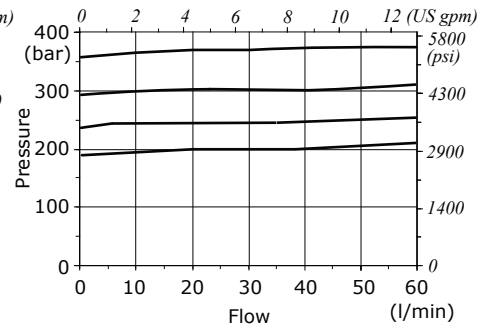
Setting example (B type spring)



Setting example (N type spring)



Setting example (R type spring)



Wrenches and tightening torques

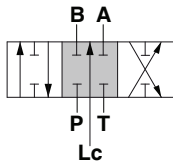
- C = wrench 22 - 42 Nm (30.9 lbf_t)
- D = wrench 13 - 24 Nm (17.7 lbf_t)
- E = allen wrench 4

Spool

103 type

A and B closed
in neutral position

2 0 1



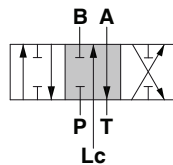
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

107 type

A to tank, B closed
in neutral position

2 0 1



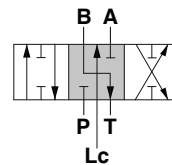
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

108 type

B to tank, A closed
in neutral position

2 0 1



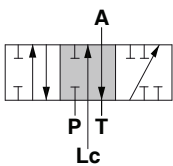
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

109 type

A to tank in neutral position,
B plugged

2 0 1



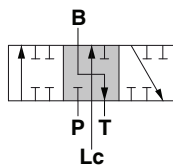
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

110 type

B to tank in neutral position,
A plugged

2 0 1



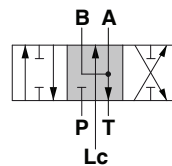
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

111 type

A and B to tank
in neutral position

2 0 1



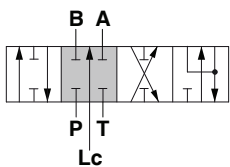
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

116 type

With floating in the 4th position
(spool in)

2 0 1 3



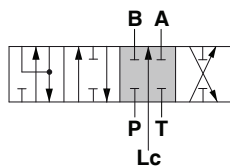
Stroke

Position 1: - 4 mm (- 0.15 in)
Position 2: + 5 mm (+ 0.19 in)
Position 3: - 8.6 mm (- 0.33 in)

126 type

With floating in the 4th position
(spool out)

3 2 0 1



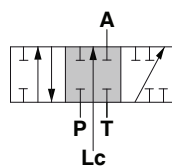
Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 5 mm (- 0.19 in)
Position 3: + 8.6 mm (- 0.33 in)

101 type

Single acting on A,
B plugged

2 0 1



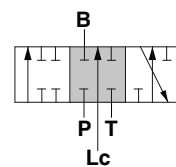
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

102 type

Single acting on B,
A plugged

2 0 1



Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

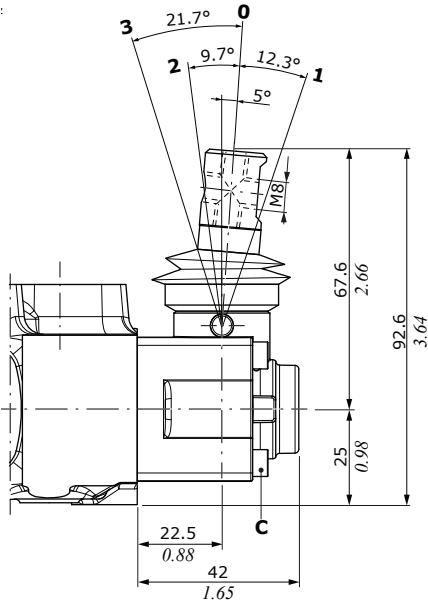
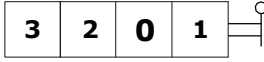
A side controls

Mechanical controls

With lever control

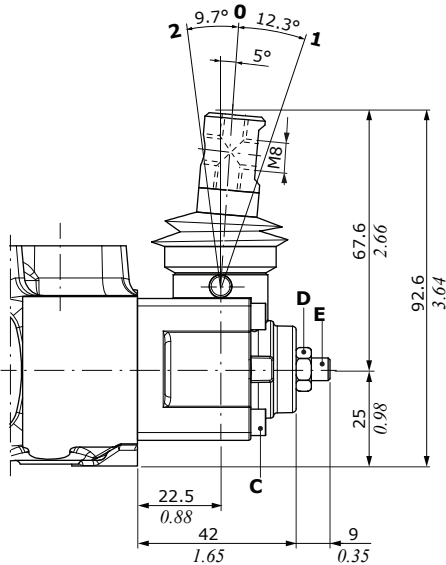
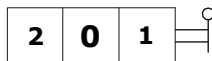
A1 type

M8 thread plastic lever box



A1/06 type

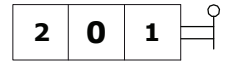
M8 thread, with stroke limiter



A1/10 type

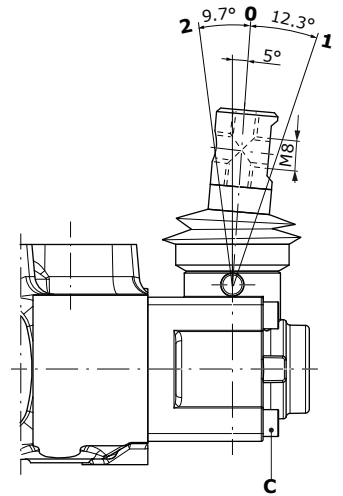
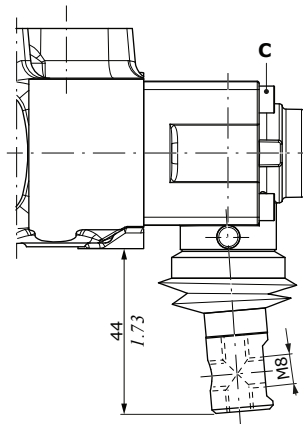
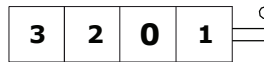
M8 thread aluminium lever box. Dimensions are the same of A1 type

A2/10 type As A1/10 type, rotated 180°



A2 type

As A1 type, rotated 180°

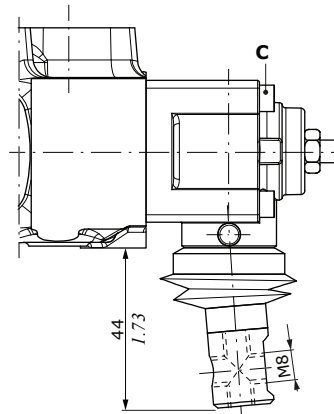
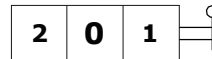


Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = wrench 10 - 9.8 Nm (7.2 lbf_t)
- E = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

A2/06 type

As A1/06 type, rotated 180°



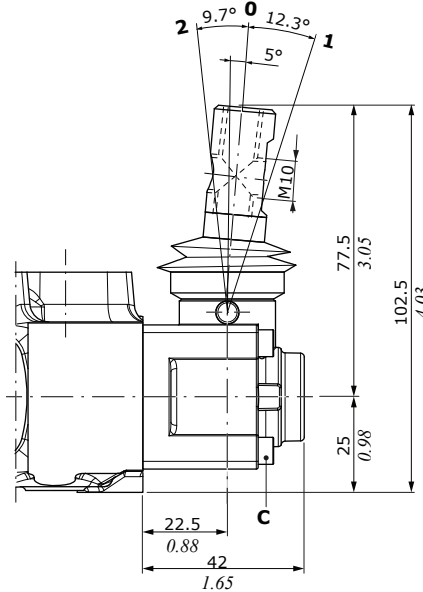
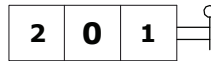
A side controls

Mechanical controls

With lever control

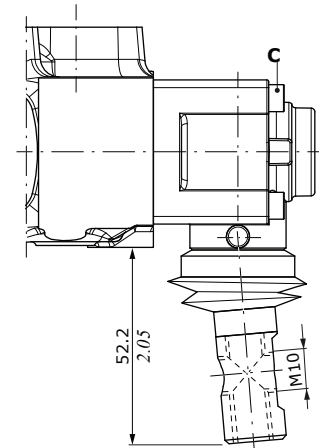
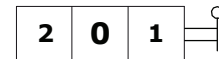
A1/PM type

M10 thread aluminium lever box



A2/PM type

As A1/PM type, rotated 180°



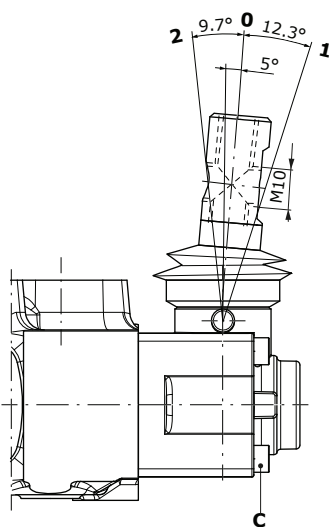
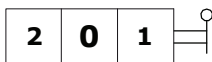
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)

A1/PMP type

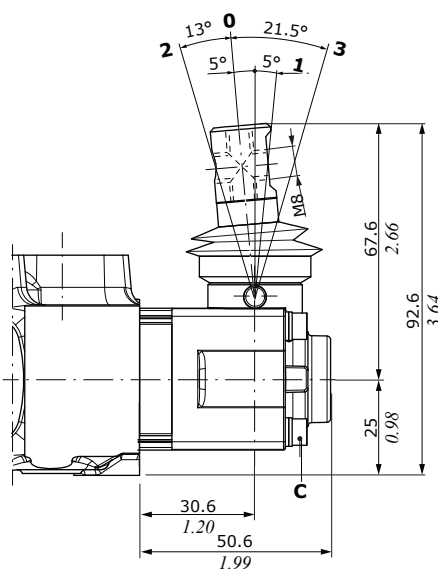
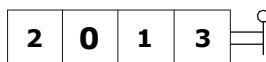
M10 thread plastic lever box.

Dimensions are the same of A1/PM type



A2/PMP type

As A1/PMP type, rotated 180°

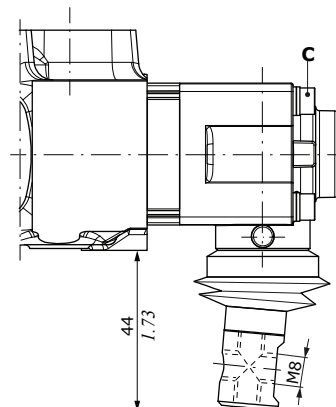
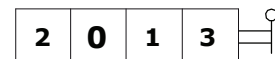


A1/Z1 type

M8 thread, for 116 floating spool type

A2/Z1 type

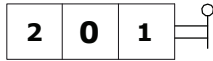
As A1/Z1 type, rotated 180°



Mechanical controls

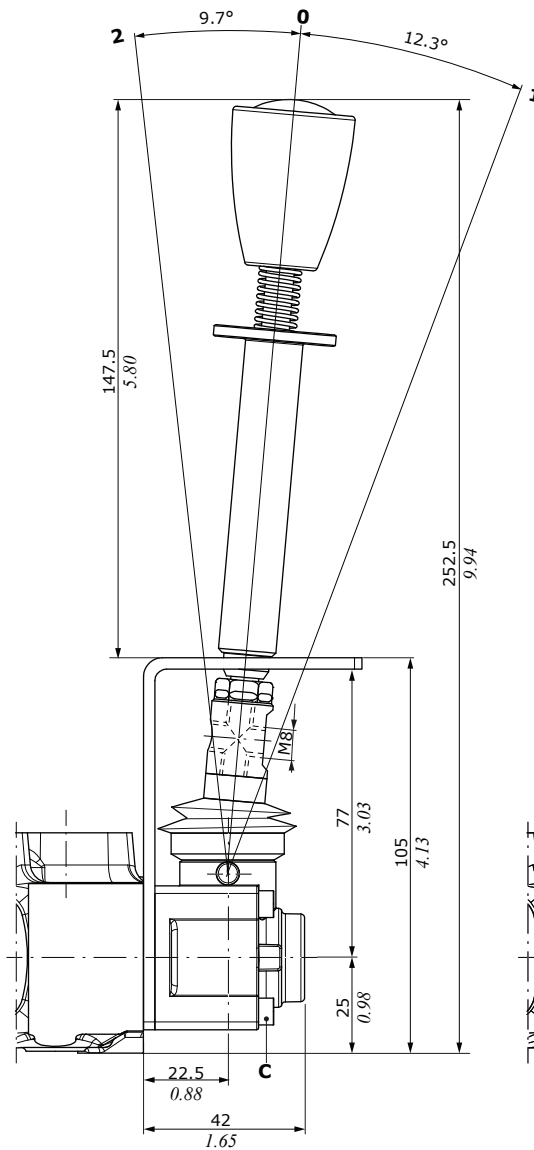
With safety lever control

A1/S type
M8 thread, aluminium lever box

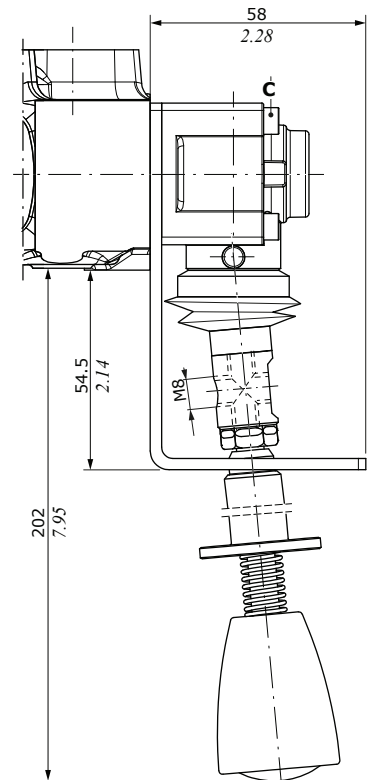
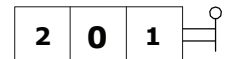


Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbft)
D = cross-head - 3 Nm (2.2 lbft)

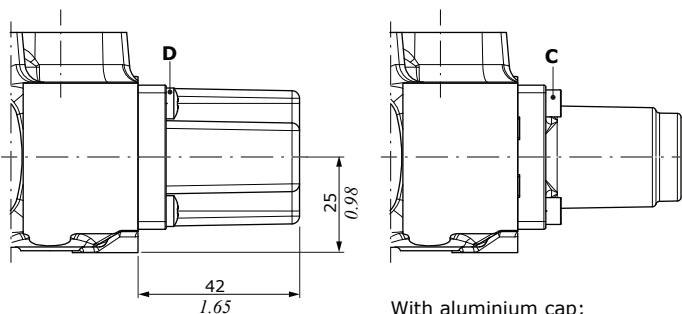
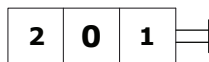


A2/S type
As A1/S type, rotated 180°



Without lever control

A3 type
With cap.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

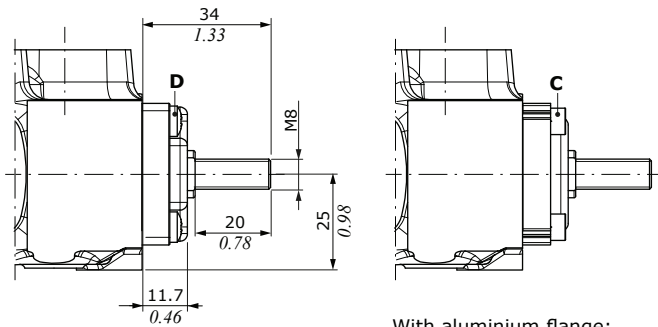
A side controls

Mechanical controls

Without lever control

A4 type

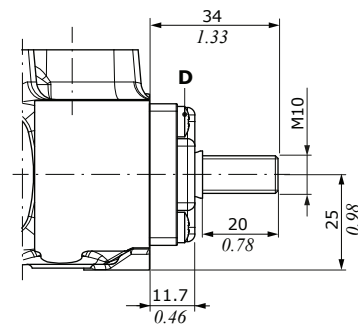
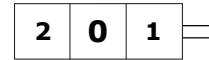
M8 male thread external pin with flange.
Available with aluminium flange



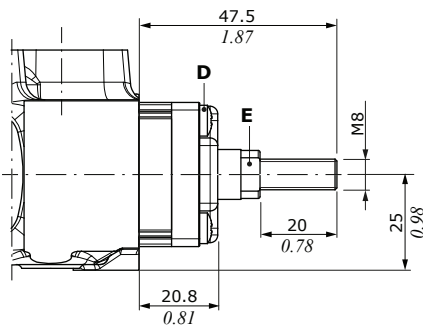
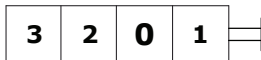
With aluminium flange;
dimensions are the same of standard type

A4/01 type

M10 male thread external pin with flange

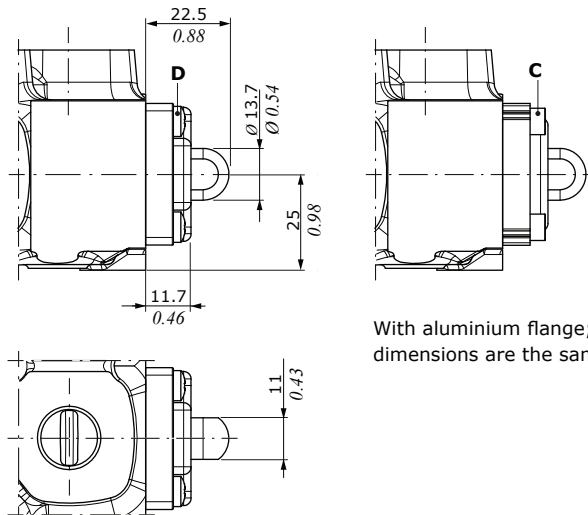
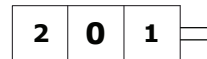


A4/Z1 type
As A4 type,
for 116 floating spool type



A5 type

Flange with spherical spool end.
Available with aluminium flange



With aluminium flange;
dimensions are the same of standard type

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)

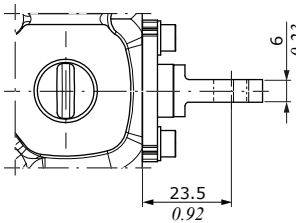
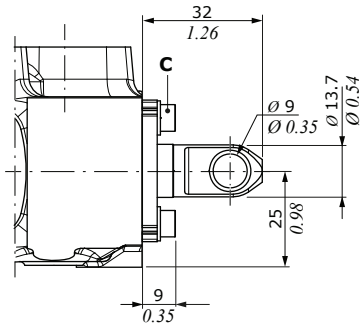
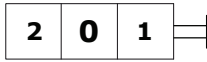
D = cross-head - 3 Nm (2.2 lbf^t)

E = wrench 9 - 9.8 Nm (7.2 lbf^t)

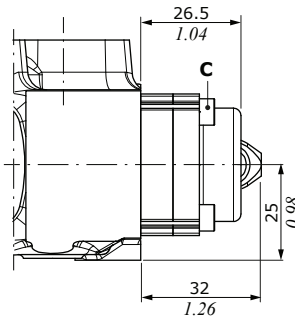
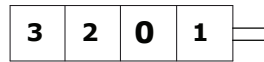
Mechanical controls

Without lever control

A6 type
With flange



A6-H/Z1 type
As A6 type,
for 116 floating spool type

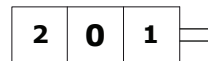


Wrenches and tightening torques

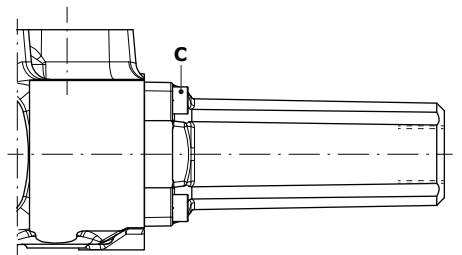
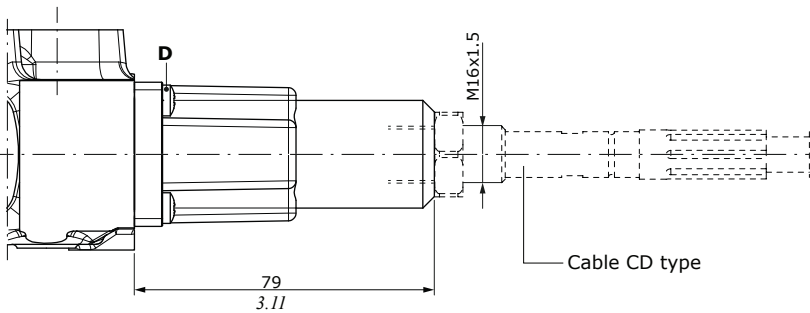
C = allen wrench 3 - 3 Nm (2.2 lbf)
D = cross-head - 3 Nm (2.2 lbf)

A8 type

Flexible cable control arrangement.
Available with aluminium cap

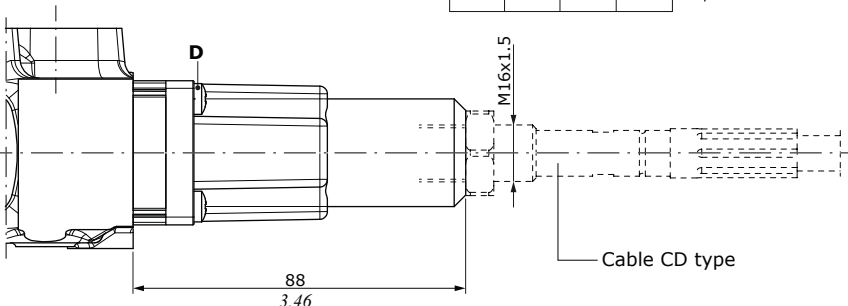
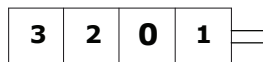


With flexible cable control arrangement



With aluminium cap;
dimensions are the same of standard type

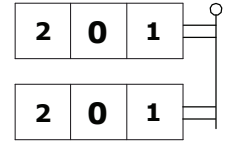
A8/Z1 type
As A8 type,
for 116 floating spool type



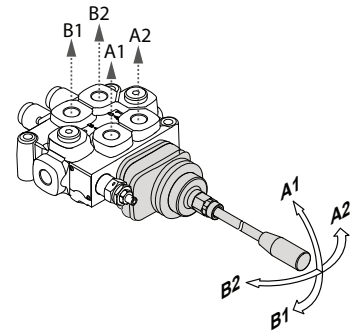
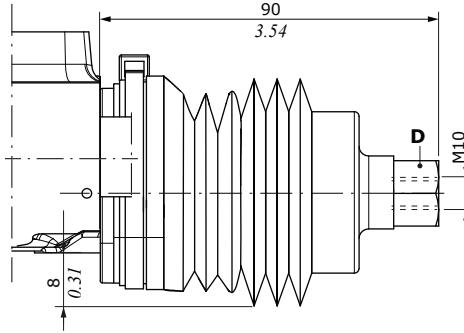
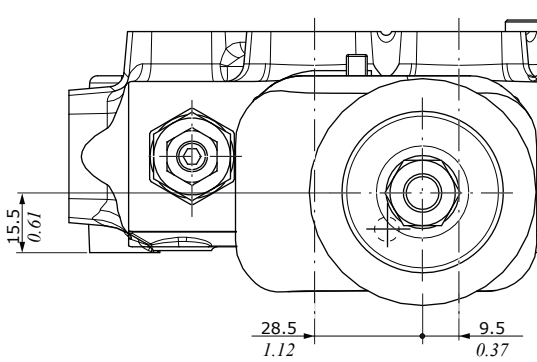
A side controls

Joystick controls

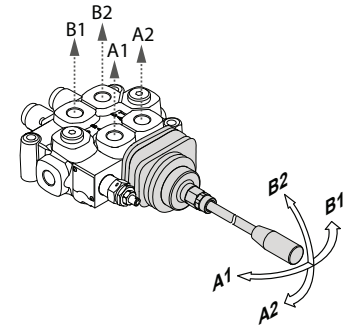
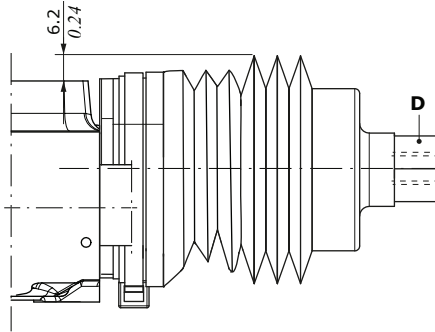
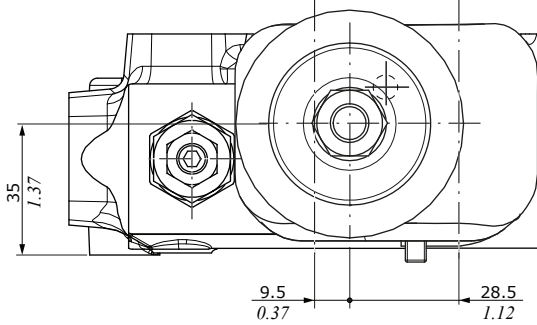
For operating the joystick control in the floating position, contact Sales Department.



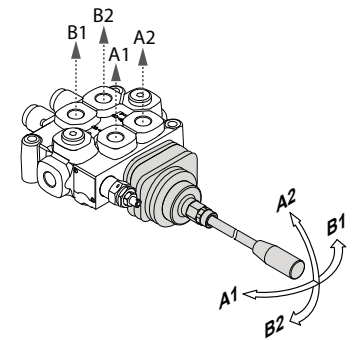
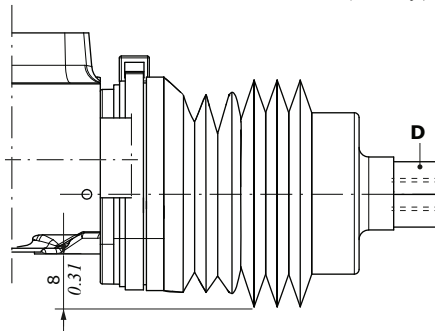
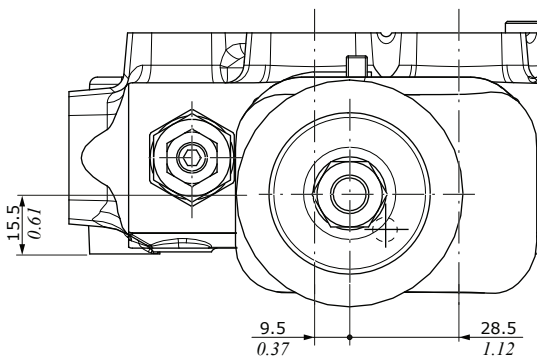
A35-1 type



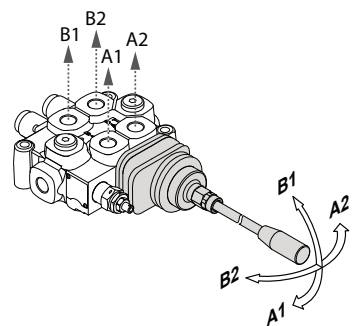
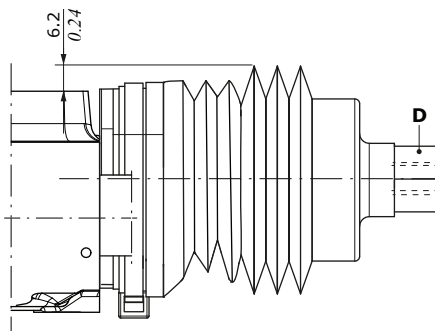
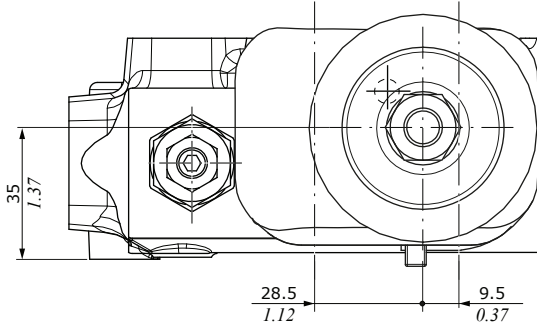
A35-2 type



A35-3 type



A35-4 type



Wrenches and tightening torques

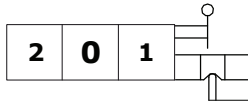
D = wrench 17 - 24 Nm (17.7 lbft)

Spool position microswitch

With lever control

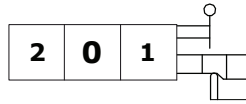
N1-A1 type

Micro operation in position 1 and 2.
Available with aluminium lever box



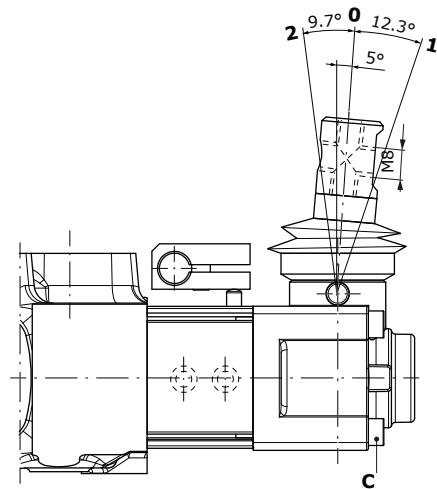
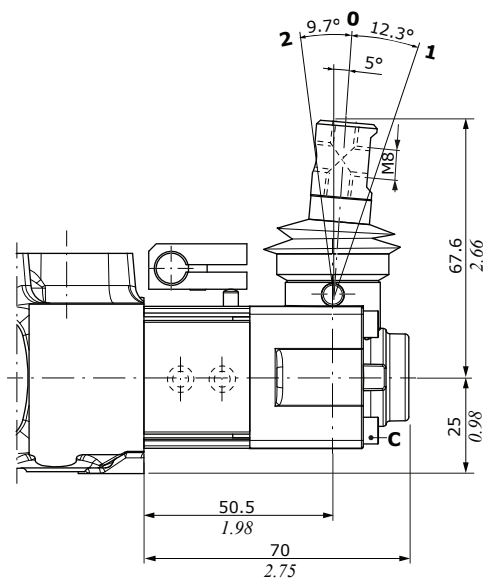
N1A-A1 type

Micro operation in position 1



N1B-A1 type

Micro operation in position 2



With aluminium lever box;
dimensions are the same of standard type

Without lever control, with cap

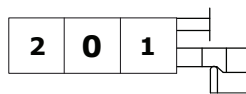
N1-A3 type

Micro operation in position 1 and 2



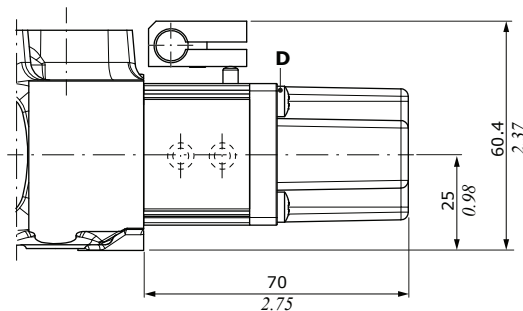
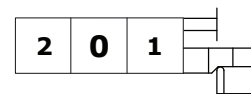
N1A-A3 type

Micro operation in position 1



N1B-A3 type

Micro operation in position 2



Wrenches and tightening torques

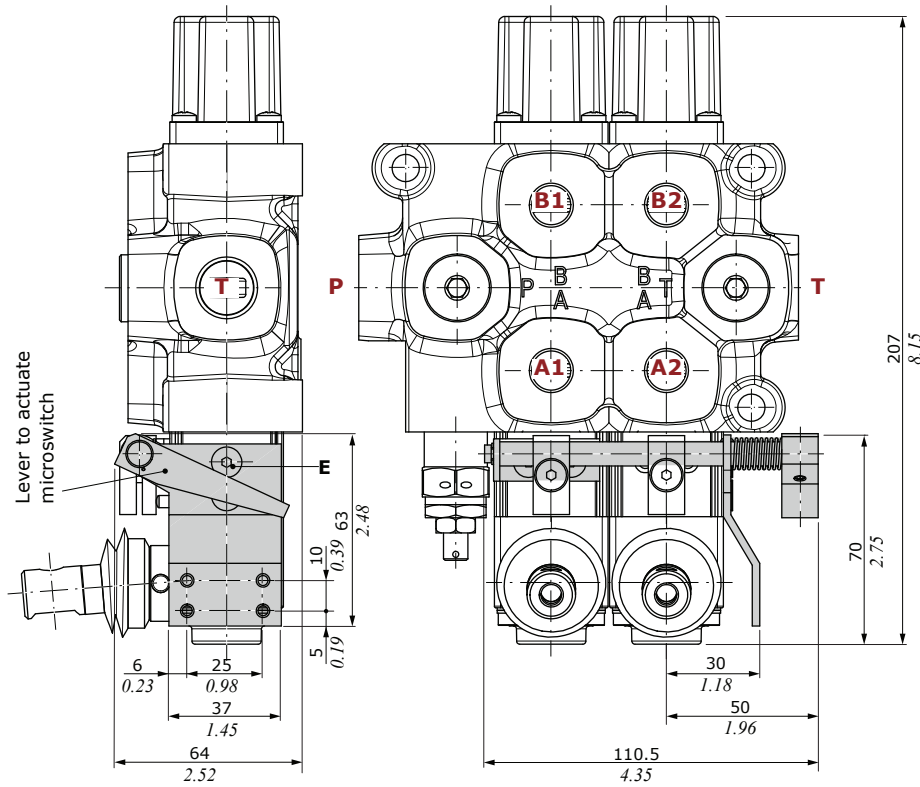
C = allen wrench 3 - 3 Nm (2.2 lbf^t)

D = cross-head - 3 Nm (2.2 lbf^t)

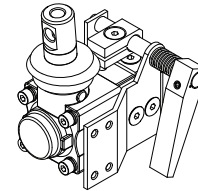
A side controls

Spool position microswitch

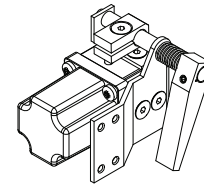
Microswitch assembly kit for 2 working section (N1-A1 type)



with cap



with lever box



Wrenches and tightening torques
E = allen wrench 3 - 6.6 Nm (4.8 lbf_t)

Drawing is referred to a Q25 monoblock valve.

Mechanical controls

With spring return control

M1 type

3 position, spring return in neutral position.
Available with aluminium cap

M1/01 type

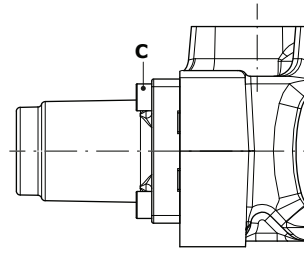
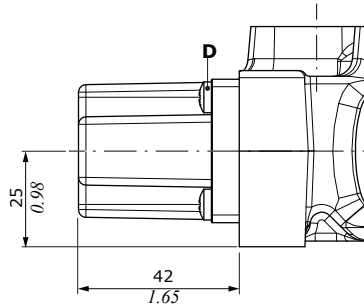
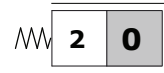
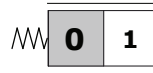
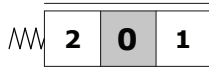
3 position, for joystick control.
Available with aluminium cap

M2 type

2 position (0-1), spring return in neutral position.
Available with aluminium cap

M3 type

2 position (0-2), spring return in neutral position.
Available with aluminium cap

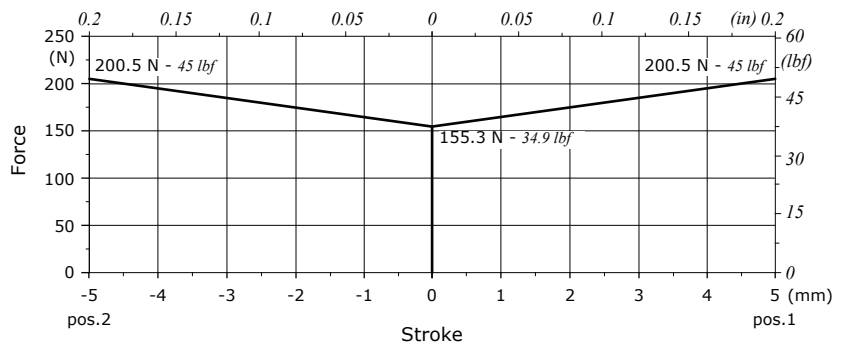


With aluminium cap;
dimensions are the same of standard type

Wrenches and tightening torques

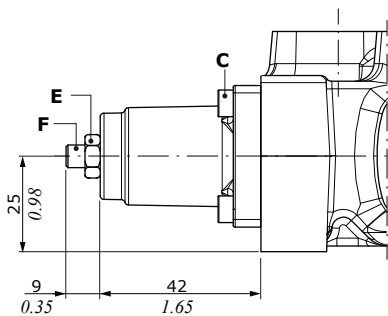
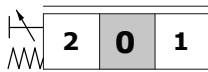
- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = cross-head - 3 Nm (2.2 lbf_t)
- E = wrench 10 - 9.8 Nm (7.2 lbf_t)
- F = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

M1 control type - Force vs. Stroke diagram



M1/02 type

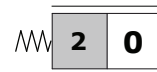
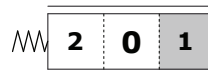
As M1 type, with stroke limiter



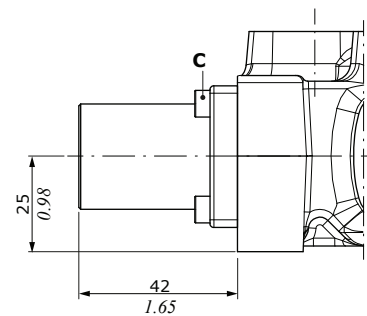
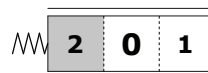
M4 types

2 position (1-2), spring return in position 1

2 position (2-0), spring return in position 2



2 position (2-1), spring return in position 2



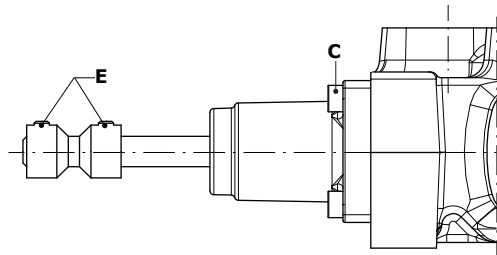
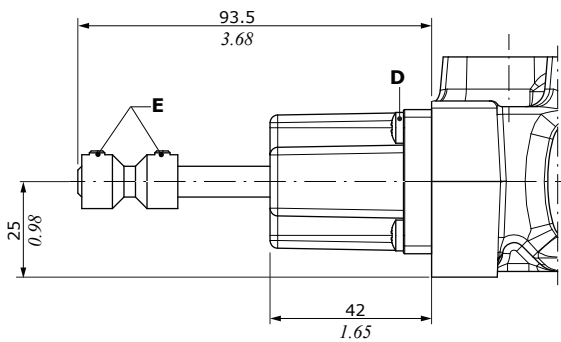
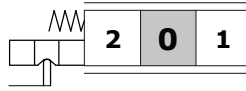
B side controls

Mechanical controls

With spring return control

M1-B1 type

3 position, microswitch arrangement.
Available with aluminium cap

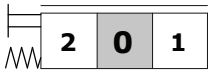


With aluminium cap;
dimensions are the same of standard type

With flexible cable control arrangement

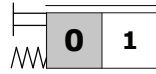
M1-U1 type

3 position, with M8 male thread external pin



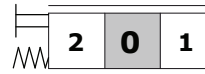
M2-U1 type

2 position (0-1), with M8 male thread external pin



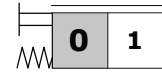
M1-U2 type

3 position, spring return in neutral position



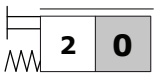
M2-U2 type

2 position (0-1), spring return in neutral position



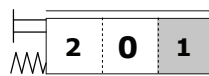
M3-U1 type

2 position (0-2), with M8 male thread external pin



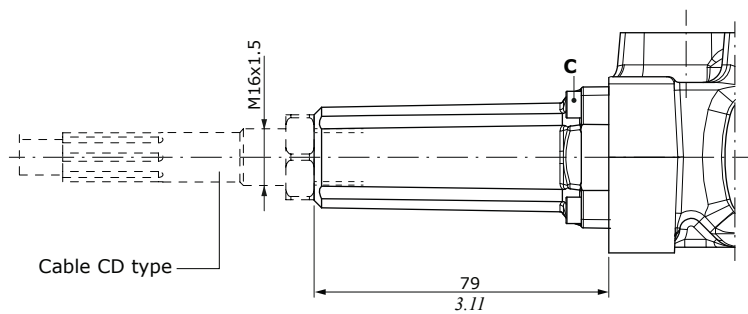
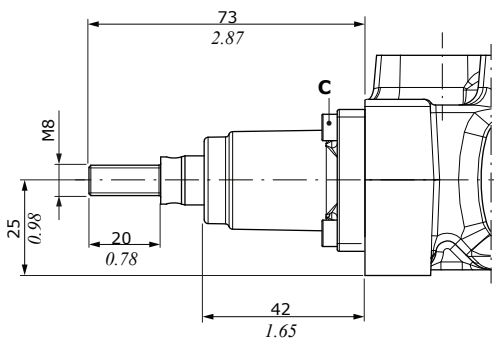
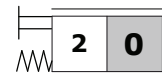
M4-U1 type

2 position (1-2), with M8 male thread external pin



M3-U2 type

2 position (0-2), spring return in neutral position



Wrenches and tightening torques

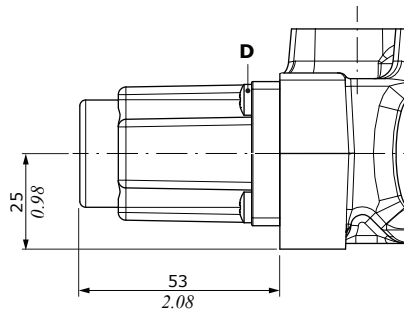
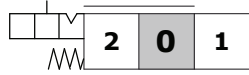
- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = cross-head - 3 Nm (2.2 lbf_t)
- E = allen wrench 3 - 5 Nm (3.68 lbf_t)

Mechanical controls

With detent control

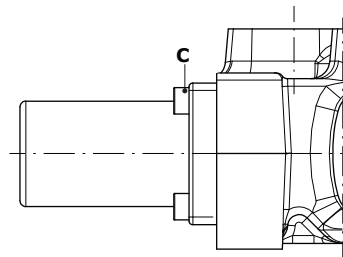
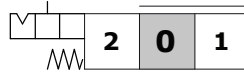
R1 type

3 position, detent in position 1.
Available with aluminium cap



R2 type

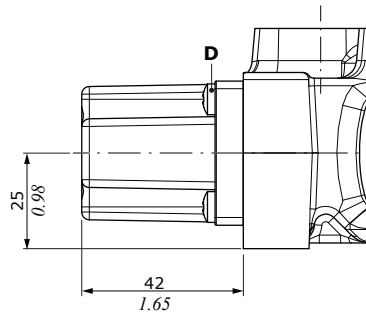
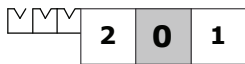
3 position, detent in position 2.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

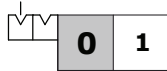
R3 type

3 position,
detent in all position.
Available with aluminium cap



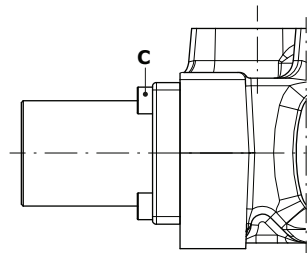
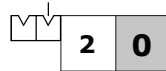
R4 type

2 position,
detent in position 0-1.
Available with aluminium cap



R5 type

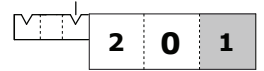
2 position,
detent in position 0-2.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

R6 type

2 position,
detent in position 1-2.
Available with aluminium cap



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)
D = cross-head - 3 Nm (2.2 lbf)

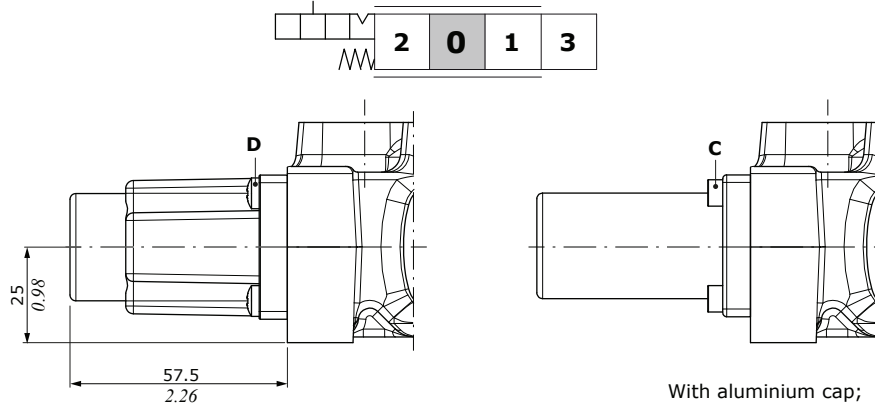
B side controls

Mechanical controls

With detent control

R8 type

4 position, detent in 4th position, for 116 floating spool type.
Available with aluminium cap



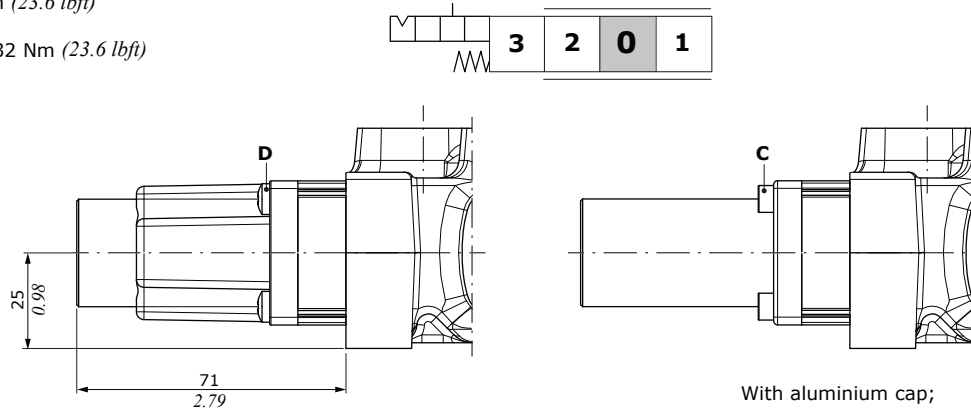
With aluminium cap;
dimensions are the same of standard type

Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = cross-head - 3 Nm (2.2 lbft)
- E = wrench 22 - 32 Nm (23.6 lbft)
- F = wrench 16
- G = allen wrench 10 - 32 Nm (23.6 lbft)

R10/Z1 type

4 position, detent in 4th position, for 126 floating spool type.
Available with aluminium cap

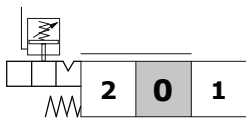


With aluminium cap;
dimensions are the same of standard type

With detent control and kick out function

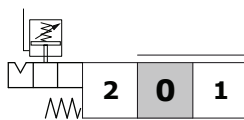
R1K type

3 position, detent in position 1.
Available with aluminium cap



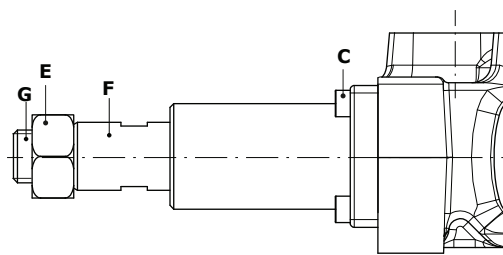
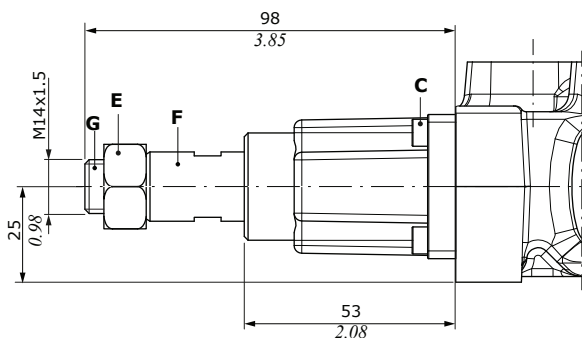
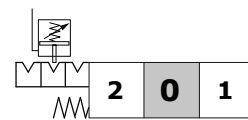
R2K type

3 position, detent in position 2.
Available with aluminium cap



R3K type

3 position, detent in all position.
Available with aluminium cap

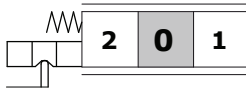


With aluminium cap;
dimensions are the same of standard type

Spool position microswitch

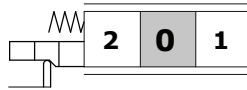
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position.
Available with aluminium cap



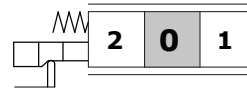
M1-N1A type

3 position, micro operation in position 1.
Available with aluminium cap



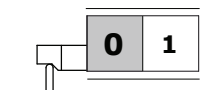
M1-N1B type

3 position, micro operation in position 2.
Available with aluminium cap



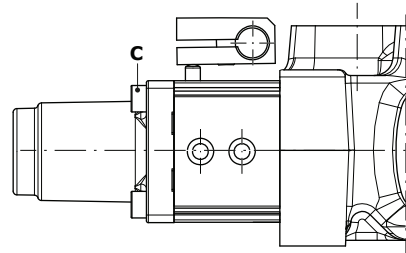
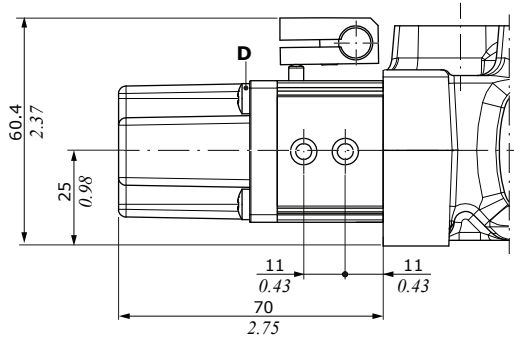
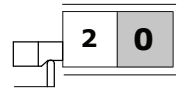
M2-N1 type

2 position (0-1) spring return in neutral position



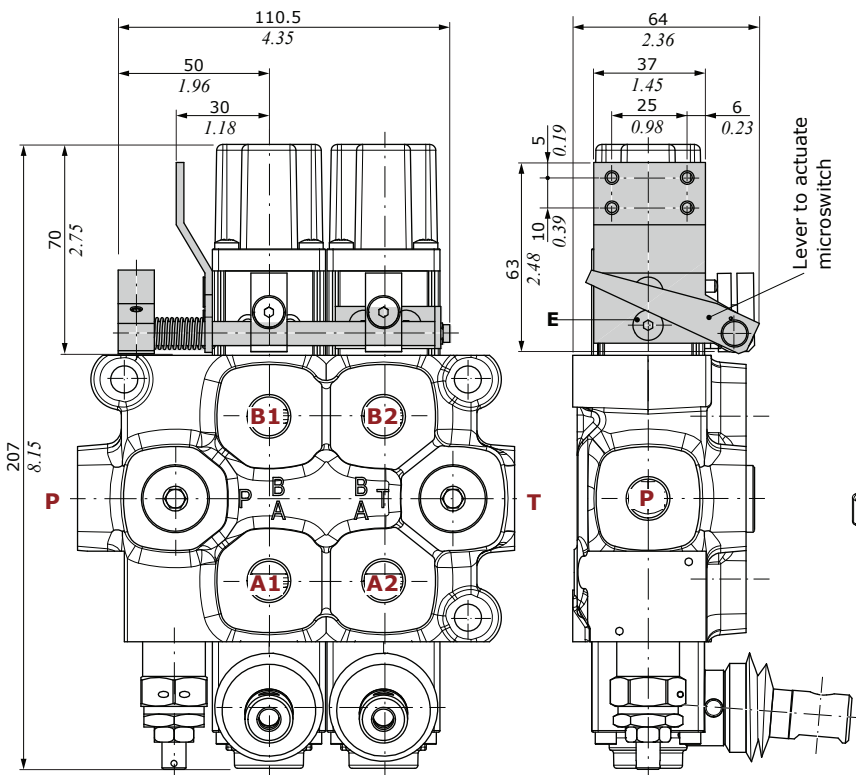
M3-N1 type

2 position (0-2) spring return in neutral position



With aluminium cap; dimensions are the same of standard type

Microswitch assembly kit for 2 working section (M1-N1 type)



Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf)
- D = cross-head - 3 Nm (2.2 lbf)
- E = allen wrench 3 - 6.6 Nm (4.8 lbf)

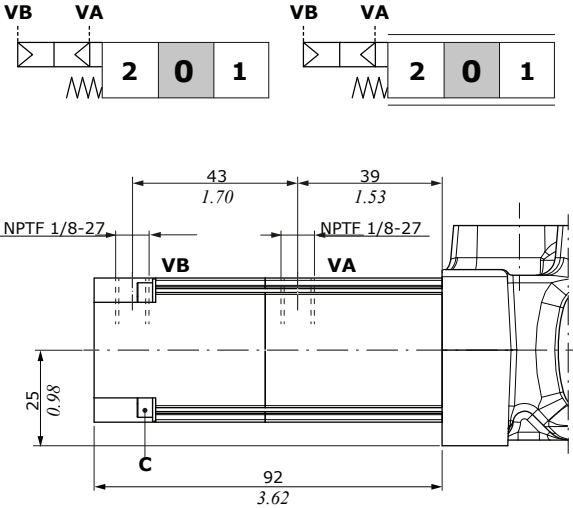
Drawing is referred to a Q25 monoblock valve.

B side controls

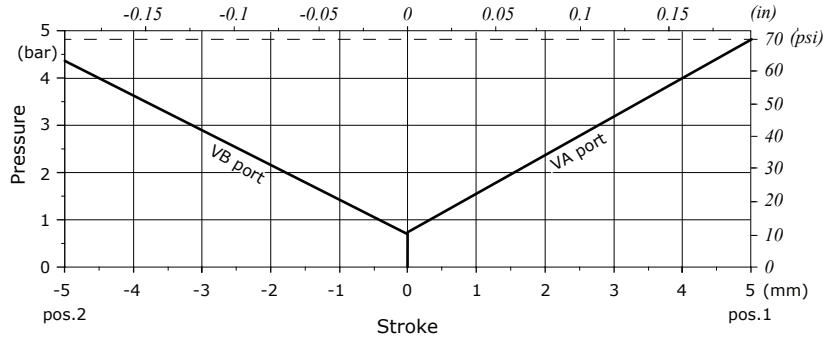
Pneumatic control

P1NW type
ON/OFF control

P1NPW type
Proportional control



Proportional pilot pressure curves



Operating features

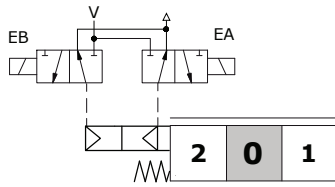
Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
 Pilot volume..... : 4 cm³/min (0.24 in³/min)

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbft)

ON/OFF electropneumatic control

D3 type
ON/OFF control



Operating features

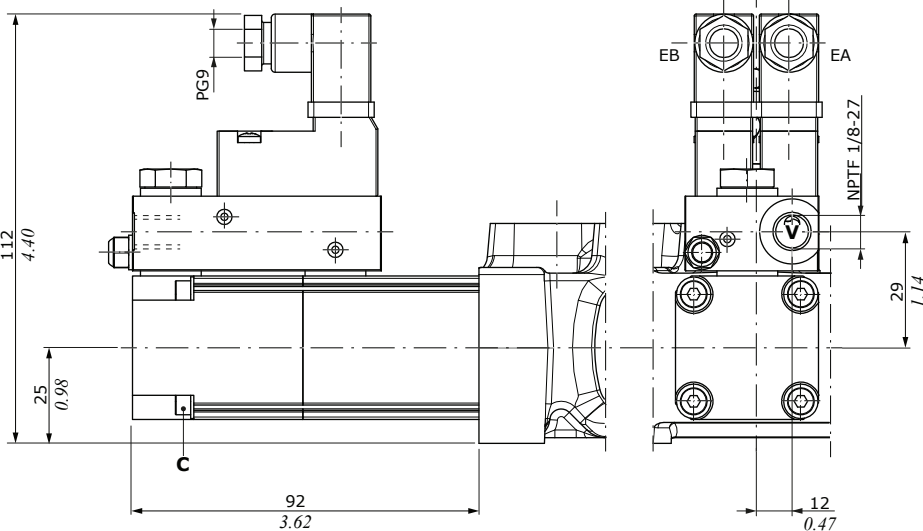
Pilot pressure.....:min. 1 bar (14.5 psi)
 max. 10 bar (145 psi)

COILS

Nominal voltage tolerance....: -5% +10%
 Power rating..... : 2.3 W
 Nominal current..... : 12 VDC - 24VDC
 Coil insulation..... : Class F
 Weather protection..... : IP65
 Duty cycle..... : 100%

Wrenches and tightening torques

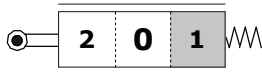
C = allen wrench 3 - 3 Nm (2.2 lbft)



Cam control

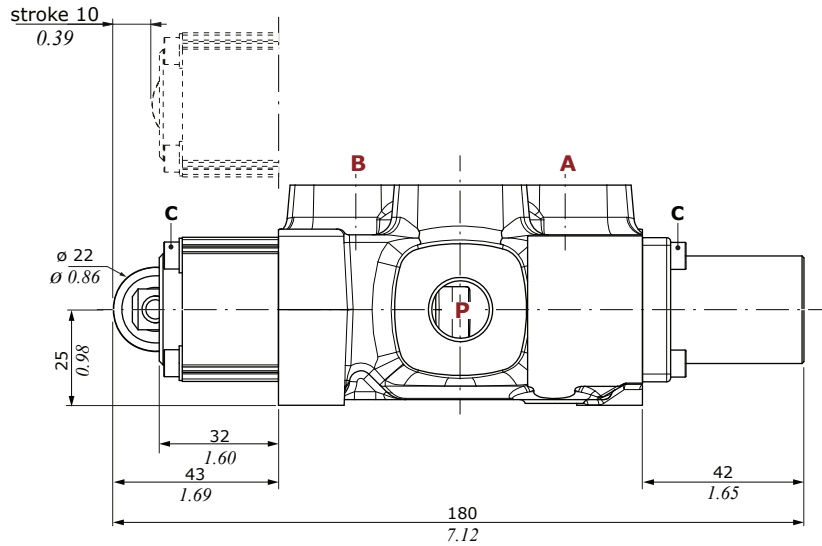
C2 type

From position 1 to position 2,
spring return in position 1



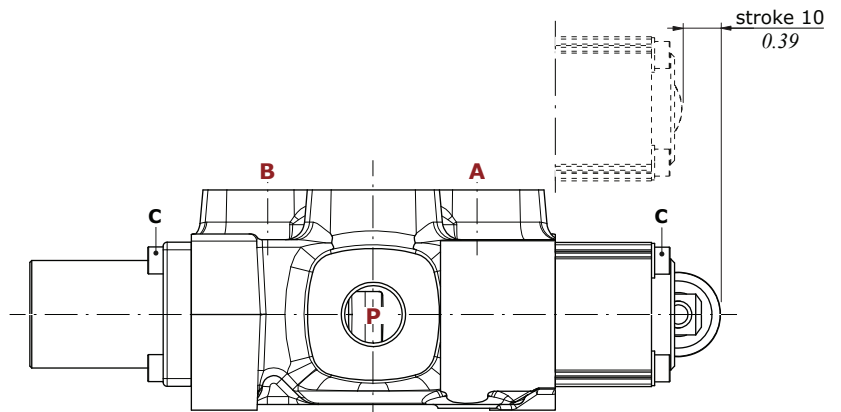
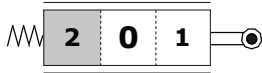
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)



C3 type

From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type

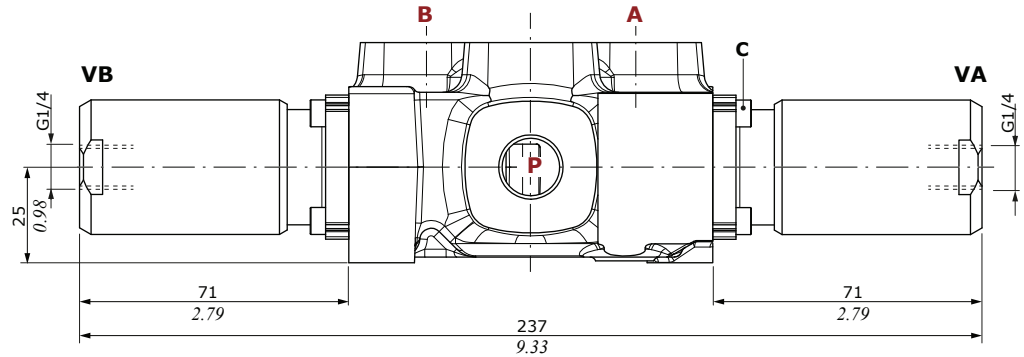
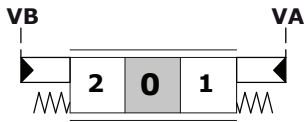


A+B side controls

Proportional hydraulic controls

H1 type

High pressure control with side ports

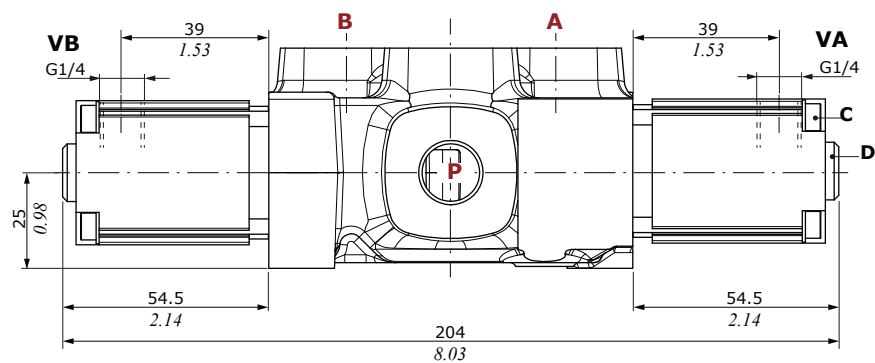
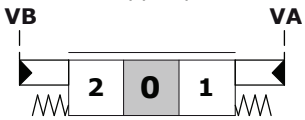


Operating features

Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)

H5 type

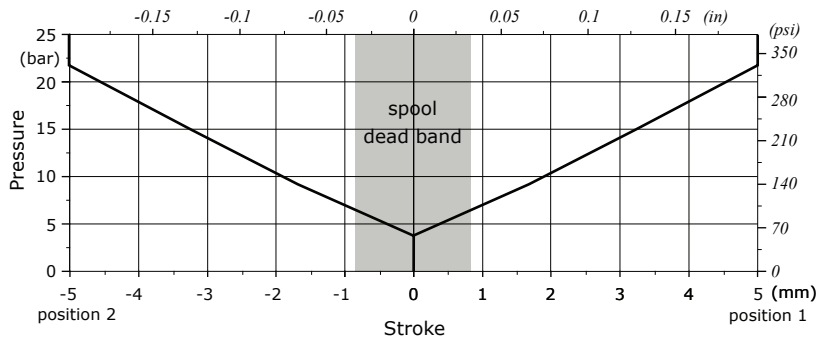
Low pressure control with upper ports



Operating features

Pilot pressure..... : max. 100 bar (1450 psi)

Stroke vs. Pressure diagram for H5 type control



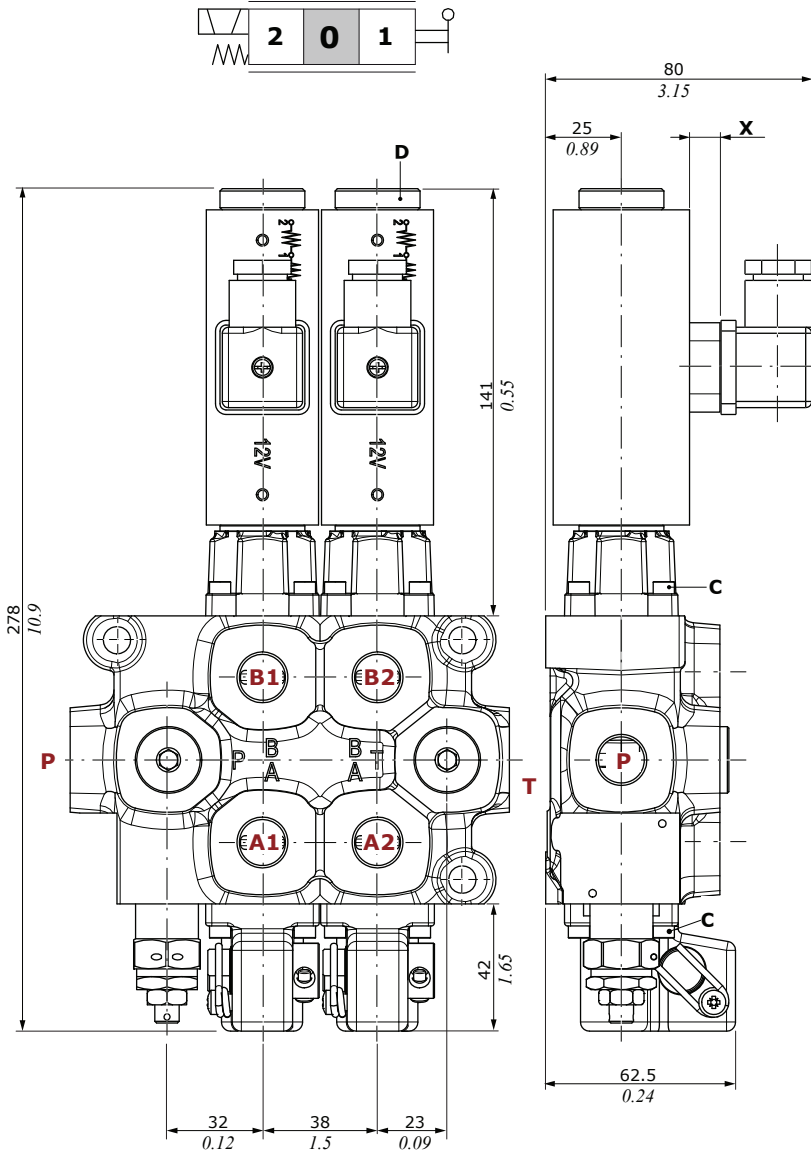
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)
 D = allen wrench 4 - 9.8 Nm (7.2 lbf^t)

Direct solenoid control

D41 type: ON/OFF one side

Drawing is referred to a Q25 monoblock valve.



D41 coil		
	Q25	Q45
Nominal voltage	12 VDC	24 VDC
Nominal voltage tolerance	±10%	
Power rating	58 W	52 W
Insulance	Class H	
Weather protection	IP65	

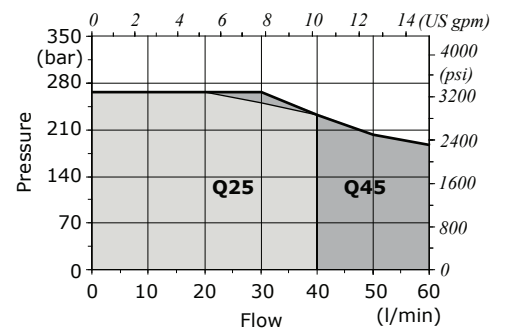
Connector type: ISO4400 3P+T-PG11

X		
	Coil type	mm - in
Q25	ZEB012 coil	10 - 0.39
	ZEB024 coil	
Q45	4SLG111200 coil	8 - 0.31
	4SLG111200 coil	

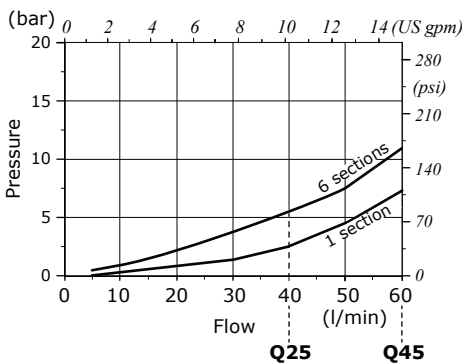
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = manual tightening - 6.6 Nm (7.2 lbft)

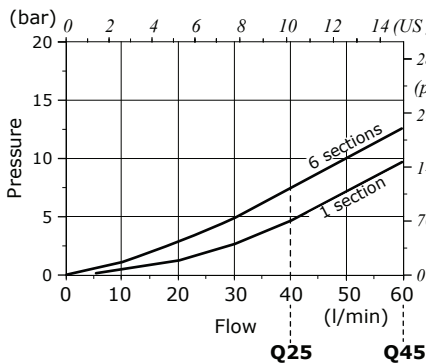
Dynamic conditions



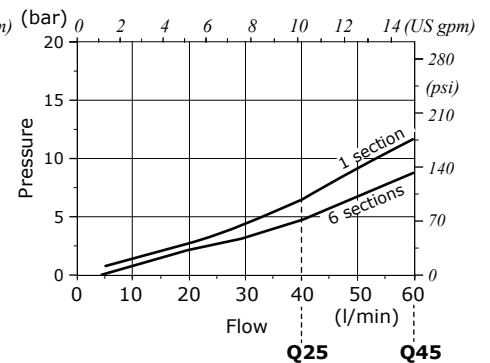
P⇒T pressure drops



P⇒A(B) pressure drops



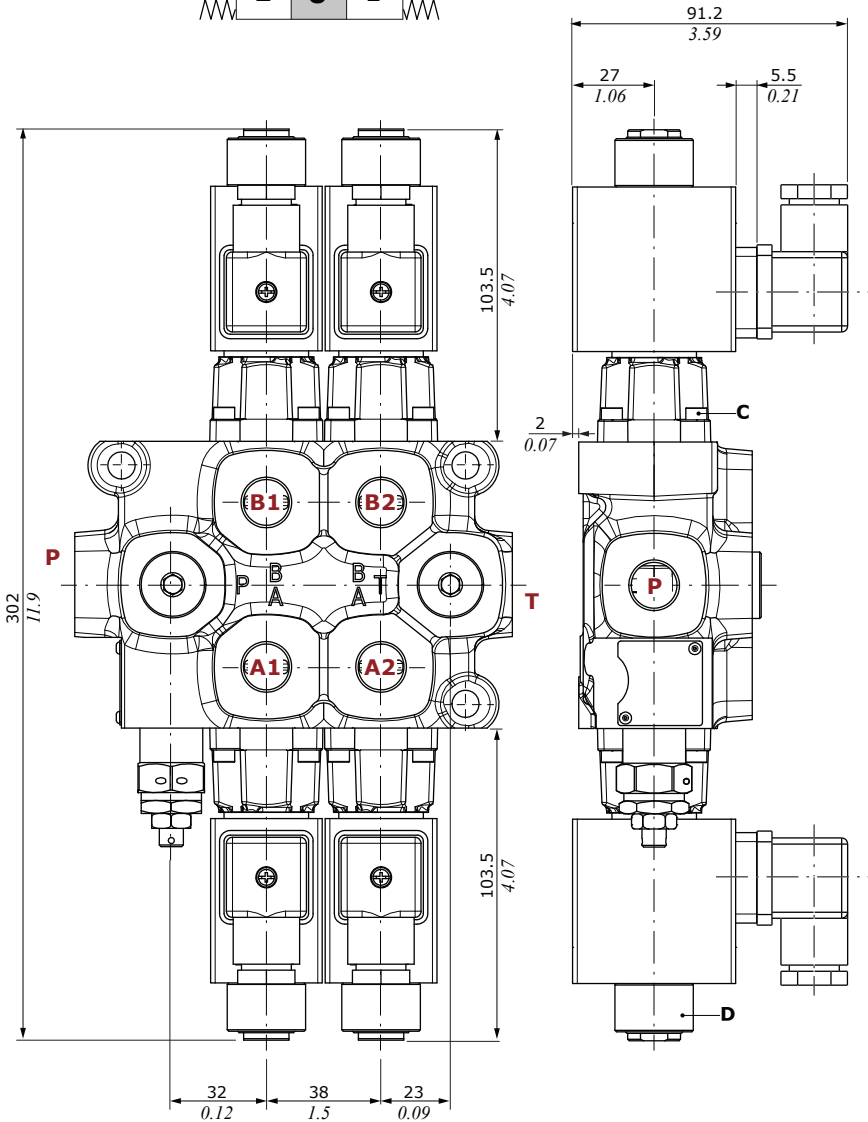
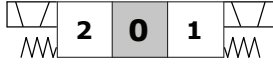
A(B)⇒T pressure drops



Direct solenoid control

D9 type: ON/OFF two side

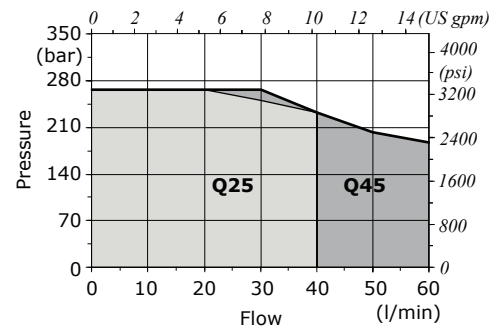
Drawing is referred to a Q25 monoblock valve.



D9 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	58 W
Insulance	Class H
Weather protection	IP65

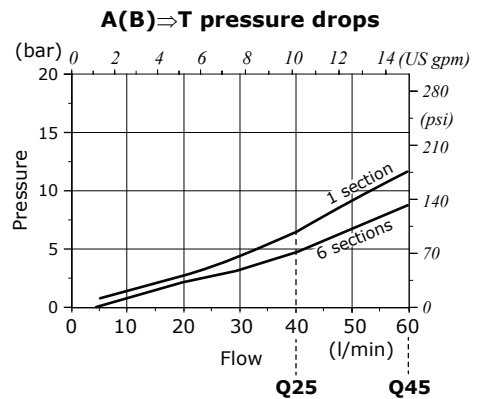
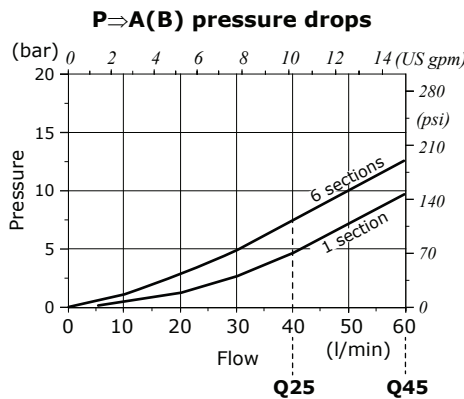
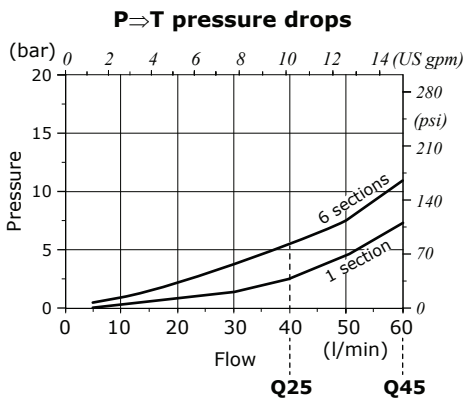
Connector type: ISO4400 3P+T-PG11

Dynamic conditions



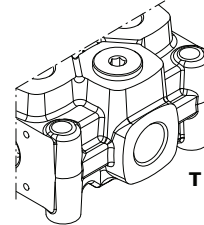
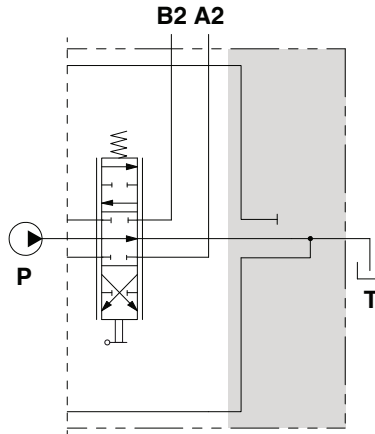
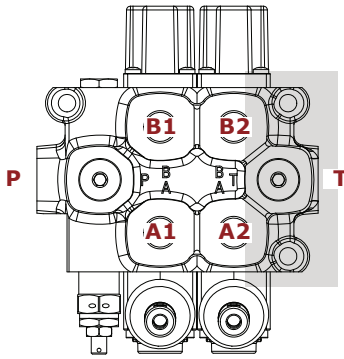
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf)
- D = manual tightening - 6.6 Nm (4.8 lbf)

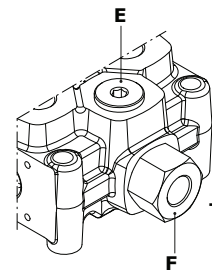
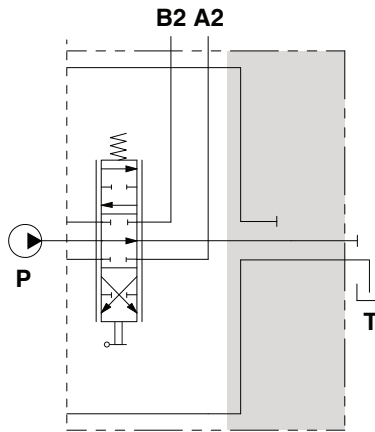
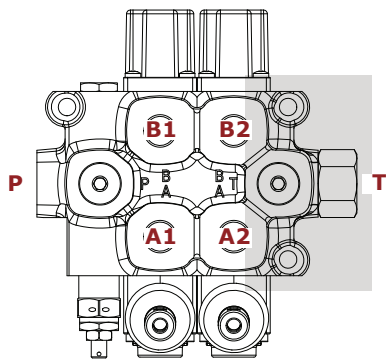


Outlet configuration

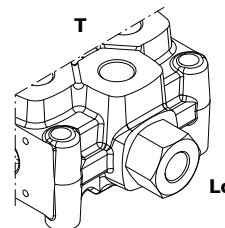
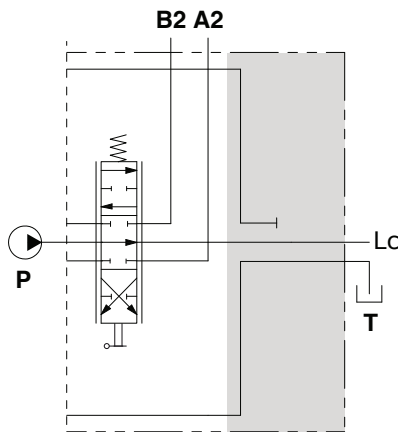
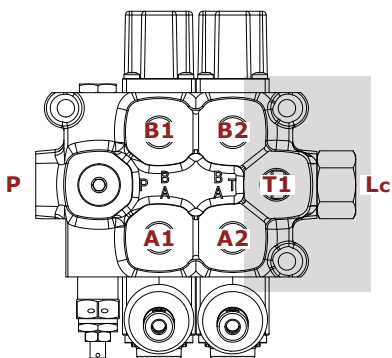
F3D configuration
Open center configuration



F16D configuration
Closed center configuration



F6D configuration
Carry-over configuration

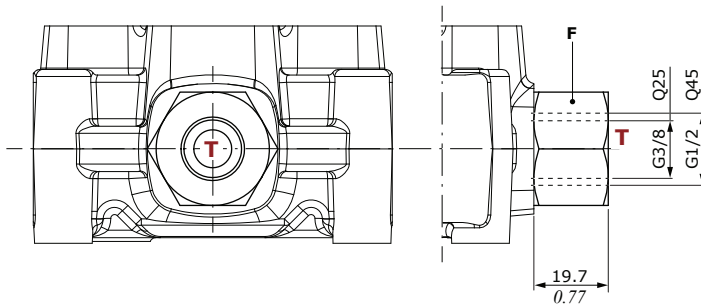


Wrenches and tightening torques
 E (Q25) = allen wrench 6 - 24 Nm (17.7 lbft)
 (Q45) = allen wrench 8 - 42 Nm (22 lbft)
 F = wrench 30 - 42 Nm (30.9 lbft)

Outlet configuration

F6D - F16D joint dimension

Drawing is referred to a Q25 monoblock valve.



Wrenches and tightening torques

F = wrench 30 - 42 Nm (30.9 lbf·ft)



Q75 - Q95

Monoblock directional valves

- Simple, compact and heavy duty designed monoblock valve
- From 1 to 6 sections
- For open and closed center hydraulic systems, optional carry over port
- Mechanical, pneumatic, electropneumatic, hydraulic and direct solenoid controls

Working conditions

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

	Q75	Q95
Nominal flow rating	80 l/min - (22 Us gpm)	100 l/min - (27 Us gpm)
Max. pressure		270 bar (3900 psi)
Max. back pressure on outlet T port		25 bar (360 psi)
Number sections		from 1 to 6
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	6 cm ³ /min (0.36 in ³ /min)
Fluid		Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt
Max. contamination level		16/14/12 - ISO 4406 - NAS1638 class 6
Ambient temperature	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F

NOTES - For different conditions please contact our Sales Department.

REFERENCE STANDARD

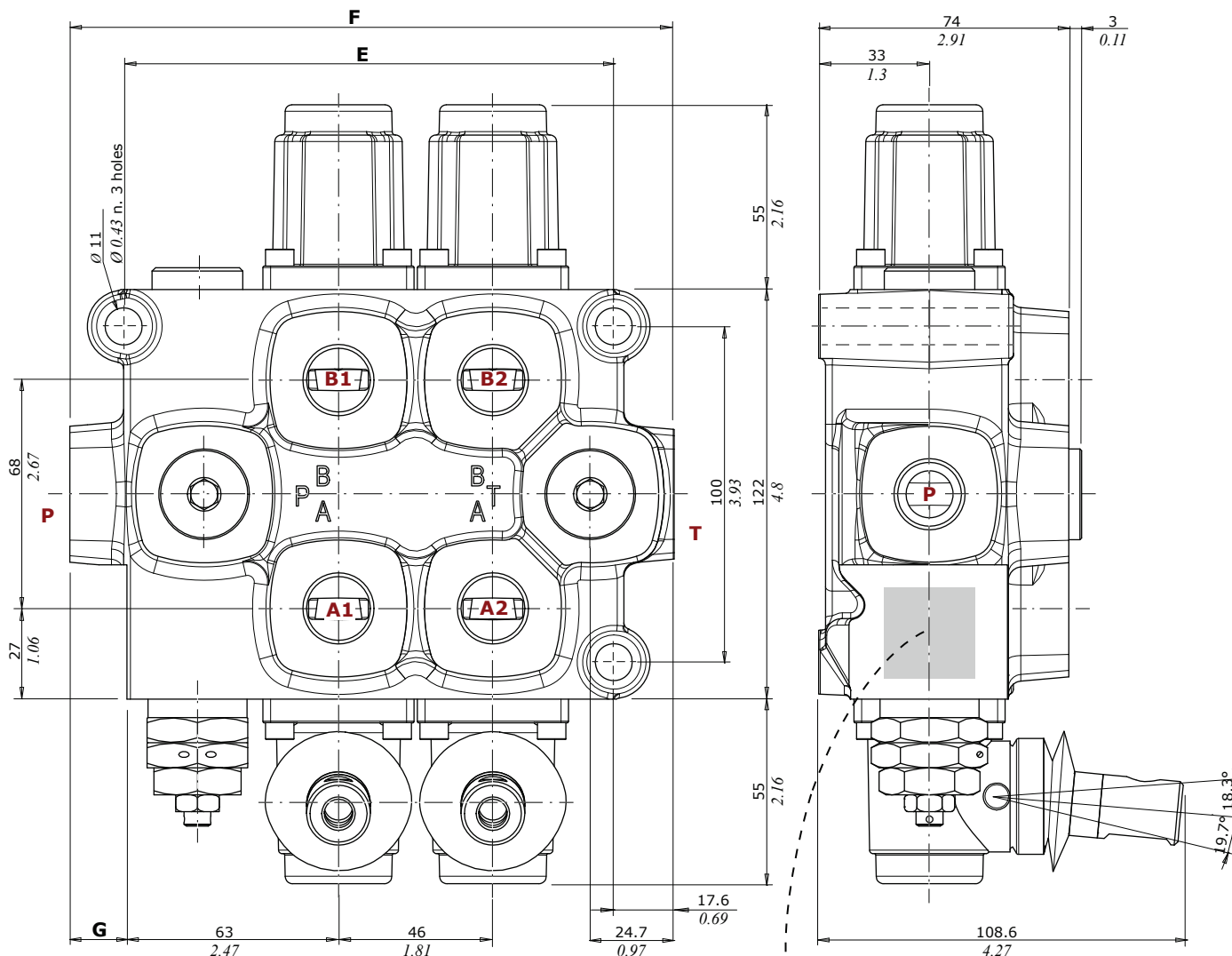
	BSP	UN-UNF
THREAD ACCORDING TO	ISO 228/1	ISO 263
	BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	11926
	SAE	J11926
	DIN	3852-2 shape X or Y

PORT THREADING

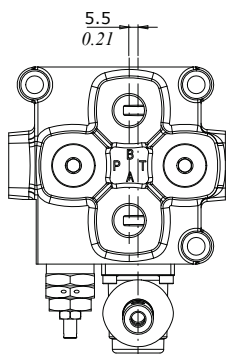
PORTS	Q75		Q95	
	BSP	UN-UNF	BSP	UN-UNF
P Inlet	G 1/2	7/8-14 (SAE 10)	G 3/4	1" 1/16-12 (SAE 12)
P1 Inlet	G 1/2	7/8-14 (SAE 10)	G 3/4	1" 1/16-12 (SAE 12)
A and B ports	G 1/2	7/8-14 (SAE 10)	G 3/4	1" 1/16-12 (SAE 12)
T Outlet	G 3/4	1" 1/16-12 (SAE 12)	G 3/4	1" 1/16-12 (SAE 12)
T1 Outlet	G 1/2	7/8-14 (SAE 10)	G 3/4	1" 1/16-12 (SAE 12)
Lc port (Carry-over plug - T port)	G 1/2	7/8-14 (SAE 10)	G 3/4	7/8-14 (SAE 10)
Hydraulic controls	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

The Q75 and Q95 monoblock valves, have same dimensions but different threads. See port threading on page 63. Drawing are referred to a Q75 monoblock valve.



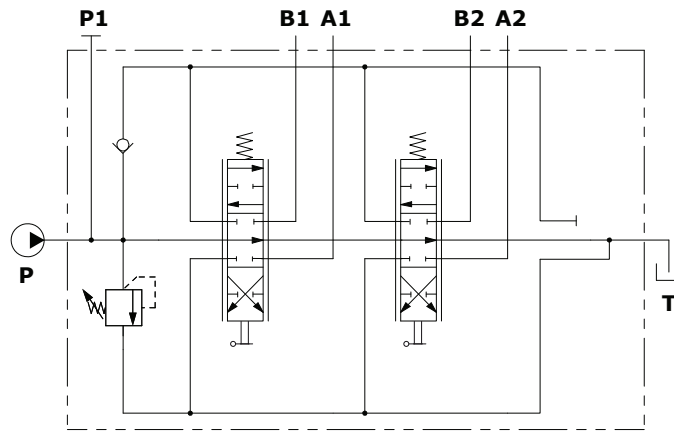
Directional valve with 1 section



walvoil
 MADE IN ITALY
1GB75040009 ----- Product code
DISTRIBUTORE ----- Code description
Q75/2 ----- Product allotment
MD1600464-001 ----- Datamatrix with product allotment

Type	E		F		G	
	mm	in	mm	in	mm	in
Q75/1 - Q95/1	100	3.93	134	5.27	16.5	0.65
Q75/2 - Q95/2	146	5.75	180	7.08	16.5	0.65
Q75/3 - Q95/3	192	7.56	226	8.89	16.5	0.65
Q75/4 - Q95/4	238	9.37	269	10.59	13.5	0.53
Q75/5 - Q95/5	284	11.18	315	12.4	13.5	0.53
Q75/6 - Q95/6	330	13	365	14.67	16.5	0.65

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

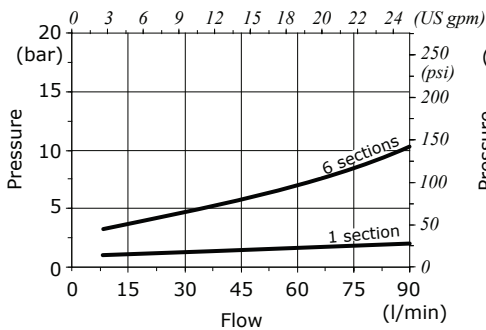


Description example (parallel circuit):
 Q75/2/F1S(R250)/103-A1-M1/103-A1-M1/F3D
 Q95/2/F1S(R250)/103-A1-M1/103-A1-M1/F3D

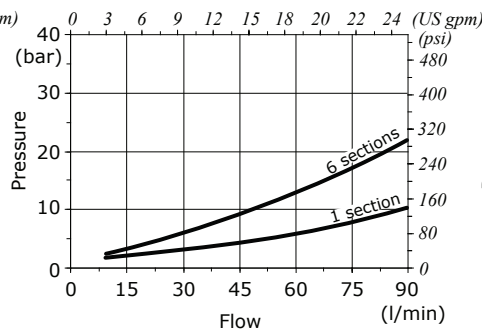
Performance data

Q75

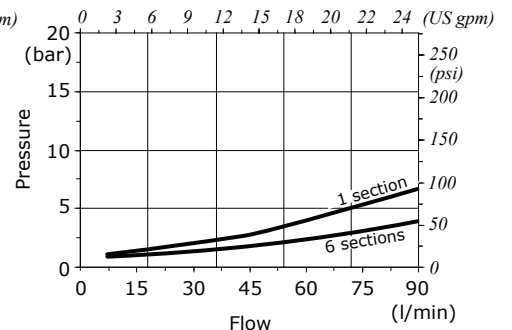
P⇒T pressure drops



P⇒A(B) pressure drops

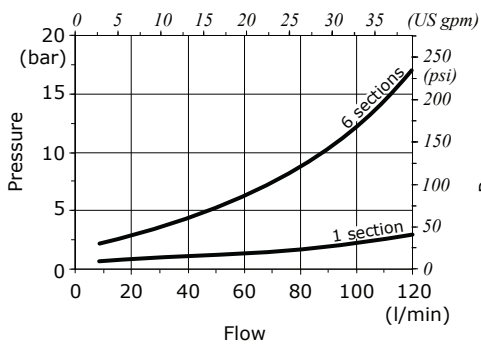


A(B)⇒T pressure drops

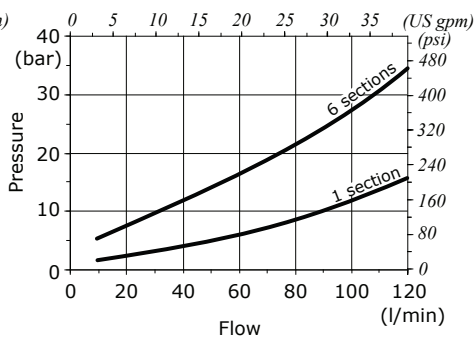


Q95

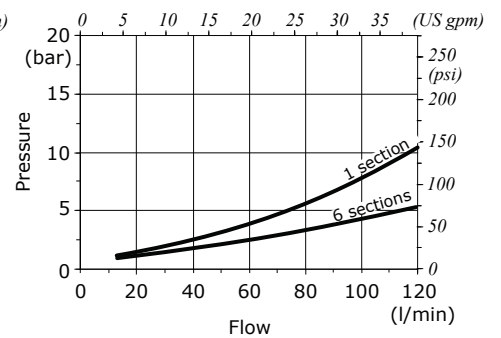
P⇒T pressure drops



P⇒A(B) pressure drops

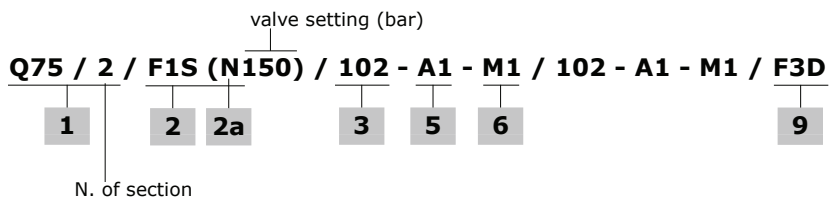


A(B)⇒T pressure drops

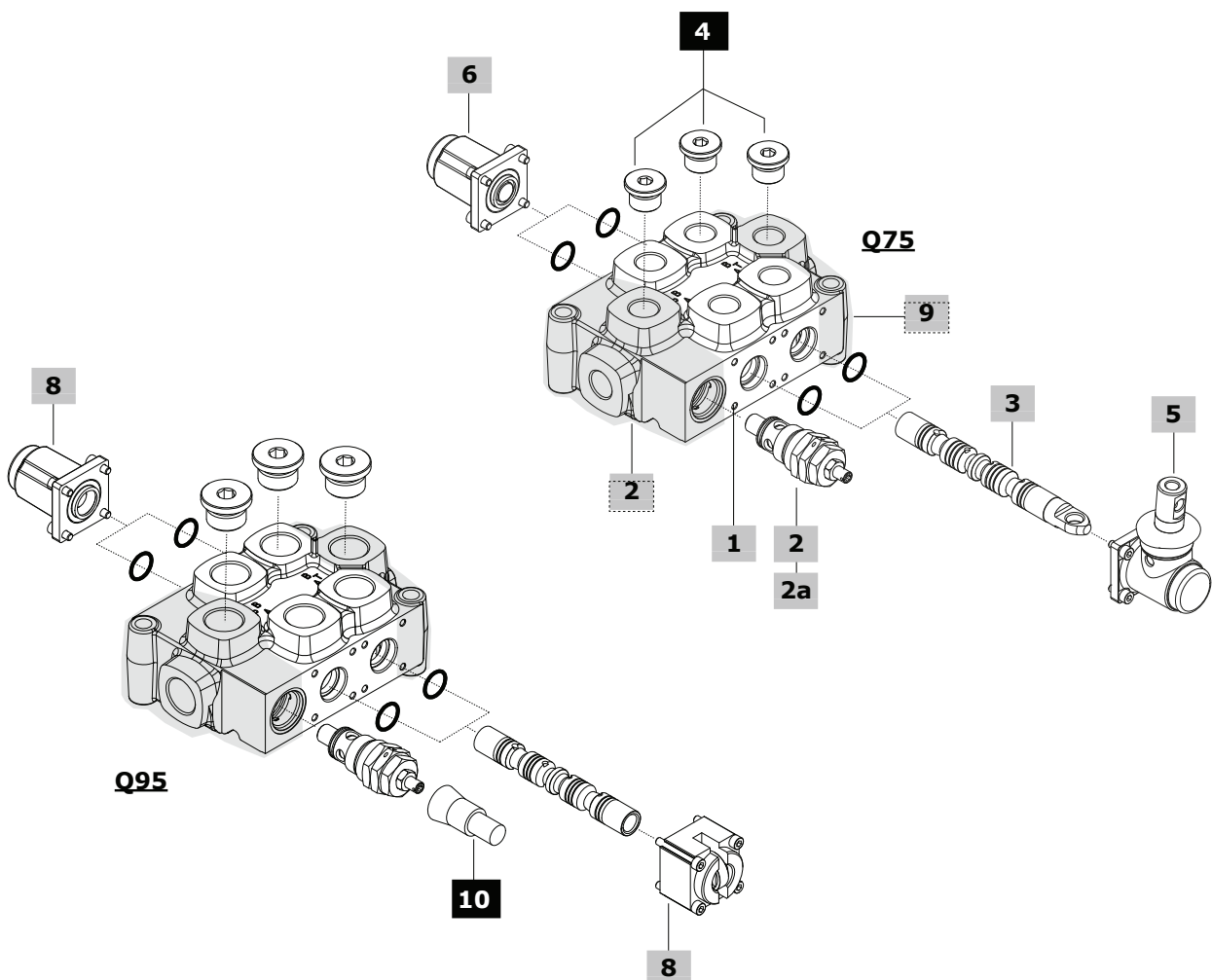
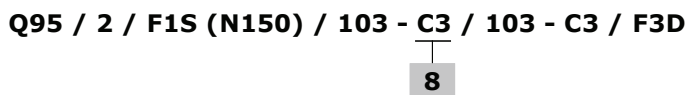


Parts ordering codes

Mechanical control valve configuration example



C2/C3 complete mechanical control valve configuration example



1 Body kit*

The codes are referred to sections with O-ring seals

TYPE	CODE	DESCRIPTION
Q75/1	5KC0600129549	1 section
Q75/2	5KC0600127951	2 sections
Q75/3	5KC0600127952	3 sections
Q75/4	5KC0600127953	4 sections
Q75/5	5KC0600127513	5 sections
Q75/6	5KC0600131252	6 sections

Q95/1	5KC0600129646	1 section
Q95/2	5KC0600130377	2 sections
Q95/3	5KC0600130378	3 sections
Q95/4	5KC0600132067	4 sections
Q95/5	5KC0600131717	5 sections
Q95/6	5KC0600131453	6 sections

2 Inlet configuration* page 71

TYPE	DESCRIPTION
F1S	With load check and pressure relief valves
F2S	With load check valve
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)

Note: Inlet configurations require upper P port plugged: see #4

2a Main pressure relief valve page 72

TYPE: B	CODE: 700065205000000
DESCRIPTION: VLP65S valve, setting range 10-100 bar (145-1450 psi)	
TYPE: N	CODE: 700065105000000
DESCRIPTION: VLP65S valve, setting range 101-200 bar (1460-2900 psi)	
TYPE: R	CODE: 700065305000000
DESCRIPTION: VLP65S valve, setting range 201-380 bar (2910-5500 psi)	
TYPE: -	CODE: 060002788999
DESCRIPTION: Relief valve blanking plug	

3 Spool page 73

TYPE	CODE	DESCRIPTION
Standard spools		
103	060102894999	Double acting, A and B closed in neutral position
	3CUG3051600	As previous one, for kick-out control
106	KR80106	Double acting, for closed circuit
107	KR80107-108	Double acting, A to tank and B closed in neutral position
108	KR80107-108	Double acting, B to tank and A closed in neutral position
111	060102996799	Double acting, A and B to tank in neutral position
114	KR80114	Double acting, A and B to tank in neutral position, for closed circuit
101	3CUG2891900	Single acting on port A (3)
102	3CUG2891901	Single acting on port B (3)
116	3CUG2897800	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	3CUG2897801	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control

Note (3): Q75 valve required G1/2 plug, see #4
Q95 valve required G3/4 plug, see #4

Special spools for cam, microswitch controls and other leverless controls

103	060102879199	Double acting, A and B closed in neutral position
111	060102864199	Double acting, A and B to tank in neutral position

4 Plug for single acting spool or P-T ports*

TYPE	CODE	DESCRIPTION
-	060002792099	G1/2 plug for Q75 body kit
-	3XTAP732200	G3/4 plug for Q95 body kit

5 A side control page 74

TYPE	CODE	DESCRIPTION
For standard spools		
<u>With lever control:</u>		
A1	08600A1-A2	M10 thread aluminium lever box
A2	08600A1-A2	As A1 type, with lever box rotated 180°
A1/06	08606A1-A2/06	Aluminium lever box with stroke limiter
A2/06	08606A1-A2/06	As A1/06 type, with lever box rotated 180°
A1/Z1	08610A1-2/Z1	Aluminium lever box for 116 spool type
A2/Z1	08610A1-2/Z1	As A1/Z1 type, with lever box rotated 180°
<u>With safety lever control:</u>		
A1/S⁽¹⁾	08624A1-A2/S	M10 thread aluminium lever box
A2/S⁽¹⁾	08624A1-A2/S	As A1/S type, with lever box rotated 180°
<u>Without lever control:</u>		
A6	08620A6	With flange
A8	08622A8	Flexible cable control arrangement
A8/Z1	08622A8/Z1	As A8 type, for 116 spool type
<u>Joystick controls for 2 section operation:</u>		
A35/1	08637A35-12	Joystick 1 type
A35/2	08637A35-12	Joystick 2 type
A35/3	08637A35-34	Joystick 3 type
A35/4	08637A35-34	Joystick 4 type
For types 103 and 111 special spools		
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #7		
N1-A1	08641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
N1A-A1	08642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	08643N1B-A1/A2	Micro operation in pos. 2, with lever box
N1-A3	08648N1-A3L	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	08648N1A-A3	Micro operation in pos. 1, without lever with cap
N1B-A3	08648N1B-A3	Micro operation in pos. 2, without lever with cap
<u>Without lever control:</u>		
A3	08614A3	Without lever, with cap
A4	08617A4	M10 male thread external pin with flange
A5⁽²⁾	08619A5	Flange with spherical spool end

(*): Codes are referred to **BSP** thread

(¹): Always complete with lever knob

(²): To be assembled only with M4 control

Parts ordering codes

6 B side control page 79

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	08730M1	3 pos., spring return in neutral position
M1-B1	08753M1-B1	As M1 type, with microswitch arrangement
M1/O1	08730M1/O1	As M1 type, for mechanical joystick
M1/O2	08730M1/O2	As M1 type, with stroke limiter
M1-U1	08701M1-U1	As M1 type, with M10 male thread external pin
M2	08732M2	2 pos. (0-1), spring return in neutral position
M2-U1	08702M2-U1	As M2 type, with M10 male thread external pin
M3	08733M3	2 pos. (0-2), spring return in neutral position
M3-U1	08703M3-U1	As M3 type, with M10 male thread external pin
M4	08734M4-1-2	2 pos. (1-2), spring return in position 1
	08735M4-2-1	2 pos. (2-1), spring return in position 2
M4-U1	08704M4-U11-2	As M4 type (1-2), with M10 male thread external pin
<u>With flexible cable control arrangement:</u>		
M1-U2	08715M1-U2	3 pos., spring return in neutral position
M2-U2	08716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	08717M3-U2	2 pos. (0-2), spring return in neutral position
<u>With detent:</u>		
R1	08741R1	3 pos., detent in position 1
R2	08742R2	3 pos., detent in position 2
R3	08743R3	3 pos., detent in all position
R4	08744R4	2 pos., detent in position 0-1
R5	08745R5	2 pos., detent in position 0-2
R6	08746R6	2 pos., detent in position 1-2
R8	08748R8	4 pos., detent in 4 th pos., for 116 type spool
R10/Z1	08750R10/Z1	4 pos., detent in 4 th pos., for 126 type spool
<u>With detent and kick out function:</u>		
R1K	08741R1K	3 pos., detent in position 1
	08741R1K-TS	As previous one, water-proof configuration
R2K	08742R2K	3 pos., detent in position 2
	08742R2K-TS	As previous one, water-proof configuration
R3K	08743R3K	3 pos., detent in all position
	08743R3K-TS	As previous one, water-proof configuration
<u>With spool position microswitch:</u>		
Note: to complete the control you must use the assembly kit at #7		
M1-N1	08766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
M1-N1A	08767M1-N1A	As M1-N1 type, micro operation in pos. 1
M1-N1B	08768M1-N1B	As M1-N1 type, micro operation in pos. 2
M2-N1	08769M2-N1	2 pos. (0-1), spring return in neutral pos.
M3-N1	08772M3-N1	2 pos. (0-2), spring return in neutral pos.
<u>Pneumatic and electropneumatic controls:</u>		
P1N	08561P1-N	ON/OFF pneumatic control
P1NP	08561P1-NP	Proportional pneumatic control
D3	08591D3-V-12DC	12 VDC, ON/OFF electropneumatic control
	08592D3-V-24DC	24 VDC, ON/OFF electropneumatic control

7 Microswitch assembling kit

CODE	DESCRIPTION
08650N1-01	Kit for 1 section
08650N1-02	Kit for 2 sections
08650N1-03	Kit for 3 sections
08650N1-04	Kit for 4 sections
08650N1-05	Kit for 5 sections
08650N1-06	Kit for 6 sections

8 Complete controls A+B sides page 84

TYPE	CODE	DESCRIPTION
<u>For types 103 and 111 special spools</u>		
C2	08792C2-C3	Cam control from pos. 1 to 2
C3	08792C2-C3	Cam control from pos. 2 to 1

9 Outlet configuration* page 87

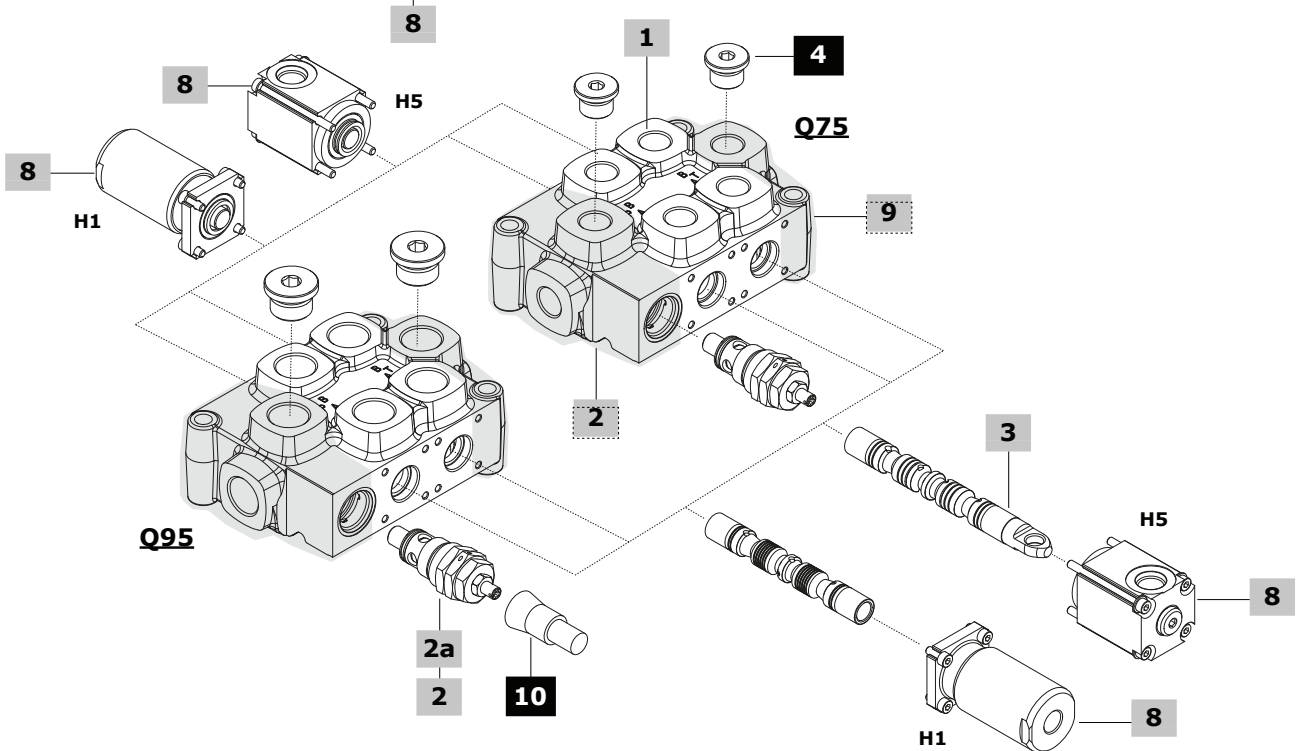
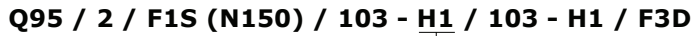
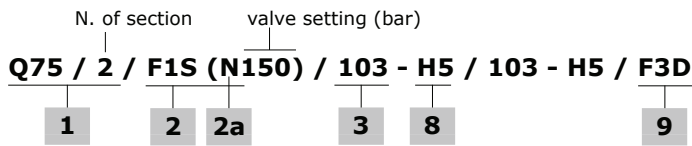
TYPE	DESCRIPTION
F3D	Open center configuration: for Q75 n. 1 G1/2 plug code 060002792099, on T1 port; for Q95 n. 1 G3/4 plug code 3XTAP732200, on T1 port
F6D	Carry-over configuration: for Q75 n. 1 G1/2 joint code 060002315899, on T port; for Q95 n. 1 G3/4 joint code 060002790899, on T port
F16D	Closed center configuration: for Q75 n. 1 G1/2 plug code 060002792099, on T1 port; for Q75 n. 1 G1/2 joint code 060002530199, on T port; for Q95 n. 1 G3/4 plug code 3XTAP732200, on T1 port; for Q95 n. 1 G3/4 joint code 060003016499, on T port

10 Accessory

TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

(*): Codes are referred to **BSP** thread

Proportional hydraulic controls valve configuration example

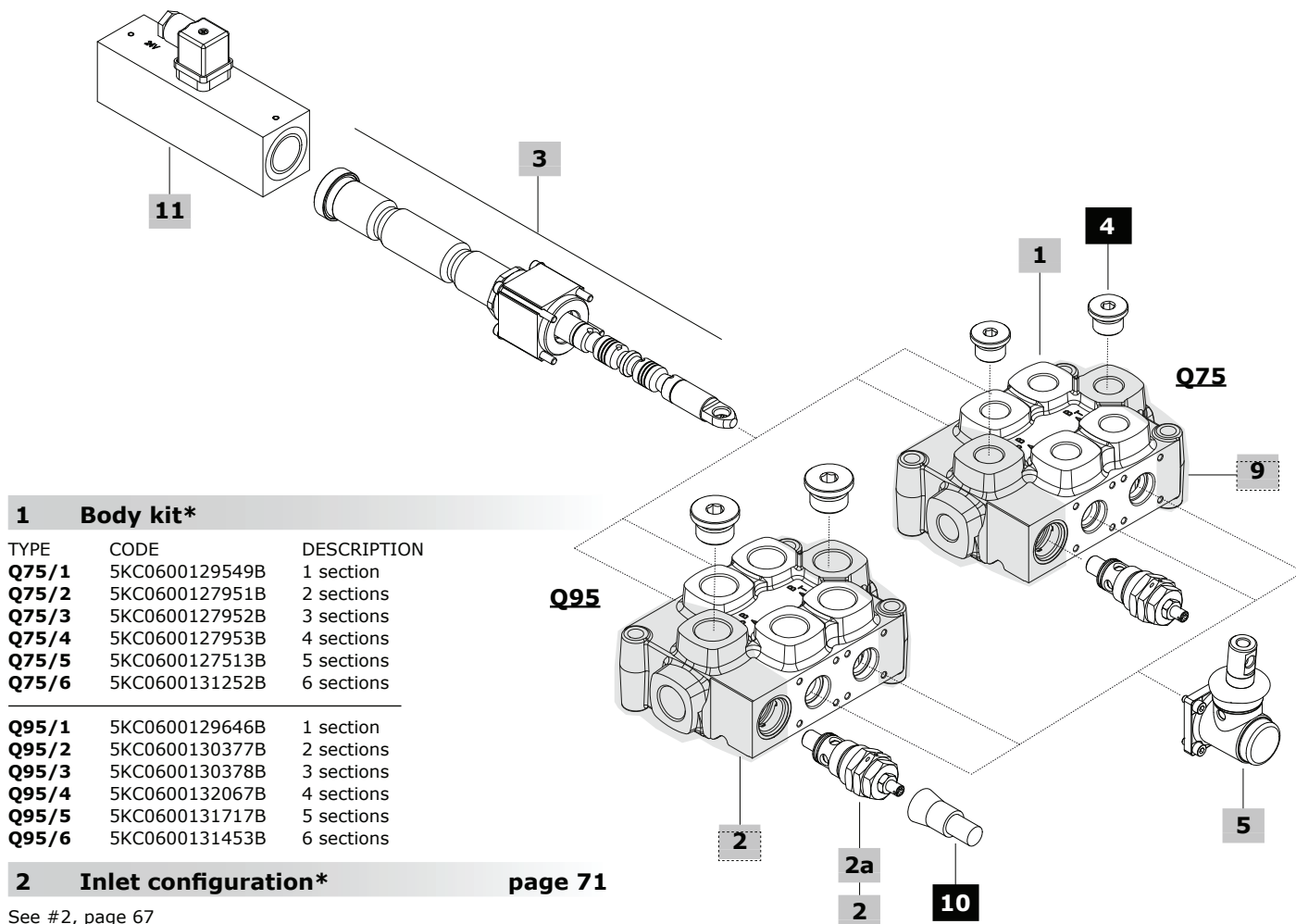
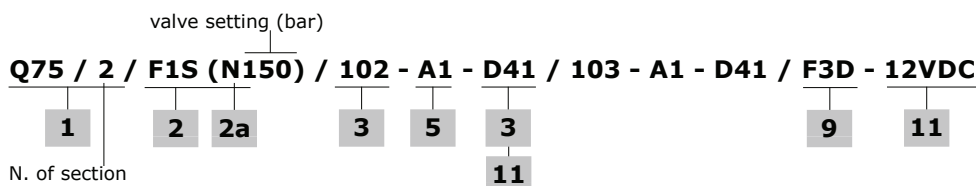


1 Body kit*			3 Spool page 73		
The body kits listed below are for H5 hydraulic control. H1 hydraulic control requires standard body: see #1, page 67			TYPE CODE DESCRIPTION For H5 hydraulic control 103 060102894999 Double acting, A and B closed in neutral position For H1 hydraulic control 103 060102879099 Double acting, A and B closed in neutral position 111 060102864199 Double acting, A and B to tank in neutral position		
TYPE CODE DESCRIPTION Q75/1 5KC0600129549A 1 section Q75/2 5KC0600127951A 2 sections Q75/3 5KC0600127952A 3 sections Q75/4 5KC0600127953A 4 sections Q75/5 5KC0600127513A 5 sections Q75/6 5KC0600131252A 6 sections	4 Plug for P-T ports* See #4, page 67			8 Hydraulic controls A+B sides* page 85	
Q95/1 5KC0600129646A 1 section Q95/2 5KC0600130377A 2 sections Q95/3 5KC0600130378A 3 sections Q95/4 5KC0600132067A 4 sections Q95/5 5KC0600131717A 5 sections Q95/6 5KC0600131453A 6 sections	9 Outlet configuration* page 87 See #9, page 68			10 Accessory See #10, page 68	
2 Inlet configuration* page 71 See #2, page 67			2a Main pressure relief valve page 72 See #2a, page 67		

(*): Codes are referred to **BSP** thread

Parts ordering codes

One side - ON/OFF direct solenoid control valve configuration example



1 Body kit*		
TYPE	CODE	DESCRIPTION
Q75/1	5KC0600129549B	1 section
Q75/2	5KC0600127951B	2 sections
Q75/3	5KC0600127952B	3 sections
Q75/4	5KC0600127953B	4 sections
Q75/5	5KC0600127513B	5 sections
Q75/6	5KC0600131252B	6 sections

Q95/1	5KC0600129646B	1 section
Q95/2	5KC0600130377B	2 sections
Q95/3	5KC0600130378B	3 sections
Q95/4	5KC0600132067B	4 sections
Q95/5	5KC0600131717B	5 sections
Q95/6	5KC0600131453B	6 sections

2 Inlet configuration* page 71

See #2, page 67

2a Main pressure relief valve page 72

See #2a, page 67

3 Solenoid control page 86

TYPE	CODE	DESCRIPTION
103	X0601030059	Tube assembly with double acting spool, A and B closed in neutral position
111	X0601030043	Tube assembly with double acting spool, A and B to tank in neutral position
101	X0601030060A	Tube assembly with single acting spool on port A (1)
102	X0601030060B	Tube assembly with single acting spool on port B (1)

Note (1): Q75 valve required G1/2 plug, see #4
Q95 valve required G3/4 plug, see #4

4 Plug for single acting spool or P-T ports*

See #4, page 67

5 A side control page 86

TYPE	CODE	DESCRIPTION
A1	08600A1-A2	M10 thread cast iron lever box
A2	08600A1-A2	As A1 type, with lever box rotated 180°

9 Outlet configuration* page 87

See #9, page 68

10 Accessory

See #10, page 68

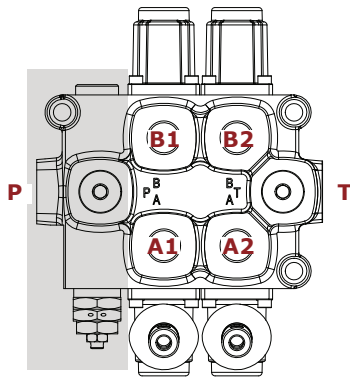
11 Coil page 86

TYPE	CODE	DESCRIPTION
-	ZEB112	12 VDC ISO4400 coil
-	ZEB124	24 VDC ISO4400 coil

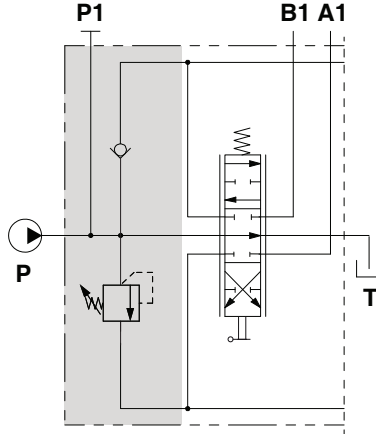
Note: The connector is included

(*): Codes are referred to **BSP** thread

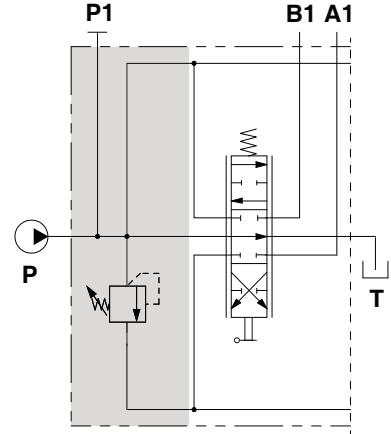
Inlet configuration



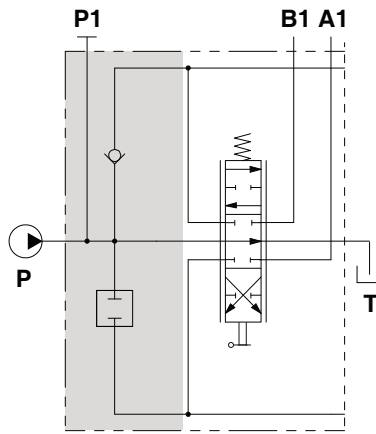
F1S configuration
With load check and pressure relief valve



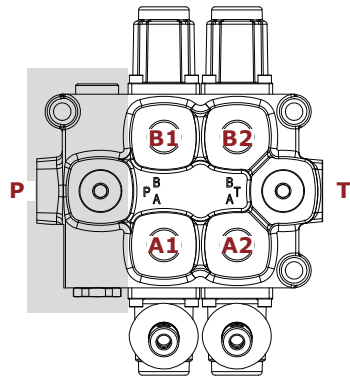
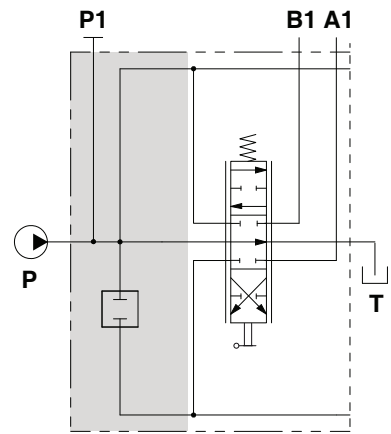
F7S configuration
With pressure relief valve



F2S configuration
With load check valve

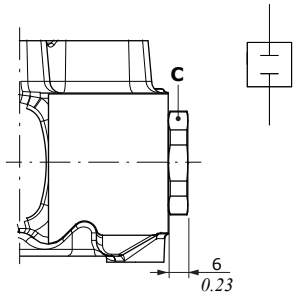


F8S configuration
Without valves
(pressure relief valve plugged port)

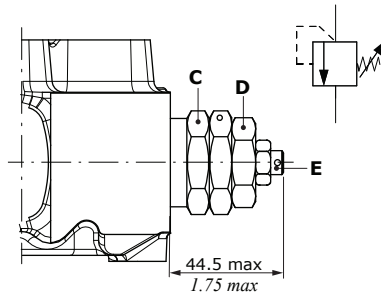


Main pressure relief valve

Relief valve blanking plug

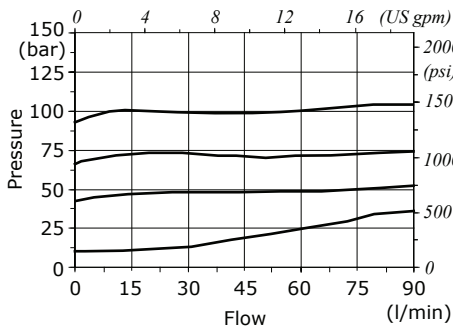


Main pressure relief valve

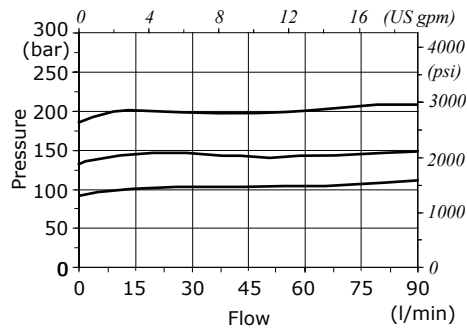


Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

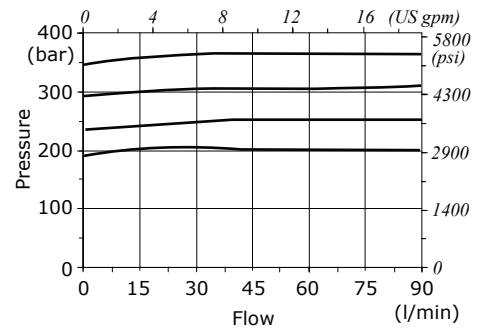
Setting example (B type spring)



Setting example (N type spring)



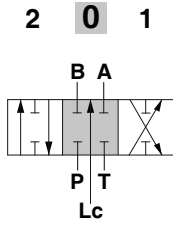
Setting example (R type spring)



Wrenches and tightening torques

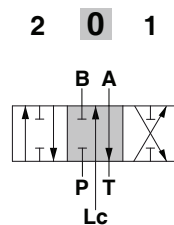
- C = wrench 30 - 80 Nm (59 lbf_t)
- D = wrench 26 - 42 Nm (35.2 lbf_t)
- E = allen wrench 4

103 type
A and B closed
in neutral position



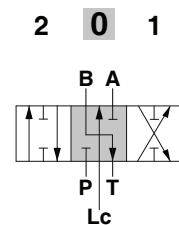
Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

107 type
A to tank, B closed
in neutral position



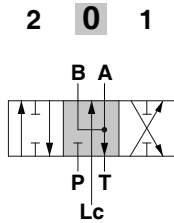
Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

108 type
B to tank, A closed
in neutral position



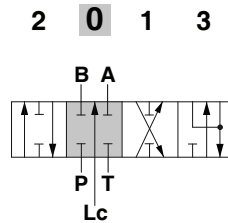
Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

111 type
A and B to tank
in neutral position



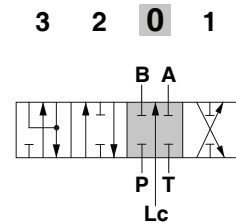
Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

116 type
With floating in the 4th position
(spool in)



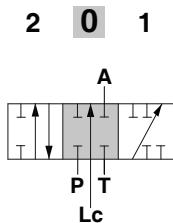
Stroke
Position 1: - 7 mm (+ 0.27 in)
Position 2: + 7 mm (+ 0.27 in)
Position 3: - 10.25 mm (- 0.40 in)

126 type
With floating in the 4th position
(spool out)



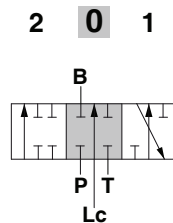
Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (+ 0.27 in)
Position 3: + 10.25 mm (- 0.40 in)

101 type
Single acting on A,
B plugged



Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

102 type
Single acting on B,
A plugged



Stroke
Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

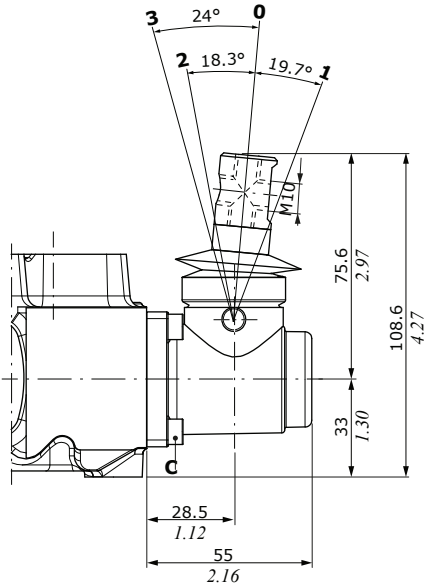
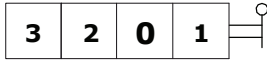
A side controls

Mechanical controls

With lever control

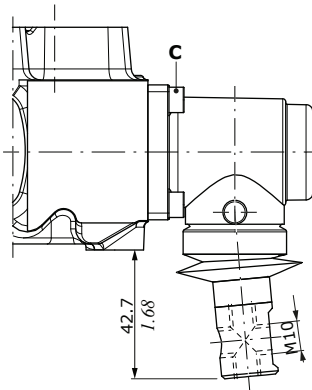
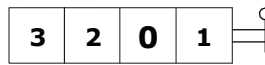
A1 type

M10 thread aluminium lever box



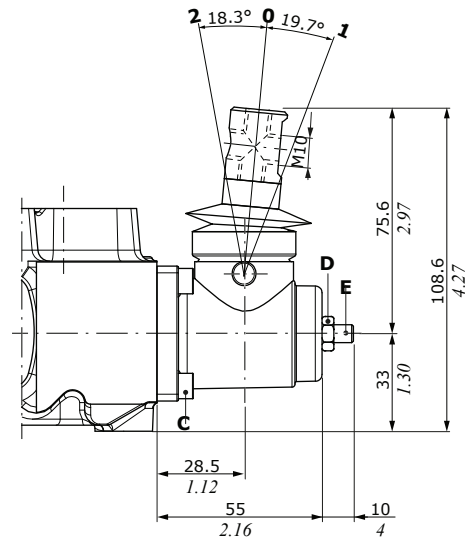
A2 type

As A1 type, rotated 180°



A1/06 type

M10 thread, with stroke limiter

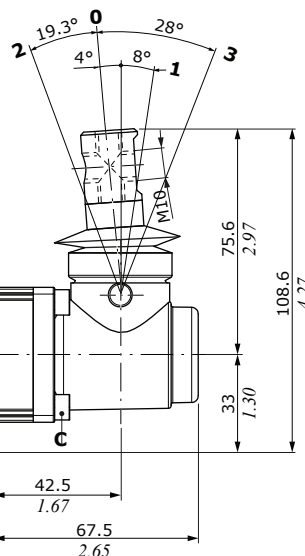
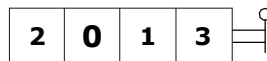


Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbft)
- D = wrench 10 - 9.8 Nm (7.2 lbft)
- E = allen wrench 4 - 9.8 Nm (7.2 lbft)

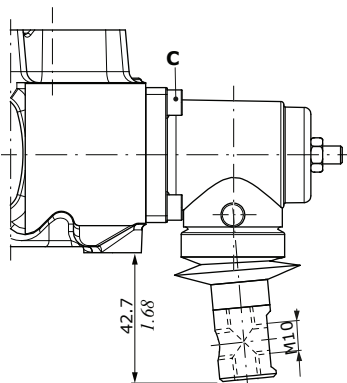
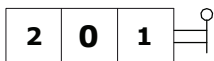
A1/Z1 type

M10 thread, for 116 floating spool type



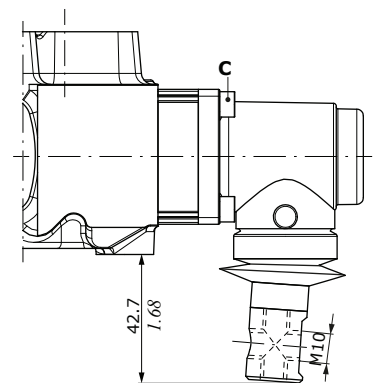
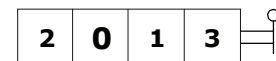
A2/06 type

As A1/06 type, rotated 180°



A2/Z1 type

As A1/Z1 type, rotated 180°

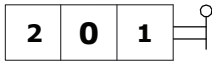


Mechanical controls

With safety lever control

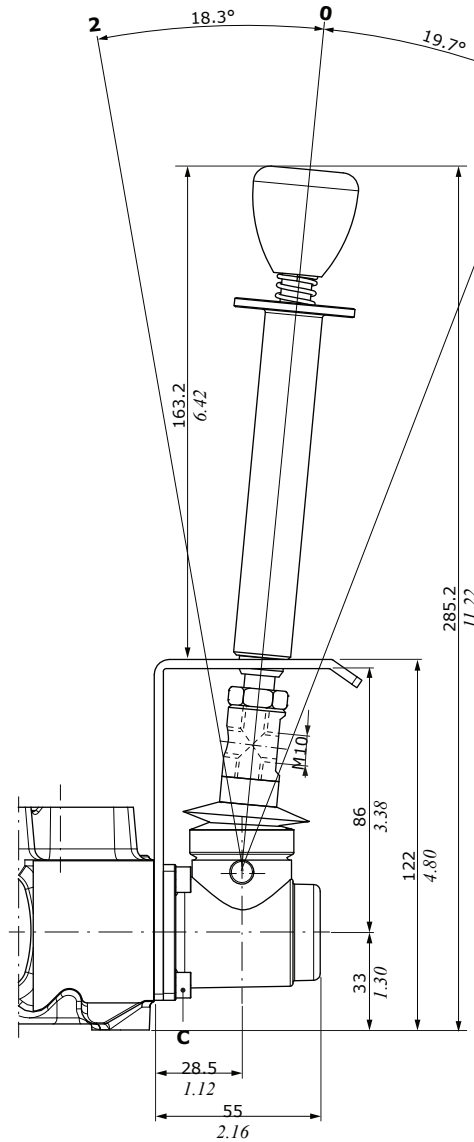
A1/S type

M10 thread, aluminium lever box



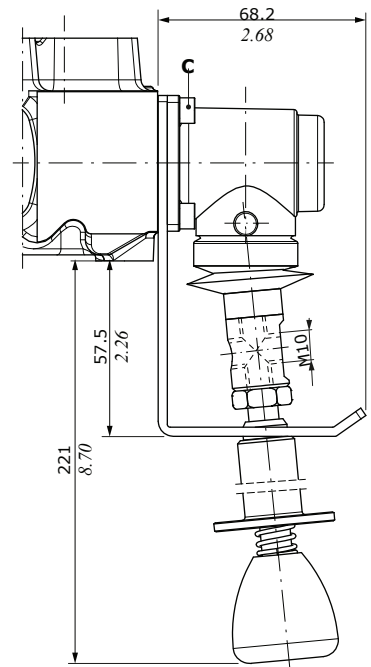
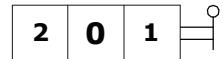
Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)



A2/S type

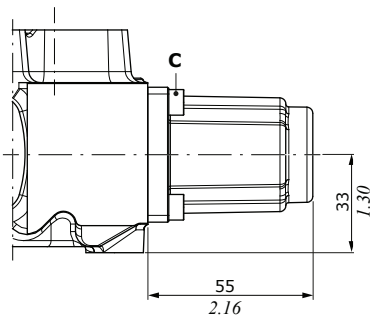
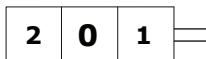
As A1/S type, rotated 180°



Without lever control

A3 type

With cap



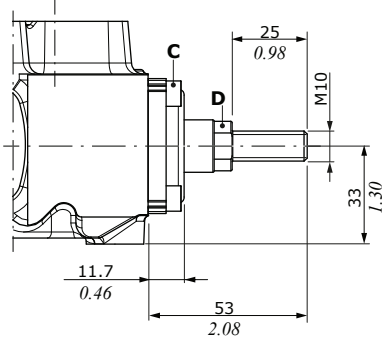
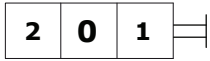
A side controls

Mechanical controls

Without lever control

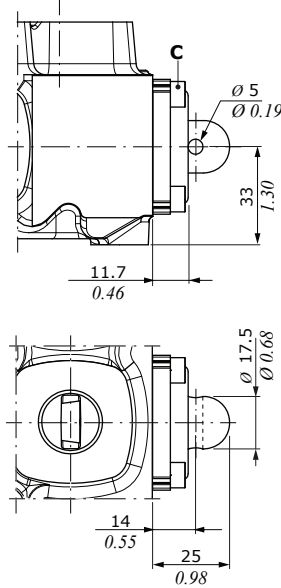
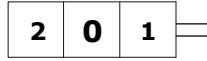
A4 type

M10 male thread
external pin with flange



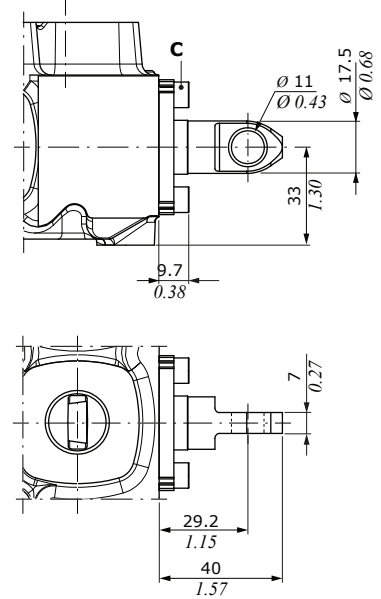
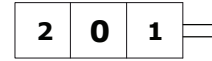
A5 type

Flange with spherical spool end



A6 type

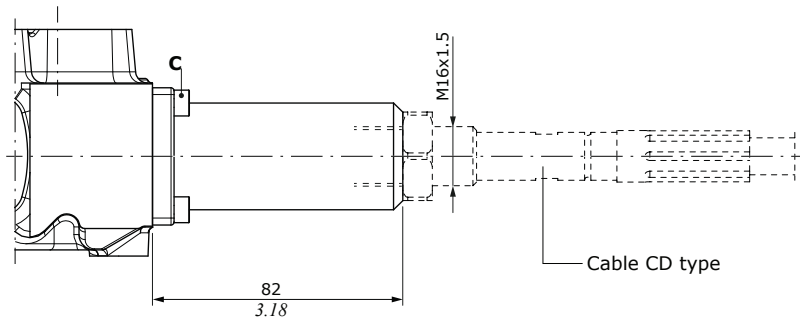
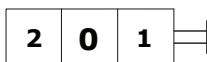
With flange



With flexible cable control arrangement

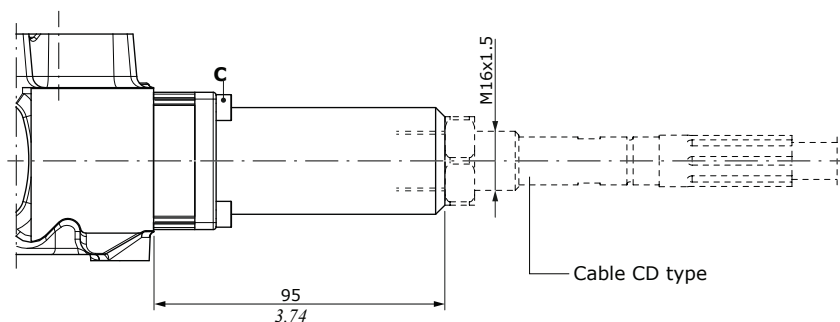
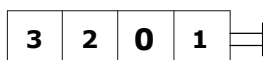
A8 type

Flexible cable control arrangement



A8/Z1 type

As A8 type,
for 116 floating spool type



Wrenches and tightening torques

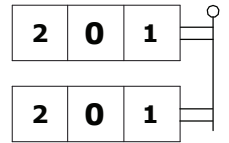
C = allen wrench 4 - 6.6 Nm (4.8 lbft)

D = wrench 13 - 9.8 Nm (7.2 lbft)

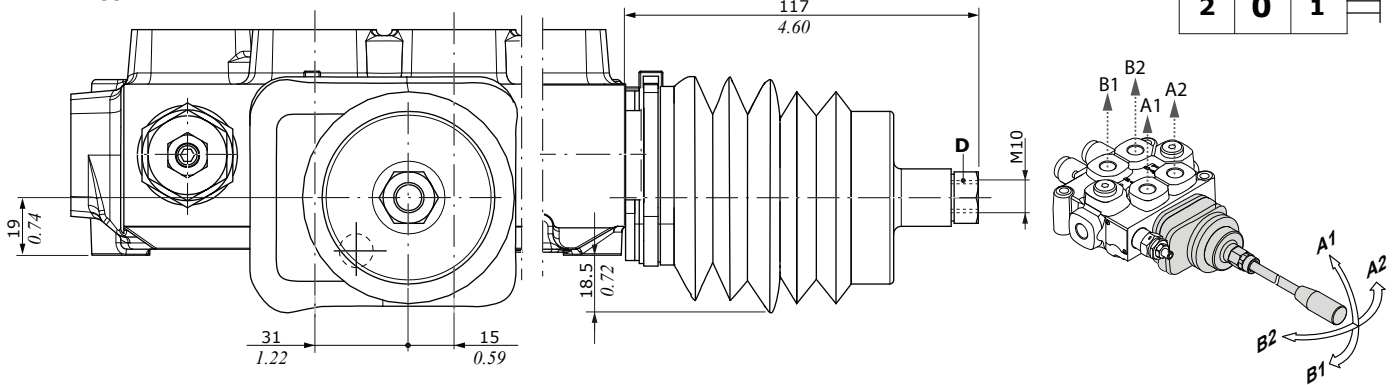
A side controls

Joystick controls

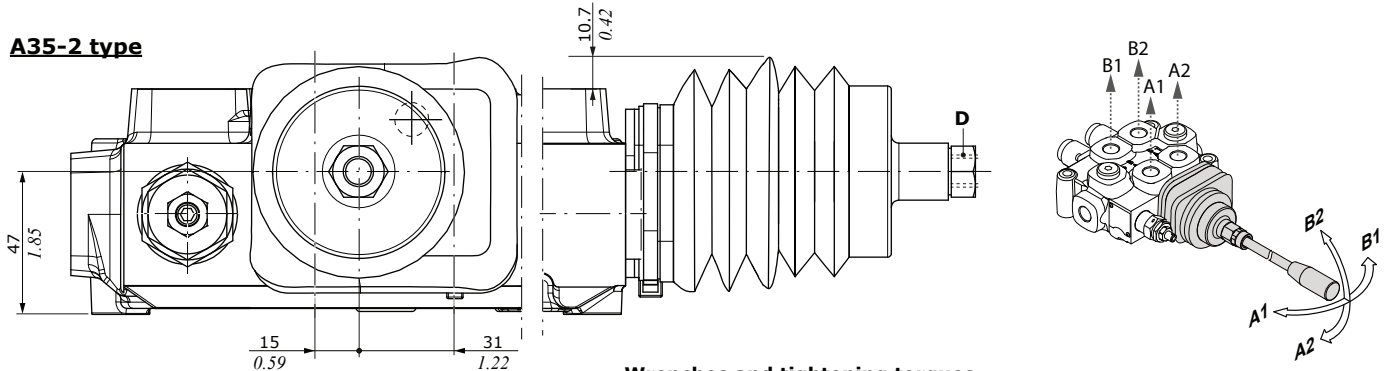
For operating the joystick control in the floating position, contact Sales Department.



A35-1 type

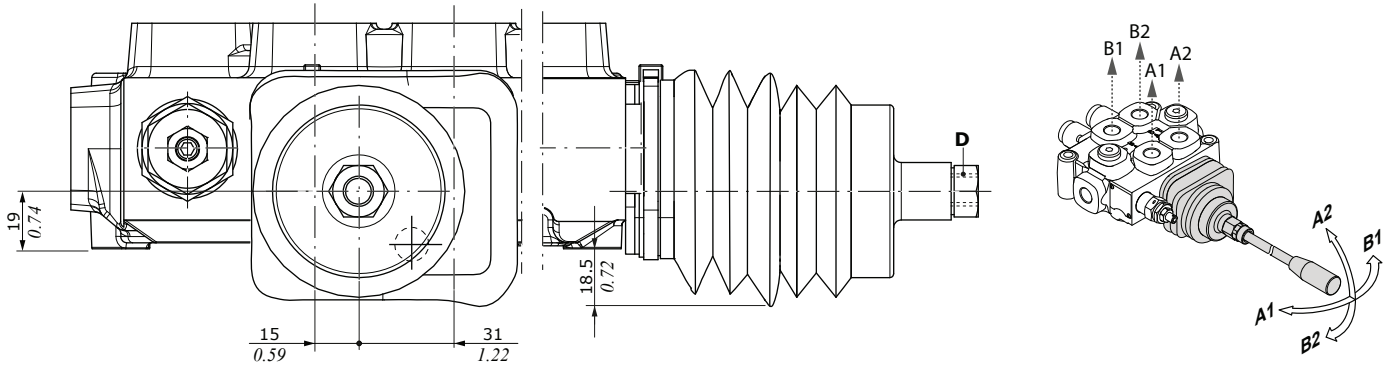


A35-2 type

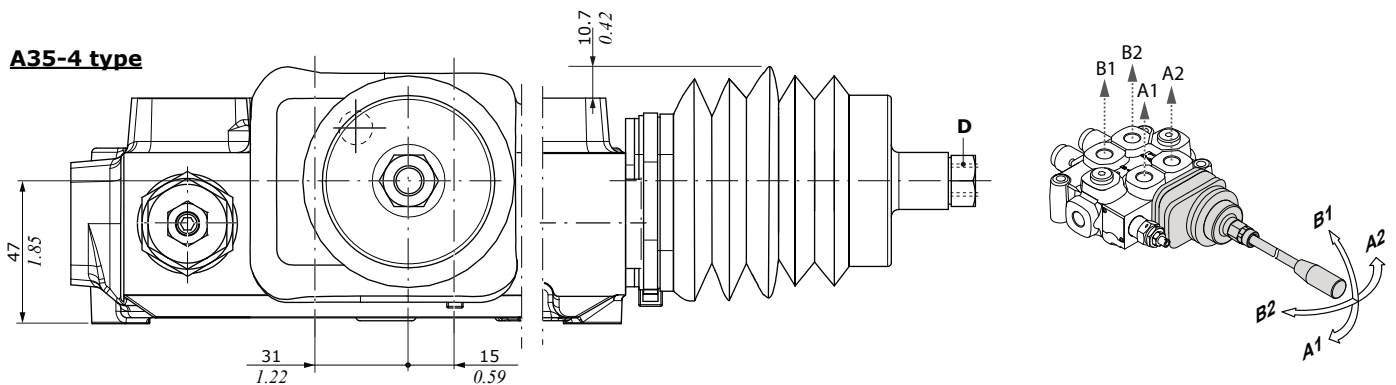


Wrenches and tightening torques
D = wrench 17 - 24 Nm (17.7 lbf_t)

A35-3 type



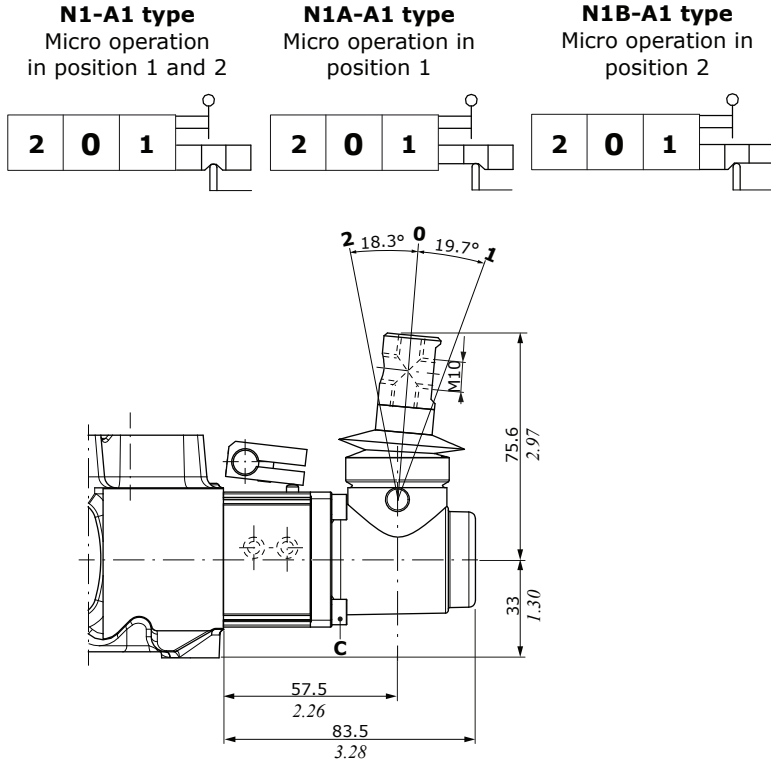
A35-4 type



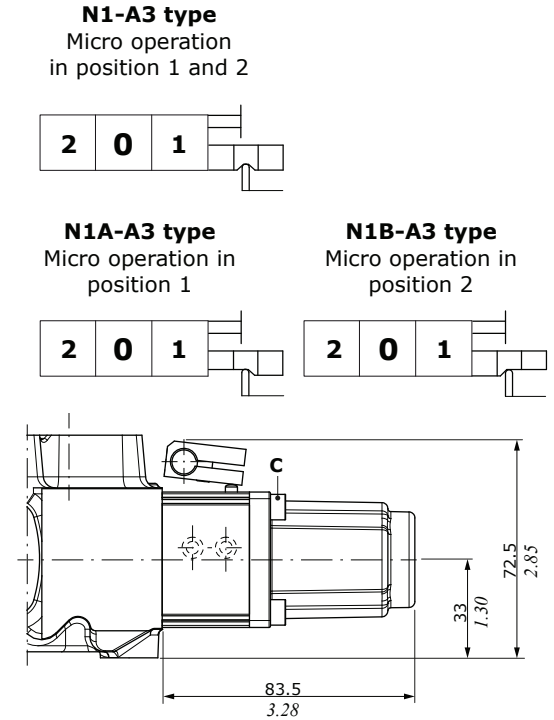
A side controls

Spool position microswitch

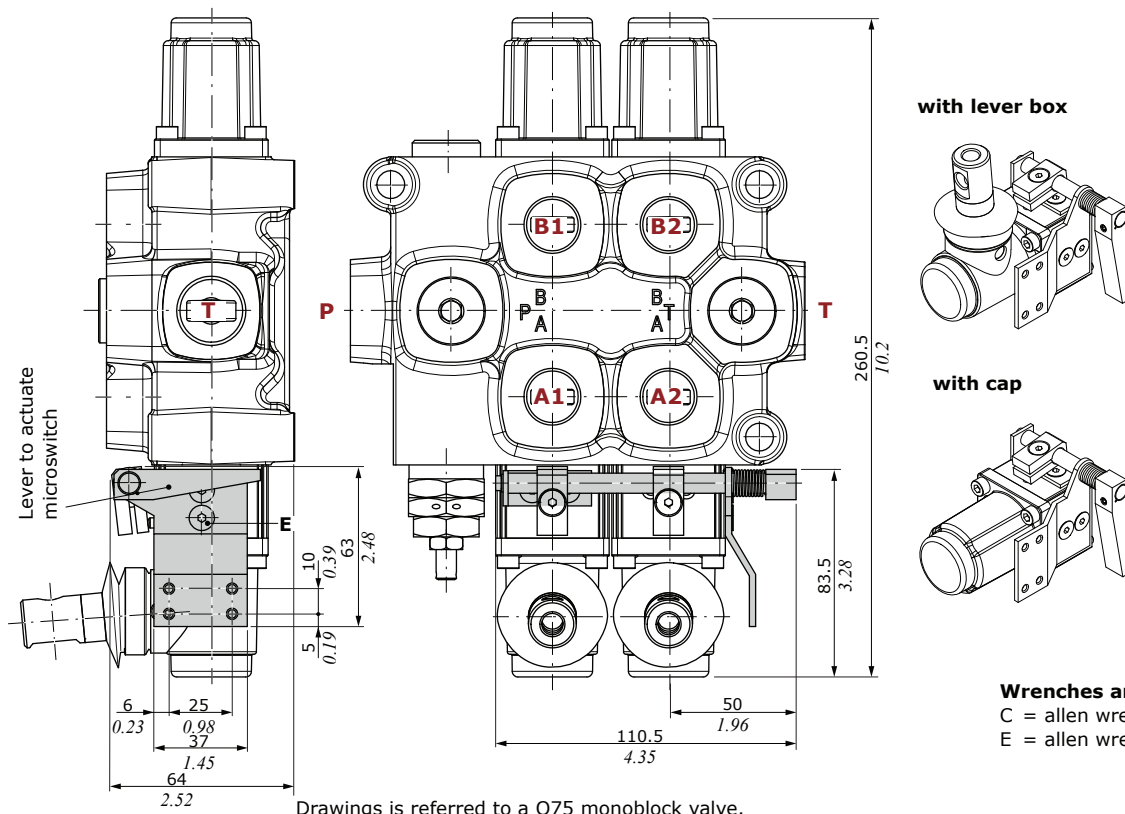
With lever control



Without lever control, with cap



Microswitch assembly kit for 2 working section (N1-A1 type)



Drawings is referred to a Q75 monoblock valve.

Mechanical controls

With spring return control

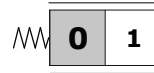
M1 type
3 position, spring return
in neutral position



M1/01 type
3 position,
for joystick control

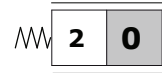
M2 type

2 position (0-1), spring return
in neutral position



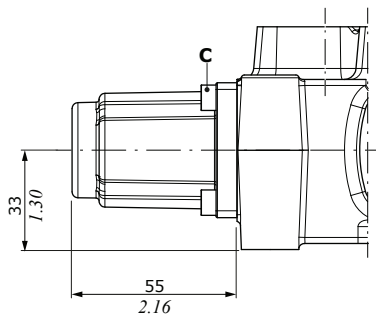
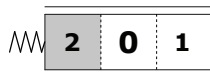
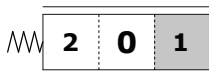
M3 type

2 position (0-2), spring return
in neutral position

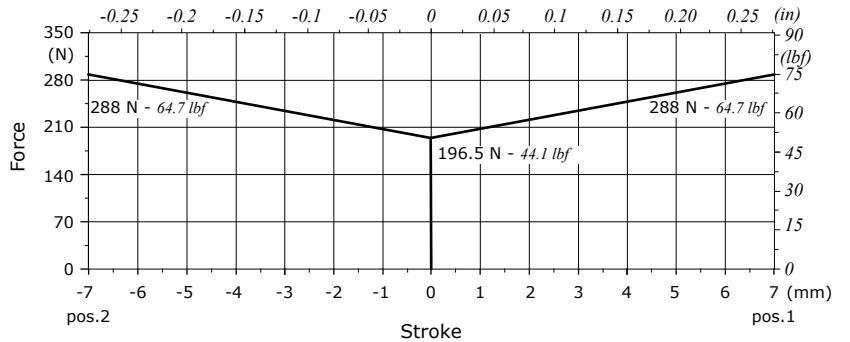


M4 types

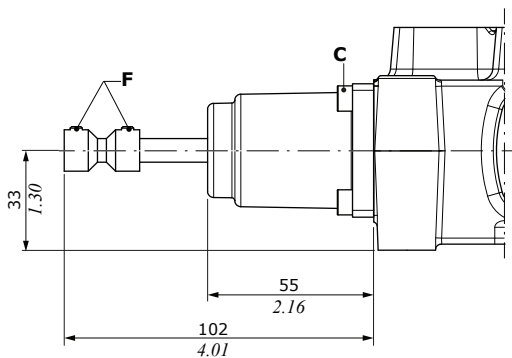
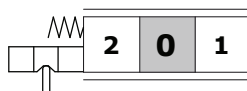
2 position (1-2),
spring return in position 1 2 position (2-1),
spring return in position 2



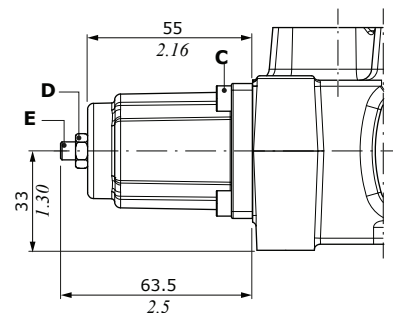
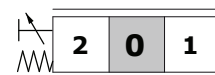
M1 control type - Force vs Stroke diagram



M1-B1 type
3 position,
microswitch arrangement



M1/02 type
As M1 type, with stroke limiter



Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)
- D = wrench 10 - 9.8 Nm (7.2 lbf_t)
- E = allen wrench 4 - 9.8 Nm (7.2 lbf_t)
- F = allen wrench 3 - 5 Nm (3.68 lbf_t)

B side controls

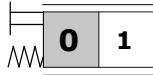
Mechanical controls

With spring return control

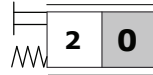
M1-U1 type
3 position, with M10 male thread external pin



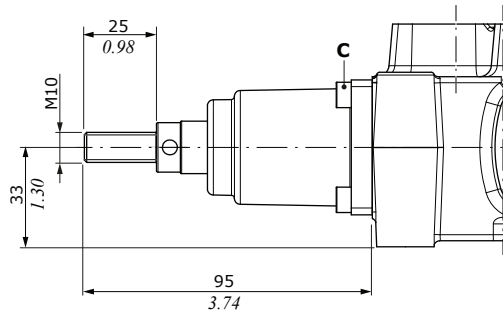
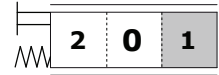
M2-U1 type
2 position (0-1), with M10 male thread male external pin



M3-U1 type
2 position (0-2), with M10 male thread male external pin



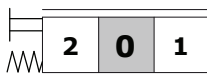
M4-U1 type
2 position (1-2), with M10 male thread external pin



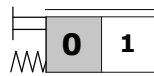
Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)

With flexible cable control arrangement

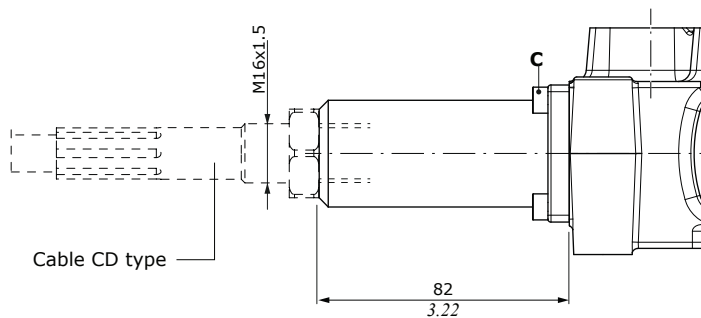
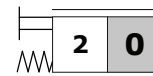
M1-U2 type
3 position, spring return in neutral position



M2-U2 type
2 position (0-1), spring return in neutral position

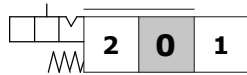


M3-U2 type
2 position (0-2), spring return in neutral position

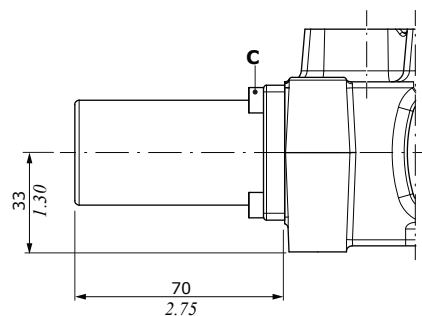
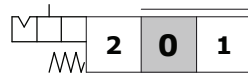


With detent control

R1 type
3 position, detent in position 1

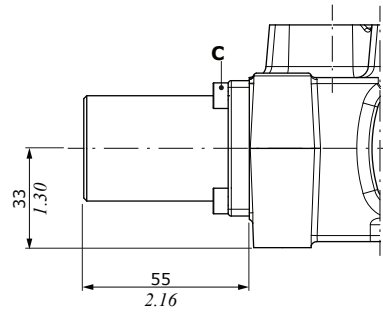
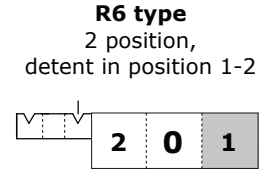
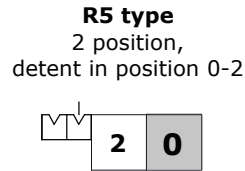
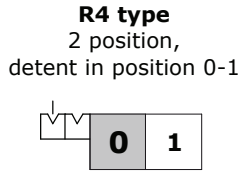
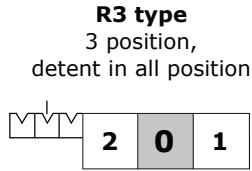


R2 type
3 position, detent in position 2

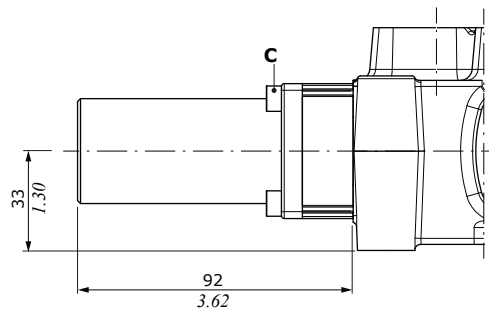
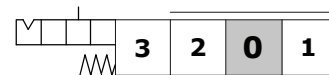
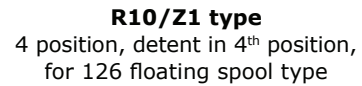
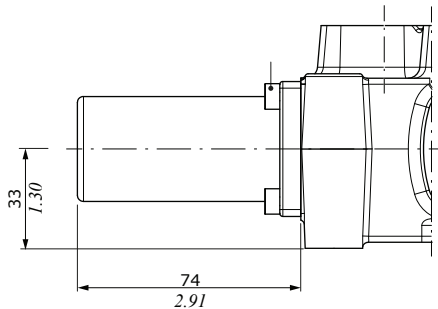
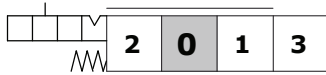
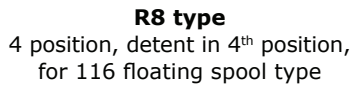


Mechanical controls

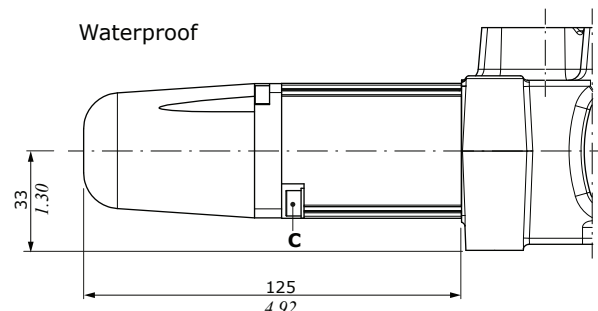
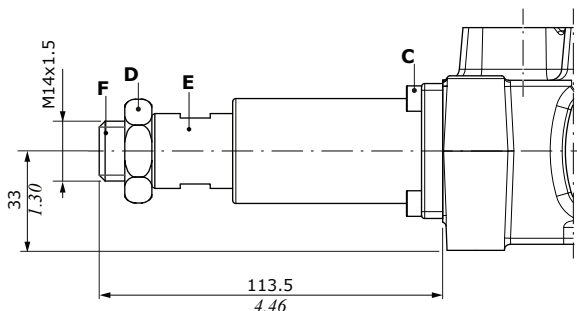
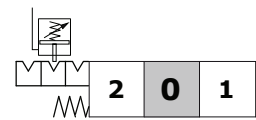
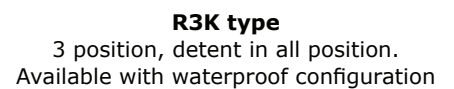
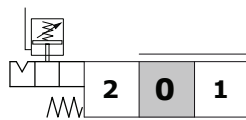
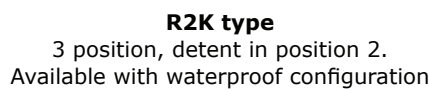
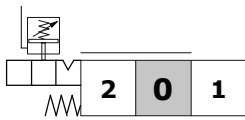
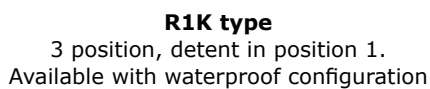
With detent control



Wrenches and tightening torques
 C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
 D = wrench 30 - 42 Nm (30.9 lbf^t)
 E = wrench 22
 F = allen wrench 10 - 42 Nm (30.9 lbf^t)



With detent control and kick out function

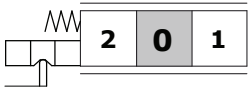


B side controls

Spool position microswitch

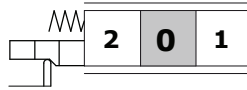
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position



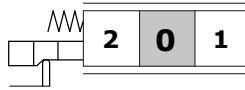
M1-N1A type

3 position, micro operation in position 1



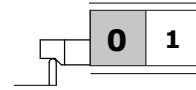
M1-N1B type

3 position, micro operation in pos. 2



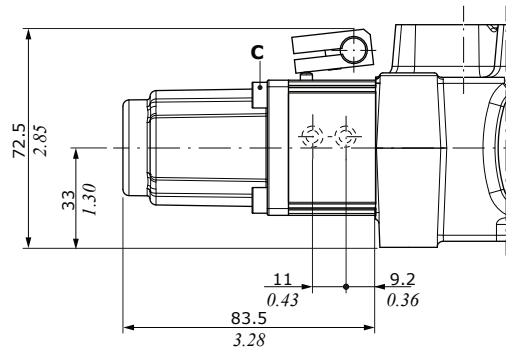
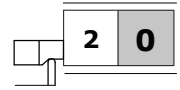
M2-N1 type

2 position (0-1) spring return in neutral position

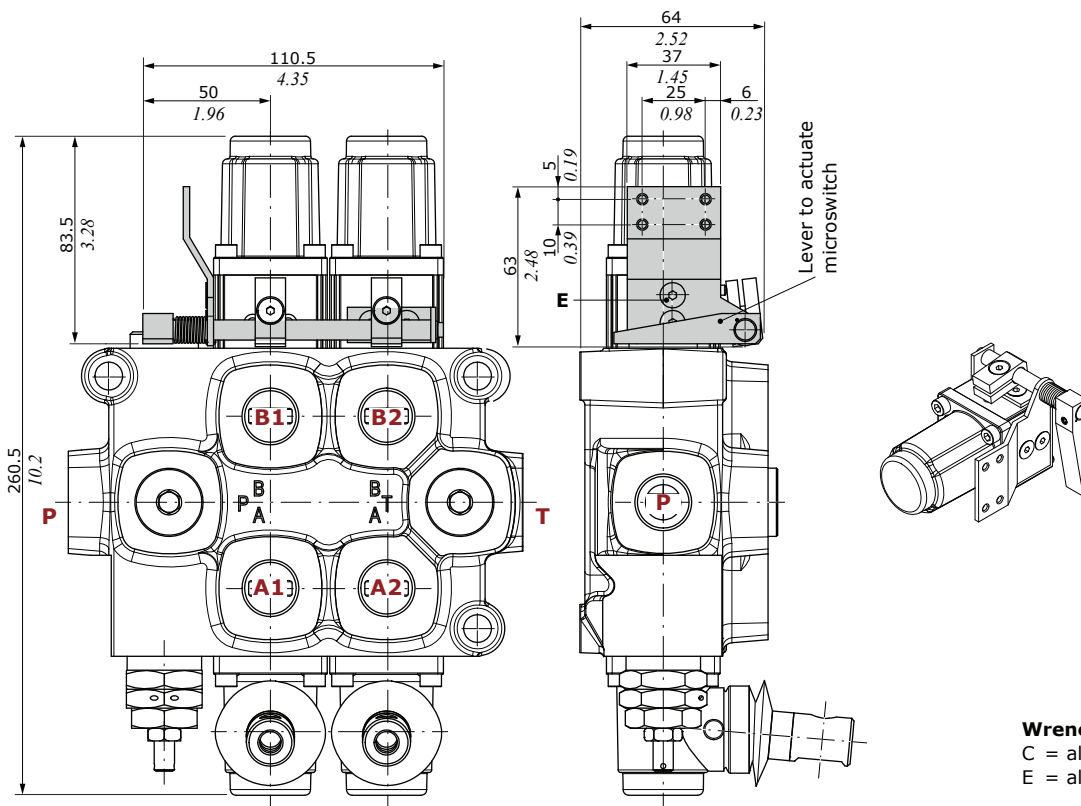


M3-N1 type

2 position (0-2) spring return in neutral position



Microswitch assembly kit for 2 working section (M1-N1 type)



Wrenches and tightening torques

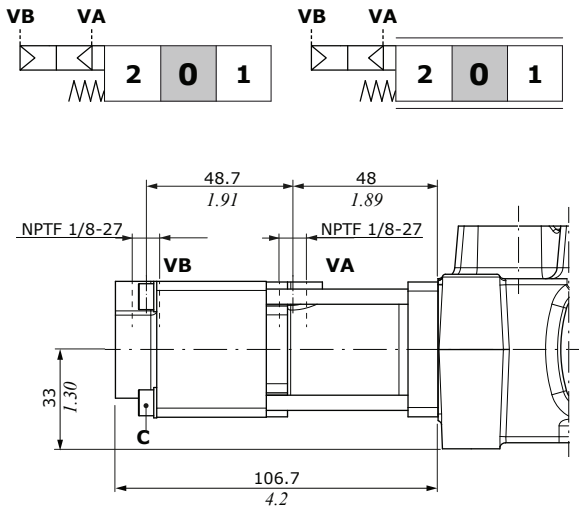
- C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
- E = allen wrench 3 - 6.6 Nm (4.8 lbf^t)

Drawing is referred to a Q75 monoblock valve.

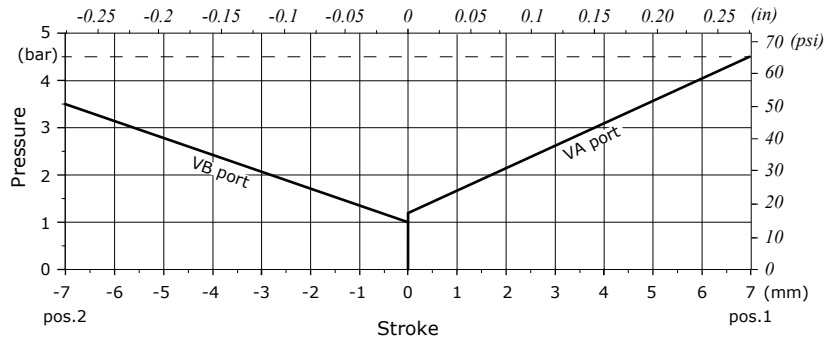
Pneumatic control

P1N type
ON/OFF control

P1NP type
Proportional control



Proportional pilot pressure curves



Operating features

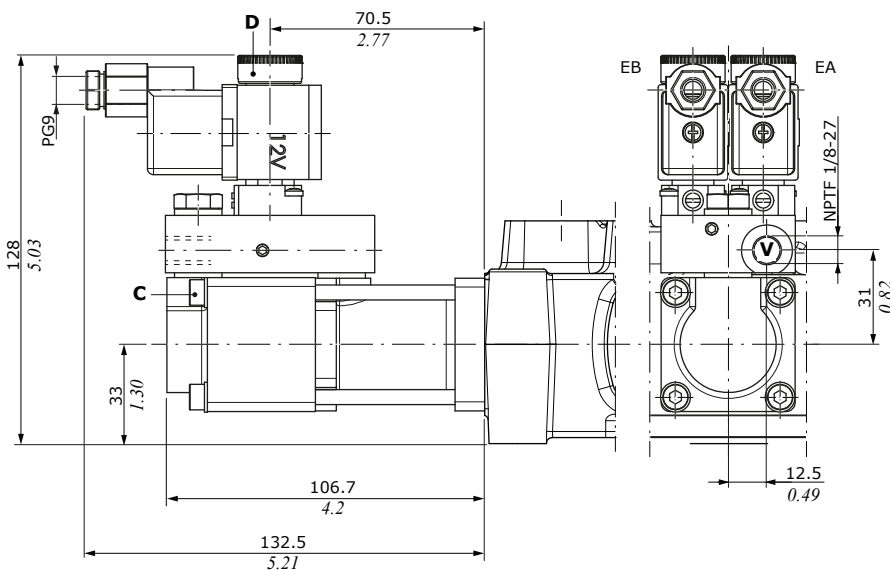
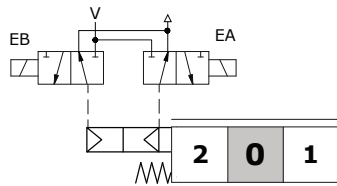
Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
Pilot volume..... : 9 cm³/min (0.54 in³/min)

Wrenches and tightening torques

C = wrench 4 - 6.6 Nm (4.8 lbft)

ON/OFF electropneumatic control

D3 type
ON/OFF control



Operating features

Pilot pressure..... : min. 1 bar (14.5 psi)
max. 10 bar (145 psi)

COILS

Nominal voltage tolerance..... : -5% +10%
Power rating..... : 2.3 W
Nominal current..... : 12 VDC - 24VDC
Coil insulation..... : Class F
Weather protection..... : IP65
Duty cycle..... : 100%

Wrenches and tightening torques

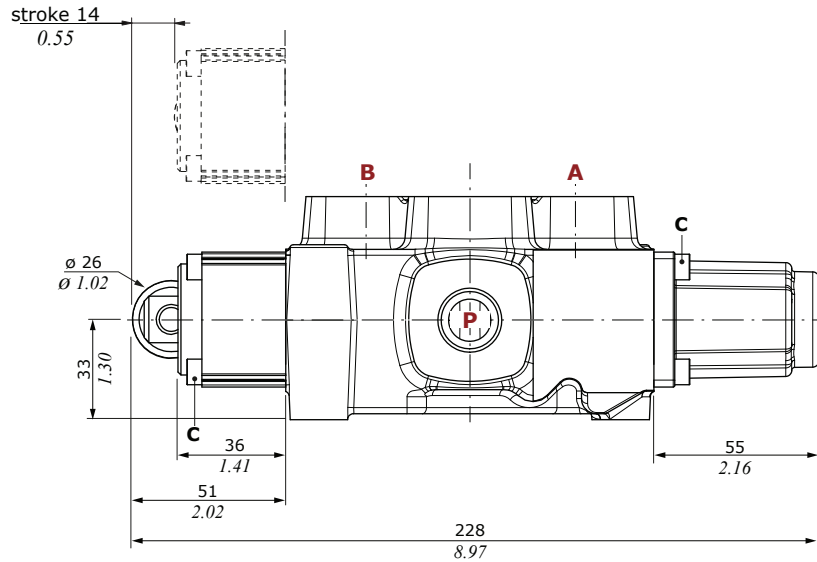
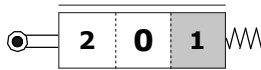
C = wrench 4 - 6.6 Nm (4.8 lbft)
D = manual tightening - 6.6 Nm (4.8 lbft)

A+B side controls

Cam control

C2 type

From position 1 to position 2,
spring return in position 1

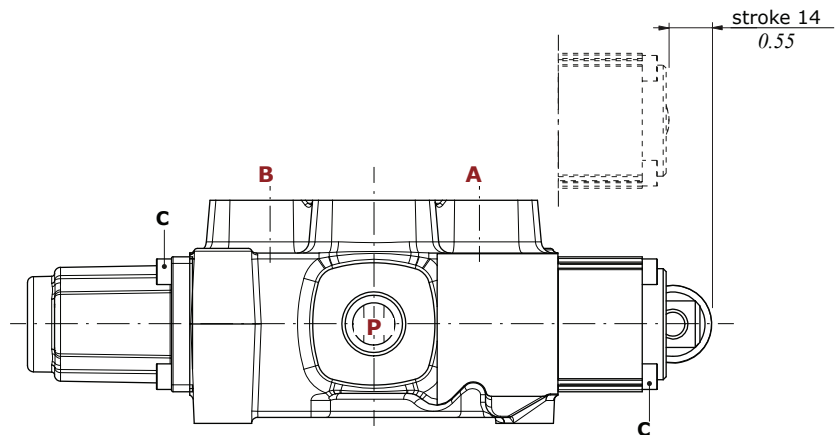
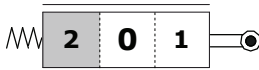


Wrenches and tightening torques

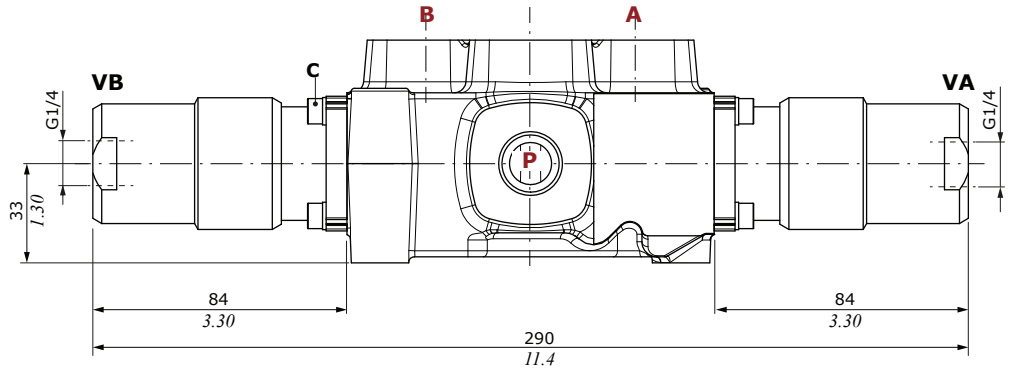
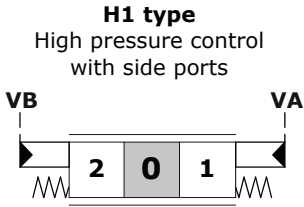
C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)

C3 type

From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type

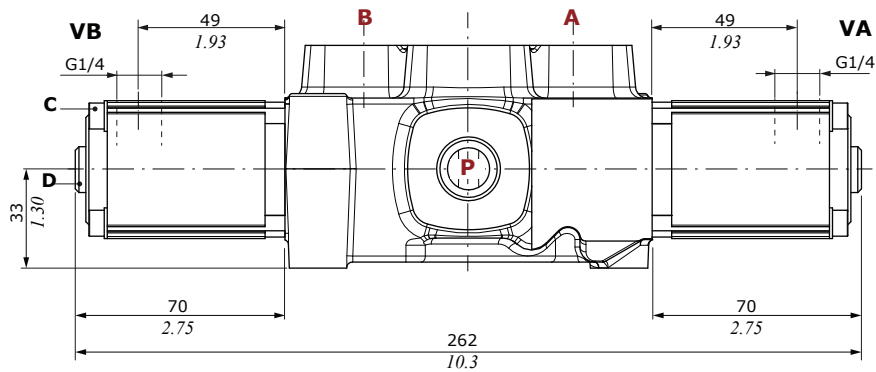
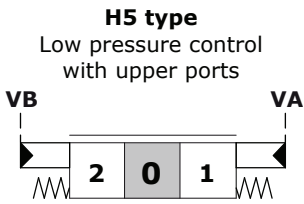


Proportional hydraulic controls



Operating features

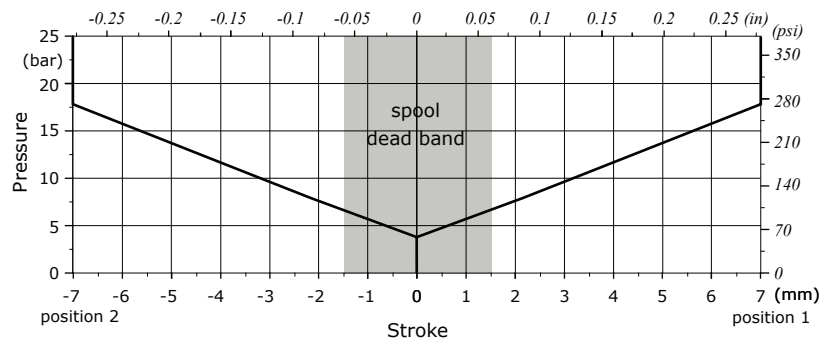
Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)



Operating features

Pilot pressure..... : max. 100 bar (1450 psi)

Stroke vs. Pressure diagram for H5 type control



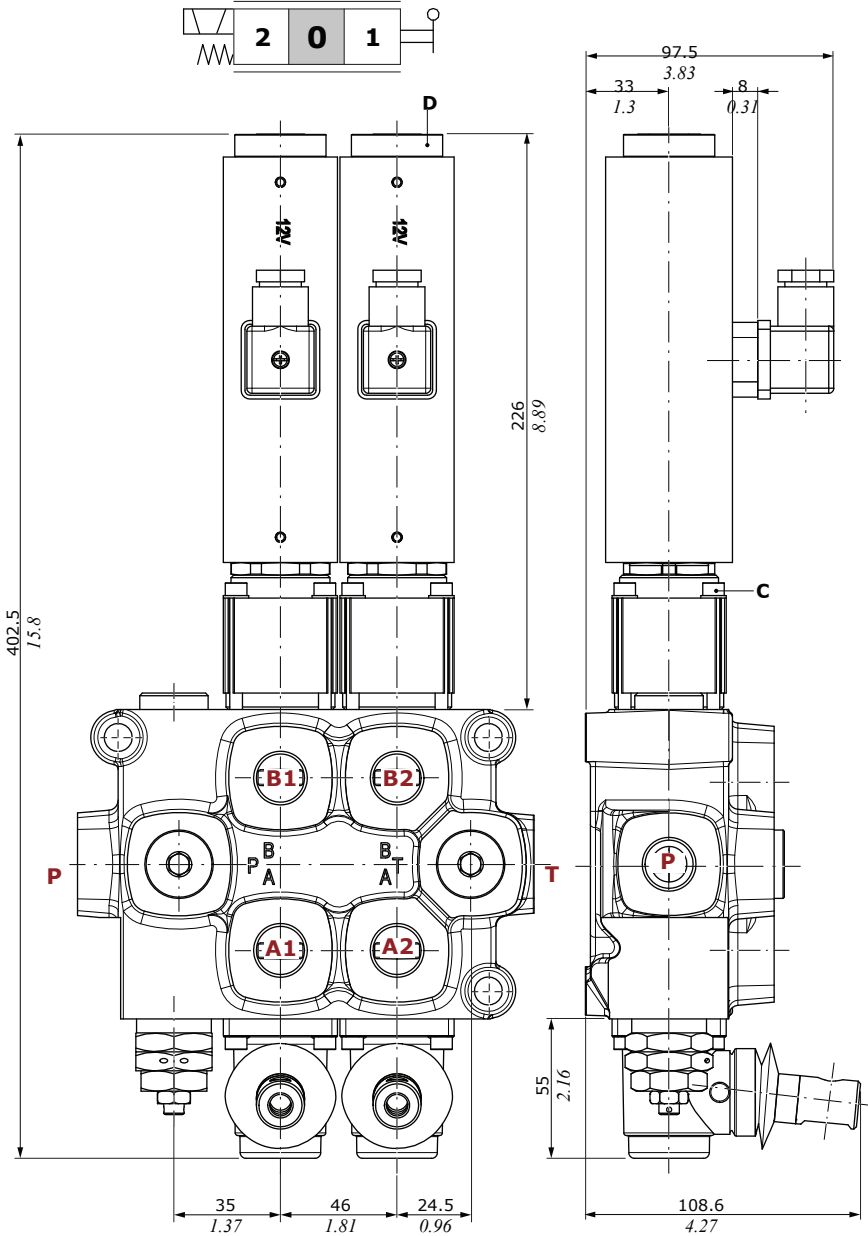
Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbft)
- D = allen wrench 4 - 9.8 Nm (7.2 lbft)

Direct solenoid control

D41 type: ON/OFF one side

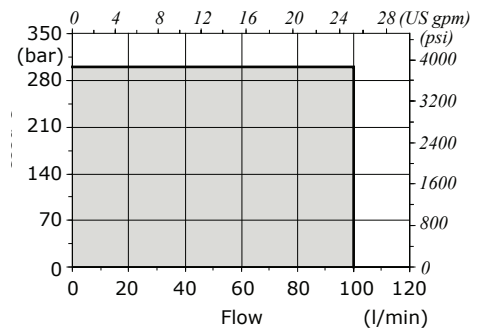
Drawing is referred to a Q75 monoblock valve.



D41 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	80 W
Insulance	Class H
Weather protection	IP65

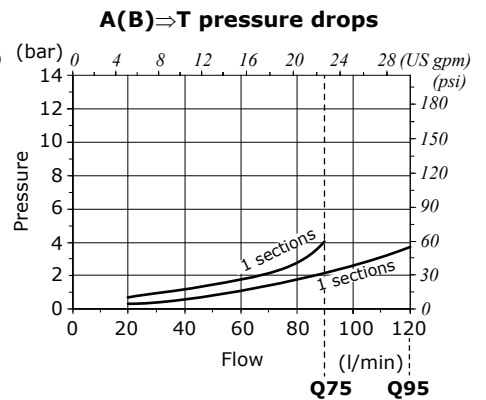
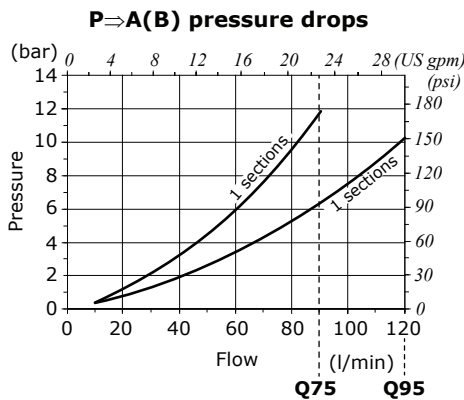
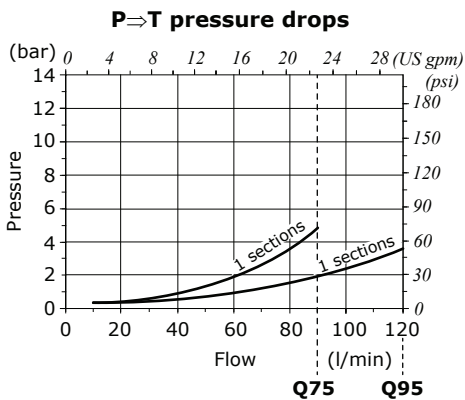
Connector type: ISO4400 3P+T-PG11

Dynamic conditions



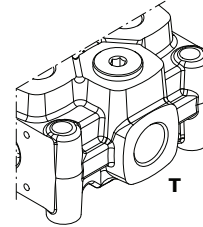
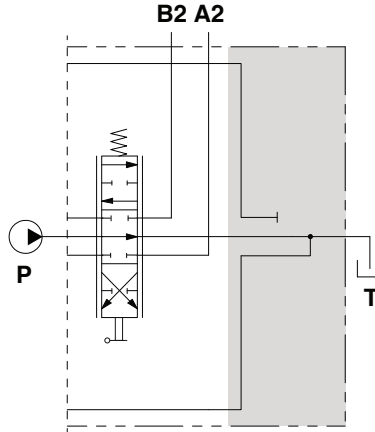
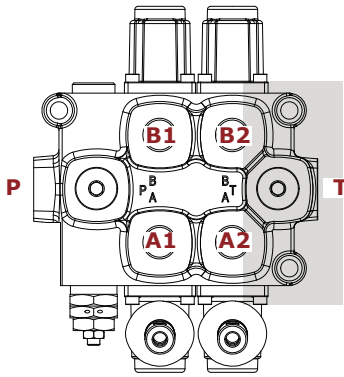
Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)
- D = manual tightening - 6.6 Nm (4.8 lbf_t)

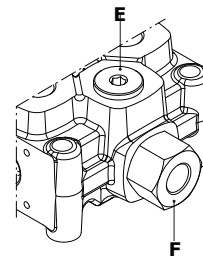
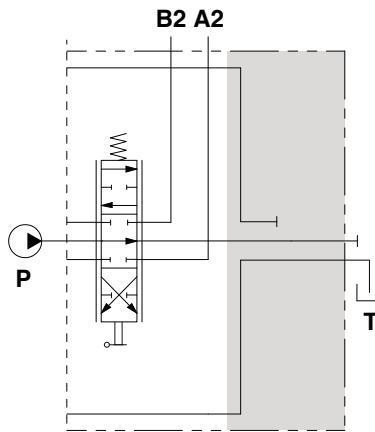
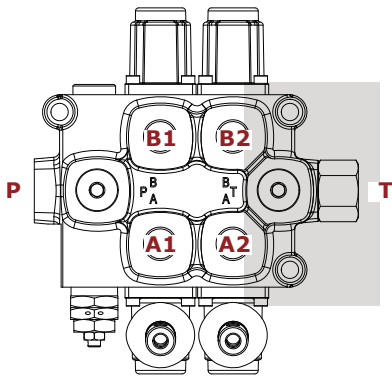


Outlet configuration

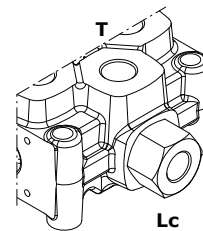
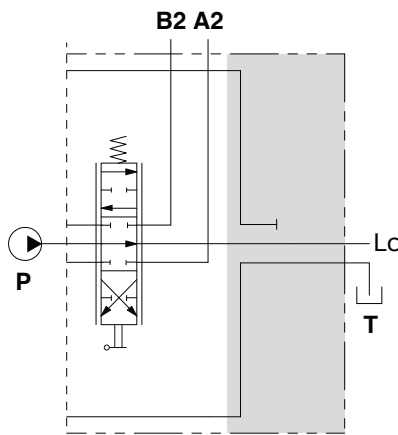
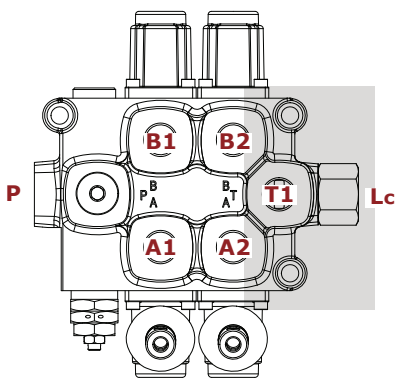
F3D configuration
Open center configuration



F16D configuration
Closed center configuration



F6D configuration
Carry-over configuration

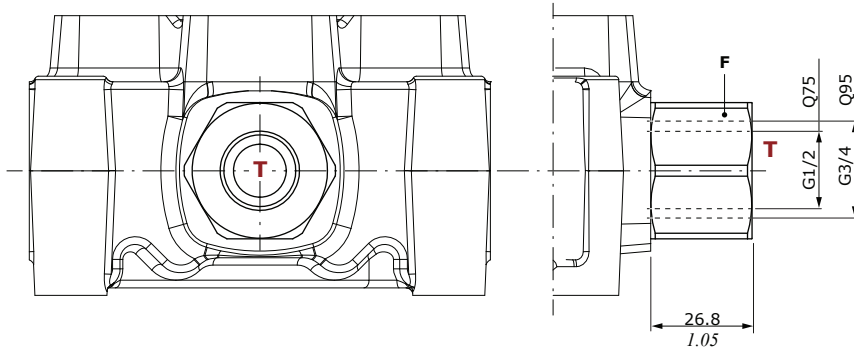


Wrenches and tightening torques
E (Q75) = allen wrench 6 - 24 Nm (17.7 lbft)
(Q95) = allen wrench 8 - 42 Nm (22 lbft)
F = wrench 36 - 80 Nm (59 lbft)

Outlet configuration

F6D - F16D joint dimension

Drawing is referred to a Q75 monoblock valve.



Wrenches and tightening torques
 F = wrench 36 - 80 Nm (*59 lbf*)



Q30 - Q50

Sectional directional control valves

- Available with parallel, tandem or series circuit
- Optional carry over port
- A wide range of antishock + anticavitation port valves
- Intermediate sections for several types of circuit
- Mechanical, pneumatic, electropneumatic, hydraulic and direct solenoid controls

Working conditions

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

		Q30	Q50
Nominal flow rating		30 l/min - (8 Us gpm)	50 l/min - (13.2 Us gpm)
Max. pressure	parallel circuit	315 bar (4600 psi)	
	series circuit	210 bar (3050 psi)	
Max. back pressure on outlet T port		25 bar (360 psi)	
Number sections		from 1 to 10	
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	5 cm ³ /min (0.30 in ³ /min)	
Fluid		Mineral oil	
Fluid temperature	with NBR (BUNA-N) seals	from -20°C to 80°C - from -4 °F to 176 °F	
Viscosity	operating range	from 12 to 400 mm ² /s - from 12 to 400 cSt	
Max. contamination level		-/19/16 - ISO 4406 - NAS1638 class 6	
Ambient temperature	with pneumatic and hydraulic devices	from -30°C to 60°C - from -22 °F to 140 °F	
	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F	
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F	

NOTE - For different conditions please contact our Sales Department.

REFERENCE STANDARD

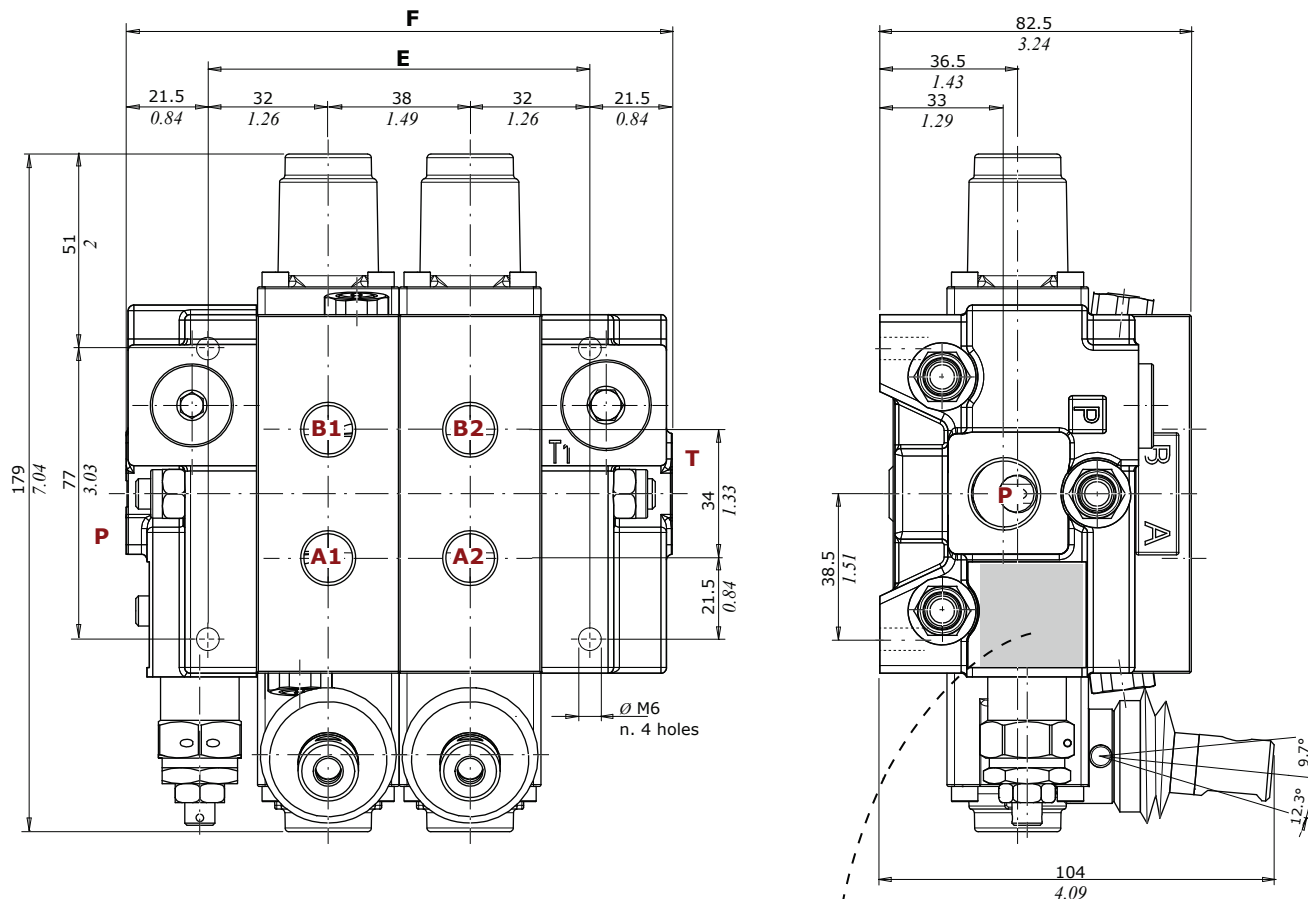
		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926
	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING

PORTS	Q30		Q50	
	BSP	UN-UNF	BSP	UN-UNF
P Inlet	G 3/8	3/4-16 (SAE 8)	G 1/2	3/4-16 (SAE 8)
P1 Inlet	G 3/8	3/4-16 (SAE 8)	G 1/2	3/4-16 (SAE 8)
A and B ports	G 3/8	9/16-18 (SAE 6)	G 1/2	3/4-16 (SAE 8)
T Outlet	G 1/2	7/8-14 (SAE 10)	G 1/2	7/8-14 (SAE 10)
T1 Outlet	G 1/2	3/4-16 (SAE 8)	G 1/2	3/4-16 (SAE 8)
Lc port (Carry-over plug - T port)	G 3/8-G 1/2	3/4-16 (SAE 8) - 7/8-14 (SAE 10)	G 3/8-G 1/2	3/4-16 (SAE 8) - 7/8-14 (SAE 10)
Hydraulic controls	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

Q30 - standard configuration*



Type	E		F	
	mm	in	mm	in
Q30/1	64	2.52	107.5	4.23
Q30/2	102	4.01	145.5	5.72
Q30/3	140	5.51	183.5	7.22
Q30/4	178	7.00	221.5	8.72
Q30/5	216	8.50	259.5	10.21
Q30/6	254	10	297.5	11.71
Q30/7	292	11.50	335.5	13.20
Q30/8	330	13	373.5	14.70
Q30/9	368	14.48	411.5	16.20
Q30/10	406	15.98	449.5	17.69

walvoil

MADE IN ITALY

1GB75040009 ----- Product code

DISTRIBUTORE ----- Code description

Q30/2

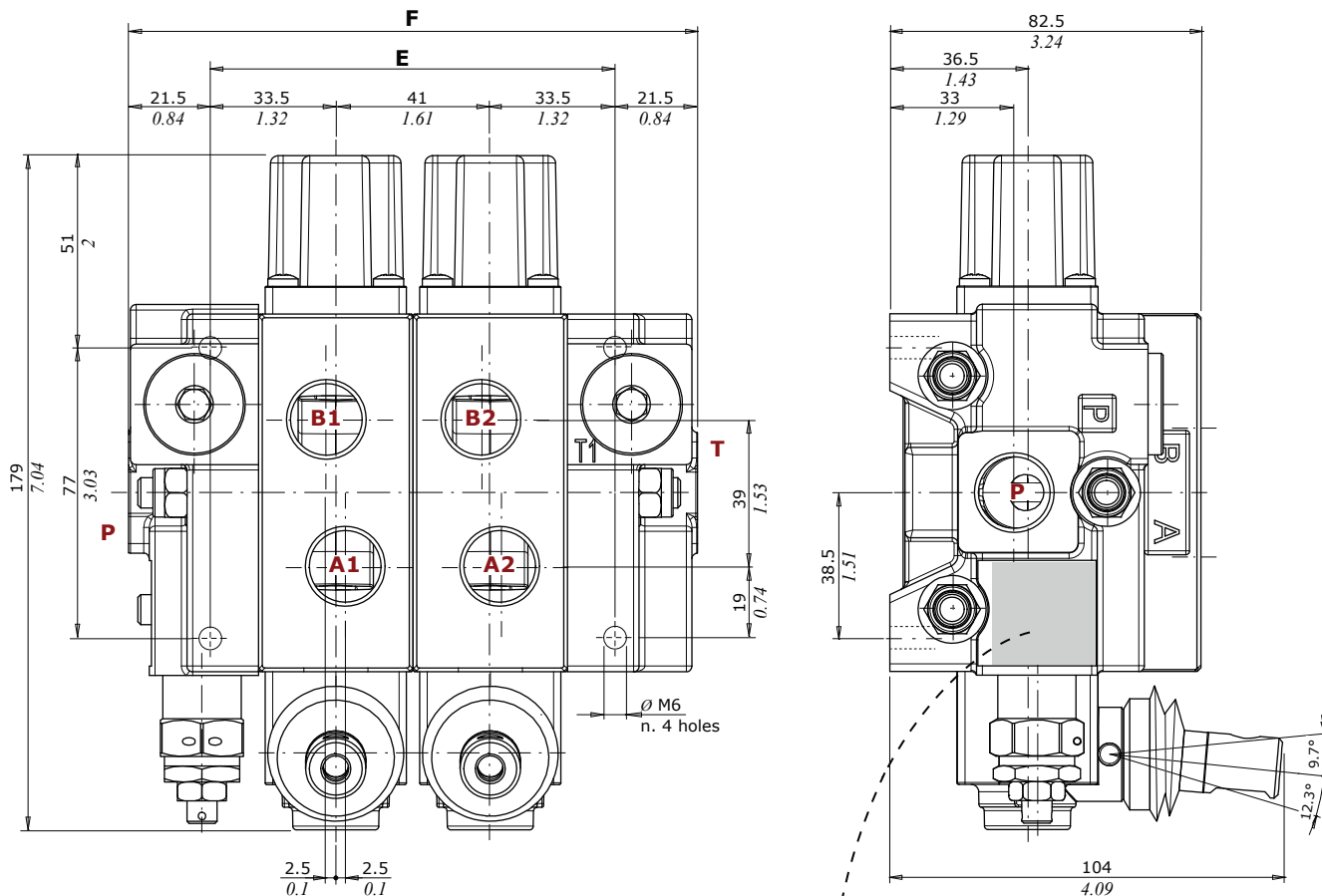
MD1600464-001 ----- Product allotment

 ----- Datamatrix with product allotment

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

(*): For other configurations, see page 135

Q50 - standard configuration*



Type	E		F	
	mm	in	mm	in
Q50/1	67	2.63	110	4.33
Q50/2	108	4.25	151	5.94
Q50/3	149	5.86	192	7.56
Q50/4	190	7.48	233	9.17
Q50/5	231	9.10	274	10.78
Q50/6	272	10.70	315	12.40
Q50/7	313	12.32	356	14
Q50/8	354	13.93	397	15.62
Q50/9	395	15.55	438	17.24
Q50/10	436	17.16	479	18.85

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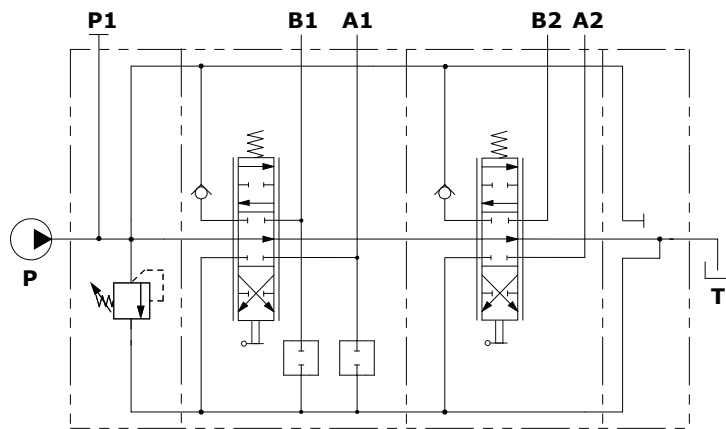
MADE IN ITALY
1GB75040009

DISTRIBUTORE
Q50/2
MD1600464-001

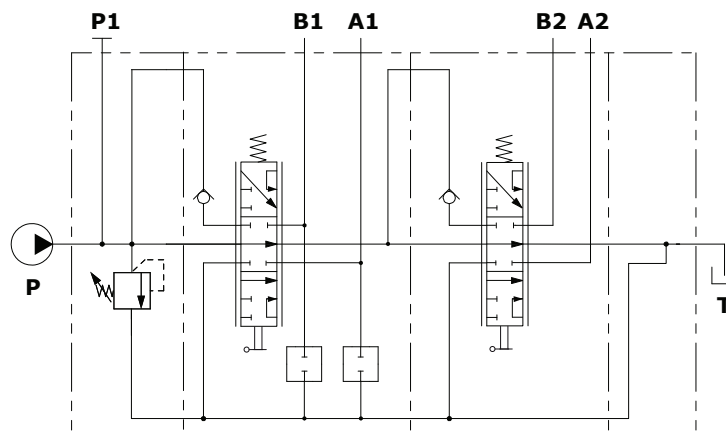
- Product code
- Code description
- Product allotment
- Datamatrix with product allotment

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.
 (*): For other configurations, see page 135

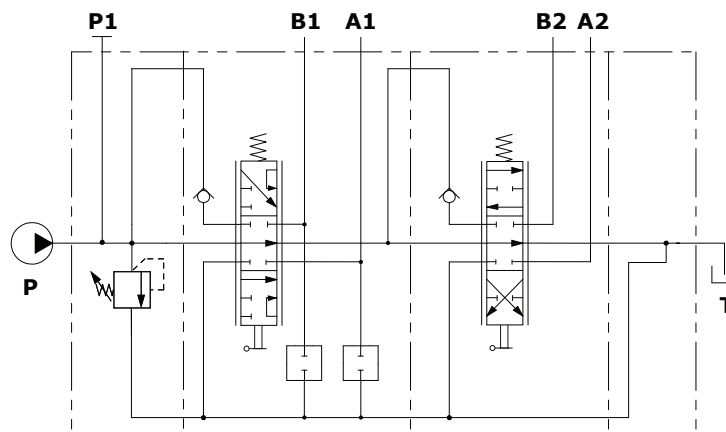
Hydraulic circuits



Description example (parallel circuit):
 Q30/2/F7S(N150)/103-A1-M1.VC/103-A1-M1/F3D-S
 Q50/2/F7S(N150)/103-A1-M1.VC/103-A1-M1/F3D-S



Description example (series circuit):
 Q30/2/F7S(N150)/403-A1-M1.VC/403-A1-M1/F3D-S
 Q50/2/F7S(N150)/403-A1-M1.VC/403-A1-M1/F3D-S

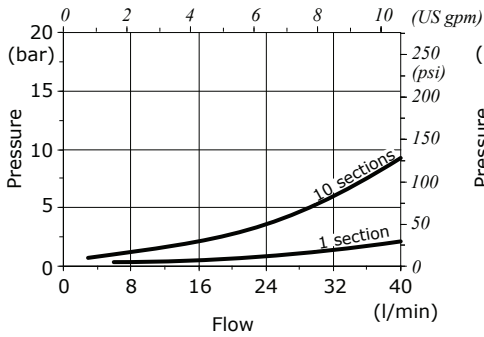


Description example (serie/parallel circuit):
 Q30/2/F7S(N150)/403-A1-M1.VC/103-A1-M1/F3D-S
 Q50/2/F7S(N150)/403-A1-M1.VC/103-A1-M1/F3D-S

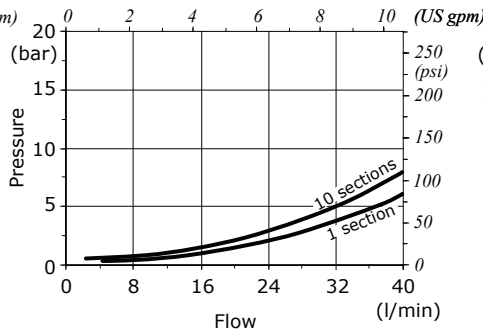
Performance data

Q30

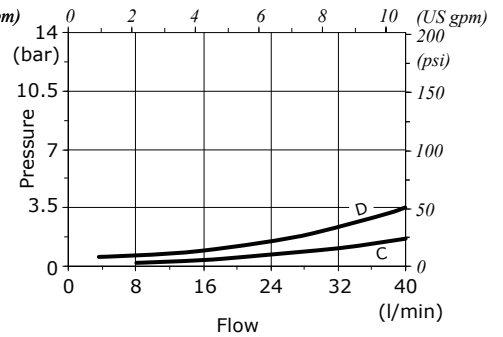
P⇒T pressure drops



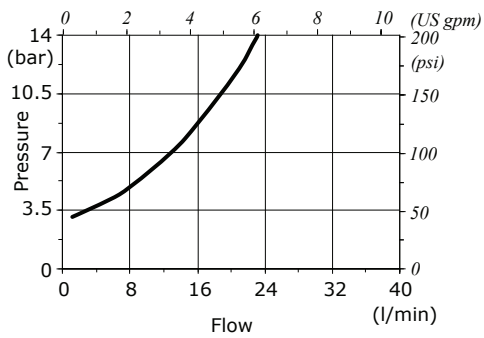
P⇒A(B) pressure drops



A(B)⇒T pressure drops



**A1(B1)⇒A2(B2) pressure drops
(with series circuit)**



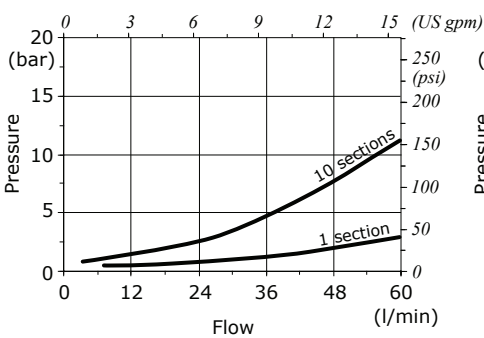
Legenda

C= 10th section

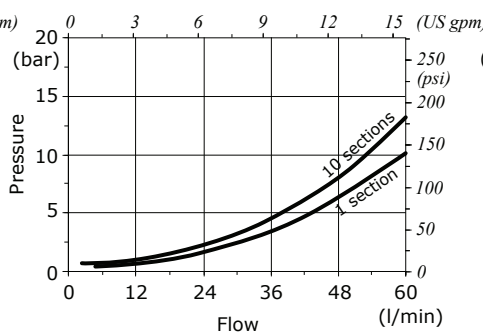
D= 1st section

Q50

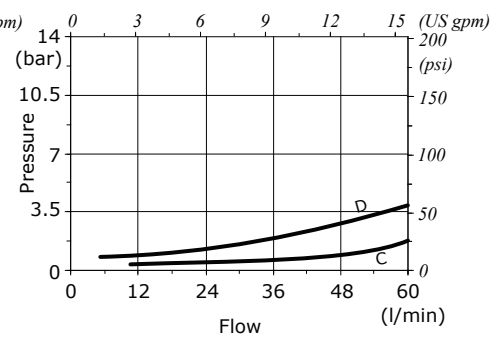
P⇒T pressure drops



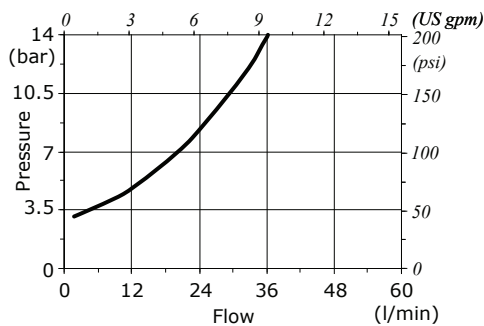
P⇒A(B) pressure drops



A(B)⇒T pressure drops



**A1(B1)⇒A2(B2) pressure drops
(with series circuit)**



Legenda

C= 10th section

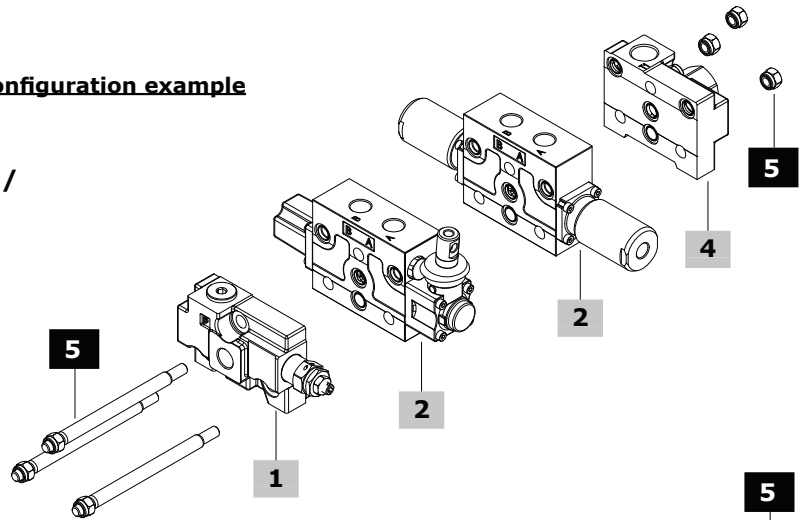
D= 1st section

Complete section ordering codes

Drawings are referred to a Q30 sectional valve.

Valve with mechanical and hydraulic controls configuration example

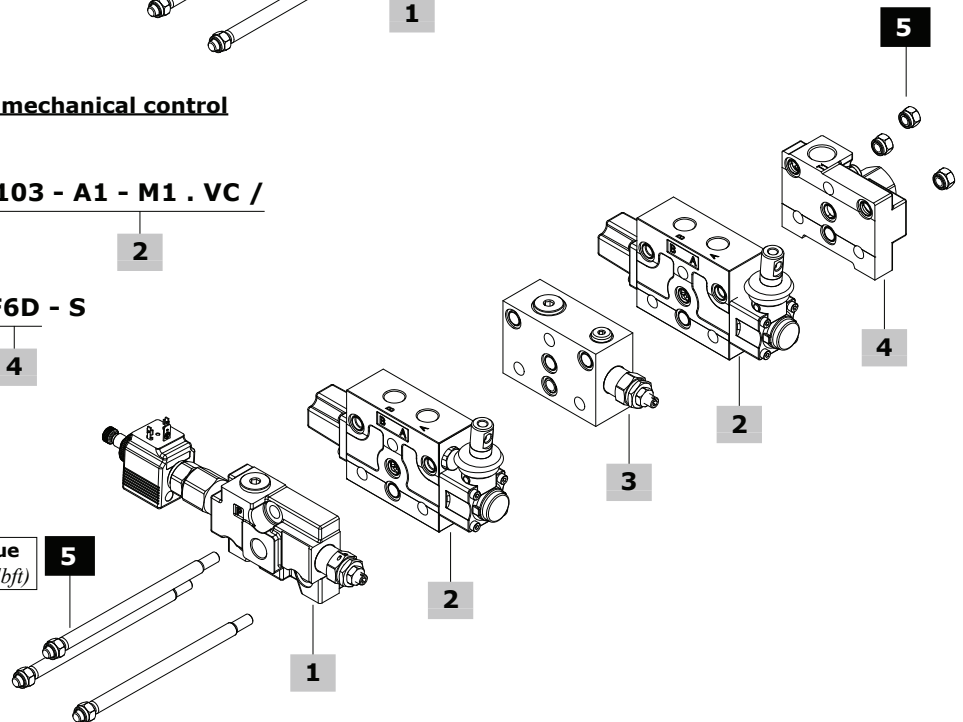
valve setting (bar)
Q30 / 2 / F7S(N150) / 103 - A1 - M1 . VC /
 N. of section **1** **2**
/ 103 - H1 / F6D - S
2 **4** aluminium controls



Valve with intermediate section and mechanical control configuration example

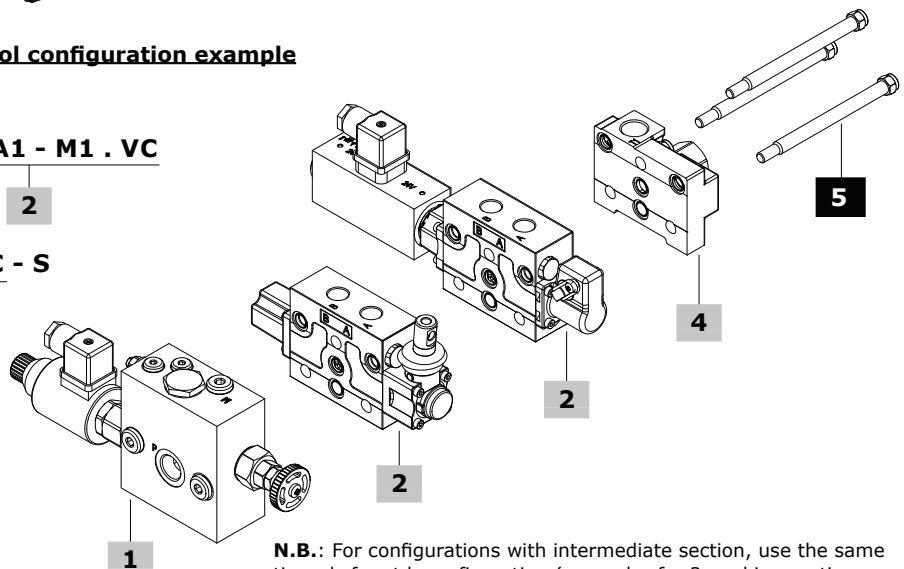
valve setting (bar)
Q30 / 2 / F7SMSE(NA)-N150 / 103 - A1 - M1 . VC /
/ E50(N150) / 103 - A1 - M1 / F6D - S
3 **2** **4**

Tie rod tightening torque
 wrench 13 - 24 Nm (17.7 lbf)



Valve with mechanical and electric control configuration example (with inlet flow regulation)

Q30 / 2 / F7SPR3M(N150) / 103 - A1 - M1 . VC
1 **2**
/ 103 - A1 - D41 . VC / F6D - 12VDC - S
2 **4** **2**



N.B.: For configurations with intermediate section, use the same tie rods for std. configuration (example: for 2 working sections + 1 intermediate section, use tie rods for 3 working sections)

Complete section ordering codes

1 Inlet section* page 97	2 Working section* page 106
Standard inlet section	With mechanical controls
TYPE CODE	TYPE CODE
FE-Q30/F7S(N150) 03000F7S/D-N	EL-Q30/103-A1-M1.VC-S SGL300025
FE-Q50/F7S(N150) 05000F7S/D-N	EL-Q50/103-A1-M1.VC-S SGL500005
DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve, setting range 101-200 bar (1460-2900 psi)	DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position
TYPE CODE	TYPE CODE
FE-Q30/F8S 03003F8S/D	EL-Q30/103-A1-M1-S 030000103001000
FE-Q50/F8S 05003F8S/D	EL-Q50/103-A1-M1-S 050000103001000
DESCRIPTION: As previous one, without valves (pressure relief valve plugged port)	DESCRIPTION: As previous one, without valve arrangement
TYPE CODE	With proportional hydraulic controls
FE-Q30/F7SMSE(NA) 03000F7SDMS1-N	TYPE CODE
FE-Q50/F7SMSE(NA) 05000F7SDMS1-N	EL-Q30/103-H1.VC-S SGL300008
DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve setting range 101-200 bar (1460-2900 psi), 12VDC normally open unloader valve	EL-Q50/103-H1.VC-S SGL500006
TYPE CODE	DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, high pressure hydraulic controls, spring return to neutral position
FE-Q30/F7SMSE(NC) 03000F7SDMS7-N	TYPE CODE
FE-Q50/F7SMSE(NC) 05000F7SDMS7-N	EL-Q30/103-H1-S SGL300009
DESCRIPTION: As previous one, with normally closed unloader valve	EL-Q50/103-H1-S SGL500007
TYPE CODE	DESCRIPTION: As previous one, without valve arrangement
FE-Q30/F7SMSI 03000F7SDMSI-N	TYPE CODE
FE-Q50/F7SMSI 05000F7SDMSI-N	EL-Q30/103-H5.VC-S SGL300012
DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve setting range 101-200 bar (1460-2900 psi), and hydraulic unloader valve	EL-Q50/103-H5.VC-S SGL500008
Inlet section with flow regulator	DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, low pressure hydraulic controls, spring return to neutral position
TYPE CODE	TYPE CODE
FE-Q30/F7SPR3M(N150) 03000F7SDPRN3M	EL-Q30/103-H5-S SGL300013
FE-Q50/F7SPR3M(N150) 05000F7SDPRN3M	EL-Q50/103-H5-S SGL500009
DESCRIPTION: Side inlet open, 12 VDC proportional flow control valve, pressure relief valve setting range 101-200 bar (1460-2900 psi), manual unloader valve	DESCRIPTION: As previous one, without valve arrangement
TYPE CODE	With electric solenoid controls - one side type
FE-Q30/F7SPR3E(N150)-12VDC 03000F7SDPRN3E	TYPE CODE
FE-Q50/F7SPR3E(N150)-12VDC 05000F7SDPRN3E	EL-Q30/103-A1-D41.VC-12VDC-S SGL300019
DESCRIPTION: As previous one, with 12VDC unloader valve	EL-Q50/103-A1-D41.VC-12VDC-S SGL500010
	DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC electric direct ON/OFF control with lever
	TYPE CODE
	EL-Q30/103-A1-D41-12VDC-S 030000103098000
	EL-Q50/103-A1-D41-12VDC-S SGL500011
	DESCRIPTION: As previous one, without valve arrangement
	With electric solenoid controls - two side type
	TYPE CODE
	EL-Q30/103-D9.VC-12VDC-S SGL300024
	EL-Q50/103-D9.VC-12VDC-S SGL500012
	DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC electric direct ON/OFF control
	TYPE CODE
	EL-Q30/103-D9-12VDC-S SGL300016
	EL-Q50/103-D9-12VDC-S SGL500013
	DESCRIPTION: As previous one, without valve arrangement

(*): Codes are referred to **BSP** thread

Complete section ordering codes

3 Intermediate section page 135

TYPE	CODE	DESCRIPTION
E50	03850E50-B	With pressure relief valve, setting range 10-100 bar (145-1450 psi)
	03850E50-N	As previous one, setting range 101-200 bar (1460-2900 psi)
	03850E50-R	As previous one, setting range 201-380 bar (2910-5500 psi)
E53	03854E53-B	With pressure relief valve, setting range 10-100 bar (145-1450 psi) and P2 port open for 2 nd pump
	03854E53-N	As previous one, setting range 101-200 bar (1460-2900 psi)
	03854E53-R	As previous one, setting range 201-380 bar (2910-5500 psi)
E51	03853E51	Intermediate outlet section, T2 port open
E61	03885E61	Intermediate spacer section

4 Outlet section* page 137

TYPE	CODE
FS-Q30/Q50-F3D	03012F3D
DESCRIPTION: T port open, T1 port plugged. For open center circuit	
TYPE	CODE
FS-Q30-F16D	03016F16D
FS-Q50-F16D	05016F16D
DESCRIPTION: T port open, T1 port plugged. For closed center circuit	
TYPE	CODE
FS-Q30-F6D	03014F6D
FS-Q50-F6D	05014F6D
DESCRIPTION: Lc port and T1 port open. With joint for carry-over (HPCO) circuit	

5 Tie rod kit

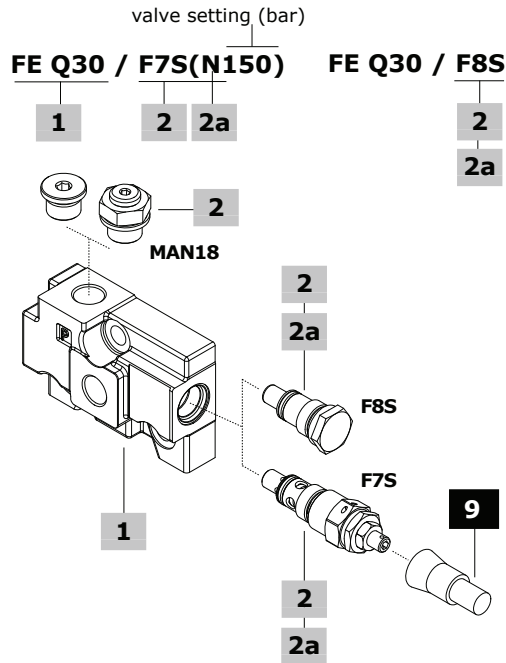
CODE	DESCRIPTION	
For standard configuration		
Q30:	Q50:	
03901TX1	05901TX1	For 1 section valve
03902TX2	05902TX2	For 2 sections valve
03903TX3	05903TX3	For 3 sections valve
03904TX4	05904TX4	For 4 sections valve
03905TX5	05905TX5	For 5 sections valve
03906TX6	05906TX6	For 6 sections valve
03907TX7	05907TX7	For 7 sections valve
03908TX8	05908TX8	For 8 sections valve
03909TX9	05909TX9	For 9 sections valve
03910TX10	05910TX10	For 10 sections valve
For flow regulator configuration		
Q30:	Q50:	
03901TX1	05931TX1	For 1 section valve
03902TX2	05932TX2	For 2 sections valve
03903TX3	05933TX3	For 3 sections valve
03904TX4	05934TX4	For 4 sections valve
03905TX5	05935TX5	For 5 sections valve
03906TX6	05936TX6	For 6 sections valve
03907TX7	05937TX7	For 7 sections valve
03908TX8	05938TX8	For 8 sections valve
03909TX9	05939TX9	For 9 sections valve
03910TX10	05940TX10	For 10 sections valve

(*): Codes are referred to **BSP** thread

Inlet section - parts ordering codes

Standard section

With relief valve:



1 Inlet body section* page 98

TYPE	CODE
FE-Q30	060012741599
FE-Q50	060012823599
DESCRIPTION: Side inlet port, upper inlet plugged, pressure relief valve arrangement	
TYPE	CODE
FE-Q30	060012979299
FE-Q50	060012998499
DESCRIPTION: As previous one, with unloader valve arrangement	

2 Configuration coding* page 99

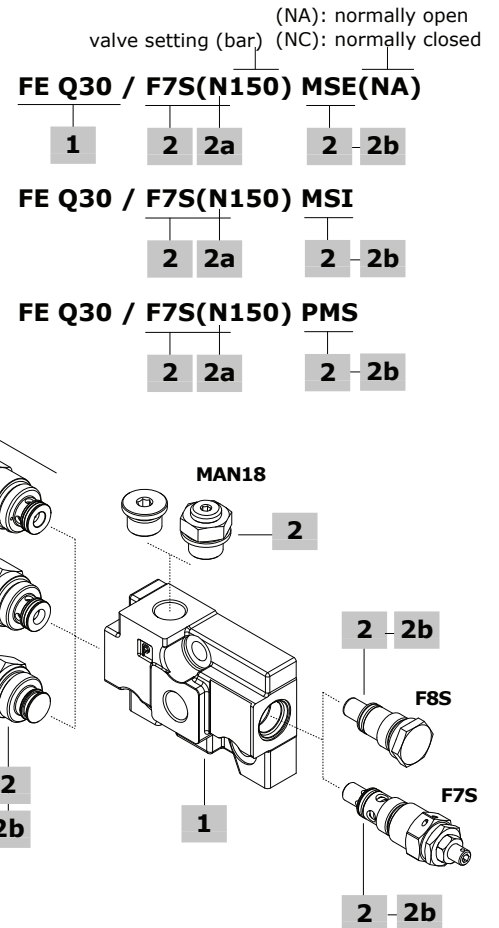
TYPE	DESCRIPTION
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)
F7S-MSE	With pressure relief valve and electric unloader valve
F7S-MSI	With pressure relief valve and hydraulic unloader valve
F7S-PMS	With pressure relief valve and PMS valve blanking plug
F8S-MSE	With electric unloader valve and pressure relief valve blanking plug
F8S-MSI	With hydraulic unloader valve and pressure relief valve blanking plug
F8S-PMS	Without valves (plugged ports)

Note: Inlet configurations require upper P port:
 for Q30 n. 1 G3/8 plug code 060002792199, or n. 1 pressure gauge arrangement code 5MAN621200;
 for Q50 n. 1 G1/2 plug code 060002792099, or n. 1 pressure gauge arrangement code 5MAN625220

2a Main pressure relief valve page 100

TYPE: B	CODE: 700035205000000
DESCRIPTION: VLP35S valve, setting range 10-100 bar (145-1450 psi)	
TYPE: N	CODE: 700035105000000
DESCRIPTION: VLP35S valve, setting range 101-200 bar (1460-2900 psi)	
TYPE: R	CODE: 700035305000000
DESCRIPTION: VLP35S valve, setting range 201-380 bar (2910-5500 psi)	
TYPE: -	CODE: 060002788899
DESCRIPTION: Relief valve blanking plug	

With relief and unloader valves:



2b Unloader inlet valve page 101

TYPE	CODE	DESCRIPTION
MSE(NA)	0EF08002003	Electric unloader valve, normally open, screw type emergency. It requires MSE assembly joint
MSE(NC)	0EF08002006	Electric unloader valve, normally closed, screw type emergency. It requires MSE assembly joint
-	060002997299	Assembling joint for MSE valves
MSI	03839MSI	Hydraulic unloader valve
PMS	060002978899	Valve blanking plug

3 Coil

TYPE	CODE	DESCRIPTION
For MSE valves		
BER	4SLE001200A	12 VDC ISO4400 coil
	4SLE002400A	24 VDC ISO4400 coil

Note: For **BER** type coils, see page 257

9 Accessory

TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

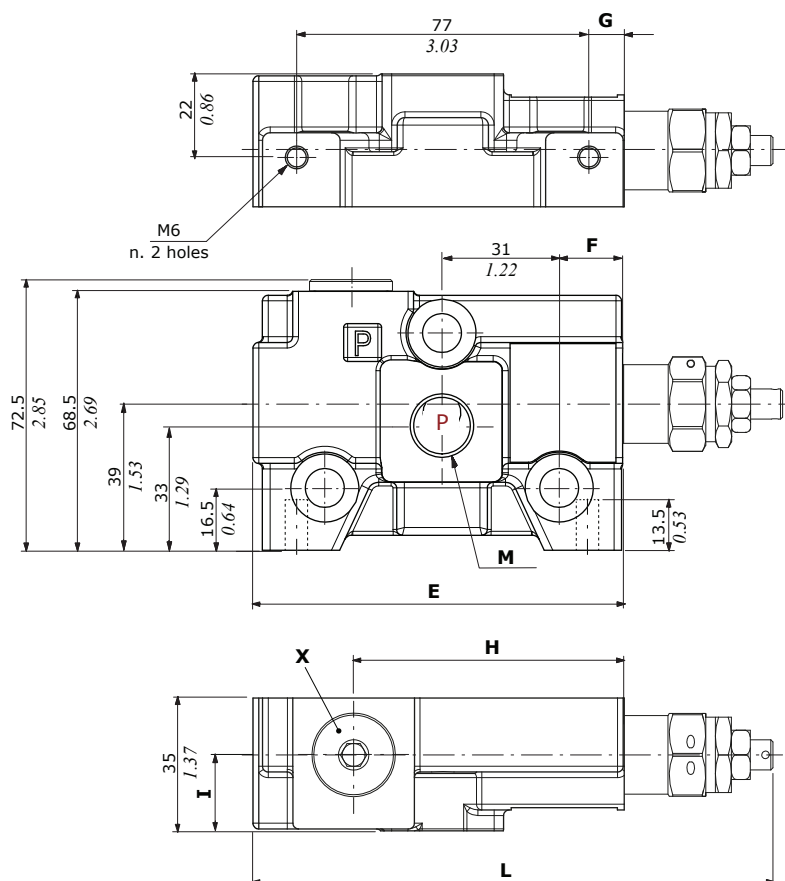
(*): Codes are referred to **BSP** thread

Standard inlet section

Dimensional data

With pressure relief valve

Drawings are referred to a Q30 sectional valve.

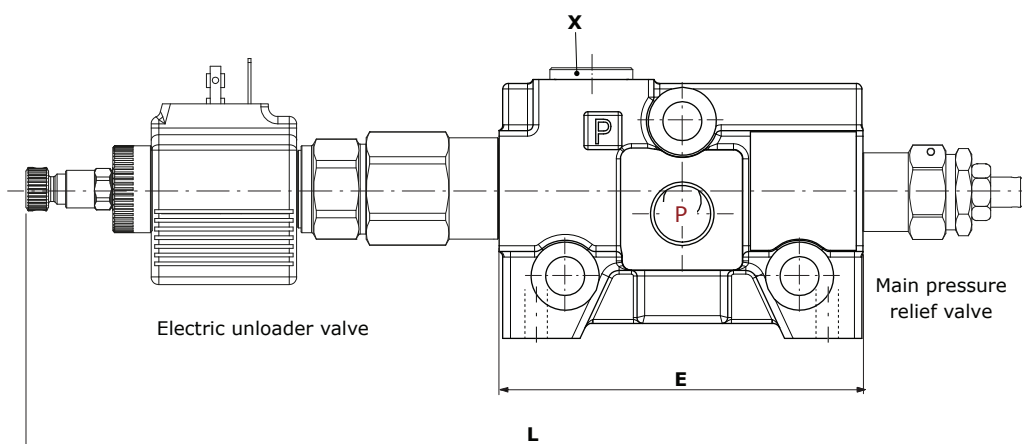


Type	Q30 mm - in	Q50 mm - in
E	97.8 - 3.85	98.5 - 3.87
F	16.8 - 0.66	17.5 - 0.68
G	10.4 - 0.41	10.7 - 0.42
H	71.3 - 2.80	72 - 2.83
I	20 - 0.78	18 - 0.70
L	140.1 - 5.51	140.8 - 5.54
M	G1/8	G1/2
X	allen wrench 6 - 24 Nm (17.7 lbft)	allen wrench 8 - 42 Nm (31 lbft)

Note: For valves wrench and torque, see related pages

With relief and unloader valves

Drawings are referred to a Q30 sectional valve.



Type	Q30 mm - in	Q50 mm - in
E	96.3 - 3.79	97 - 3.81
L	263.7 - 10.3	264.4 - 10.4
X	allen wrench 6 - 24 Nm (17.7 lbft)	allen wrench 8 - 42 Nm (31 lbft)

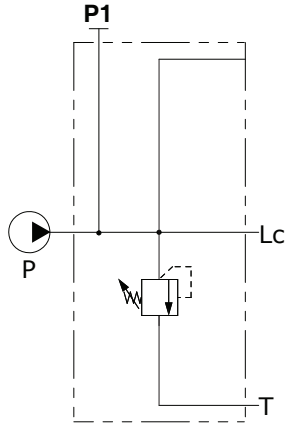
Note: For valves wrench and torque, see related pages

For other configurations, see page 101

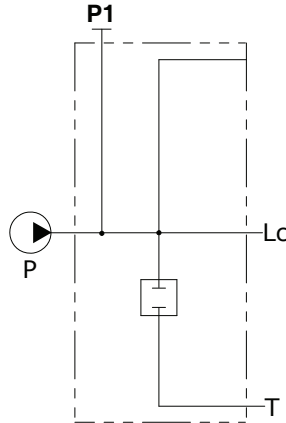
For other dimensions, see previous configuration

Hydraulic circuits

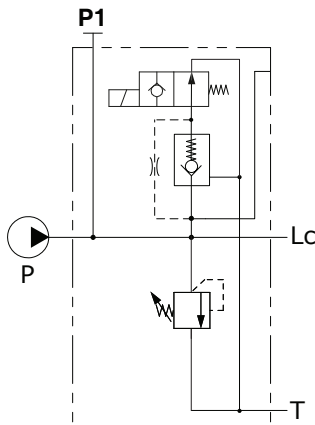
F7S configuration
With pressure relief valve



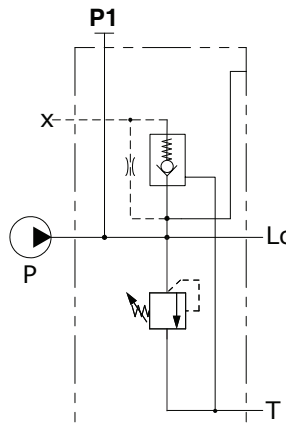
F8S configuration
Without valves
(pressure relief valve plugged port)



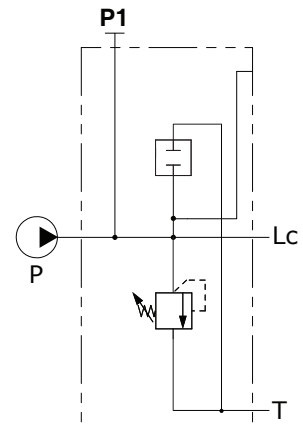
F7S-MSE(NA/NC) configuration
With pressure relief valve
and electric unloader valve



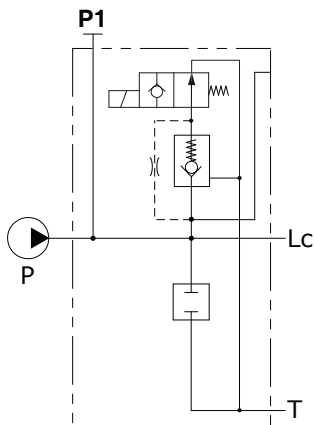
F7S-MSI configuration
With pressure relief valve
and hydraulic unloader valve



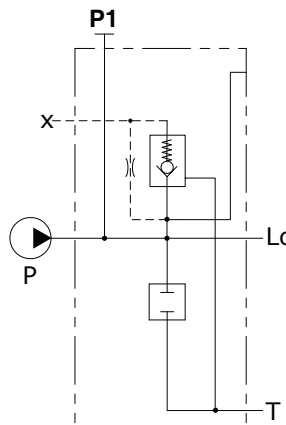
F7S-PMS configuration
With pressure relief valve
and unloader valve blanking plug



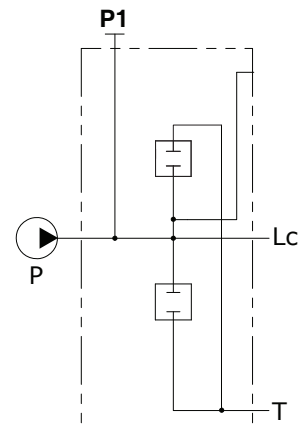
F8S-MSE(NA/NC) configuration
Without pressure relief valve
and electric unloader valve



F8S-MSI configuration
Without pressure relief valve
and hydraulic unloader valve



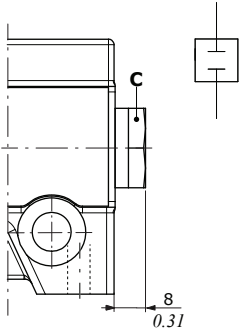
F8S-PMS configuration
Without valves (plugged ports)



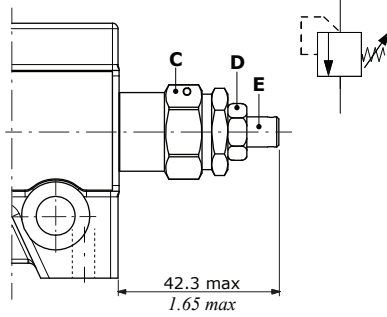
Standard inlet section

Main pressure relief valve

Relief valve blanking plug



Main pressure relief valve

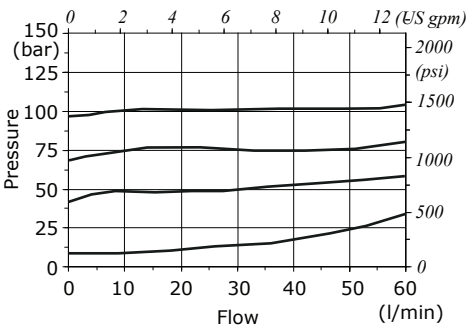


Wrenches and tightening torques

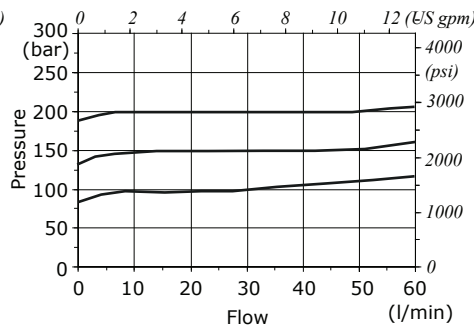
- C = wrench 22 - 42 Nm (31 lbf_t)
- D = wrench 13 - 24 Nm (17.7 lbf_t)
- E = allen wrench 4

Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

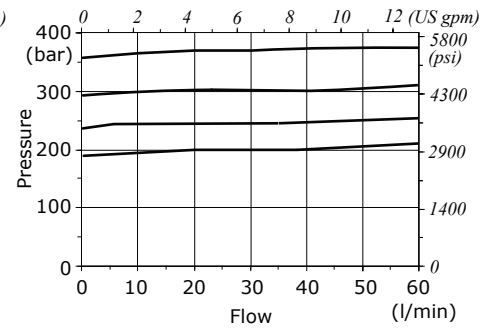
Setting example (B type spring)



Setting example (N type spring)



Setting example (R type spring)



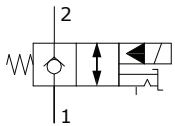
Standard inlet section

Unloader valve

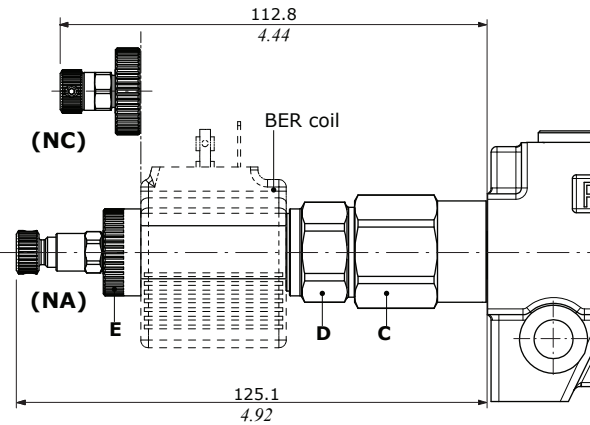
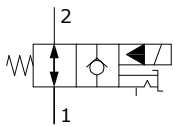
MSE type: electric control

Screw type emergency

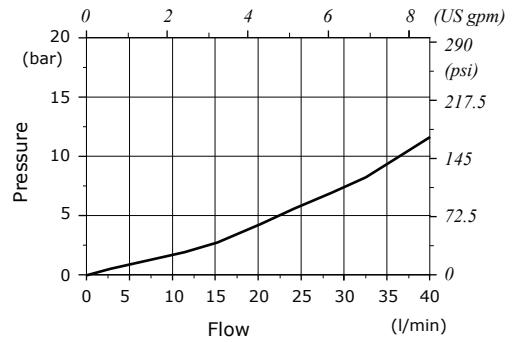
MSE(NC) type
Normally closed



MSE(NA) type
Normally open



Pressure drops

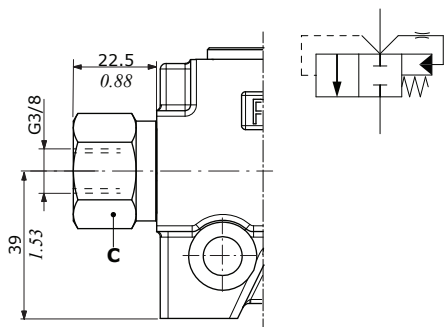


Valve features

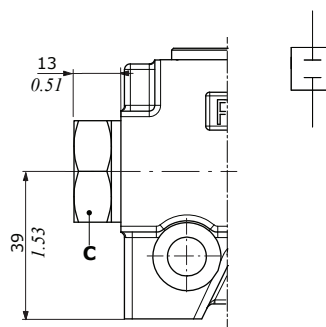
- Nominal flow.....: 40 l/min (10.5 US gpm)
- Max. pressure: 380 bar (5500 psi)
- Max. internal leakage...: 0,50 cm³/min @ 210 bar (0.030 in³/min @ 3050 psi)

For **BER** type coils see page 257

MSI type: hydraulic control



PMS type: valve blanking plug



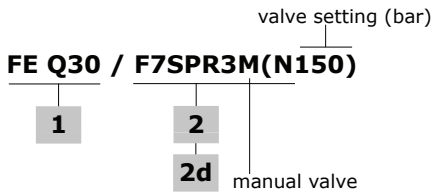
Wrenches and tightening torques

- C = wrench 27 - 42 Nm (30.9 lbft)
- D = wrench 24 - 30 Nm (22.1 lbft)
- E = manual tightening

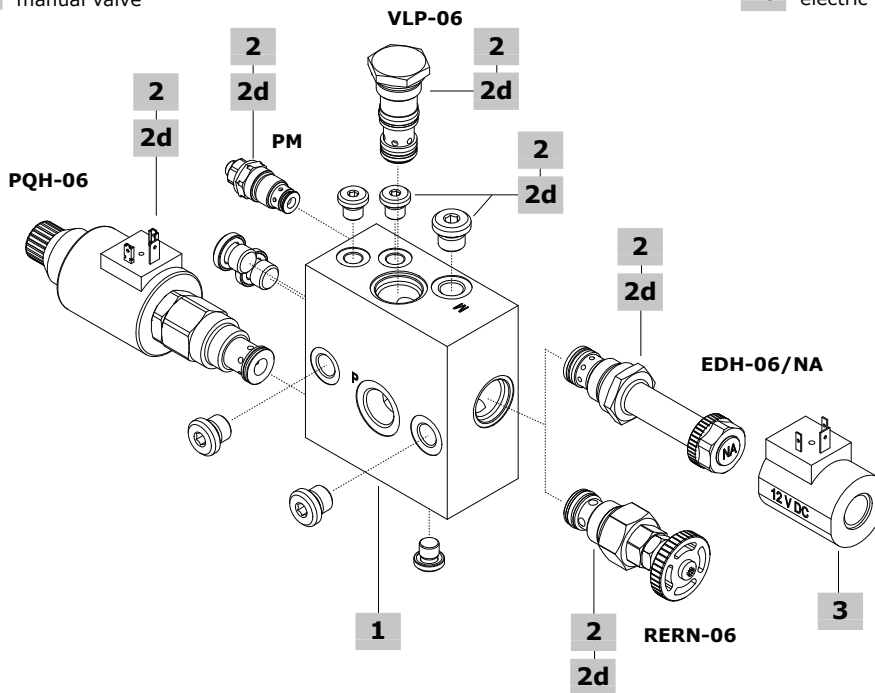
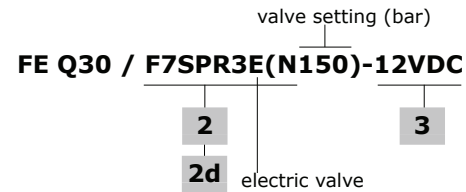
Inlet section - parts ordering codes

Section with flow regulator

With manual unloader valve:



With electric unloader valve:



1 Inlet body section* page 103

TYPE: **FE-Q30/Q50** CODE: 060013195499
 DESCRIPTION: Side inlet port, arrangement for flow control, unloader and pressure relief valve

2 Configuration coding* page 103

TYPE	DESCRIPTION
F7S-PR3M	With pressure relief valve, proportional flow control valve and manual unloader valve
F7S-PR3E	With pressure relief valve, proportional flow control valve and electric unloader valve, normally open

Note: Inlet configurations require:
 n. 5 G1/4 plugs code 3XTAP719150
 n. 3 G1/8 plugs code 3TP5110900

2d Inlet valves page 104

TYPE	CODE	DESCRIPTION
PQH-06	950208506010000	Flow control pressure compensated proportional valve, 12 VDC, coil included
	950208506010001	Flow control pressure compensated proportional valve, 24 VDC, coil included
PM	03800V30PM-N	Antishock valve
VLP-06	950209906010000	Pressure relief valve
RERN-06	955845060010000	Manual unloader valve
EDH-06/NA	950210600000000	Electric unloader valve, normally open

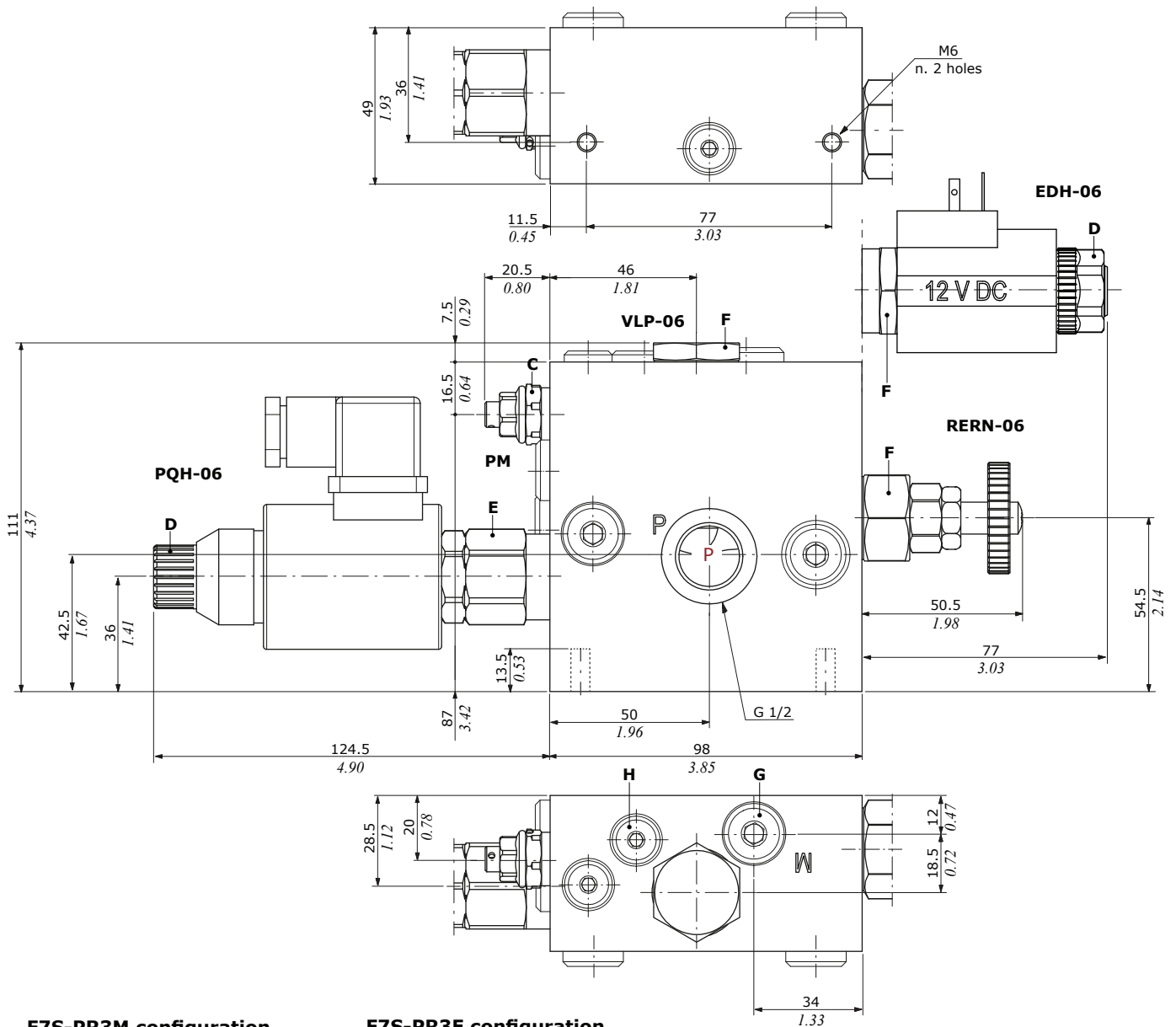
3 Coil

TYPE	CODE	DESCRIPTION
For EDH-06 valve		
A	954250000601200	12 VDC ISO4400 coil
	954250000602400	24 VDC ISO4400 coil

(*): Codes are referred to **BSP** thread

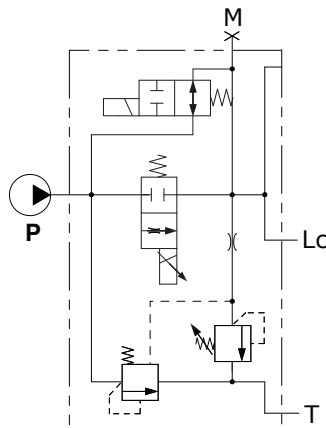
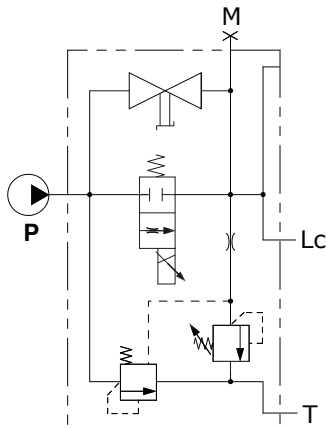
Inlet section with flow regulator

Dimensional data and hydraulic circuit



F7S-PR3M configuration
With manual unloader valve

F7S-PR3E configuration
With electric unloader valve



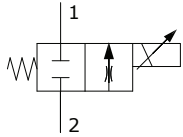
- Wrenches and tightening torques**
- C = wrench 17 - 30 Nm (22 lbf_t)
 - D = manual tightening
 - E = wrench 27 - 30 Nm (22 lbf_t)
 - F = wrench 27 - 60 Nm (44.2 lbf_t)
 - G = allen wrench 27 - 60 Nm (44.2 lbf_t)
 - H = allen wrench 6 - 24 Nm (17.7 lbf_t)

Inlet section with flow regulator

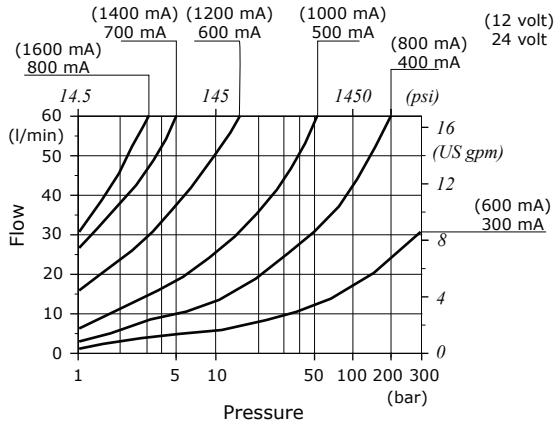
Inlet valves

PQH-06 type

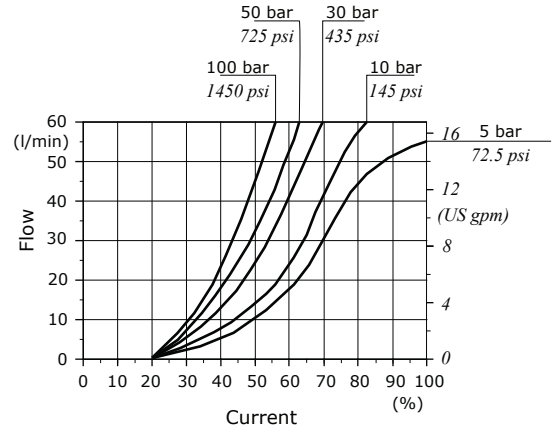
Flow control proportional pressure compensated valve, 12/24 VDC



Compensation curves



Flow control diagram



Valve features

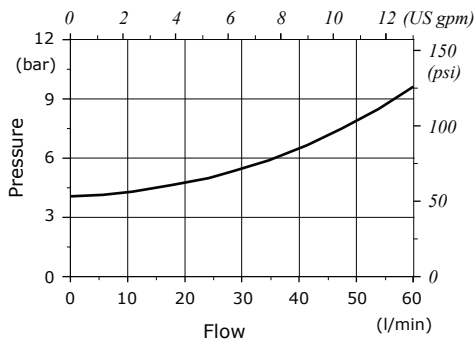
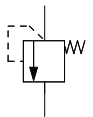
Nominal flow.....: 60 l/min (15.8 US gpm)
 Max. pressure: 310 bar (4500 psi)
 Power rating.....: 22 W
 Max. internal leakage...: 100 cm³/min @ 210 bar
 (6.10 in³/min @ 3050 psi)
 Coil insulation.....: Class F
 Voltage.....: 12/24 VDC

Note: The coil and connector is included

VLP-06 type

Pressure relief valve

Pressure drops

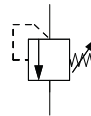


Valve features

Nominal flow.....: 60 l/min (15.8 US gpm)
 Max. pressure: 350 bar (5070 psi)
 Opening start pressure.....: 4 bar (58 psi)

PM type

Antishock valve

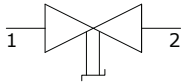


Inlet section with flow regulator

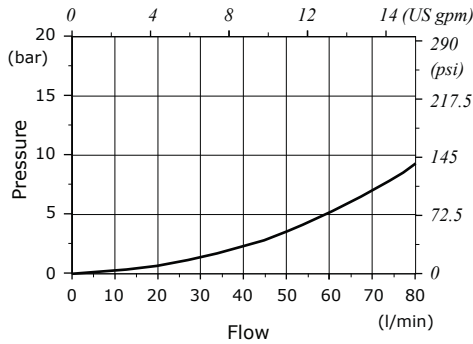
Inlet valves

RERN-06 type

Manual unloader valve



Pressure drops

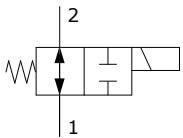


Valve features

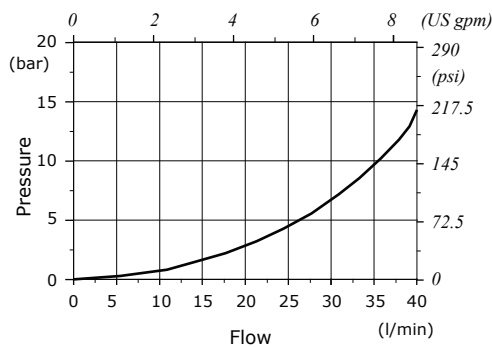
Nominal flow.....: 70 l/min (18.5 US gpm)
 Max. pressure: 315 bar (4600 psi)
 Closed valve leakage....: 0

EDH-06 type

Electric unloader valve, normally open



Pressure drops



Valve features

Nominal flow.....: 35 l/min (9.24 US gpm)
 Max. pressure: 310 bar (4500 psi)
 Max. internal leakage...: 50 cm³/min @ 210 bar
 (3.05 in³/min @ 3050 psi)

Coil **A** type: To be order separately, see #3 page 102

Working section - parts ordering codes

Mechanical control valve configuration example

spring type and valve setting (bar)

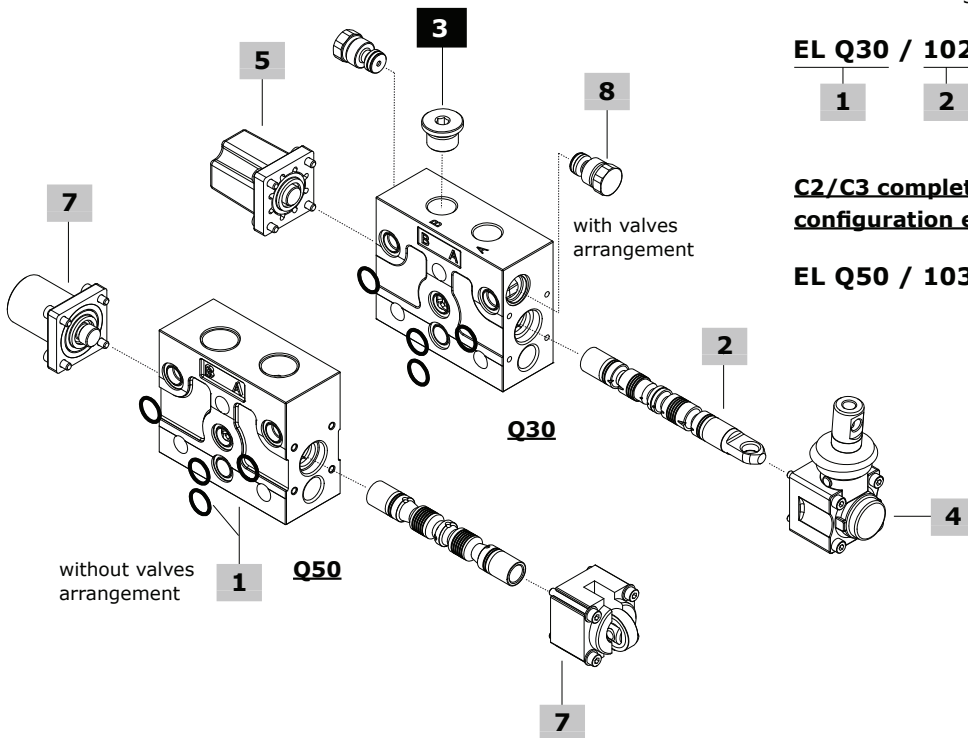
EL Q30 / 102 - A1 - M1 . V40(N)120 - S

1 2 4 5 8 aluminium controls

C2/C3 complete mechanical control configuration example:

EL Q50 / 103 - C3 . V40(N)120 - S

7



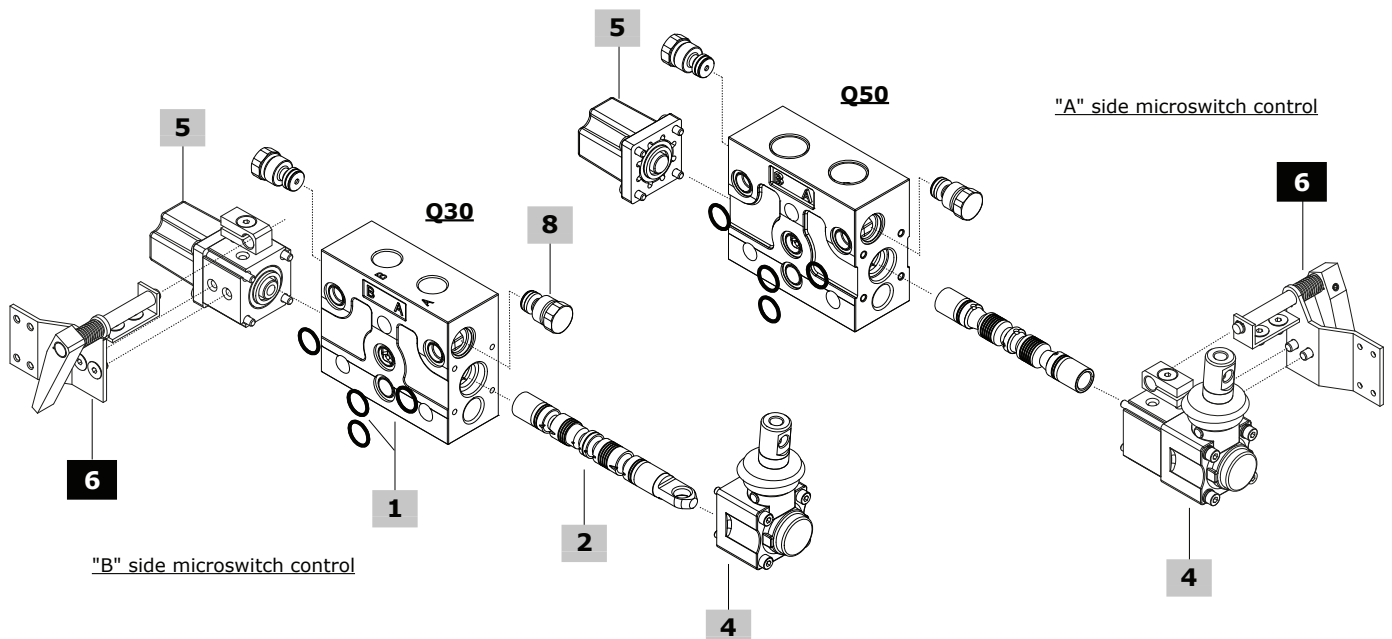
Microswitch control valve configurations example

EL Q30 / 103 - A1 - M1-N1 . V40(N)120 - S

1 2 4 5 8 aluminium controls

EL Q50 / 103 - N1-A1 - M1 . V40(N)120 - S

4 5



Working section - parts ordering codes

1 Working section body kit* page 111

TYPE	CODE	DESCRIPTION
EL-Q30.VC	5EL0600128432	
EL-Q50.VC	5EL0600128226	
DESCRIPTION: Parallel circuit, with port valves arrangement		
TYPE	CODE	DESCRIPTION
EL-Q30	5EL0600127900	
EL-Q50	5EL0600128225	
DESCRIPTION: Parallel circuit, without port valves arrangement		
TYPE	CODE	DESCRIPTION
EL-Q30.VC	5EL0600128434	
EL-Q50.VC	5EL0600128786	
DESCRIPTION: Series circuit, with port valves arrangement		

2 Spool page 112

TYPE	CODE	DESCRIPTION
Standard spools		
103	060103179499	Double acting, A and B closed in neutral position
	3CUG3197800	As previous one, for kick-out control
106	KR30106	Double acting for closed circuit
107	KR80107-108	Double acting, A to tank and B closed in neutral position
108	KR80107-108	Double acting, B to tank and A closed in neutral position
111	060103179599	Double acting, A and B to tank in neutral position
	KR30111K	As previous one, for kick-out control
114	KR30114	Double acting, A and B to tank in neutral position, for closed circuit
101	3CUG32188000	Single acting on port A (3)
102	3CUG3218002	Single acting on port B (3)
116	3CUG3179200	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	3CUG3179201	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control
403	5CUG2895202	Double acting, A and B closed in neutral position, for series circuit
411	5CUG2895402	Double acting, A and B to tank in neutral position, for series circuit
Note (3): Q30 valve required G3/8 plug, see #3 Q50 valve required G1/2 plug, see #3		
Special spools for cam, microswitch controls and other leverless controls		
103	060103179099	Double acting, A and B closed in neutral position
111	060103179199	Double acting, A and B to tank in neutral position
403	5CUG2895203	Double acting, A and B closed in neutral position, for series circuit
411	5CUG2895403	Double acting, A and B to tank in neutral position, for series circuit

3 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	060002792199	G3/8 plug for Q30 body section
-	060002792099	G1/2 plug for Q50 body section

4 A side control page 113

TYPE	CODE	DESCRIPTION
For standard spools		
<u>With lever control:</u>		
A1	03600A1-A2	M8 thread plastic lever box
A2	03600A1-A2	As A1 type, with lever box rotated 180°
A1/10	03610A1-A2/10	M8 thread aluminium lever box
A2/10	03610A1-A2/10	As A1/10 type, with lever box rotated 180°
A1/06	03606A1-A2/06	Aluminium lever box, with stroke limiter
A2/06	03606A1-A2/06	As A1/06 type, with lever box rotated 180°
A1/PM	03610A1-A2/PM	M10 thread aluminium lever box
A2/PM	03610A1-A2/PM	As A1/PM type, with lever box rotated 180°
A1/PMP	03610A1-A2/PMP	M10 thread plastic lever box
A2/PMP	03610A1-A2/PMP	As A1/PMP type, with lever box rotated 180°
A1/Z1	03610A1-A2/Z1	Plastic lever box, for 116 spool type
A2/Z1	03610A1-A2/Z1	As A1/Z1 type, with lever box rotated 180°
A1/Z1/10	03610A1-2/10Z1	As A1/Z1 type, with aluminium lever box
<u>With safety lever control:</u>		
A1/S⁽¹⁾	03624A1-A2/S	M8 thread aluminium lever box
A2/S⁽¹⁾	03624A1-A2/S	As A1/S type, with lever box rotated 180°
<u>Without lever control:</u>		
A4/Z1	03617A4/Z1	As A4 type, for 116 spool type
A6	03620A6	With flange
A6-H/Z1	03620A6-H/Z1SI	As A6 type, for 116 spool type
A8	03622A8	Arrangement for flexible cable control
	03622A8/03	As previous one, with aluminium cap
A8/Z1	03622A8/Z1	As A8 type, for 116 spool type
	03622A8/Z1/10	As previous one, with aluminium cap
<u>Joystick controls for 2 section operation:</u>		
A35/1	03640A35-12	Joystick 1 type
A35/2	03640A35-12	Joystick 2 type
A35/3	03640A35-34	Joystick 3 type
A35/4	03640A35-34	Joystick 4 type
For types 103, 111, 403 e 411 special spools		
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #6		
N1-A1	03641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
	03641N1-A1/10	As previous one, with aluminium lever box
N1A-A1	03642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	03643N1BA1/A2L	Micro operation in pos. 2, with lever box
N1-A3	03648N1-A3L	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	03648N1A-A3L	Micro operation in pos. 1, without lever with cap
N1B-A3	03648N1B-A3L	Micro operation in pos. 2, without lever with cap
<u>Without lever control:</u>		
A3	03614A3	Without lever, with cap
	03614A3/03	As previous one, with aluminium cap
A4	03617A4	M8 thread male external pin with flange
	03617A4/03	As previous one, with aluminium flange
A5⁽²⁾	03619A5	Flange with spherical spool end
	03619A5/10	As previous one, with aluminium flange

(*) : Codes are referred to **BSP** thread

(1) : Always complete with lever knob

(2) : To be assembled only with M4 control

Working section - parts ordering codes

5 B side control page 122

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	03730M1	3 pos., spring return in neutral position
	03730M1/03	As previous one, with aluminium cap
M1/01	03730M1/01	As M1 type, for joystick control
	03730M1/01/03	As previous one, with aluminium cap
M1/02	03730M1/02	As M1 type, with stroke limiter
M1/05	03730M1/05	As M1 type, for series spool
M1/06	03730M1/06	As M1/05 type, with aluminium cap
M1/07	03730M1/07	As M1 type, for joystick control with series spool
	03730M1/07/03	As previous one, with aluminium cap
M1-B1	03753M1-B1	As M1 type, with microswitch arrangement
	03753M1-B1/03	As previous one, with aluminium cap
M1-U1	03701M1-U1	As M1 type, with M8 thread male external pin
M2	03732M2	2 pos. (0-1), spring return in neutral position
	03732M2/03	As previous one, with aluminium cap
M2-U1	03702M2-U1	As M2 type, with M8 thread male external pin
M3	03733M3	2 pos. (0-2), spring return in neutral position
	03733M3/03	As previous one, with aluminium cap
M3-U1	03703M3-U1	As M3 type, with M8 thread male external pin
M4	03734M4-1-2	2 pos. (1-2), spring return in position 1
	03735M4-2-1	2 pos. (2-1), spring return in position 2
M4-U1	03704M4-U11-2	As M4 type (1-2), with M8 thread male external pin
<u>With flexible cable control arrangement:</u>		
M1-U2	03715M1-U2	3 pos., spring return in neutral position
M2-U2	03716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	03717M3-U2	2 pos. (0-2), spring return in neutral position
<u>With detent:</u>		
R1	03741R1	3 pos., detent in position 1
	03741R1/03	As previous one, with aluminium cap
R2	03742R2	3 pos., detent in position 2
	03742R2/03	As previous one, with aluminium cap
R3	03743R3	3 pos., detent in all position
	03743R3/03	As previous one, with aluminium cap
R4	03744R4	2 pos., detent in position 0-1
	03744R4/03	As previous one, with aluminium cap
R5	03745R5	2 pos., detent in position 0-2
	03745R5/03	As previous one, with aluminium cap
R6	03746R6	2 pos., detent in position 1-2
	03746R6/03	As previous one, with aluminium cap
R8	03748R8	4 pos., detent in 4 th pos., for 116 spool type
	03748R8/03	As previous one, with aluminium cap
R10/Z1	03750R10/Z1	4 pos., detent in 4 th pos., for 126 spool type
	03750R10/Z1/03	As previous one, with aluminium cap
<u>With detent and kick out function:</u>		
R1K	03741R1K	3 pos., detent in position 1
	03741R1K/03	As previous one, with aluminium cap
R2K	03742R2K	3 pos., detent in position 2
	03742R2K/03	As previous one, with aluminium cap
R3K	03743R3K	3 pos., detent in all position
	03743R3K/03	As previous one, with aluminium cap

5 B side control (cont.) page 122

TYPE	CODE	DESCRIPTION
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #6		
M1-N1	03766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
	03766M1-N1/03	As previous one, with aluminium lever box
M1-N1A	03767M1-N1AL	As M1-N1 type, micro operation in pos. 1
	03767M1-N1AL/3	As previous one, with aluminium cap
M1-N1B	03768M1-N1BL	As M1-N1 type, micro operation in pos. 2
	03768M1-N1BL/3	As previous one, with aluminium cap
M2-N1	03769M2-N1L	2 pos. (0-1), spring return in neutral pos.
M3-N1	03772M3-N1L	2 pos. (0-2), spring return in neutral pos.
<u>Pneumatic and electropneumatic controls:</u>		
P1NW	03661P1-NW	ON/OFF pneumatic control
P1NPW	03661P1-NPW	Proportional pneumatic control
D3W	03691D3-F-12DC	12 VDC, ON/OFF electropneumatic control
	03692D3-F-24DC	24 VDC, ON/OFF electropneumatic control

6 Microswitch assembly kit

CODE	DESCRIPTION
03650N1-01	Kit for 1 section
03650N1-02	Kit for 2 sections
03650N1-03	Kit for 3 sections
03650N1-04	Kit for 4 sections
03650N1-05	Kit for 5 sections
03650N1-06	Kit for 6 sections
03650N1-07	Kit for 7 sections
03650N1-08	Kit for 8 sections
03650N1-09	Kit for 9 sections
03650N1-10	Kit for 10 sections

7 Complete controls A+B sides page 129

TYPE	CODE	DESCRIPTION
<u>For types 103, 111, 403, 411 special spools</u>		
C2	03792C2-C3	Cam control from position 1 to 2
C3	03792C2-C3	Cam control from position 2 to 1

8 Auxiliary port valve page 133

TYPE	CODE	DESCRIPTION
<u>Antishock valve:</u>		
V30-B	0380FV30-B	Setting range: from 50 to 100 bar (from 725 to 1450 psi)
V30-N	0380FV30-N	Setting range: from 101 to 200 bar (from 1460 to 2900 psi)
V30-R	0380FV30-R	Setting range: from 201 to 350 bar (from 2910 to 5100 psi)
<u>Antishock/anticavitation valve:</u>		
V33-B	0380FV33-B	Setting range: from 50 to 100 bar (from 145 to 1450 psi)
V33-N	0380FV33-N	Setting range: from 101 to 200 bar (from 1460 to 2900 psi)
V33-R	0380FV33-R	Setting range: from 201 to 350 bar (from 2910 to 5100 psi)
<u>Anticavitation valve:</u>		
V04	03808V04	Anticavitation valve
<u>Plug:</u>		
VC	060002846099	Valve blanking plug

For other configurations and positions, see page 133

(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

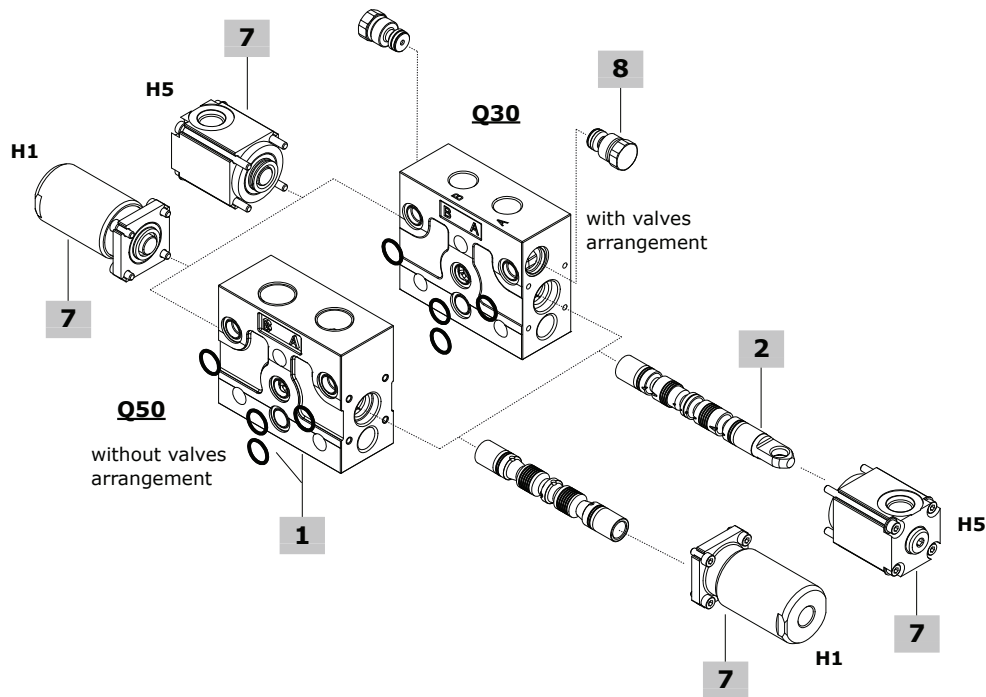
Proportional hydraulic controls valve configuration example

spring type and valve setting (bar)

EL Q30 / 103 - H5 . V40(N)120 - S

aluminium controls

EL Q50 / 103 - H1 . V40(N)120 - S



1 Working section body kit* page 111

The body kits listed below are for **H5** hydraulic control.
H1 hydraulic control requires standard body: see #1, page 107

TYPE	CODE
EL-Q30-H5.VC	5EL0600128432H5
EL-Q50-H5.VC	5EL0600128226H5

DESCRIPTION: Parallel circuit, with port valves arrangement

TYPE	CODE
EL-Q30-H5	5EL0600127900H5
EL-Q50-H5	5EL0600128225H5

DESCRIPTION: Parallel circuit, without port valves arrangement

2 Spool page 112

TYPE	CODE	DESCRIPTION
For H5 hydraulic control		
103	060103179499	Double acting, A and B closed in neutral position
For H1 hydraulic control		
103	060103179099	Double acting, A and B closed in neutral position

7 Hydraulic controls A+B sides* page 130

TYPE	CODE	DESCRIPTION
H5	03785H5	Low pressure proportional type, upper ports
H1	03779H1	High pressure proportional type, side ports

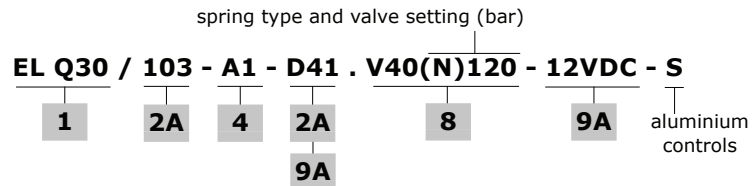
8 Auxiliary port valve page 133

See #8, page 108

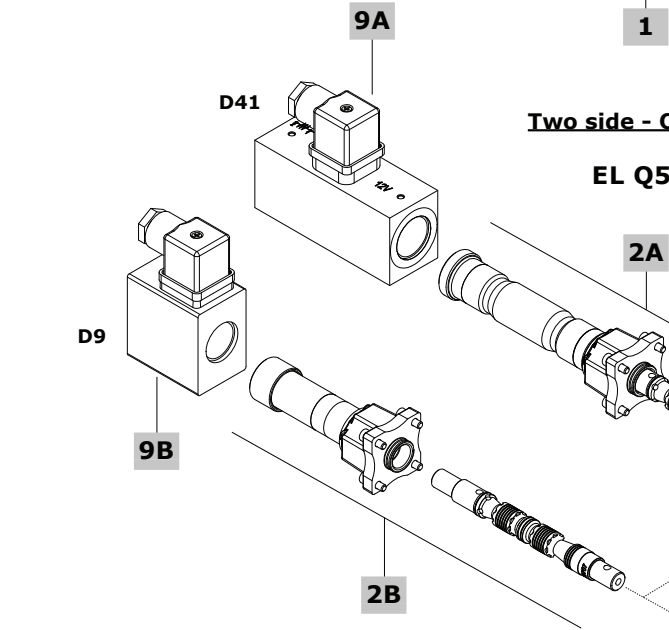
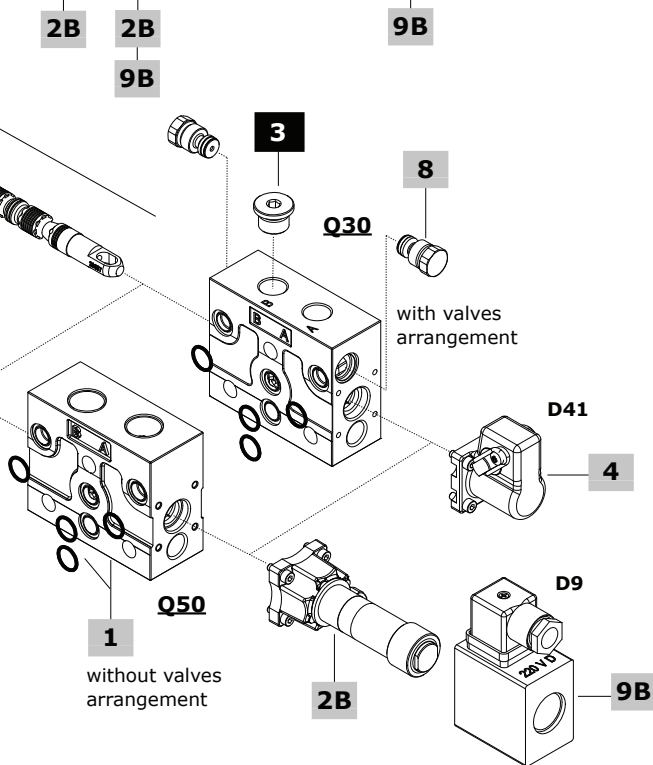
(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

One side - ON/OFF direct solenoid control valve configuration example



Two side - ON/OFF direct solenoid control valve configuration example



1 Working section body kit* page 111

See #1 for H5 hydraulic control, page 109

2A D41 solenoid control page 131

One side solenoid control

For Q30/Q50 valves:

TYPE	CODE	DESCRIPTION
103	X060102889799	Tube assembly with double acting spool, A and B closed in neutral position
107	X060102938199	Tube assembly with double acting spool, A to tank and B closed in neutral position
108	X060102937199	Tube assembly with double acting spool, B to tank and A closed in neutral position
109	X060102952699	Tube assembly with single acting spool on port A, A to tank in neutral position (1)
111	X060102894299	Tube assembly with double acting spool, A and B to tank in neutral position
101	X060102905099	Tube assembly with single acting spool on port A (1)
102	X060102894199	Tube assembly with single acting spool on port B (1)

2B D9 solenoid control page 132

Two side solenoid control

For Q30/Q50 valves:

TYPE	CODE	DESCRIPTION
103	X060102998299	Tube assembly with double acting spool, A and B closed in neutral position
108	X060103070799	Tube assembly with double acting spool, B to tank and A closed in neutral position
111	X060103000499	Tube assembly with double acting spool, A and B to tank in neutral position
101	X060103012699	Tube assembly with single acting spool on port A (1)
102	X060103012699	Tube assembly with single acting spool on port B (1)

Note (1): Q30 valve required G3/8 plug, see #3
Q50 valve required G1/2 plug, see #3

3 Plug for single acting spool* page 107

See #3, page 107

4 A side control for D41 page 131

TYPE	CODE	DESCRIPTION
A1	060003236899	M8 thread cast iron lever box
A2	060003236899	As A1 type, with lever box rotated 180°

8 Auxiliary port valve page 133

See #8, page 108

9A/B Coil page 131

D41 coil

For Q30/Q50 valves:

TYPE	CODE	DESCRIPTION
-	ZEB012	12 VDC ISO4400 coil
-	ZEB024	24 VDC ISO4400 coil

D9 coil

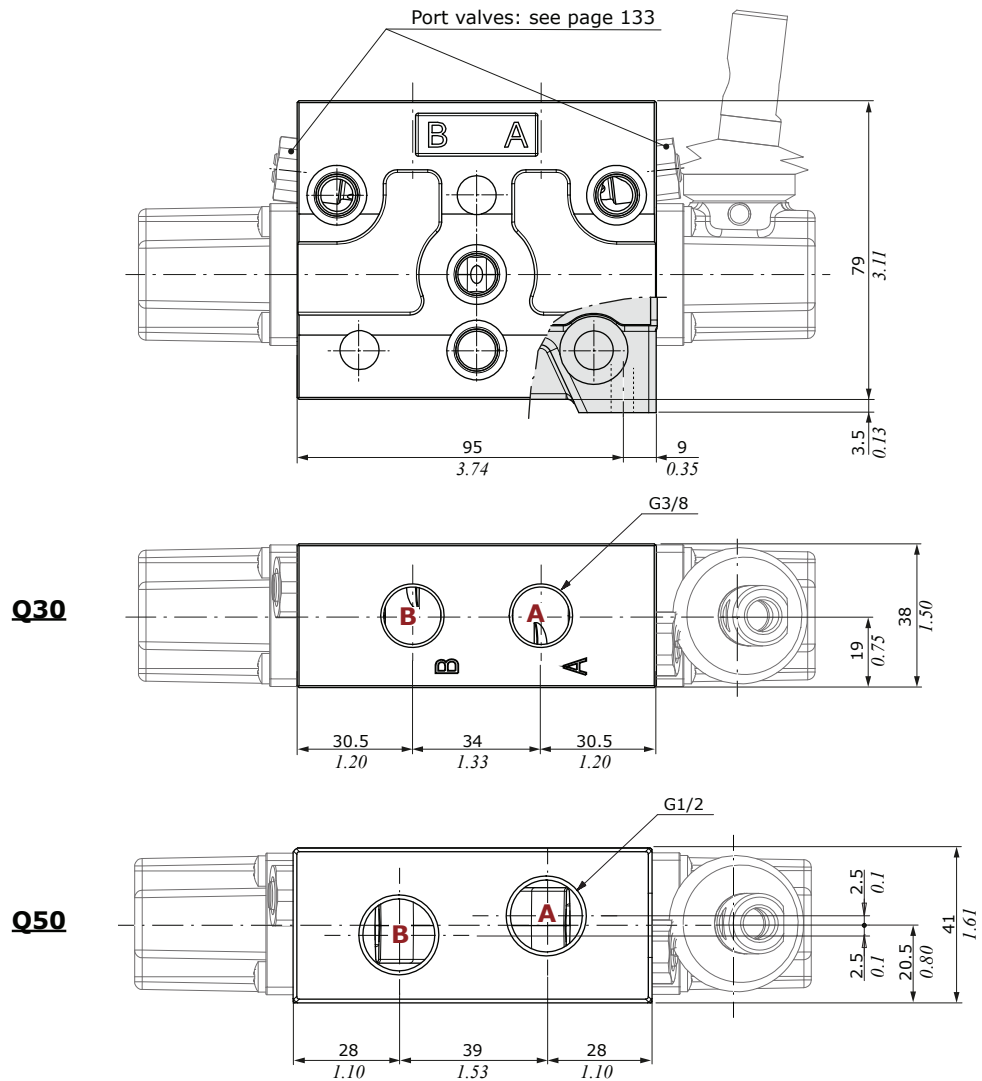
For Q30/Q50 valves:

TYPE	CODE	DESCRIPTION
-	ZDB212	12 VDC ISO4400 coil
-	ZDB224	24 VDC ISO4400 coil

Note: The connector is included

(*): Codes are referred to **BSP** thread

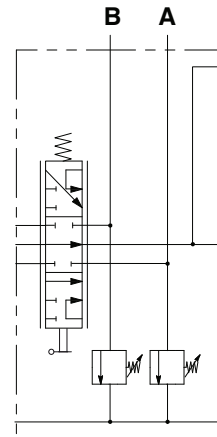
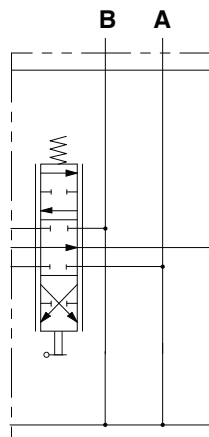
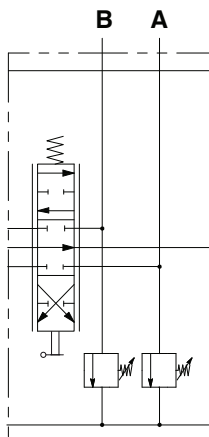
Dimensional data and hydraulic circuits



Q30/Q50.V40(N)120 configuration
Parallel circuit,
mechanical control with aux valves

Q30/Q50 configuration
Parallel circuit,
mechanical control without aux valves

Q30/Q50.V40(N)120 configuration
Series circuit,
mechanical control with aux valves



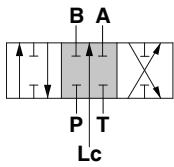
Working section

Spool

103 type

A and B closed in neutral position

2 0 1



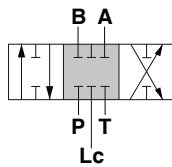
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

106 type

A, B and Lc closed in neutral position. For closed center

2 0 1



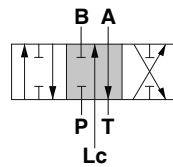
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

107 type

A to tank, B closed in neutral position

2 0 1



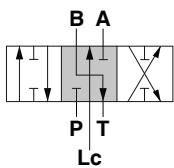
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

108 type

B to tank, A closed in neutral position

2 0 1



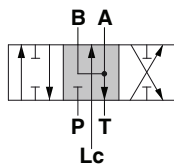
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

111 type

A and B to tank in neutral position

2 0 1



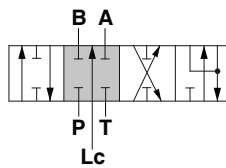
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

116 type

With floating in the 4th position (spool in)

2 0 1 3



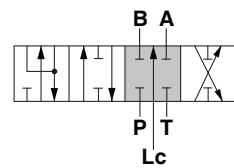
Stroke

Position 1: - 4 mm (- 0.15 in)
Position 2: + 5 mm (+ 0.19 in)
Position 3: - 8.6 mm (- 0.33 in)

126 type

With floating in the 4th position (spool out)

3 2 0 1



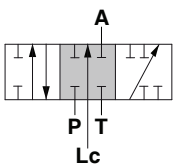
Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 5 mm (- 0.19 in)
Position 3: + 8.6 mm (+ 0.33 in)

101 type

Single acting on A, B plugged

2 0 1



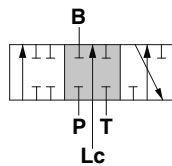
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

102 type

Single acting on B, A plugged

2 0 1



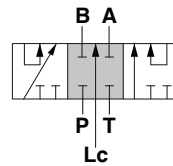
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

403 type

A and B closed in neutral position for serie circuit

2 0 1



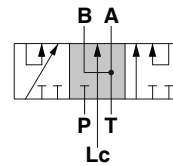
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

411 type

A and B to tank in neutral position for serie circuit

2 0 1



Stroke

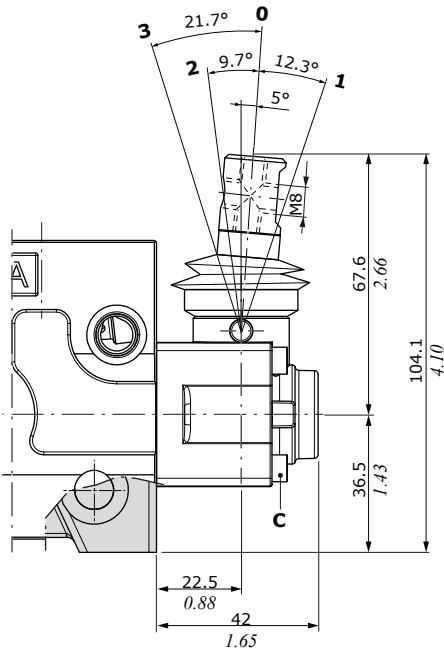
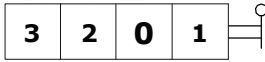
Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

A side controls

With lever control

A1 type

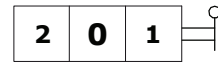
M8 thread plastic lever box



A1/10 type

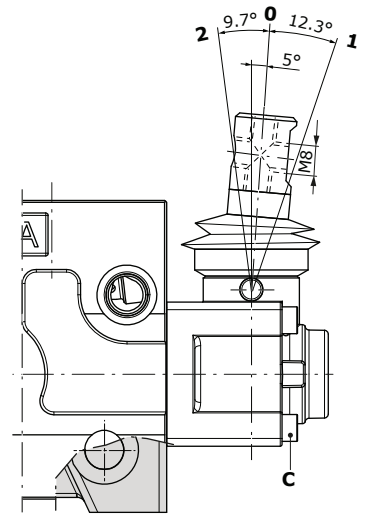
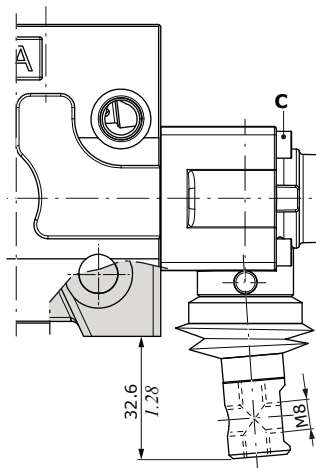
M8 thread aluminium lever box.
Dimensions are the same of A1 type

A2/10 type
As A1/10 type, rotated 180°



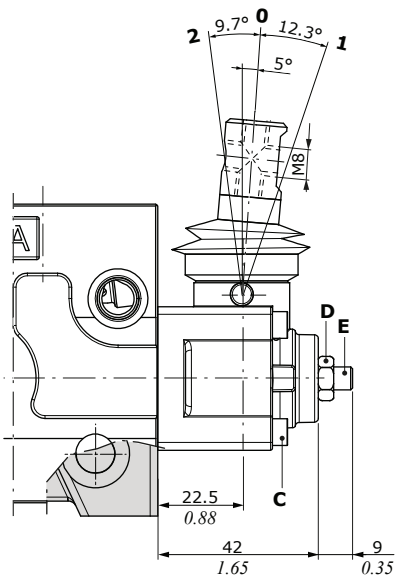
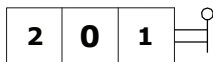
A2 type

As A1 type, rotated 180°



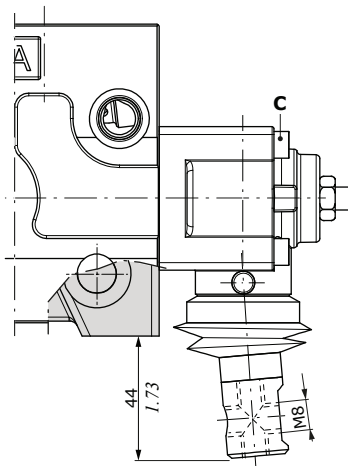
A1/06 type

M8 thread, with stroke limiter



A2/06 type

As A1/06 type, rotated 180°



Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = wrench 10 - 9.8 Nm (7.2 lbf_t)
- E = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

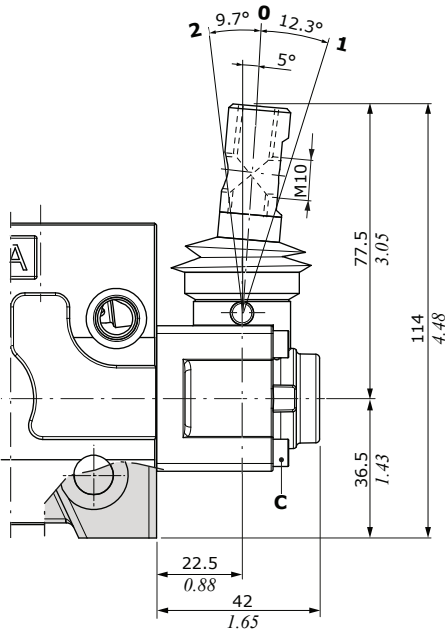
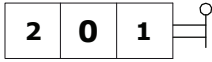
Working section

A side controls

With lever control

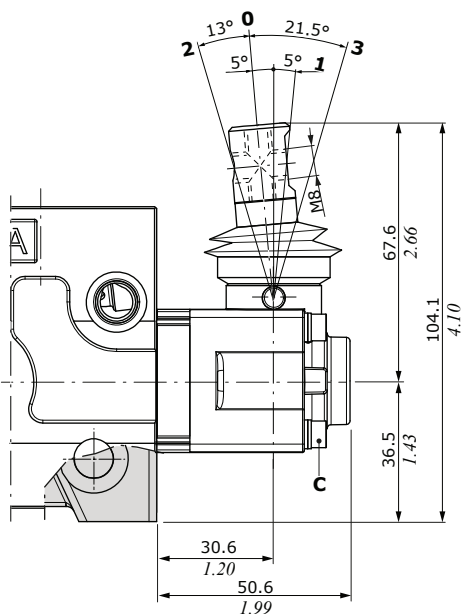
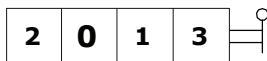
A1/PM type

M10 thread aluminium lever box



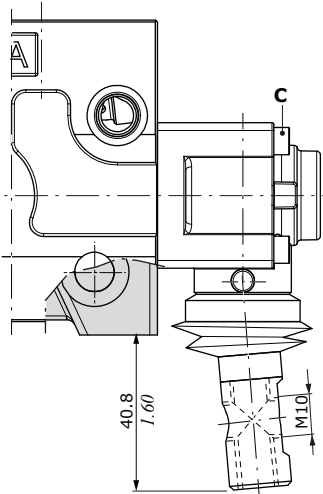
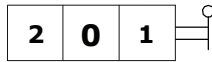
A1/Z1 type

M8 thread, for 116 floating spool type



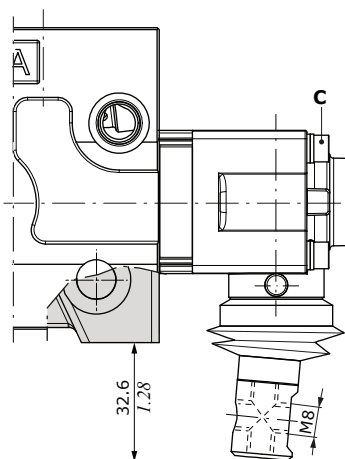
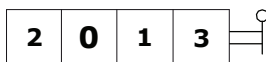
A2/PM type

As A1/PM type, rotated 180°



A2/Z1 type

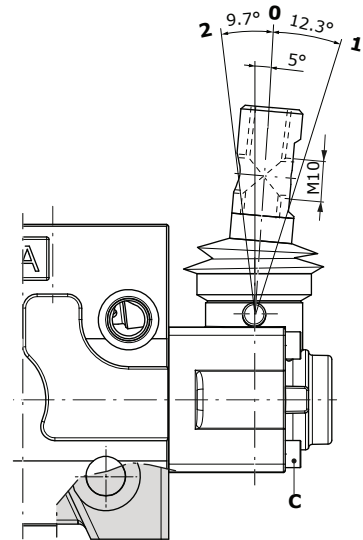
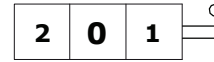
As A1/Z1 type, rotated 180°



A1/PMP type

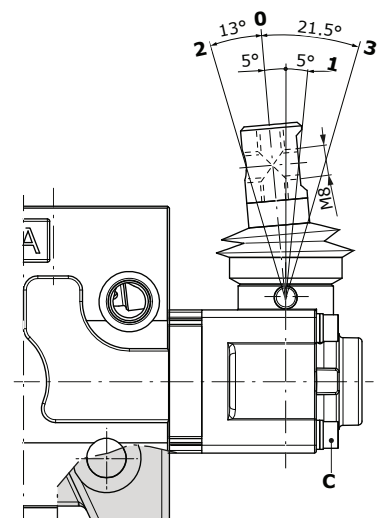
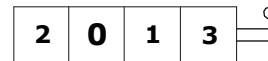
M10 thread plastic lever box. Dimensions are the same of A1/PM type

A2/PMP type
As A1/PMP type, rotated 180°



A1/Z1/10 type

As A1/Z1 type, with aluminium lever box

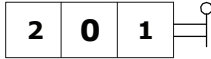


Wrenches and tightening torques

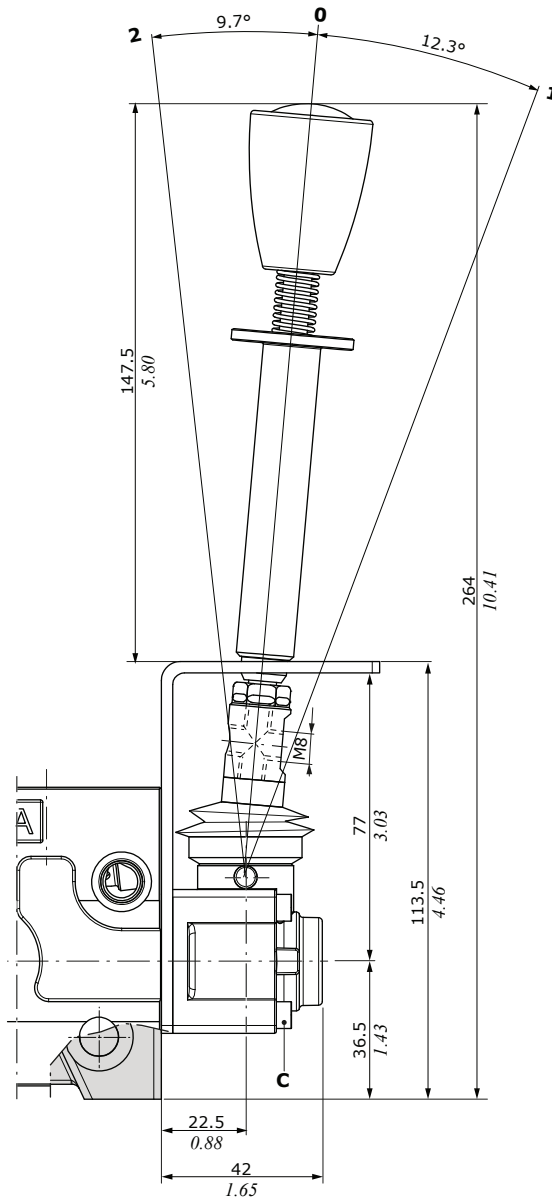
C = allen wrench 3 - 3 Nm (2.2 lbf^{ft})

A side controls

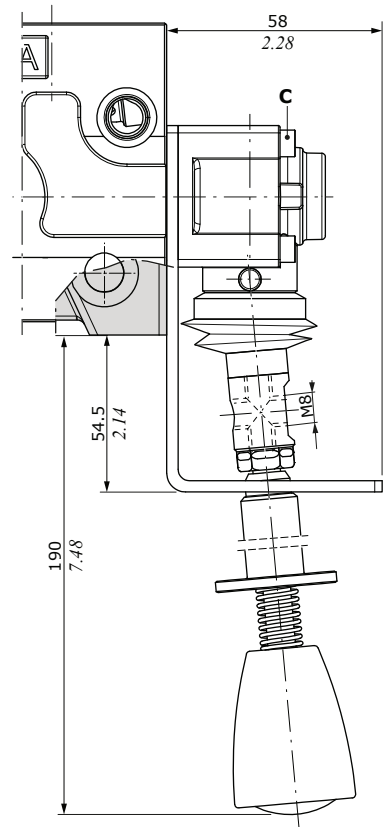
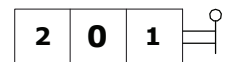
A1/S type
M8 thread, aluminium lever box



Wrenches and tightening torques
C = allen wrench 3 - 3 Nm (2.2 lbf·ft)



A2/S type
As A1/S type, rotated 180°

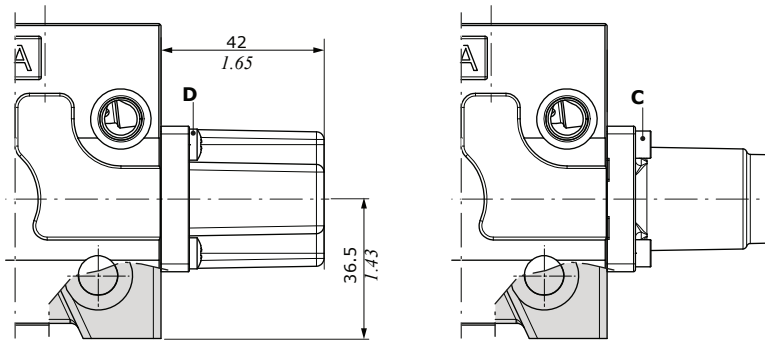


Working section

A side controls

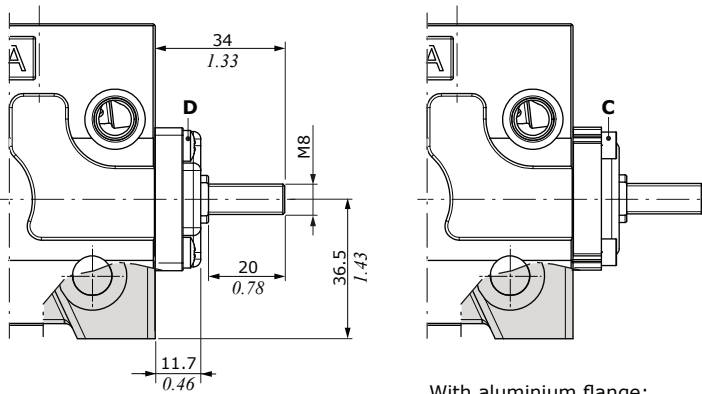
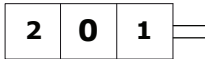
Without lever control

A3 type
With cap.
Available with aluminium cap



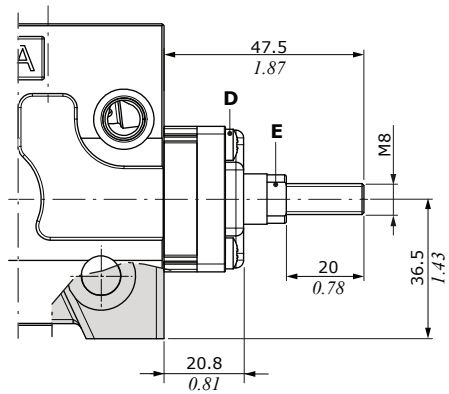
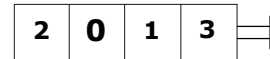
With aluminium cap;
dimensions are the same of standard type

A4 type
M8 male thread external pin with flange.
Available with aluminium flange



With aluminium flange;
dimensions are the same of
standard type

A4/Z1 type
As A4 type,
for 116 floating spool type



Wrenches and tightening torques

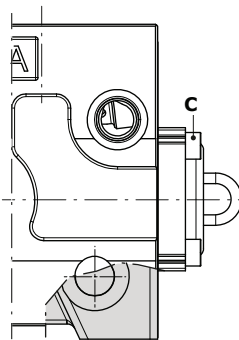
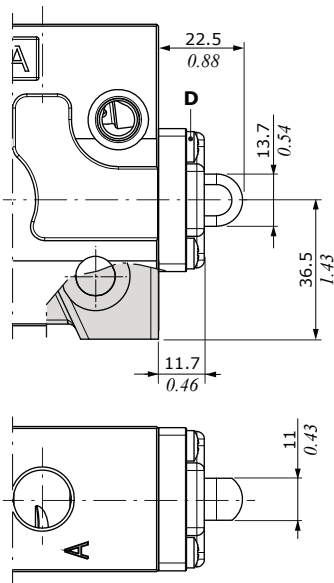
- C = allen wrench 3 - 3 Nm (2.2 lbf^t)
- D = cross-head - 3 Nm (2.2 lbf^t)
- E = wrench 9 - 9.8 Nm (7.2 lbf^t)

A side controls

Without lever control

A5 type

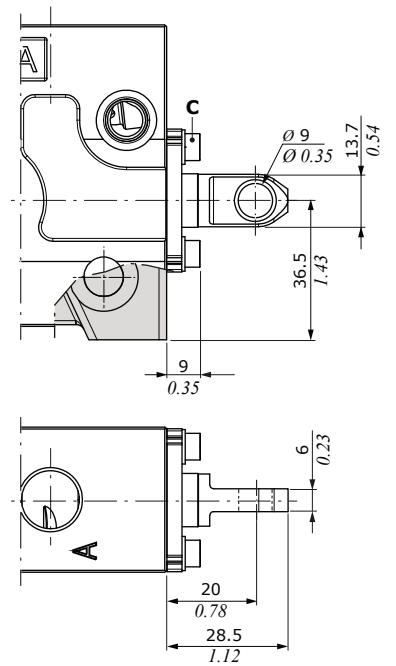
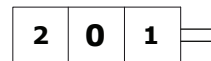
Flange with spherical spool end.
Available with aluminium flange



With aluminium flange;
dimensions are the same of
standard type

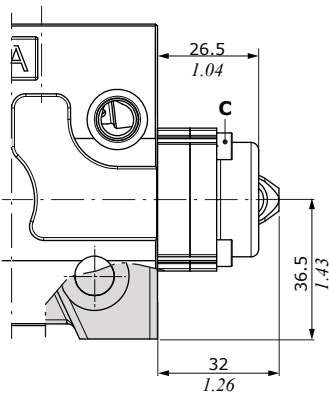
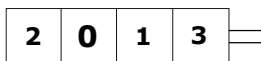
A6 type

With flange



A6-H/Z1 type

As A6 type,
for 116 floating spool type



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)
D = cross-head - 3 Nm (2.2 lbf)

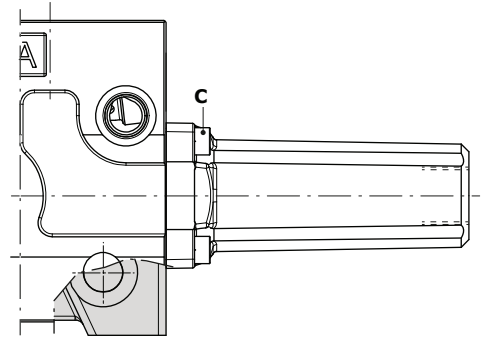
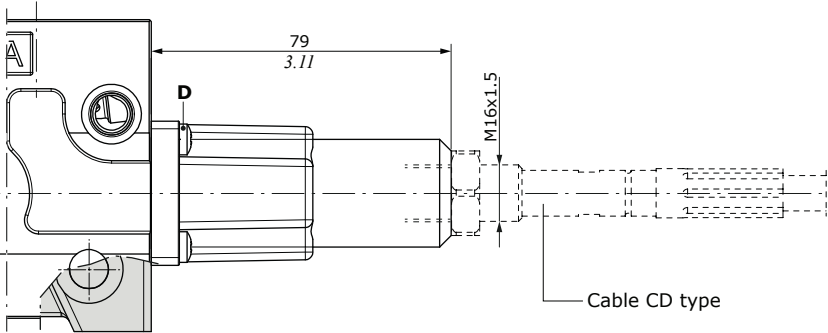
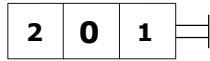
Working section

A side controls

With flexible cable control arrangement

A8 type

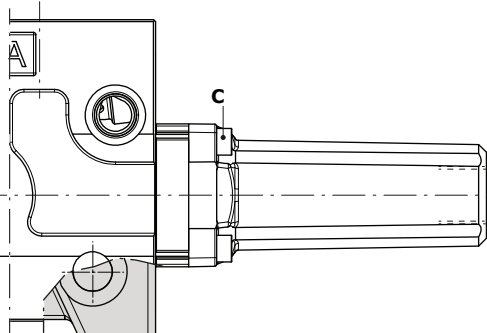
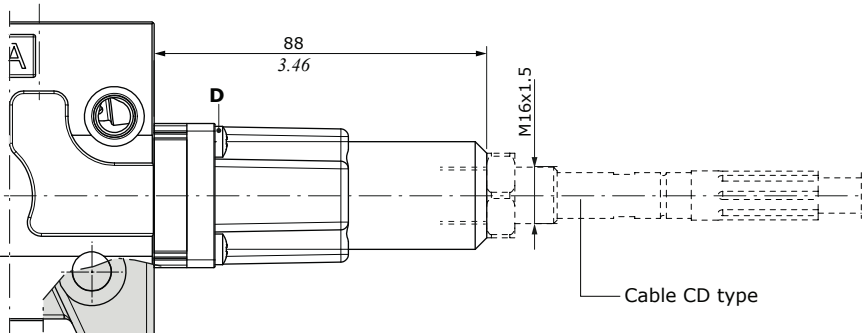
Flexible cable control arrangement.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

A8/Z1 type

As A8 type, for 116 floating spool type.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

Wrenches and tightening torques

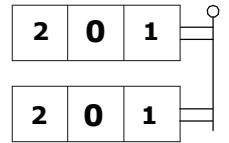
C = allen wrench 3 - 3 Nm (2.2 lbft)
D = cross-head - 3 Nm (2.2 lbft)

A side controls

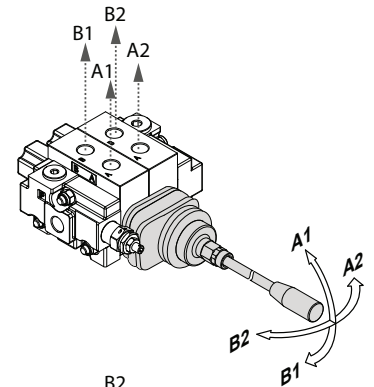
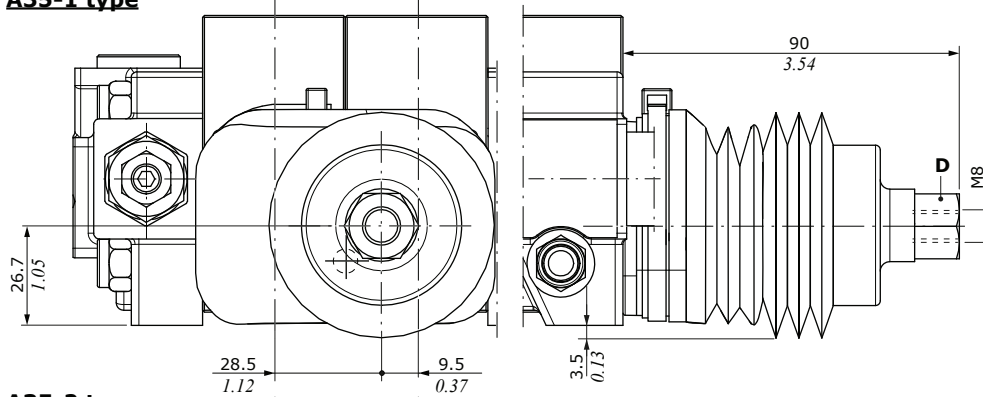
Joystick control

For operating the joystick control in the floating position, contact Sales Department.

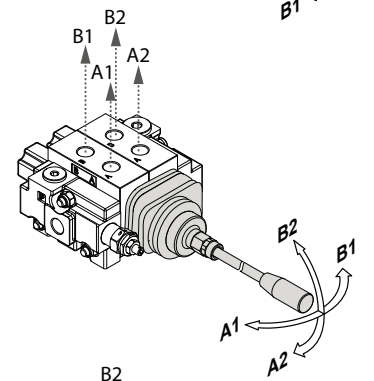
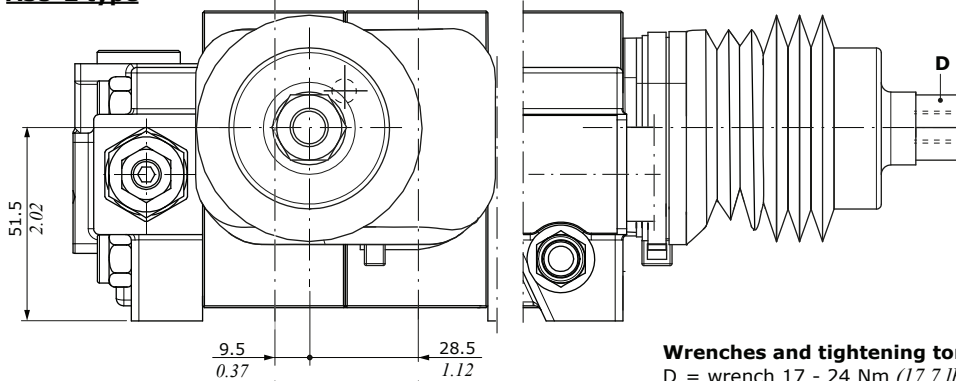
Drawings are referred to a Q30 sectional valve.



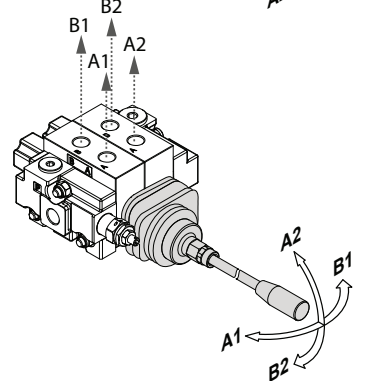
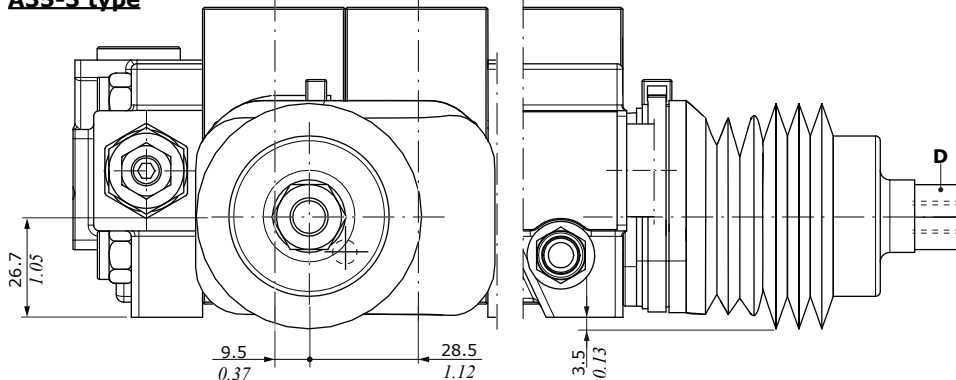
A35-1 type



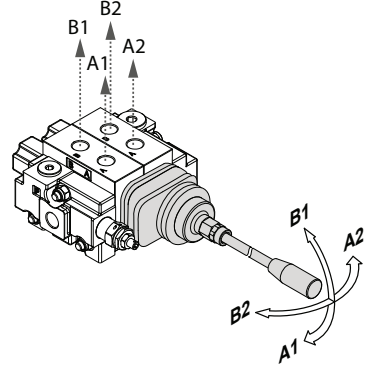
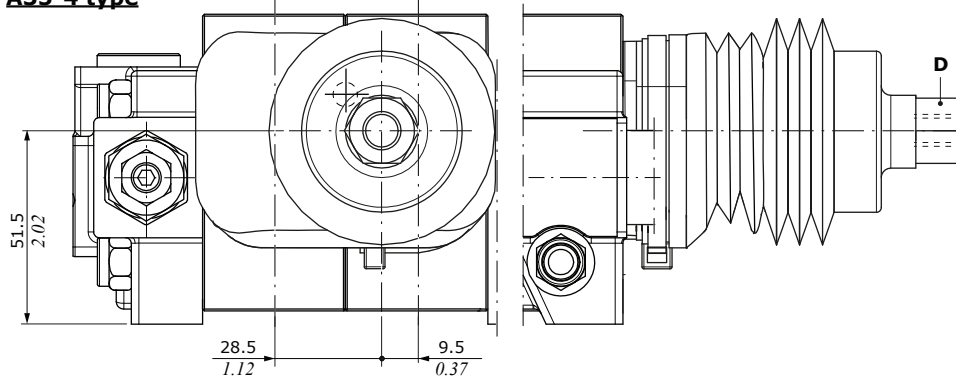
A35-2 type



A35-3 type



A35-4 type



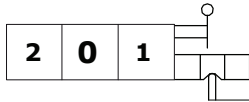
Wrenches and tightening torques
D = wrench 17 - 24 Nm (17.7 lbf)

Working section

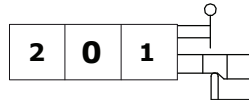
A side controls

With spool position microswitch, with lever

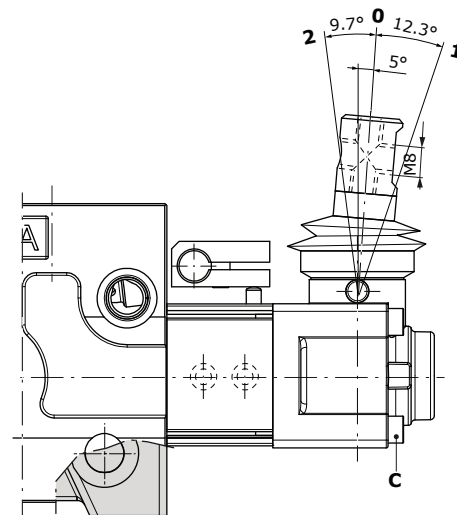
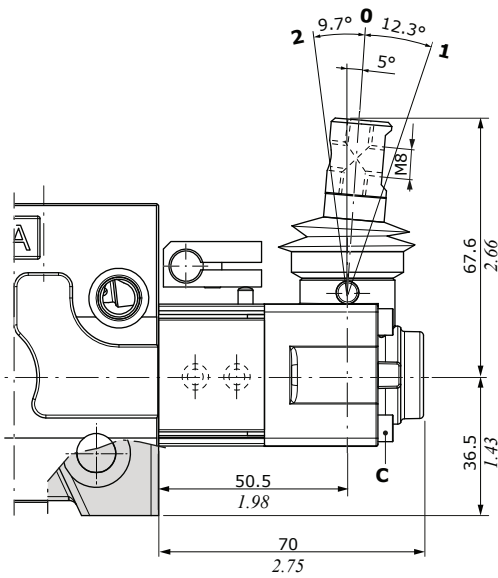
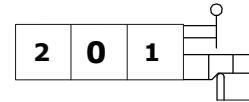
N1-A1 type
Micro operation in position 1 and 2.
Available with aluminium lever box



N1A-A1 type
Micro operation in position 1



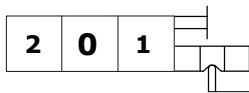
N1B-A1 type
Micro operation in position 2



With aluminium lever box;
dimensions are the same of standard type

With spool position microswitch, with cap

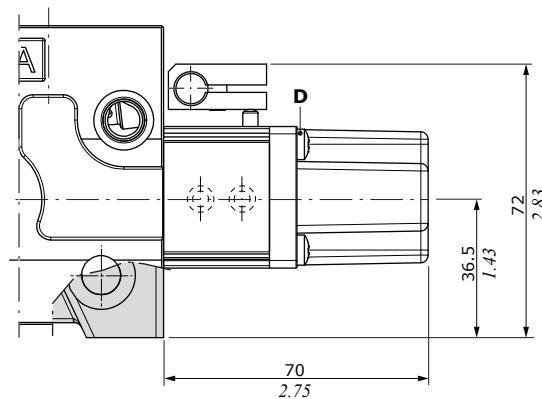
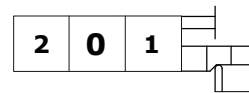
N1-A3 type
Micro operation in position 1 and 2



N1A-A3 type
Micro operation in position 1



N1B-A3 type
Micro operation in position 2

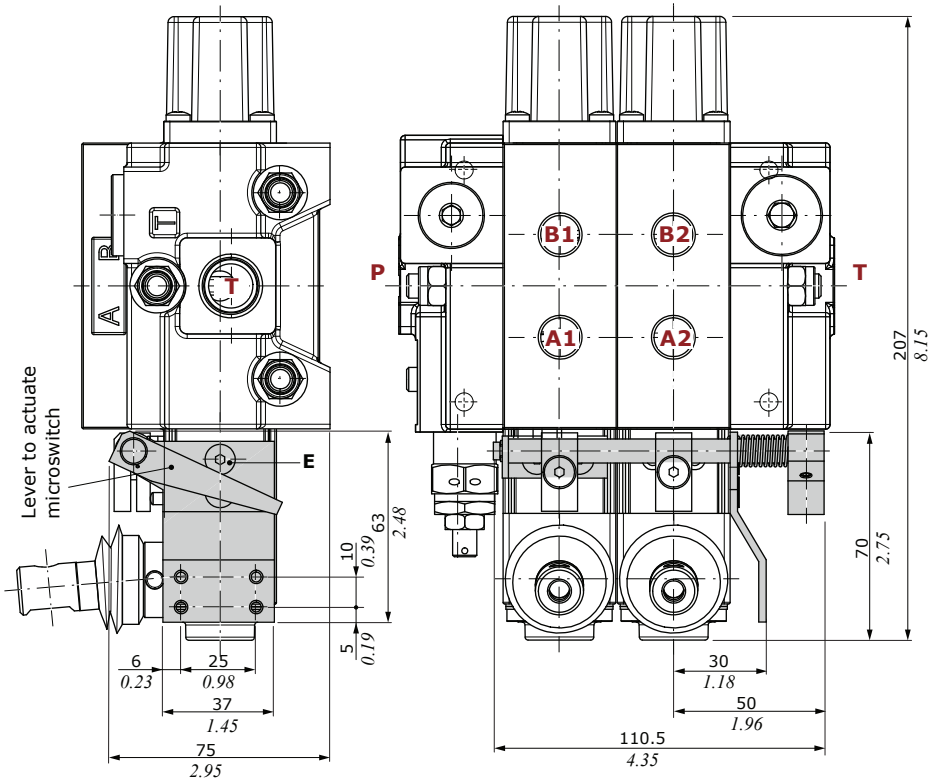


Wrenches and tightening torques
C = allen wrench 3 - 3 Nm (2.2 lbf^t)
D = cross-head - 3 Nm (2.2 lbf^t)

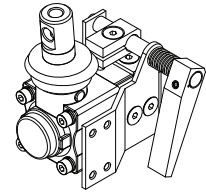
A side controls

With spool position microswitch

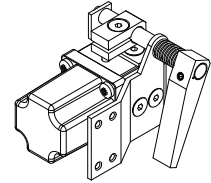
Microswitch assembly kit for 2 working section (N1-A1 type)



with cap



with lever box



Wrenches and tightening torques
E = allen wrench 3 - 6.6 Nm (4.8 lbf_t)

Drawings is referred to a Q30 sectional valve.

Working section

B side controls

With spring return control

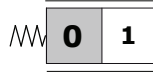
M1 type

3 position, spring return in neutral position.
Available with aluminium cap



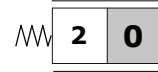
M2 type

2 position (0-1), spring return in neutral position.
Available with aluminium cap



M3 type

2 position (0-2), spring return in neutral position.
Available with aluminium cap



M1/01 type

As M1 type, for joystick control.
Available with aluminium cap

M1/05 type

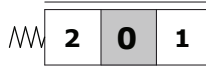
As M1 type, for series spool

M1/06 type

As M1/05 type, with aluminium cap

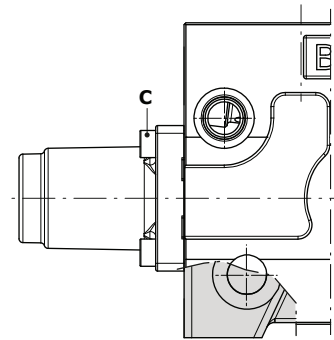
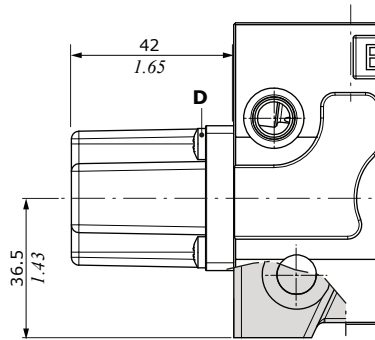
M1/07 type

As M1 type, for joystick series spool.
Available with aluminium cap



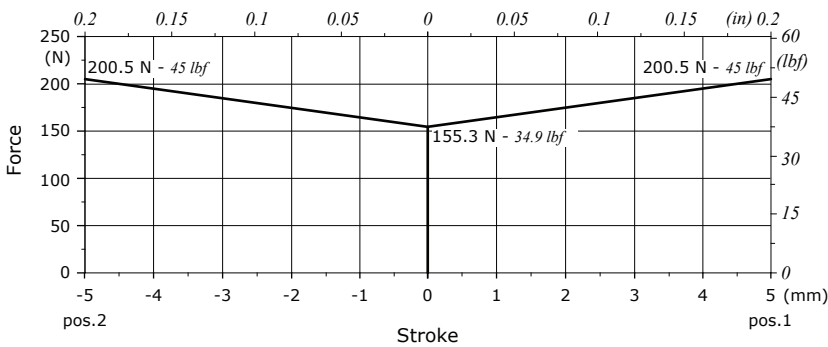
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = cross-head - 3 Nm (2.2 lbf_t)
- E = wrench 10 - 9.8 Nm (7.2 lbf_t)
- F = allen wrench 4 - 9.8 Nm (7.2 lbf_t)



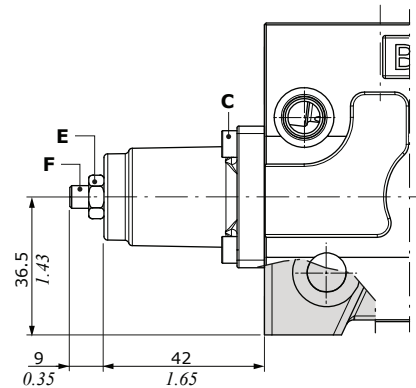
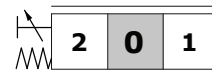
With aluminium cap; dimensions are the same of standard type

M1 control type - Force vs. Stroke diagram



M1/02 type

As M1 type, with stroke limiter



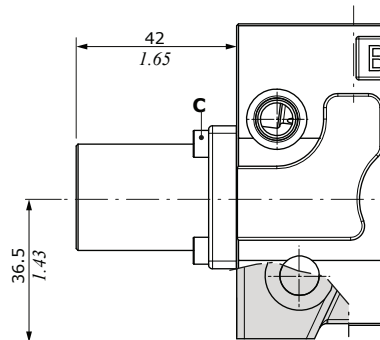
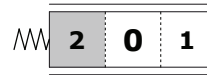
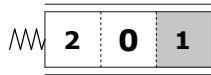
B side controls

With spring return control

M4 types

2 position (1-2),
spring return in position 1

2 position (2-1),
spring return in position 2

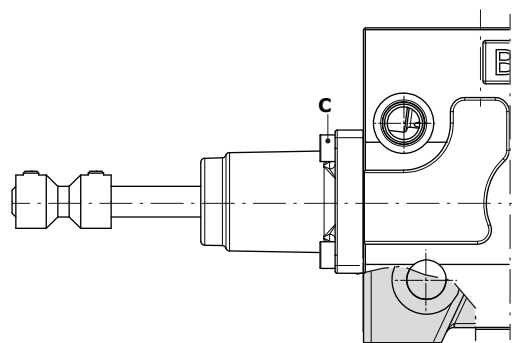
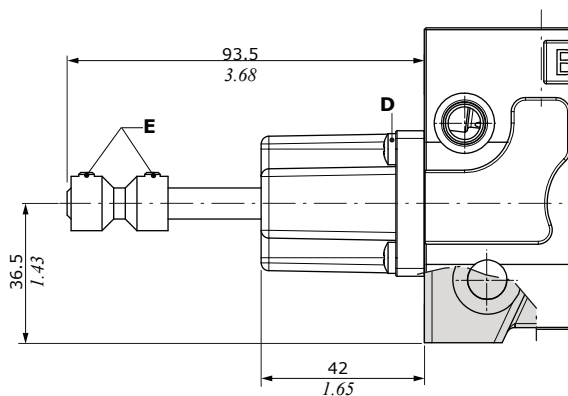
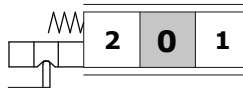


Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf^t)
- D = cross-head - 3 Nm (2.2 lbf^t)
- E = allen wrench 3 - 5 Nm (3.68 lbf^t)

M1-B1 type

3 position, microswitch arrangement.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

Working section

B side controls

With spring return control

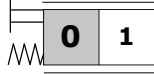
M1-U1 type

3 position, with M8 male thread external pin



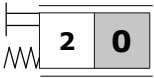
M2-U1 type

2 position (0-1), with M8 male thread external pin



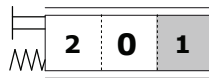
M3-U1 type

2 position (0-2), with M8 male thread external pin



M4-U1 type

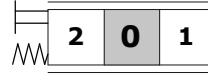
2 position (1-2), with M8 male thread external pin



With flexible cable control arrangement

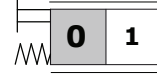
M1-U2 type

3 position, spring return in neutral position



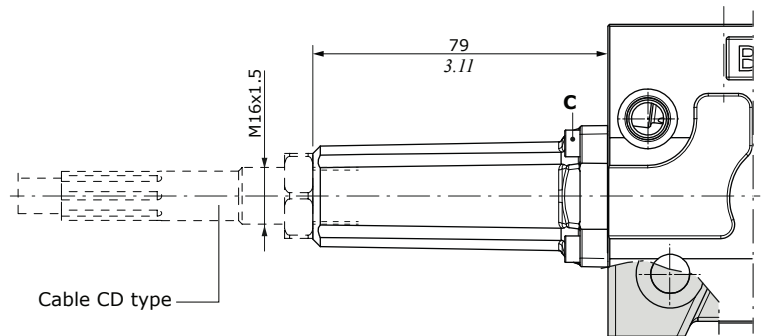
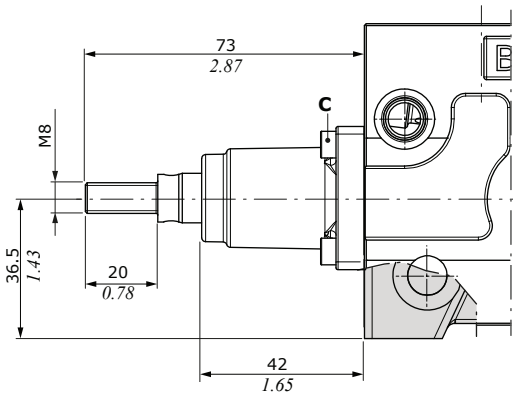
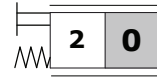
M2-U2 type

2 position (0-1), spring return in neutral position



M3-U2 type

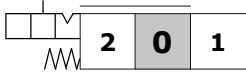
2 position (0-2), spring return in neutral position



With detent control

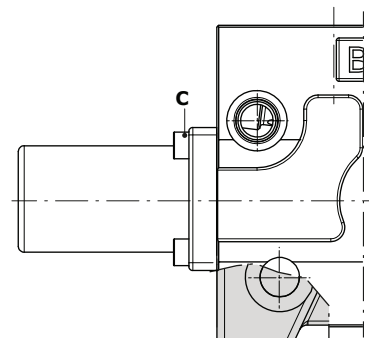
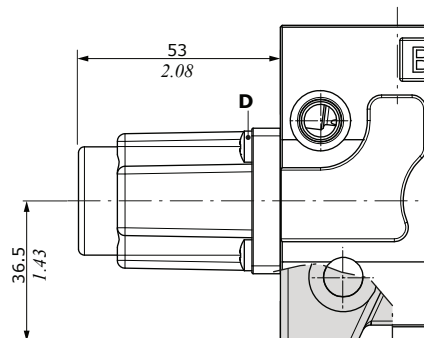
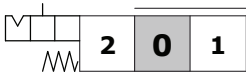
R1 type

3 position, detent in position 1. Available with aluminium cap



R2 type

3 position, detent in position 2. Available with aluminium cap



With aluminium cap; dimensions are the same of standard type

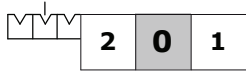
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)
D = cross-head - 3 Nm (2.2 lbf^t)

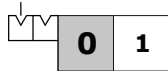
B side controls

With detent control

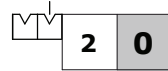
R3 type
3 position,
detent in all position.
Available with aluminium cap



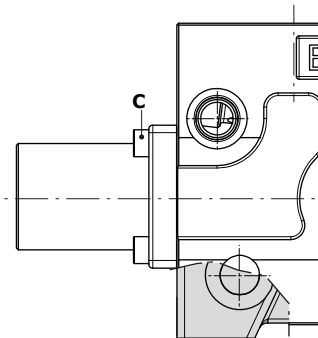
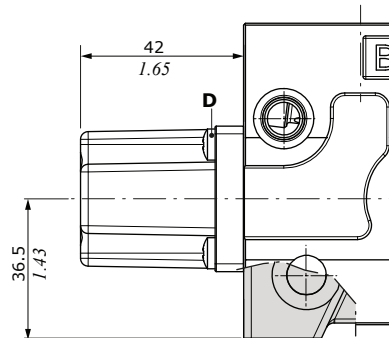
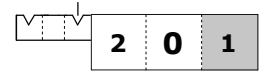
R4 type
2 position,
detent in position 0-1.
Available with aluminium cap



R5 type
2 position,
detent in position 0-2.
Available with aluminium cap



R6 type
2 position,
detent in position 1-2.
Available with aluminium cap

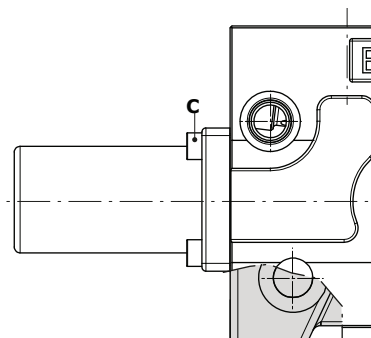
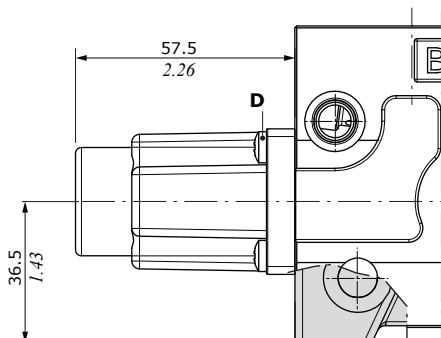
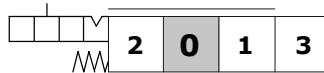


With aluminium cap;
dimensions are the same of standard type

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)
D = cross-head - 3 Nm (2.2 lbf^t)

R8 type
4 position, detent in 4th position, for 116 floating spool type.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

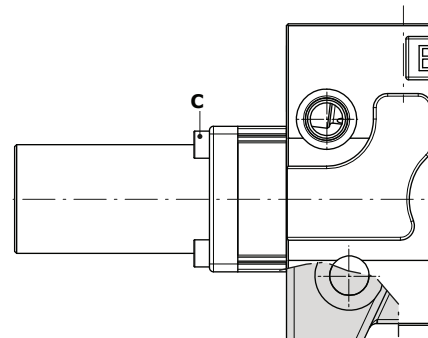
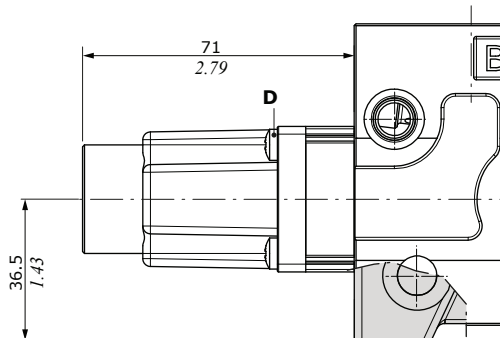
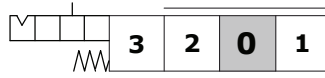
Working section

B side controls

With detent control

R10/Z1 type

4 position, detent in 4th position, for 126 floating spool type.
Available with aluminium cap

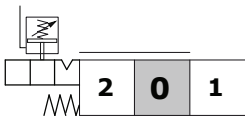


With aluminium cap;
dimensions are the same of standard type

With detent control and kick out function

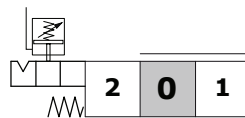
R1K type

3 position, detent in position 1.
Available with aluminium cap



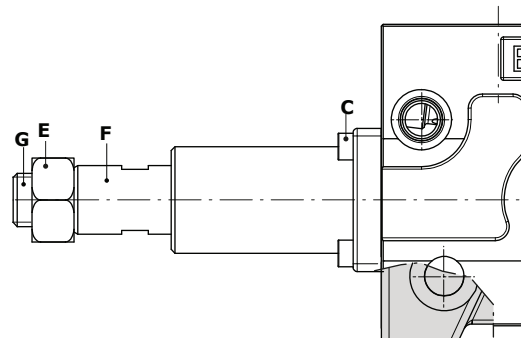
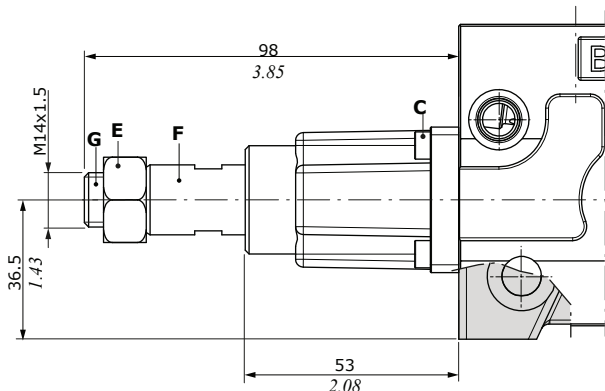
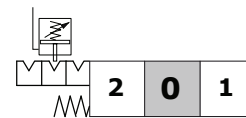
R2K type

3 position, detent in position 2.
Available with aluminium cap



R3K type

3 position, detent in all position.
Available with aluminium cap



With aluminium cap;
dimensions are the same of standard type

Wrenches and tightening torques

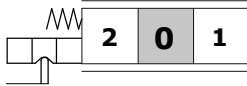
- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = cross-head - 3 Nm (2.2 lbft)
- E = wrench 22 - 32 Nm (23.6 lbft)
- F = wrench 16
- G = allen wrench 10 - 32 Nm (23.6 lbft)

B side controls

With spool position microswitch

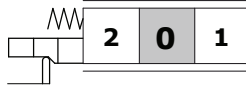
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position.
Available with aluminium cap



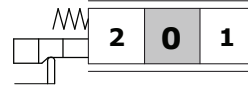
M1-N1A type

3 position, micro operation in position 1.
Available with aluminium cap



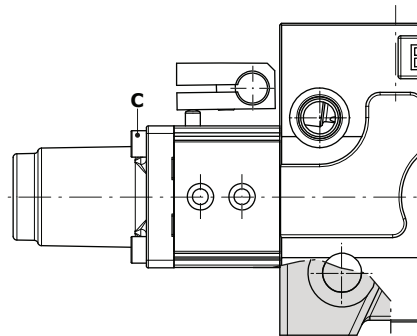
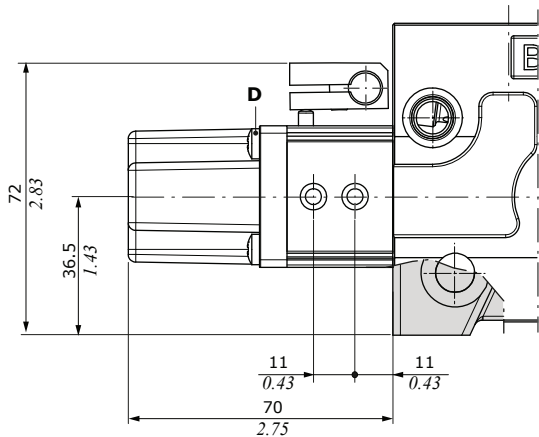
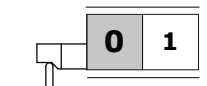
M1-N1B type

3 position, micro operation in position 2.
Available with aluminium cap



M2-N1 type

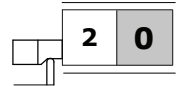
2 position (0-1) spring return in neutral position



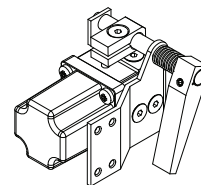
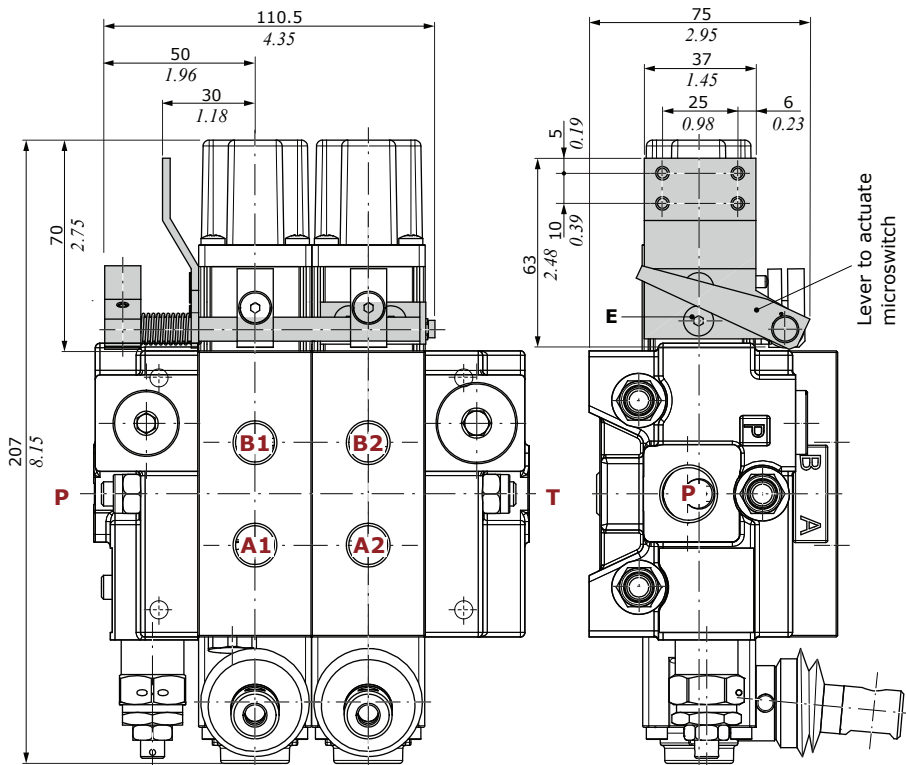
With aluminium cap; dimensions are the same of standard type

M3-N1 type

2 pos. (0-2) spring return in neutral position



Microswitch assembly kit for 2 working section (M1-N1 type)



Wrenches and tightening torques

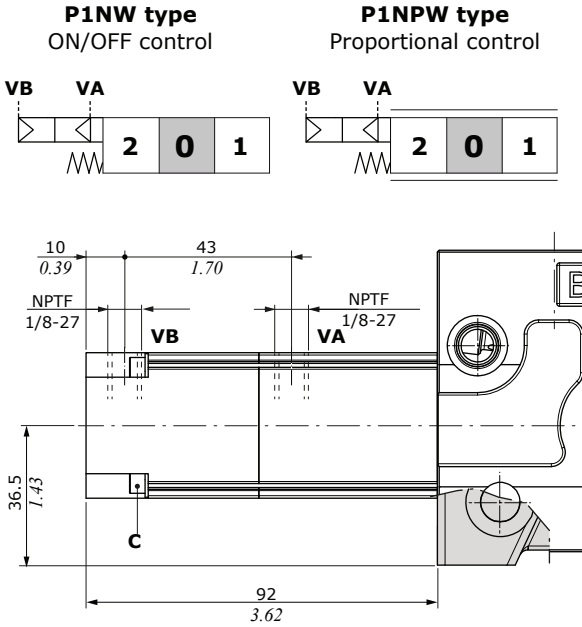
- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = cross-head - 3 Nm (2.2 lbft)
- E = allen wrench 3 - 6.6 Nm (4.8 lbft)

Drawings is referred to a Q30 sectional valve.

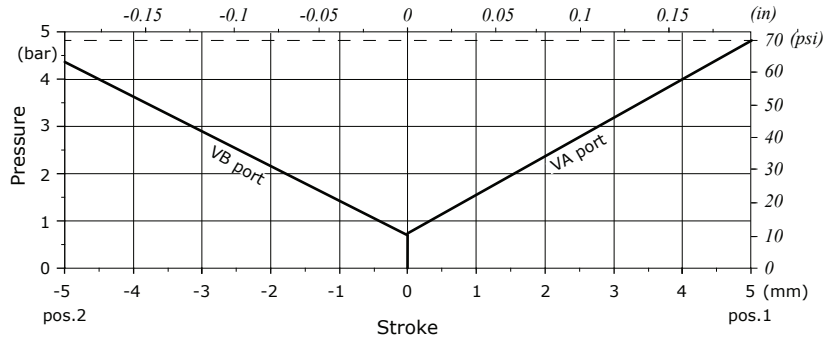
Working section

B side controls

With pneumatic control



Proportional pilot pressure curves



Operating features

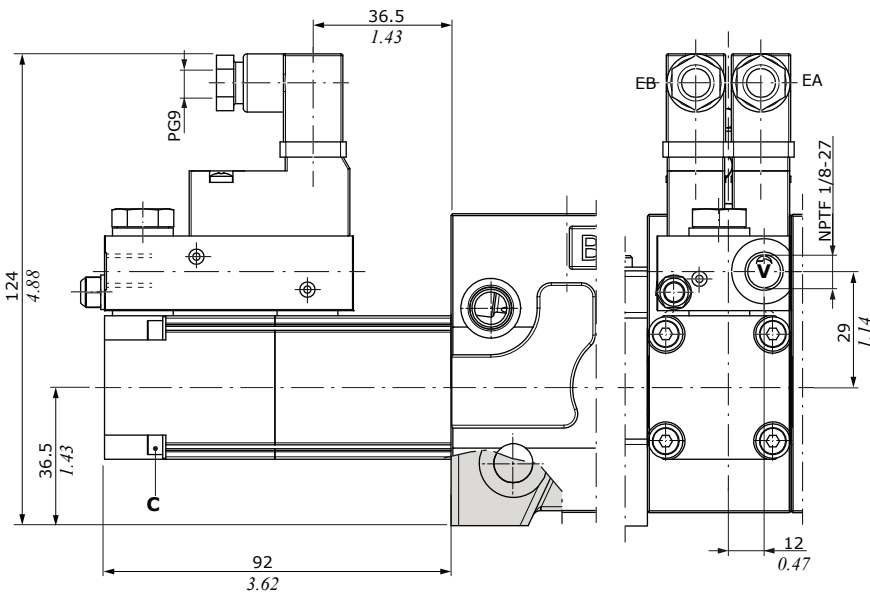
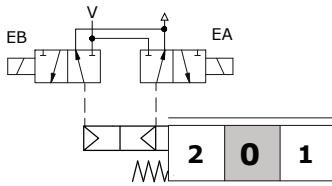
Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
 Pilot volume..... : 4 cm³/min (0.24 in³/min)

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)

With ON/OFF electropneumatic control

D3 type ON/OFF control



Operating features

Pilot pressure..... : min. 1 bar (14.5 psi)
 max. 10 bar (145 psi)

COILS

Nominal voltage tolerance..... : -5% +10%
 Power rating..... : 2.3 W
 Nominal current..... : 12 VDC - 24VDC
 Coil insulation..... : Class F
 Weather protection..... : IP65
 Duty cycle..... : 100%

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)

A+B side controls

Whit cam control

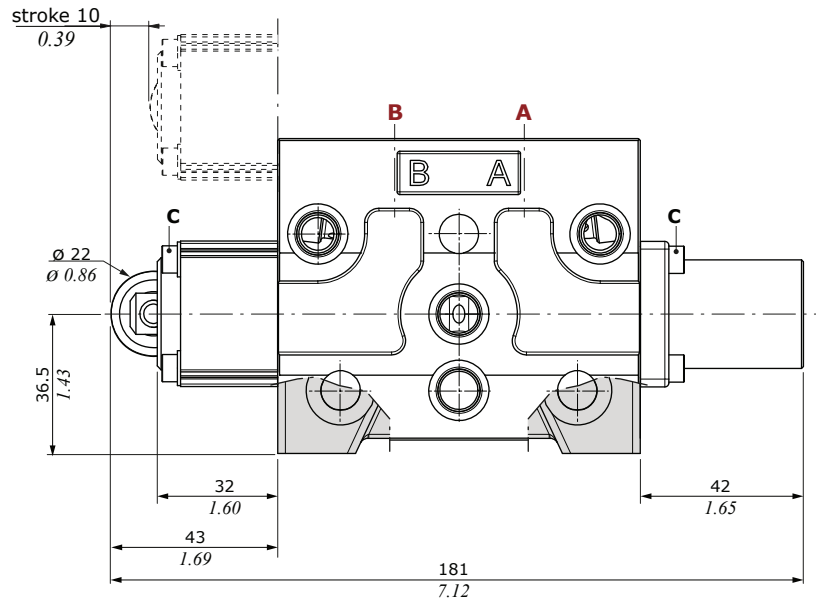
C2 type

From position 1 to position 2,
spring return in position 1



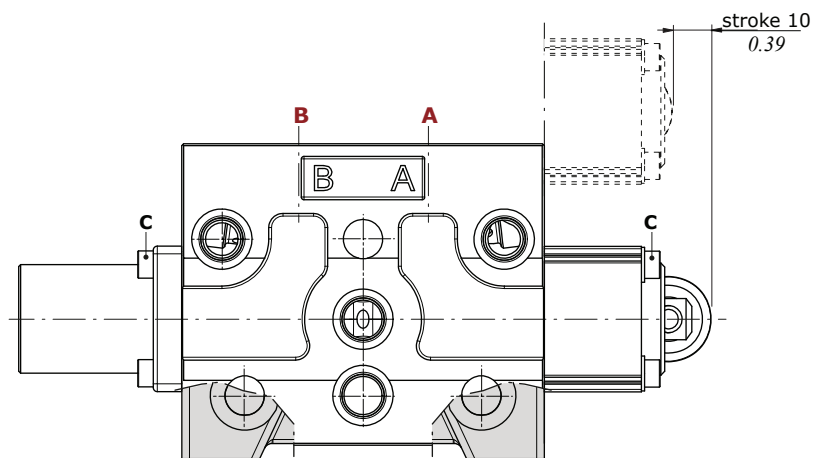
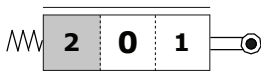
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)



C3 type

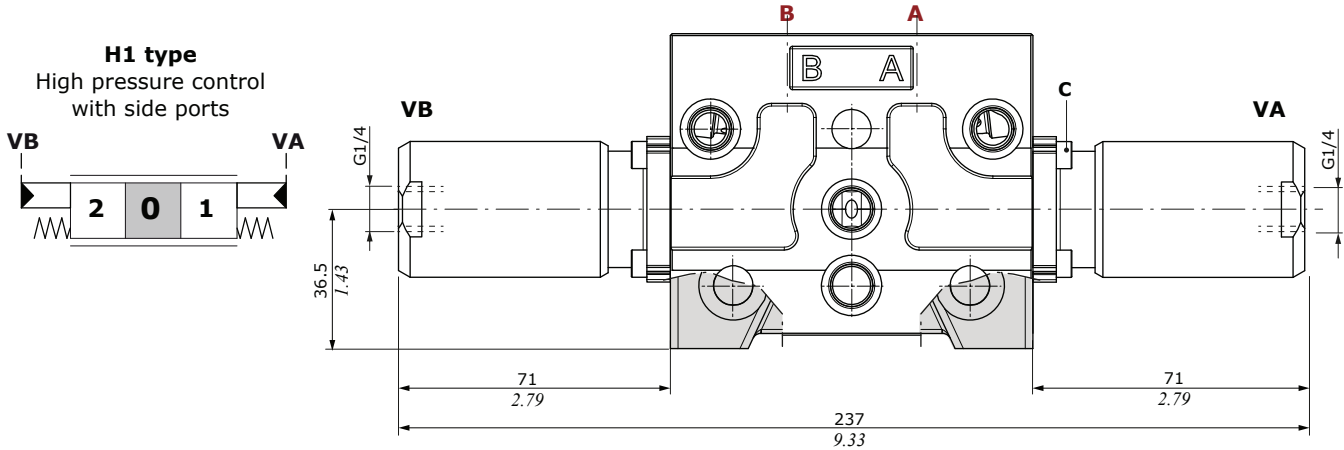
From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type



Working section

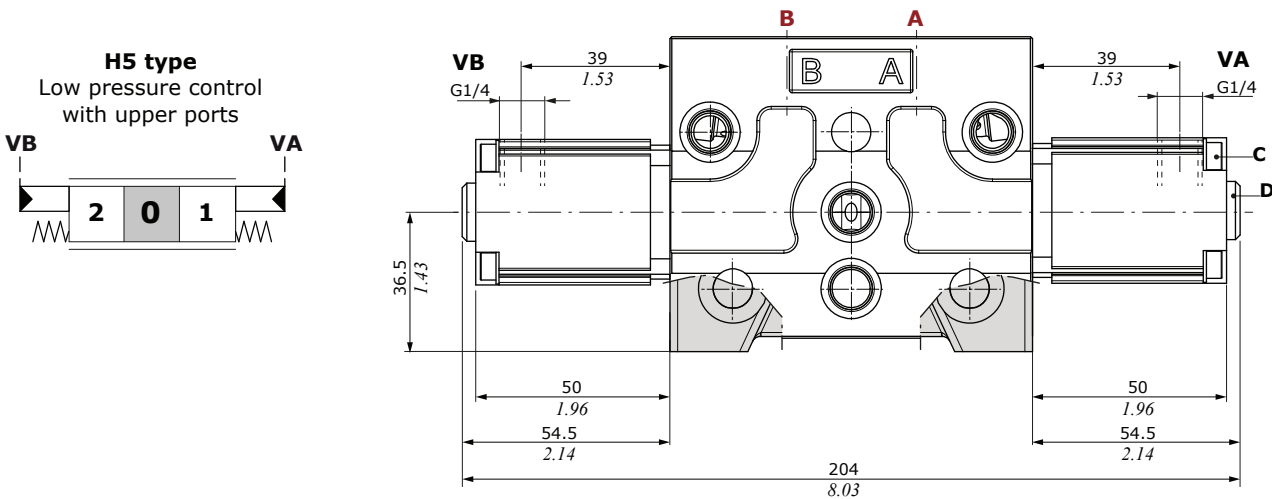
A+B side controls

With proportional hydraulic controls



Operating features

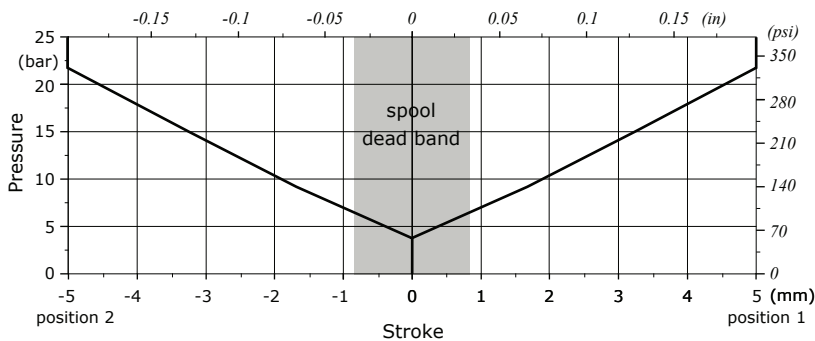
Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)



Operating features

Pilot pressure..... : max. 100 bar (1450 psi)

Stroke vs. Pressure diagram for H5 type control



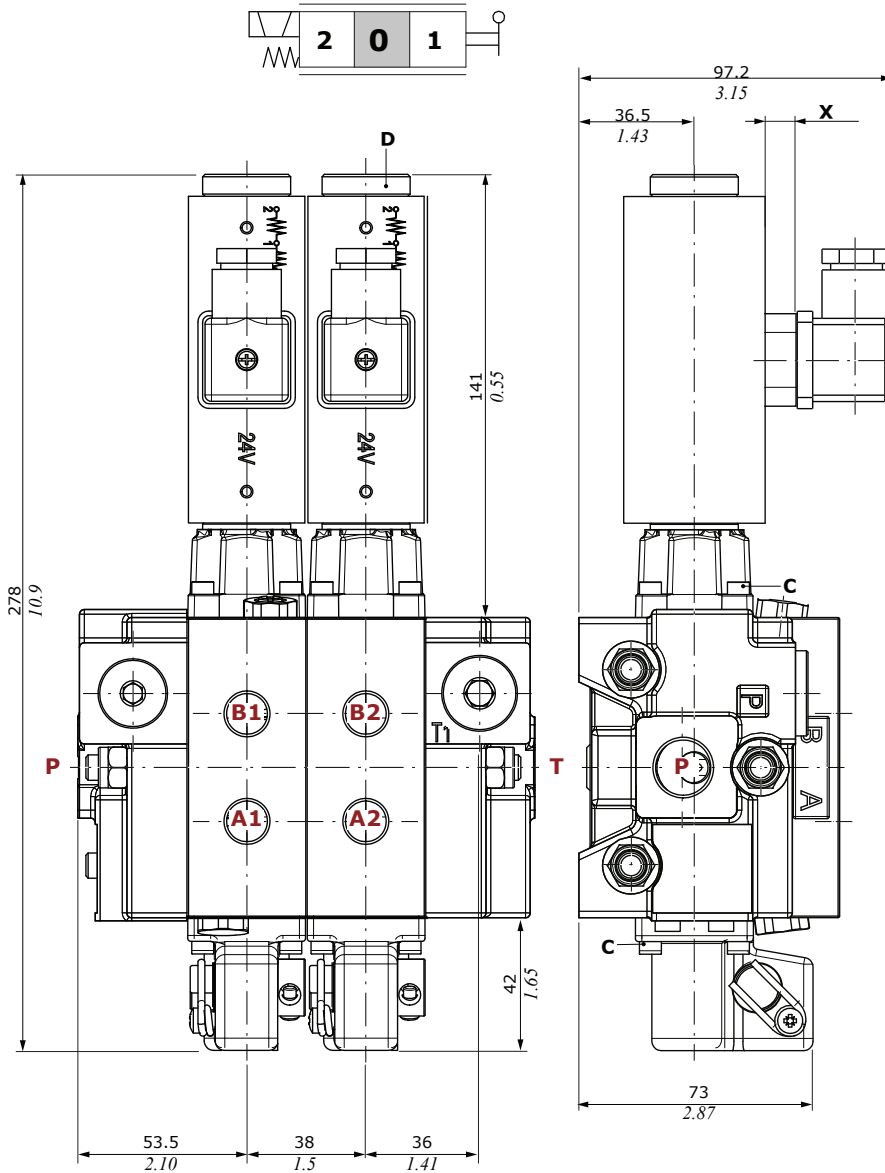
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf)
 D = allen wrench 4 - 9.8 Nm (7.2 lbf)

Direct solenoid control

D41 type: ON/OFF one side

Drawings is referred to a Q30 sectional valve.



D41 coil		
	Q30	Q50
Nominal voltage	12 VDC	24 VDC
Nominal voltage tolerance	±10%	
Power rating	58 W	52 W
Insulance	Class H	
Weather protection	IP65	

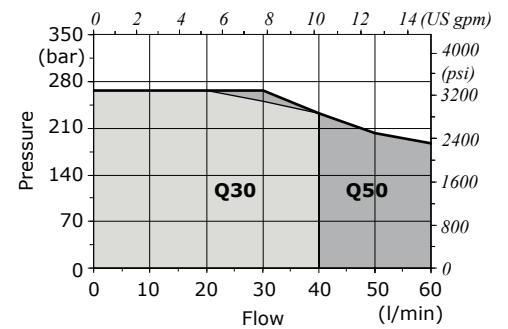
Connector type: ISO4400 3P+T-PG11

X		
	coil type	
	mm - in	
Q30	ZEB012 coil	10 - 0.39
	ZEB024 coil	
Q50	4SLG111200 coil	8 - 0.31
	4SLG111200 coil	

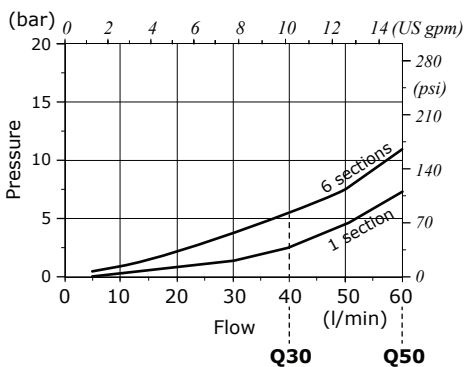
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = manual tightening - 6.6 Nm (7.2 lbft)

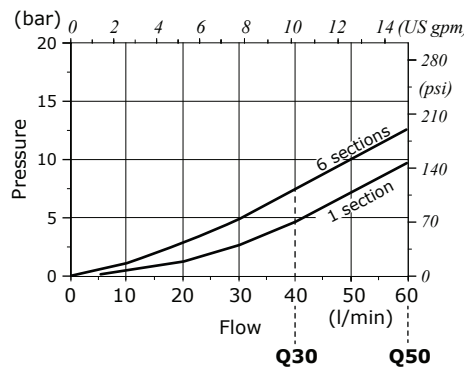
Dynamic conditions



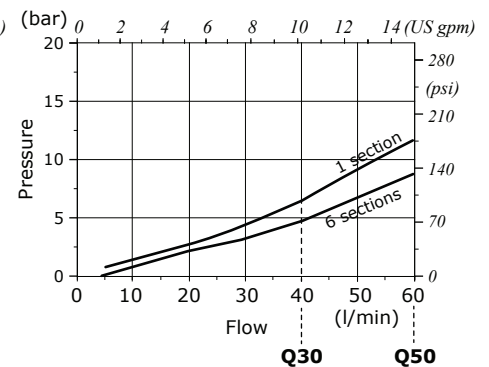
P⇒T pressure drops



P⇒A(B) pressure drops



A(B)⇒T pressure drops

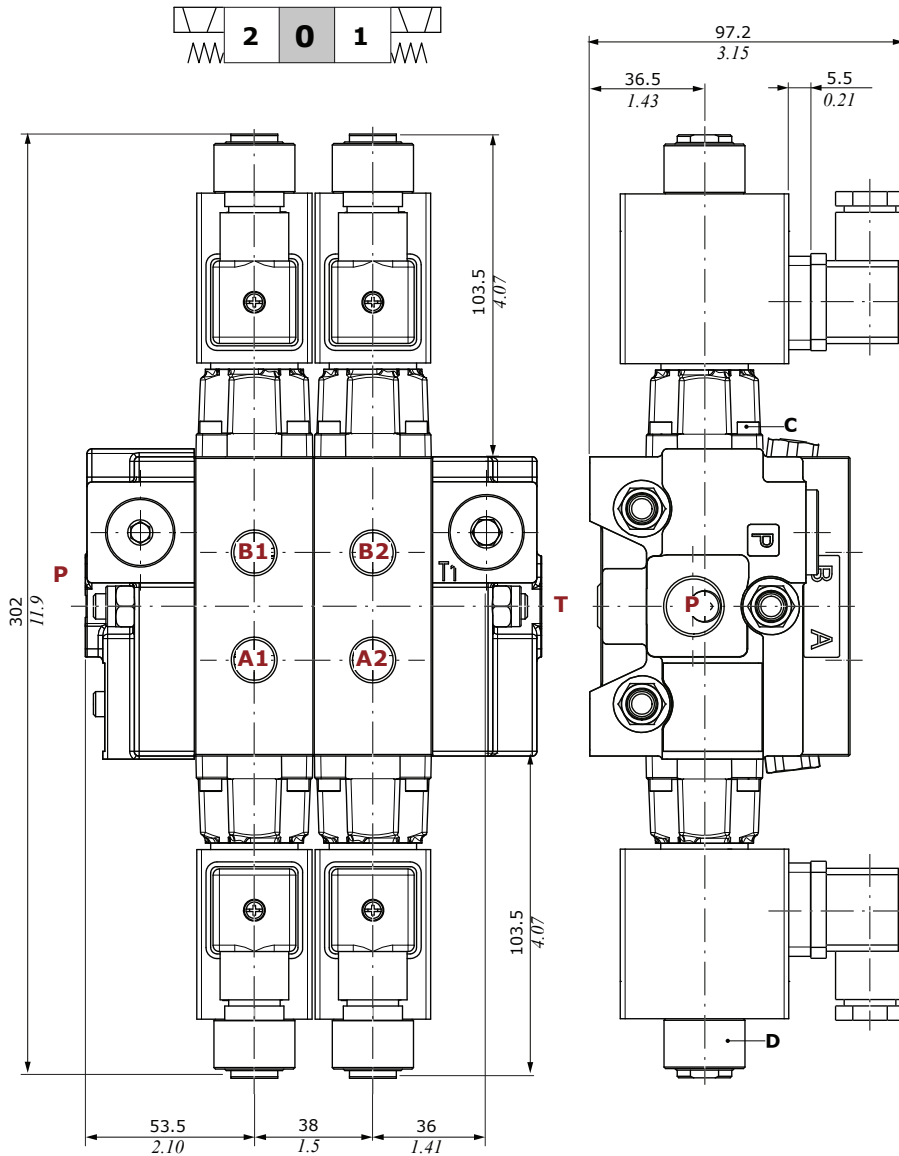


Working section

Direct solenoid control

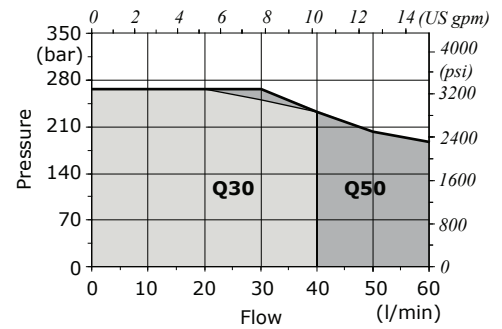
D9 type: ON/OFF two side

Drawings is referred to a Q30 sectional valve.



D9 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	58 W
Insulance	Class H
Weather protection	IP65
Connector type: ISO4400 3P+T-PG11	

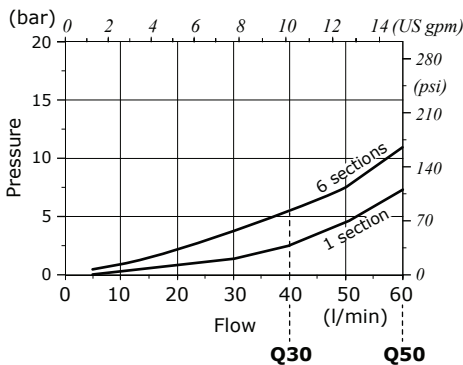
Dynamic conditions



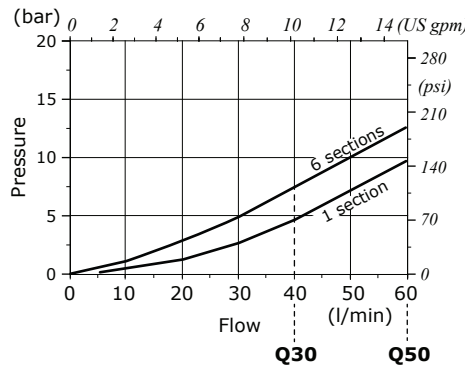
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf)
- D = manual tightening - 6.6 Nm (4.8 lbf)

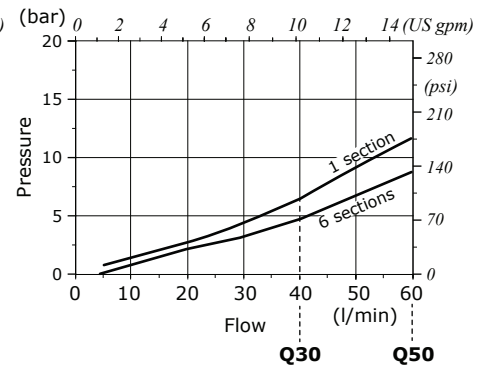
P⇒T pressure drops



P⇒A(B) pressure drops



A(B)⇒T pressure drops



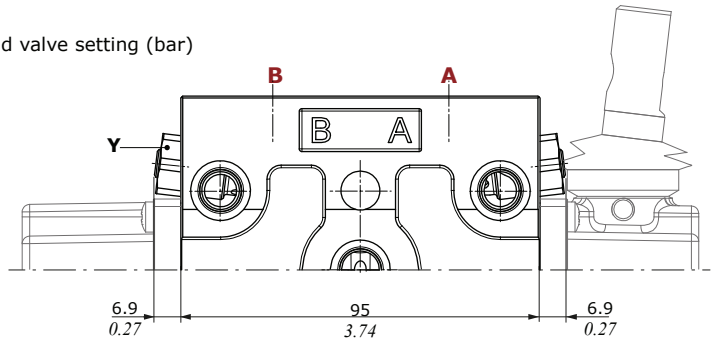
Auxiliary valve configuration

Dimensional data, hydraulic circuits and performance data

Description example

Q30 / 1 / ... / 103 - A1 - M1 - **V32(N)120** / ...

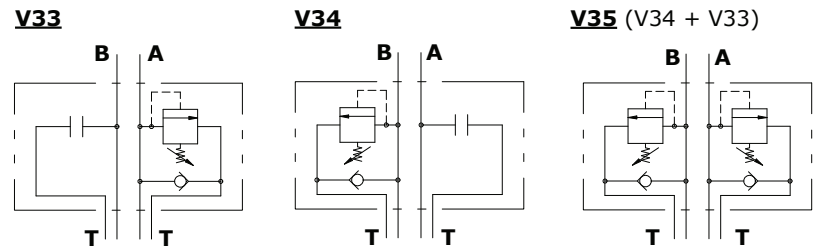
aux valve spring type and valve setting (bar)



Wrenches and tightening torques
 Y = wrench 16 - 20 Nm (14.7 lbf)

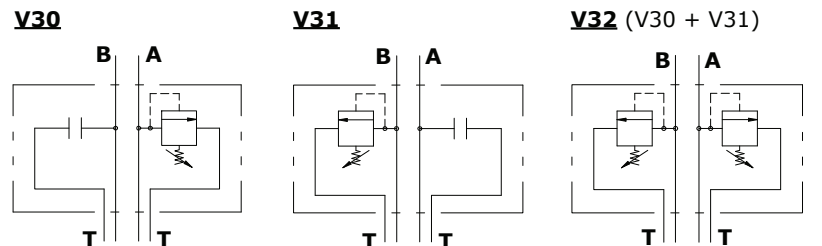
Antishock/anticavitation valve example

A side configuration: B side configuration: A+B side configuration:



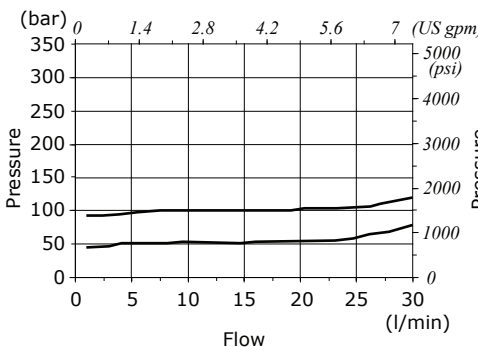
Antishock valve example

A side configuration: B side configuration: A+B side configuration:

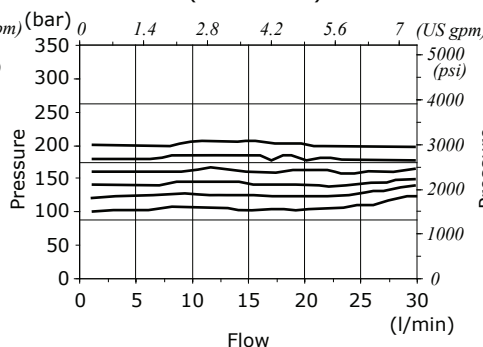


Spring type	Setting ranges (bar - psi)
B (white)	From 50 to 100 - from 725 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 350 - from 2910 to 5100

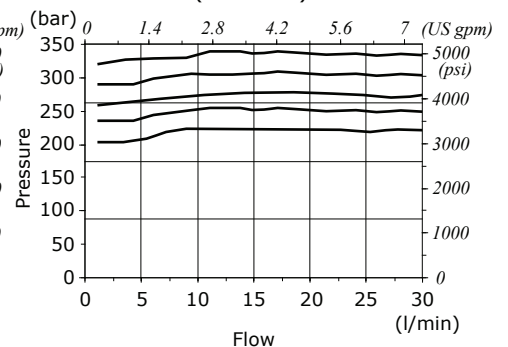
Setting range example (white band)



Setting range example (black band)



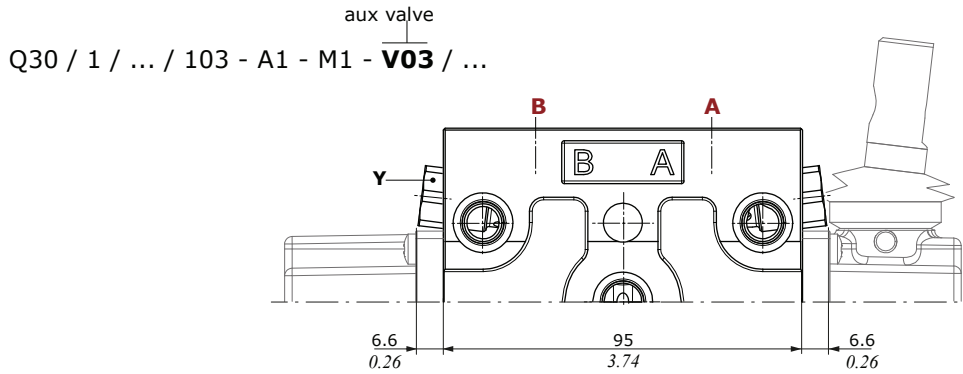
Setting range example (red band)



Auxiliary valve configuration

Dimensional data and hydraulic circuits

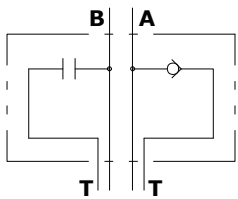
Anticavitation valve example



Wrenches and tightening torques
Y = wrench 16 - 20 Nm (14.7 lbf)

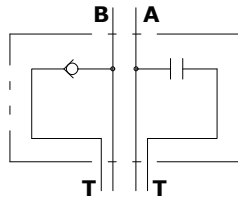
A side configuration:

V04



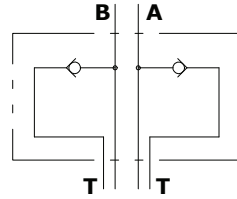
B side configuration:

V05



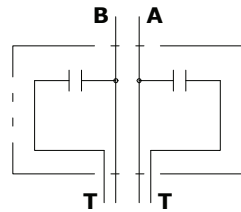
A+B side configuration:

V03 (V04 + V05)

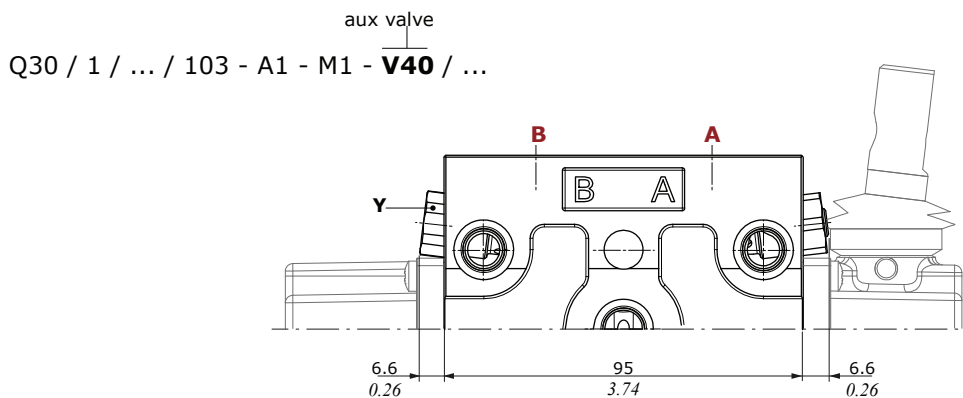


Plug valve:

VC

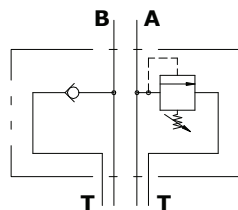


Antishock and anticavitation combining valves example



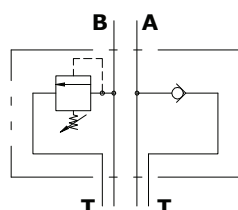
A side configuration:

V40 (V30 + V05)



B side configuration:

V41 (V31 + V04)



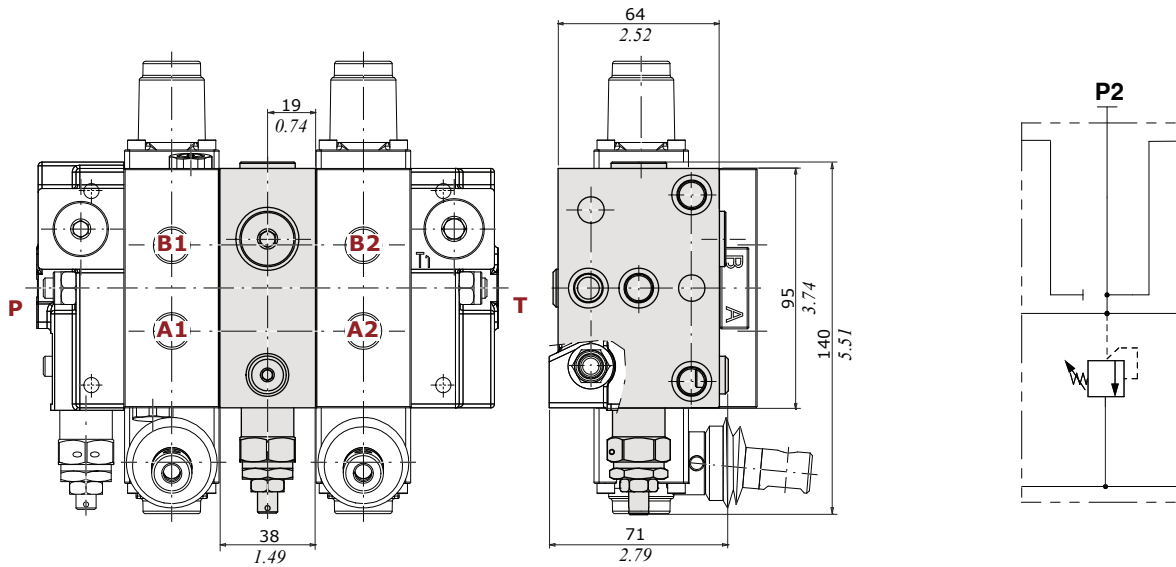
Intermediate section

Dimensional data and hydraulic circuit

Drawings is referred to a Q30 sectional valve.

E50 type

Intermediate inlet section with pressure relief valve

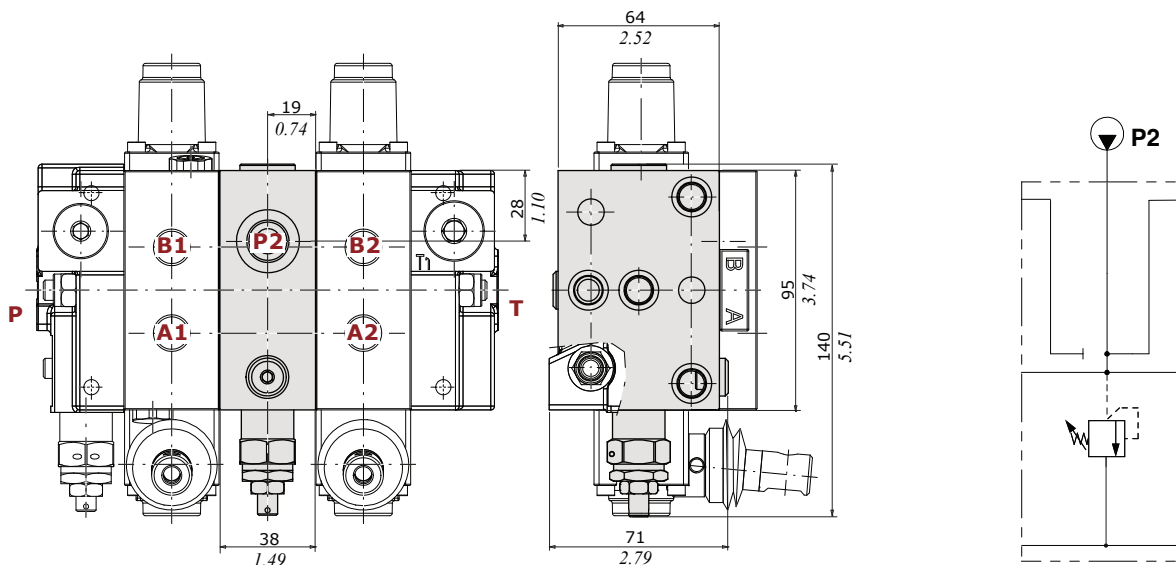


Description example: Q30/2/F7S(N150)/103-A1-M1.VC/**E50(N150)**/103-A1-M1/F3D-S

intermediate section spring type and valve setting (bar)

E53 type

Intermediate inlet section with pressure relief valve and P2 port open



Description example: Q30/2/F7S(N150)/103-A1-M1.VC/**E53(N150)**/103-A1-M1/F3D-S

intermediate section spring type and valve setting (bar)

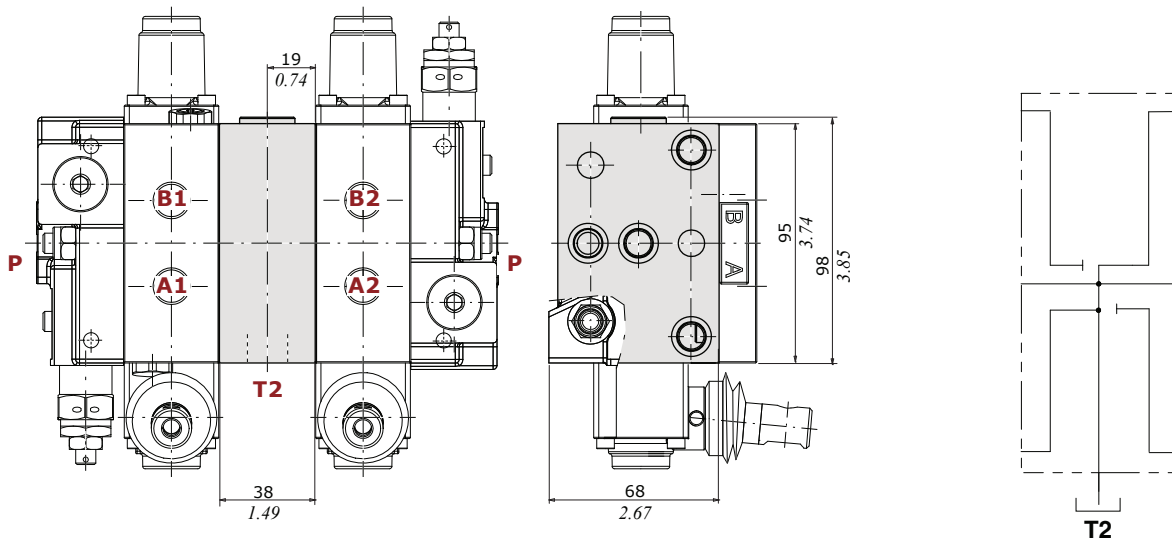
Intermediate section

Dimensional data and hydraulic circuit

Drawings is referred to a Q30 sectional valve.

E51 type

Intermediate outlet section, T2 port open

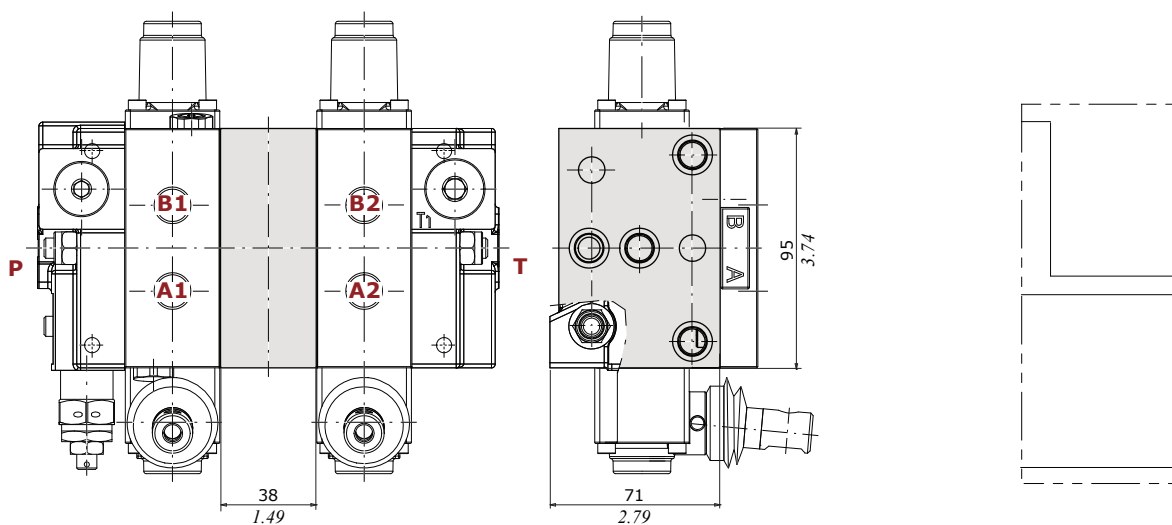


Description example: Q30/2/F7S(N150)/103-A1-M1.VC/**E51**/103-A1-M1/F3D-S

intermediate
section

E61 type

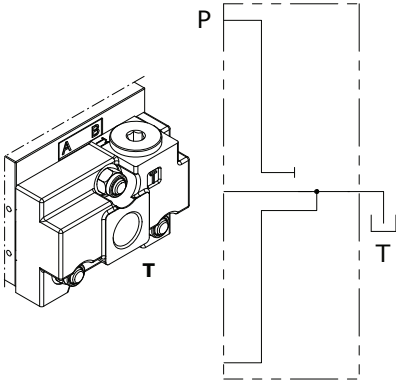
Intermediate spacer section



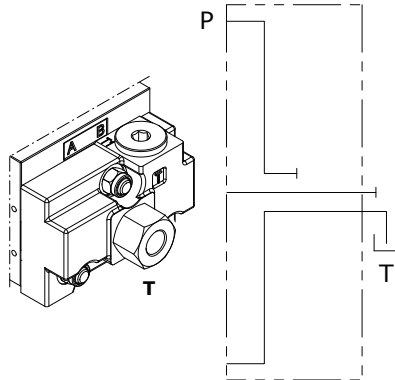
Description example: Q30/2/F7S(N150)/103-A1-M1.VC/**E61**/103-A1-M1/F3D-S

intermediate
section

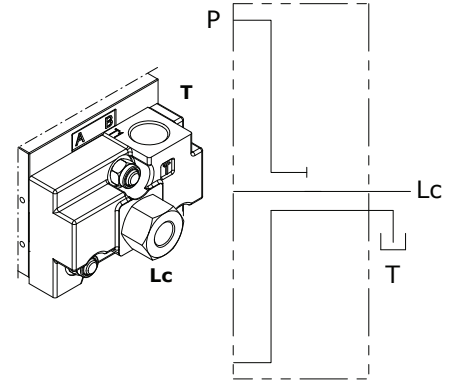
F3D configuration
Open center configuration



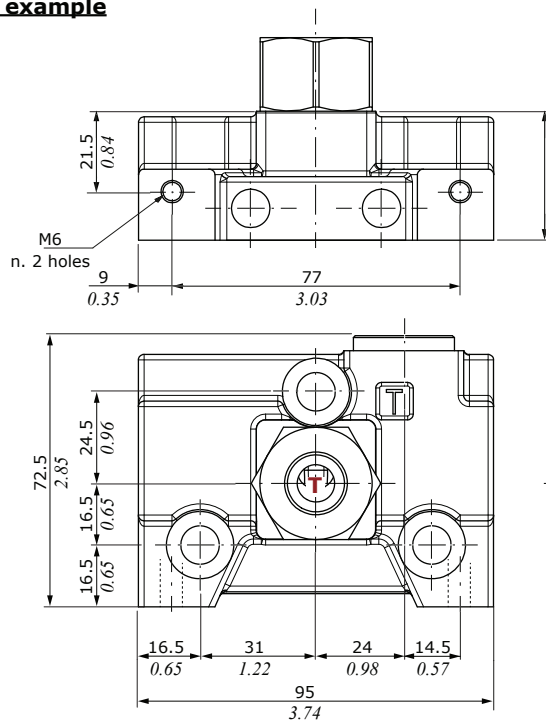
F16D configuration
Closed center configuration



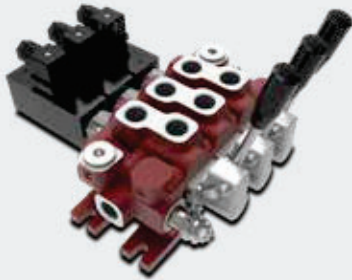
F6D configuration
Carry-over configuration



F16D configuration example



Wrenches and tightening torques
E = allen wrench 8 - 42 Nm (30.9 lbft)
F = wrench 30 - 42 Nm (30.9 lbft)



GSV50

Sectional directional control valve

- Available with parallel circuit
- Optional carry over port
- A wide range of antishock + anticavitation port valves
- Mechanical, pneumatic, electropneumatic, hydraulic and direct solenoid controls

Working conditions

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

Nominal flow rating		50 l/min - (13.2 Us gpm)
Max. pressure		315 bar (4550 psi)
Max. back pressure on outlet T port		25 bar (360 psi)
Number sections		from 1 to 10
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	5 cm ³ /min (0.30 in ³ /min)
Fluid		Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -20°C to 80°C - from -4 °F to 176 °F
Viscosity	operating range	from 12 to 400 mm ² /s - from 12 to 400 cSt
Max. contamination level		-/19/16 - ISO 4406 - NAS1638 class 6
Ambient temperature	with pneumatic and hydraulic devices	from -30°C to 60°C - from -22 °F to 140 °F
	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F

NOTE - For different conditions please contact our Sales Department.

REFERENCE STANDARD

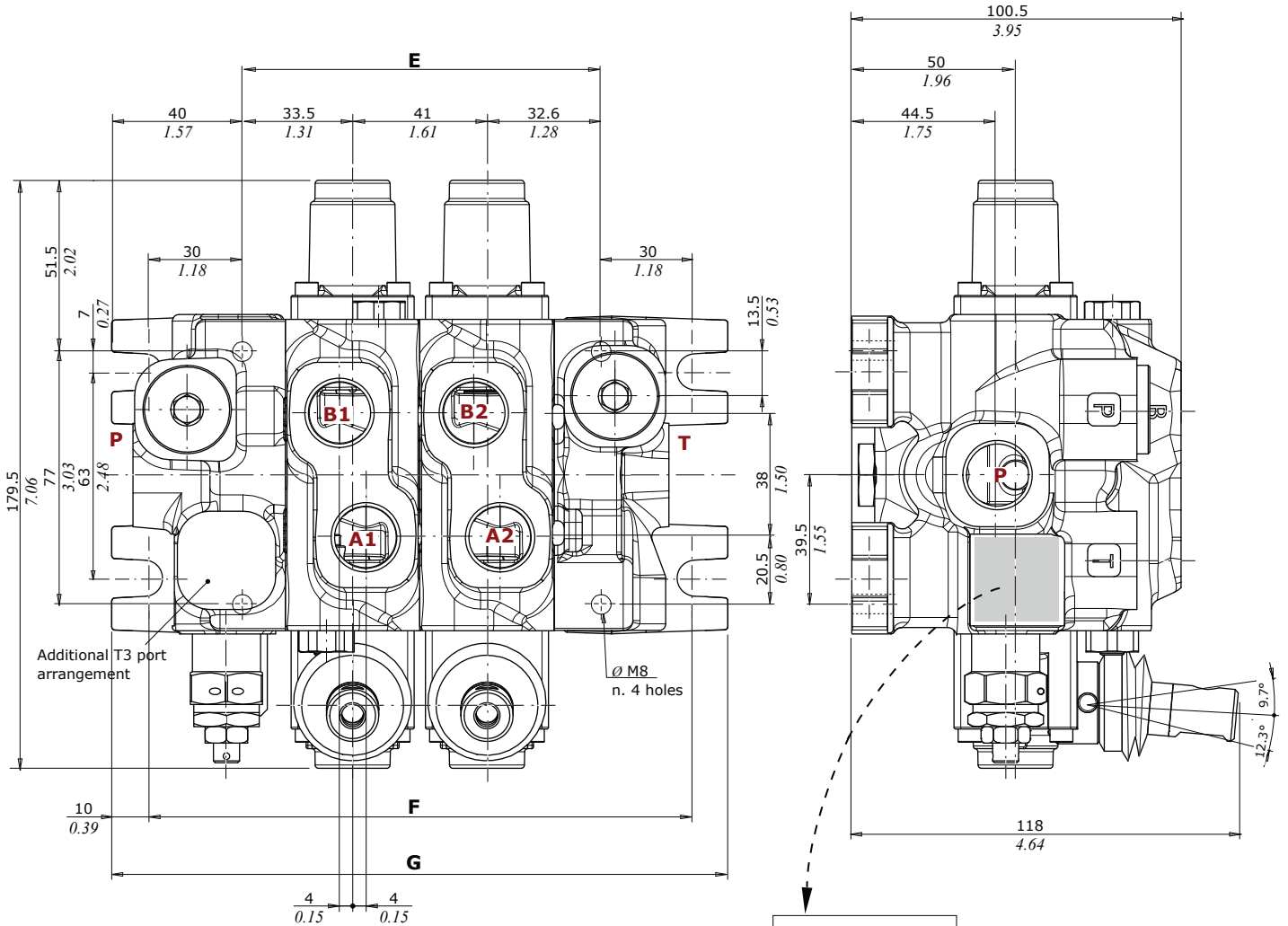
		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926
	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING

PORTS	BSP	UN-UNF
P Inlet	G 1/2	3/4-16 (SAE 8)
P1 Inlet	G 1/2	3/4-16 (SAE 8)
A and B ports	G 1/2	3/4-16 (SAE 8)
T Outlet	G 1/2	7/8-14 (SAE 10)
T1 Outlet	G 1/2	3/4-16 (SAE 8)
Lc port (Carry-over plug - T port)	G 3/8-G 1/2	3/4-16 (SAE 8) - 7/8-14 (SAE 10)
Hydraulic controls	G 1/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

Standard configuration*



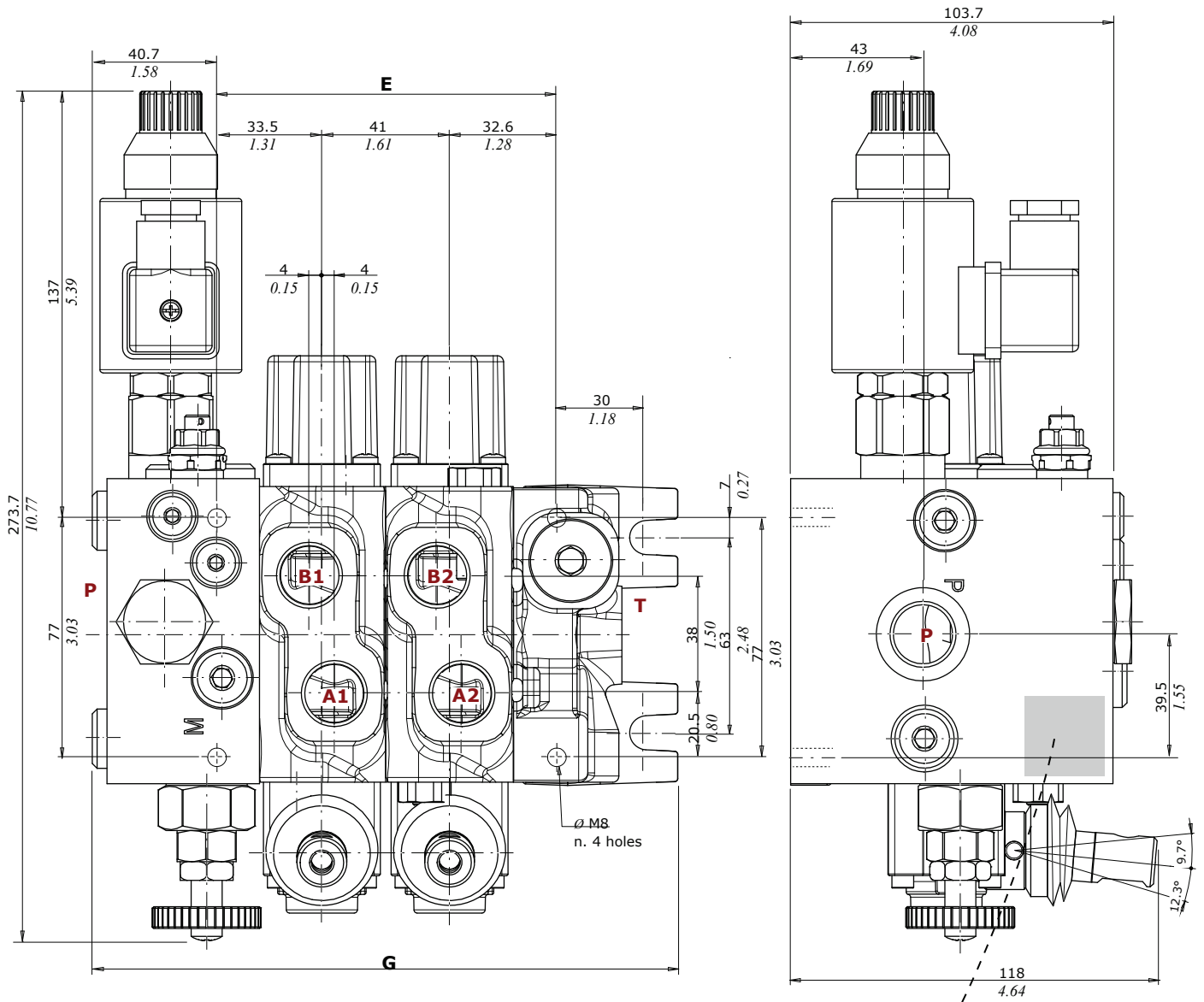
Type	E		F		G	
	mm	in	mm	in	mm	in
GSV50/1	66.1	2.60	126	4.96	146	5.74
GSV50/2	107.1	4.21	167	6.57	187	7.36
GSV50/3	148.1	5.83	208	8.18	228	8.97
GSV50/4	189.1	7.44	249	9.80	269	10.60
GSV50/5	230.1	9.06	290	11.41	310	12.20
GSV50/6	271.1	10.67	331	13.03	351	13.81
GSV50/7	312.1	12.28	372	14.64	392	15.43
GSV50/8	353.1	13.90	413	16.25	433	17.04
GSV50/9	394.1	15.51	454	18.87	474	18.66
GSV50/10	435.1	17.12	495	19.48	515	20.27



Product code
Code description
Product allotment
Datamatrix with product allotment

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.
(*): For other configurations, see page 179

Proportional inlet section configuration*

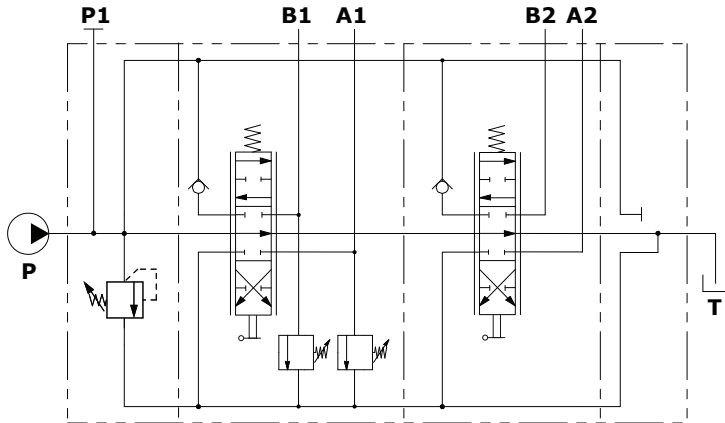


Type	E		G	
	mm	in	mm	in
GSV50/1	66.1	2.60	146.7	5.77
GSV50/2	107.1	4.21	187.7	7.38
GSV50/3	148.1	5.83	228.7	9
GSV50/4	189.1	7.44	269.7	10.61
GSV50/5	230.1	9.06	310.7	12.21
GSV50/6	271.1	10.67	351.7	13.84
GSV50/7	312.1	12.28	392.7	15.46
GSV50/8	353.1	13.90	433.7	17.07
GSV50/9	394.1	15.51	474.7	18.68
GSV50/10	435.1	17.12	515.7	20.30

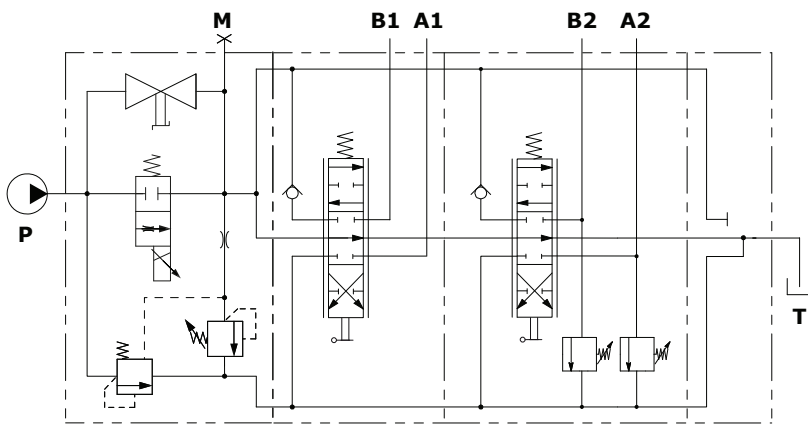
walvoil
 MADE IN ITALY
1GB75040009 ----- Product code
 DISTRIBUTORE
GSV50/2 ----- Code description
MD1600464-001 ----- Product allotment
 ----- Datamatrix with product allotment

NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.
 (*): For other configurations, see page 179

Hydraulic circuits



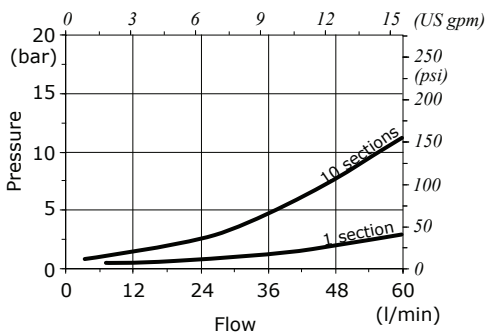
Description example (parallel circuit):
GSV50/2/F7S(N150)/
103-A1-M1.V32(N105\N105)/103-A1-M1/F3D-S



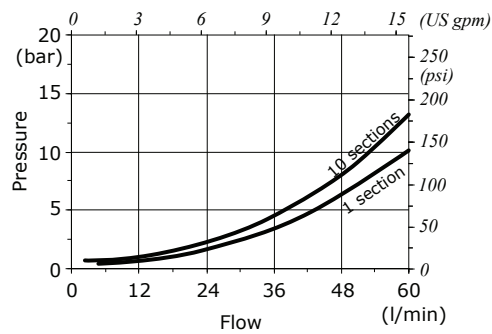
Description example (parallel circuit):
GSV50/2/F7SPRN3M(N150)-12VDC/
103-A1-M1/103-A1-M1.V32(N105\N105)/F3D-S

Performance data

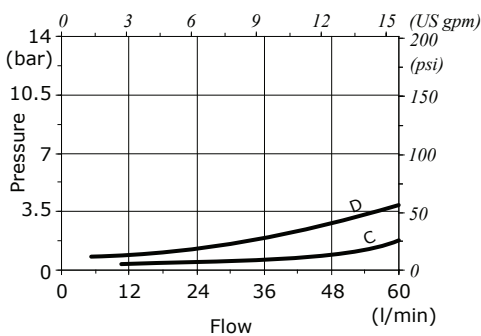
P⇒T pressure drops



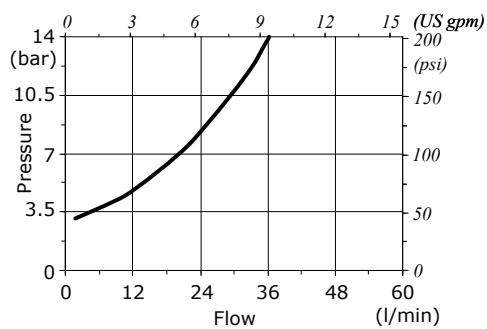
P⇒A(B) pressure drops



A(B)⇒T pressure drops



**A1(B1)⇒A2(B2) pressure drops
(with series circuit)**



Legenda

C= 10th section
D= 1st section

Complete section ordering codes

1 Inlet section* page 145

Standard inlet sections

TYPE: **FE-QGSV50/F7S(N150)** CODE: 05100F7S/D-N
 DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve, setting range 101-200 bar (1460-2900 psi)

TYPE: **FE-GSV50/F8S** CODE: 05103F8S/D
 DESCRIPTION: As previous one, without valves (pressure relief valve plugged port)

TYPE: **FE-GSV50/F7SMSE(NA)** CODE: 05100F7SDMS1-N
 DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve setting range 101-200 bar (1460-2900 psi), 12VDC normally open unloader valve

TYPE: **FE-GSV50/F7SMSE(NC)** CODE: 05100F7SDMS7-N
 DESCRIPTION: As previous one, with normally closed unloader valve

Inlet section with flow regulator

TYPE: **FE-GSV50/F7SPR3M(N150)** CODE: 05100F7SDPRN3M
 DESCRIPTION: Side inlet open, 12 VDC proportional flow control valve, pressure relief valve setting range 101-200 bar (1460-2900 psi), manual unloader valve

TYPE: **FE-GSV50/F7SPR3E(N150)-12VDC** CODE: 05100F7SDPRN3E
 DESCRIPTION: As previous one, with 12VDC unloader valve

2 Working section* page 154

With mechanical controls

TYPE: **EL-GSV50/103-A1-M1.VC-S** CODE: SGLS50000
 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position

TYPE: **EL-GSV50/103-A1-M1-S** CODE: SGLS50001
 DESCRIPTION: As previous one, without valve arrangement

With proportional hydraulic controls

TYPE: **EL-GSV50/103-H1.VC-S** CODE: SGLS50002
 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, high pressure hydraulic controls, spring return to neutral position

TYPE: **EL-GSV50/103-H1-S** CODE: SGLS50003
 DESCRIPTION: As previous one, without valve arrangement

TYPE: **EL-GSV50/103-H5.VC-S** CODE: SGLS50004
 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, low pressure hydraulic controls, spring return to neutral position

TYPE: **EL-GSV50/103-H5-S** CODE: SGLS50005
 DESCRIPTION: As previous one, without valve arrangement

With electric solenoid controls - one side type

TYPE: **EL-GSV50/103-A1-D41.VC-12VDC-S**
 CODE: SGLS50006
 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC electric direct ON/OFF control with lever

TYPE: **EL-GSV50/103-A1-D41-12VDC-S**
 CODE: SGLS50007
 DESCRIPTION: As previous one, without valve arrangement

With electric solenoid controls - two side type

TYPE: **EL-GSV50/103-D9.VC-12VDC-S** CODE: SGLS50008
 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC electric direct ON/OFF control

TYPE: **EL-Q30/103-D9-12VDC-S** CODE: SGLS50009
 DESCRIPTION: As previous one, without valve arrangement

3 Intermediate section page 179

TYPE	CODE	DESCRIPTION
E50	03850E50-B	With pressure relief valve, setting range 10-100 bar (145-1450 psi)
	03850E50-N	As previous one, setting range 101-200 bar (1460-2900 psi)
	03850E50-R	As previous one, setting range 201-380 bar (2910-5500 psi)
E53	03854E53-B	With pressure relief valve, setting range 10-100 bar (145-1450 psi) and P2 port open for 2 nd pump
	03854E53-N	As previous one, setting range 101-200 bar (1460-2900 psi)
	03854E53-R	As previous one, setting range 201-380 bar (2910-5500 psi)
E51	03853E51	Intermediate outlet section, T2 port open
E61	03885E61	Intermediate spacer section

4 Outlet section* page 181

TYPE: FS-GSV50-F3D	CODE: 05112F3D
DESCRIPTION: T port open, T1 port plugged. For open center circuit	
TYPE: FS-GSV50-F16D	CODE: 05116F16D
DESCRIPTION: T port open, T1 port plugged. For closed center circuit	
TYPE: FS-GSV50-F6D	CODE: 05114F6D
DESCRIPTION: Lc port and T1 port open. With joint for carry-over (HPCO) circuit	

5 Tie rod kit

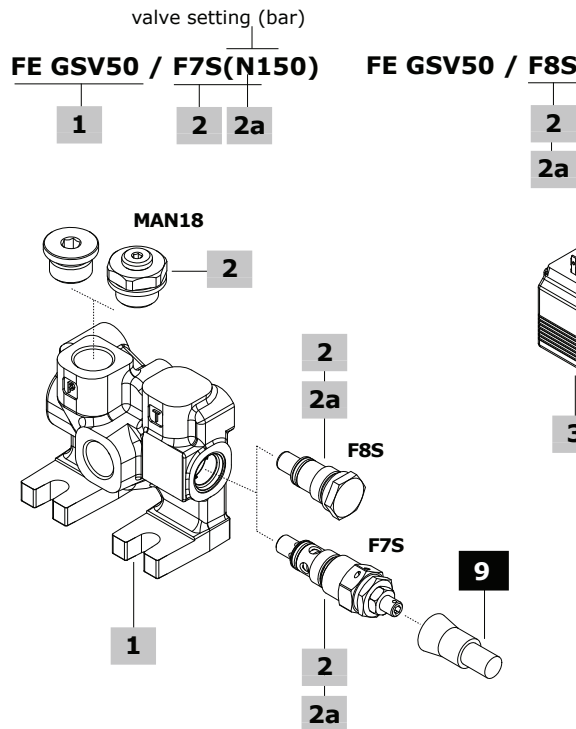
CODE	DESCRIPTION
05931TX1	For 1 section valve
05932TX2	For 2 sections valve
05933TX3	For 3 sections valve
05934TX4	For 4 sections valve
05935TX5	For 5 sections valve
05936TX6	For 6 sections valve
05937TX7	For 7 sections valve
05938TX8	For 8 sections valve
05939TX9	For 9 sections valve
05940TX10	For 10 sections valve

(*): Codes are referred to **BSP** thread

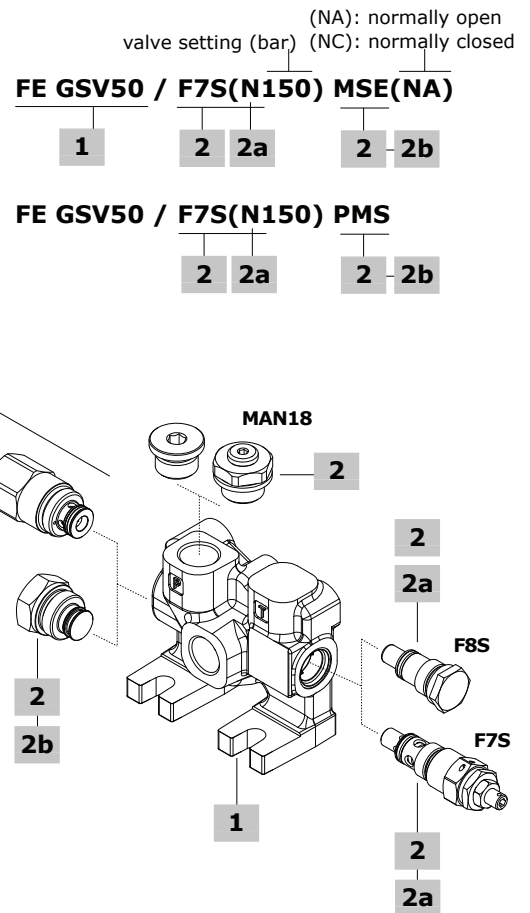
Inlet section - parts ordering codes

Standard section

With relief valve:



With relief and unloader valves:



1 Inlet body section* page 146

TYPE: **FE-GSV50** CODE: 060013190799
 DESCRIPTION: Side inlet port, upper inlet plugged, pressure relief valve arrangement
 TYPE: **FE-GSV50** CODE: 060013198199
 DESCRIPTION: As previous one, with unloader valve arrangement

2 Configuration coding* page 147

TYPE	DESCRIPTION
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)
F7S-MSE	With pressure relief valve and electric unloader valve
F7S-PMS	With pressure relief valve and PMS valve blanking plug
F8S-MSE	With electric unloader valve and pressure relief valve blanking plug
F8S-PMS	Without valves (plugged ports)

Note: Inlet configurations require upper P port:
 n. 1 G1/2 plug code 060002792099, or n. 1 pressure gauge arrangement code 5MAN625220

2a Main pressure relief valve page 148

TYPE: **B** CODE: 700035205000000
 DESCRIPTION: VLP35S valve, setting range 10-100 bar (145-1450 psi)
 TYPE: **N** CODE: 700035105000000
 DESCRIPTION: VLP35S valve, setting range 101-200 bar (1460-2900 psi)
 TYPE: **R** CODE: 700035305000000
 DESCRIPTION: VLP35S valve, setting range 201-380 bar (2910-5500 psi)
 TYPE: **-** CODE: 060002788899
 DESCRIPTION: Relief valve blanking plug

2b Unloader inlet valve page 149

TYPE	CODE	DESCRIPTION
MSE(NA)	0EF08002003	Electric unloader valve, normally open, screw type emergency. It requires MSE assembly joint
MSE(NC)	0EF08002006	Electric unloader valve, normally closed, screw type emergency. It requires MSE assembly joint
-	060002997299	Assembling joint for MSE valves
PMS	060002978899	Valve blanking plug

3 Coil

TYPE	CODE	DESCRIPTION
For MSE valves		
BER	4SLE001200A	12 VDC ISO4400 coil
	4SLE002400A	24 VDC ISO4400 coil

Note: For BER type coils see page 257

9 Accessory

TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

(*): Codes are referred to **BSP** thread

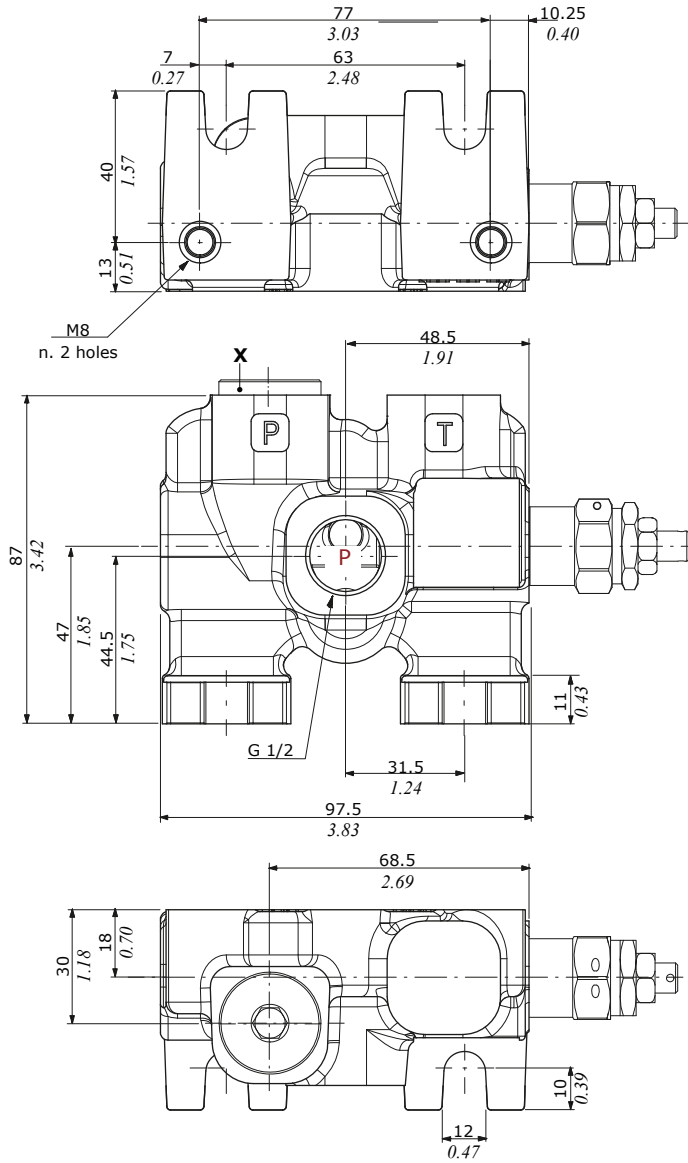
Standard inlet section

Dimensional data

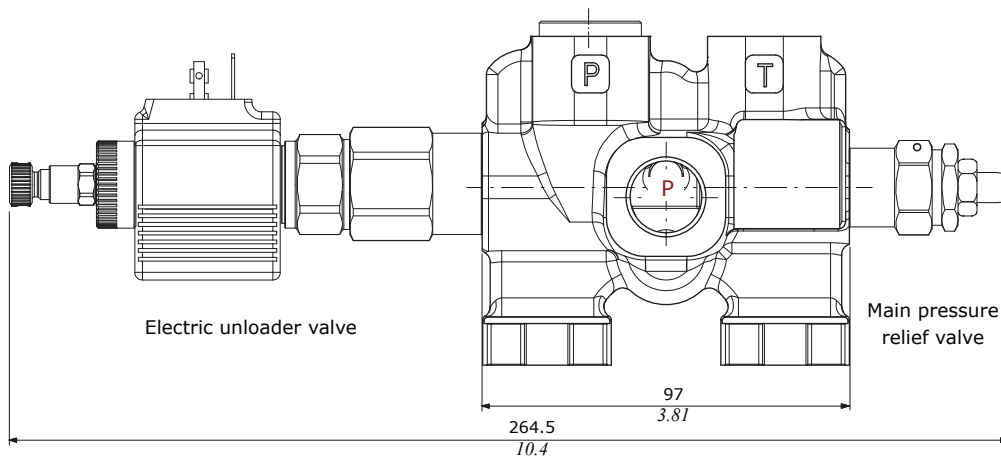
With pressure relief valve

Wrenches and tightening torques
 X = allen wrench 8 - 42 Nm (31 lbf)

Note: For valves wrench and torque, see related pages



With relief and unloader valves

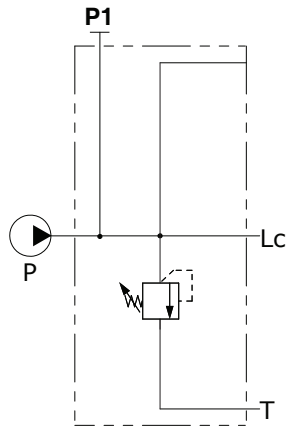


For other configurations, see page 149

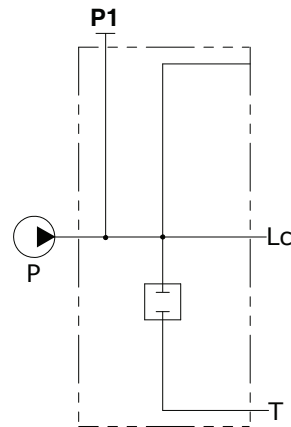
For other dimensions, see previous configuration

Hydraulic circuits

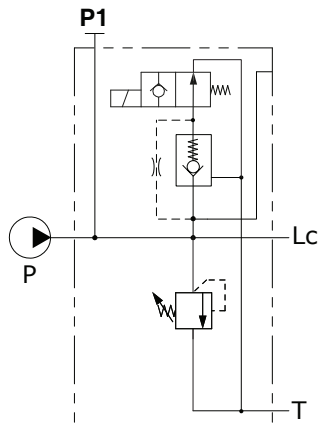
F7S configuration
With pressure relief valve



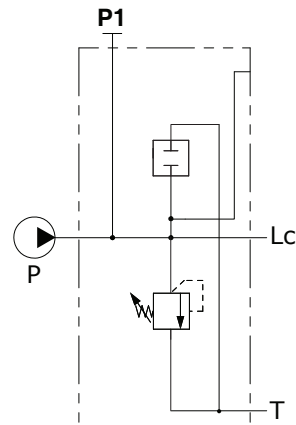
F8S configuration
Without valves
(pressure relief valve plugged port)



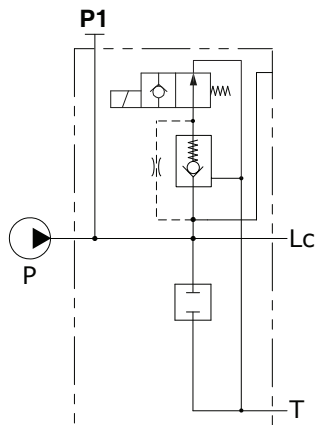
F7S-MSE(NA/NC) configuration
With pressure relief valve
and electric unloader valve



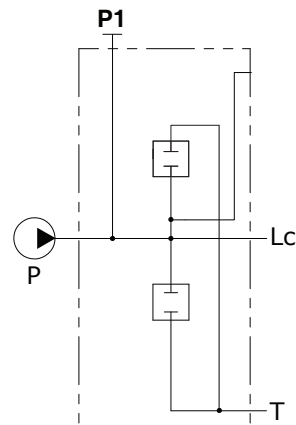
F7S-PMS configuration
With pressure relief valve
and unloader valve blanking plug



F8S-MSE(NA/NC) configuration
Without pressure relief valve
and electric unloader valve



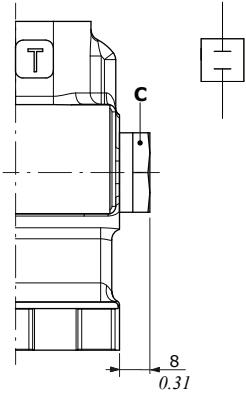
F8S-PMS configuration
Without valves (plugged ports)



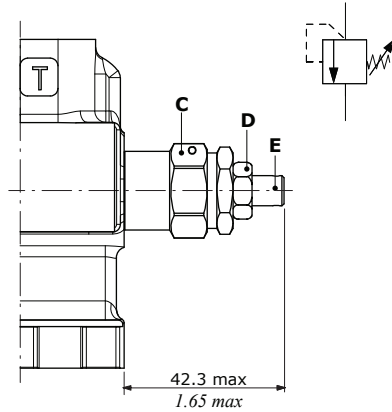
Standard inlet section

Main pressure relief valve

Relief valve blanking plug



Main pressure relief valve

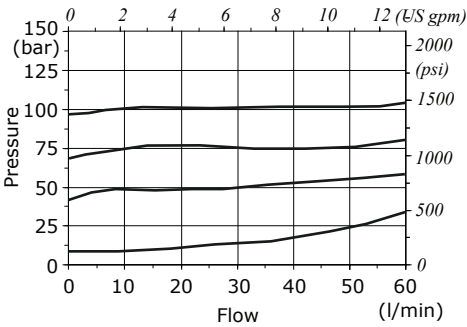


Wrenches and tightening torques

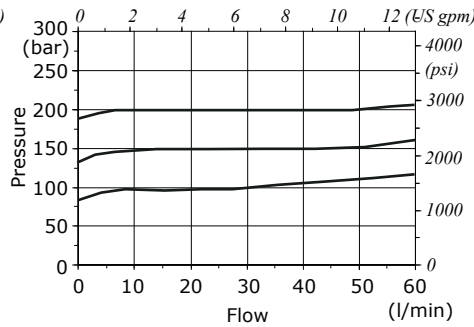
- C = wrench 22 - 42 Nm (31 lbf)
- D = wrench 13 - 24 Nm (17.7 lbf)
- E = allen wrench 4

Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

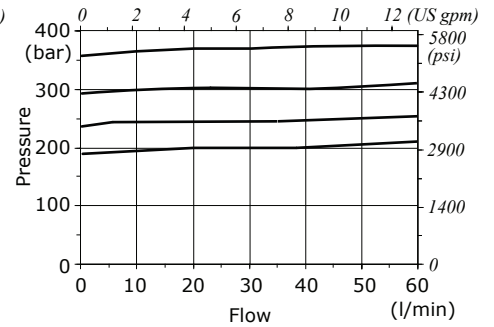
Setting example (B type spring)



Setting example (N type spring)



Setting example (R type spring)



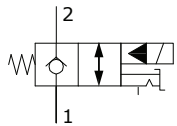
Standard inlet section

Unloader valve

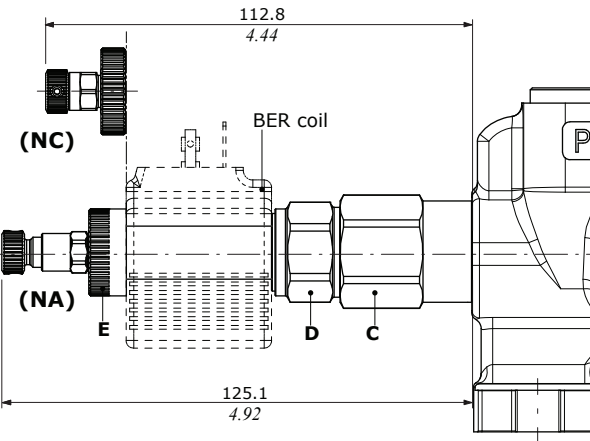
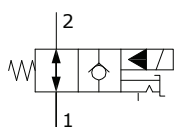
MSE type: electric control

Screw type emergency

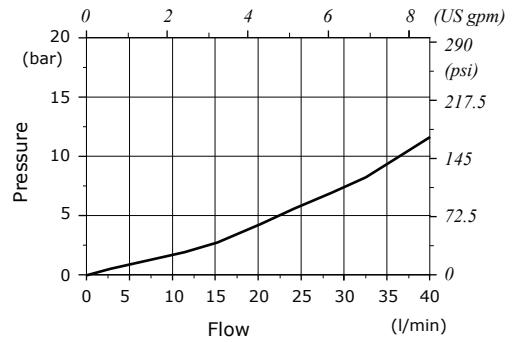
MSE(NC) type
Normally closed



MSE(NA) type
Normally open



Pressure drops

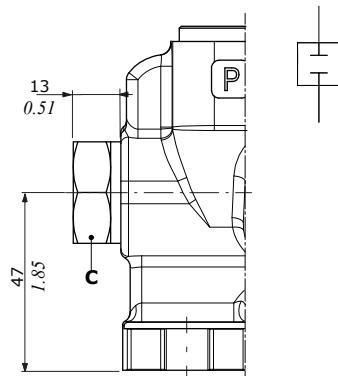


Valve features

- Nominal flow.....: 40 l/min (10.5 US gpm)
- Max. pressure: 380 bar (5500 psi)
- Max. internal leakage...: 0,50 cm³/min @ 210 bar (0.030 in³/min @ 3050 psi)

For **BER** type coils see page 257

PMS type: valve blanking plug



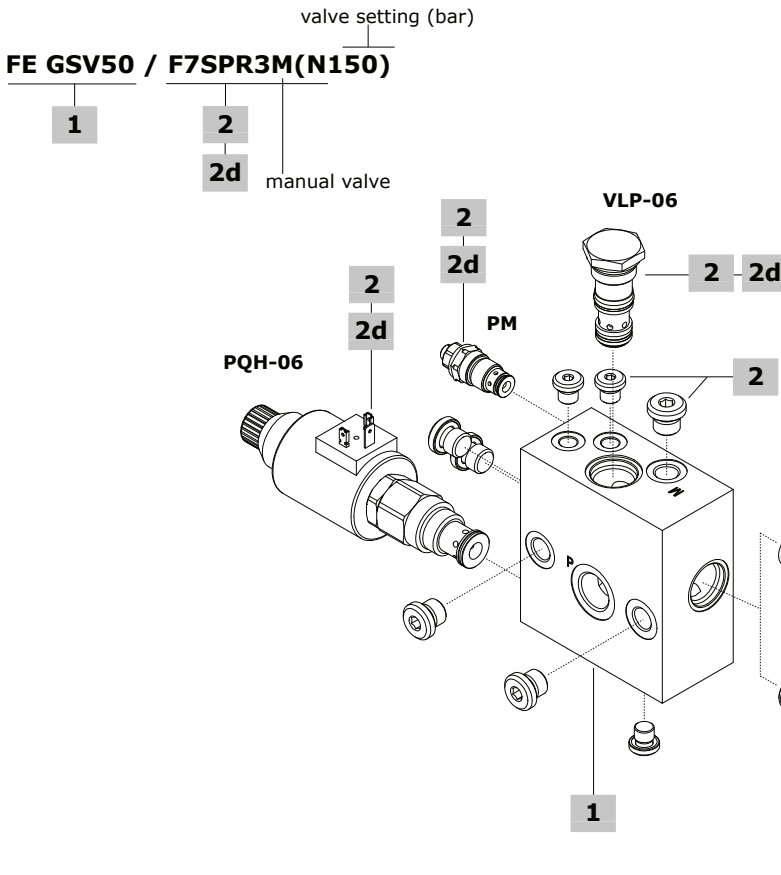
Wrenches and tightening torques

- C = wrench 27 - 42 Nm (30.9 lbft)
- D = wrench 24 - 30 Nm (22.1 lbft)
- E = manual tightening

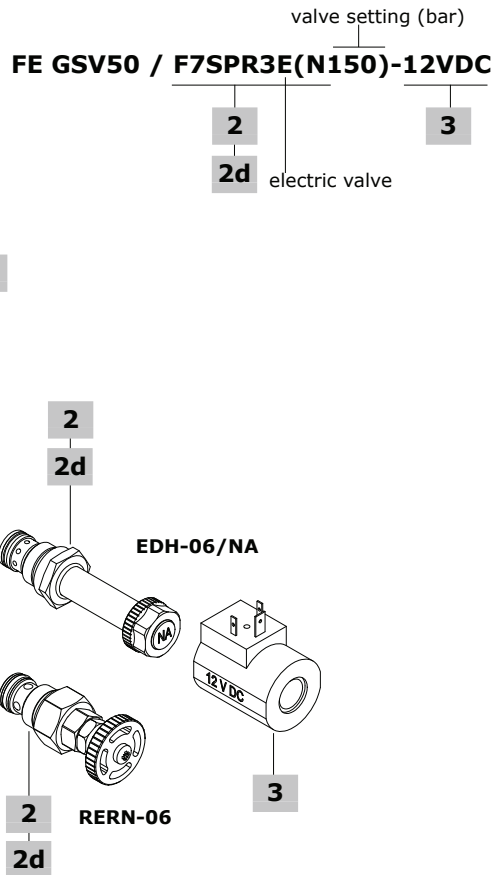
Inlet section - parts ordering codes

Section with flow regulator

With manual unloader valve:



With electric unloader valve:



1 Inlet body section* page 151

TYPE: **FE-GSV50** CODE: 060013195499
 DESCRIPTION: Side inlet port, arrangement for flow control, unloader and pressure relief valve

2 Configuration coding* page 151

TYPE	DESCRIPTION
F7S-PR3M	With pressure relief valve, proportional flow control valve and manual unloader valve
F7S-PR3E	With pressure relief valve, proportional flow control valve and electric unloader valve, normally open

Note: Inlet configurations require:
 n. 5 G1/4 plugs code 3XTAP719150
 n. 3 G1/8 plugs code 3TP5110900

2d Inlet valves page 152

TYPE	CODE	DESCRIPTION
PQH-06	950208506010000	Flow control pressure compensated proportional valve, 12 VDC, coil included
	950208506010001	Flow control pressure compensated proportional valve, 24 VDC, coil included
PM	03800V30PM-N	Antishock valve
VLP-06	950209906010000	Pressure relief valve
RERN-06	955845060010000	Manual unloader valve
EDH-06/NA	950210600000000	Electric unloader valve, normally open

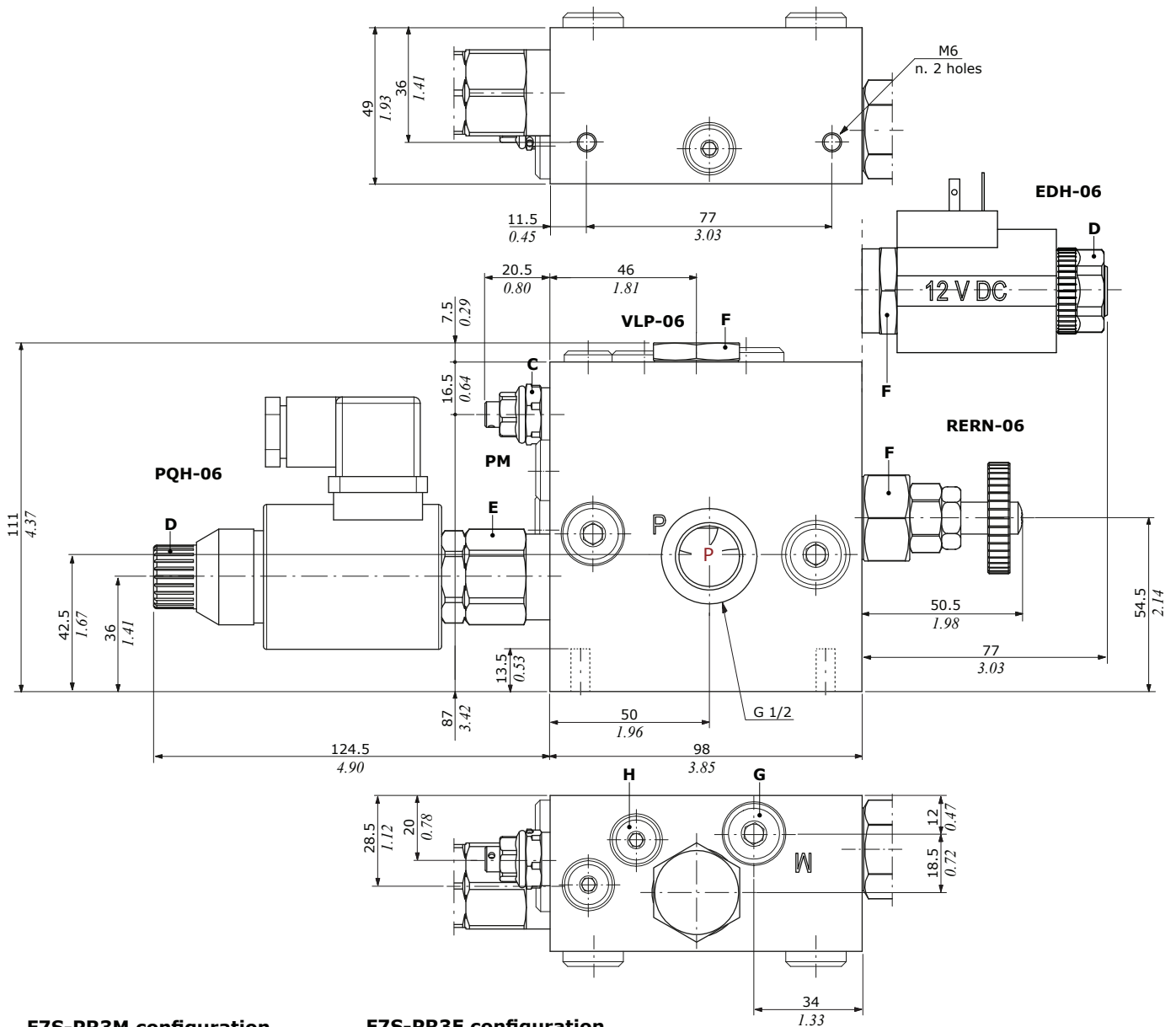
3 Coil

TYPE	CODE	DESCRIPTION
For EDH-06 valve		
A	954250000601200	12 VDC ISO4400 coil
	954250000602400	24 VDC ISO4400 coil

(*): Codes are referred to **BSP** thread

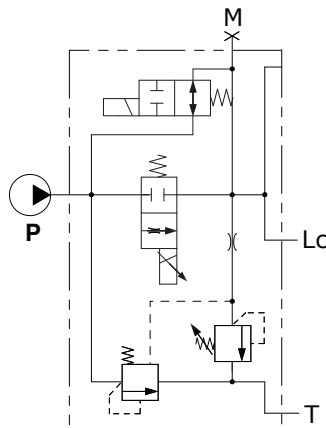
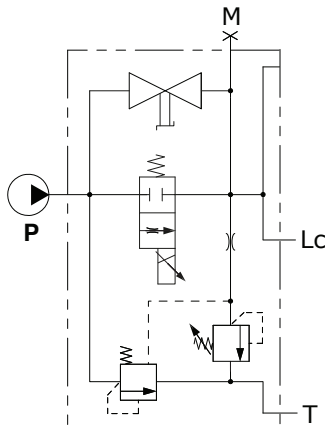
Inlet section with flow regulator

Dimensional data and hydraulic circuits



F7S-PR3M configuration
With manual unloader valve

F7S-PR3E configuration
With electric unloader valve



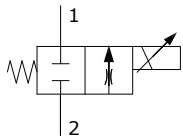
- Wrenches and tightening torques**
- C = wrench 17 - 30 Nm (22 lbf_t)
 - D = manual tightening
 - E = wrench 27 - 30 Nm (22 lbf_t)
 - F = wrench 27 - 60 Nm (44.2 lbf_t)
 - G = allen wrench 27 - 60 Nm (44.2 lbf_t)
 - H = allen wrench 6 - 24 Nm (17.7 lbf_t)

Inlet section with flow regulator

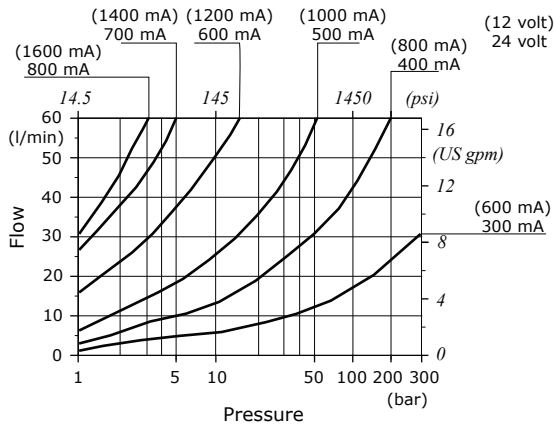
Inlet valves

PQH-06 type

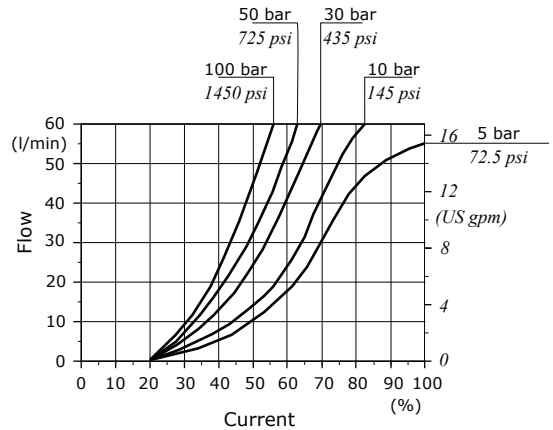
Flow control proportional pressure compensated valve, 12/24 VDC



Compensation curves



Flow control diagram



Valve features

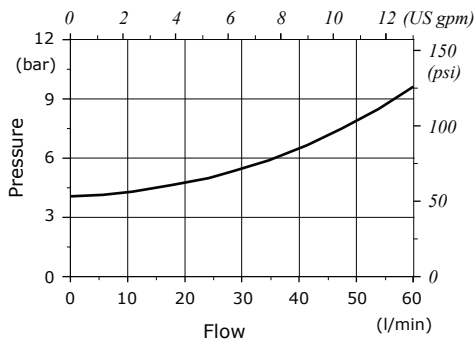
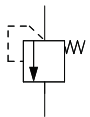
- Nominal flow.....: 60 l/min (15.8 US gpm)
- Max. pressure: 310 bar (4500 psi)
- Power rating.....: 22 W
- Max. internal leakage...: 100 cm³/min @ 210 bar (6.10 in³/min @ 3050 psi)
- Coil insulation.....: Class F
- Voltage.....: 12/24 VDC

Note: The coil and connector is included

VLP-06 type

Pressure relief valve

Pressure drops

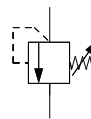


Valve features

- Nominal flow.....: 60 l/min (15.8 US gpm)
- Max. pressure: 350 bar (5070 psi)
- Opening start pressure.....: 4 bar (58 psi)

PM type

Antishock valve

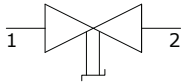


Inlet section with flow regulator

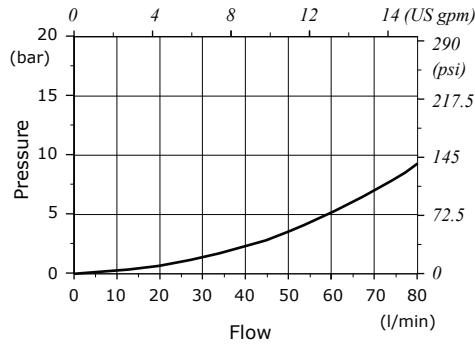
Inlet valves

RERN-06 type

Manual unloader valve



Pressure drops

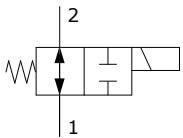


Valve features

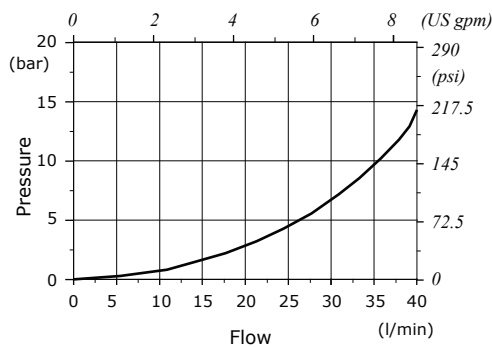
Nominal flow.....: 70 l/min (18.5 US gpm)
 Max. pressure: 315 bar (4600 psi)
 Closed valve leakage....: 0

EDH-06 type

Electric unloader valve, normally open



Pressure drops



Valve features

Nominal flow.....: 35 l/min (9.24 US gpm)
 Max. pressure: 310 bar (4500 psi)
 Max. internal leakage...: 50 cm³/min @ 210 bar
 (3.05 in³/min @ 3050 psi)

Coil **A** type: To be order separately, see #3 page 150

Working section - parts ordering codes

Mechanical control valve configuration example

spring type and setting valve (bar)

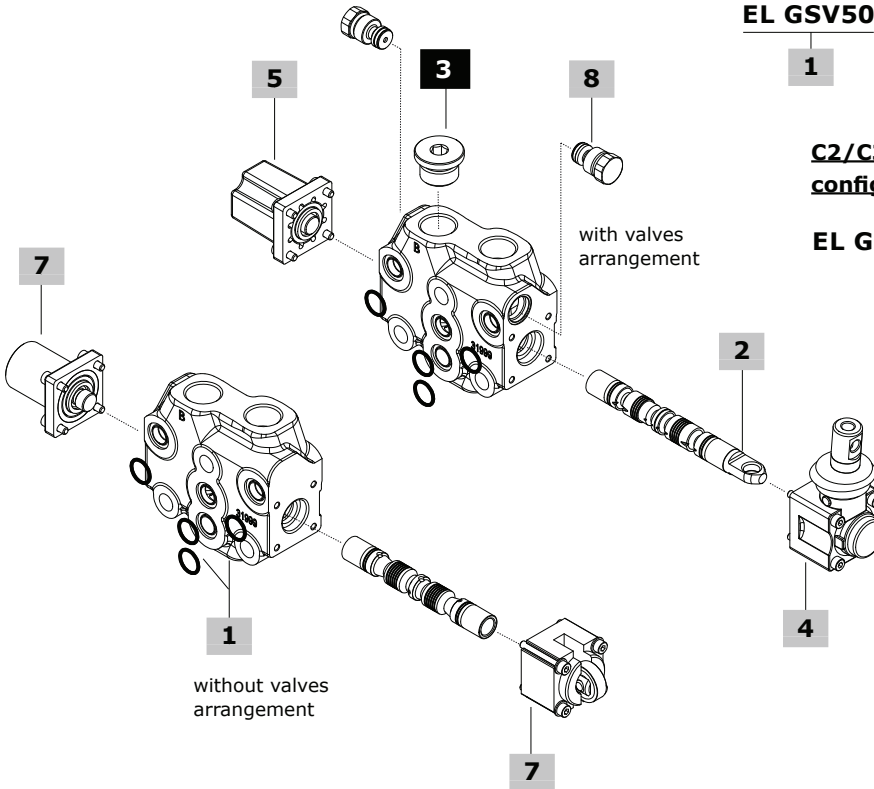
EL GSV50 / 102 - A1 - M1 . V40(N)120 - S

1 2 4 5 8 aluminium controls

C2/C3 complete mechanical control configuration example

EL GSV50 / 103 - C3 . V40(N)120 - S

7



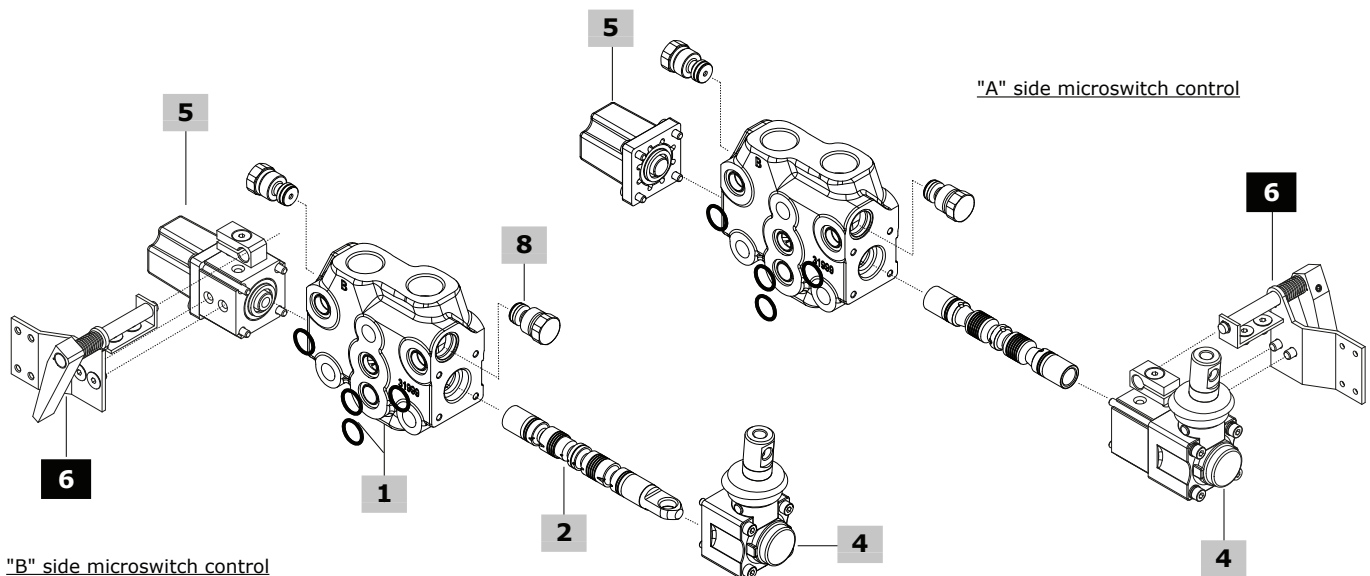
Microswitch control valve configurations example

EL GSV50 / 103 - A1 - M1-N1 . V40(N)120 - S

1 2 4 5 8 aluminium controls

EL GSV50 / 103 - N1-A1 - M1 . V40(N)120 - S

4 5



Working section - parts ordering codes

1 Working section body kit* page 159

TYPE: **EL-GSV50.VC** CODE: 5EL0600131743
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **EL-GSV50** CODE: 5EL0600131742
 DESCRIPTION: Parallel circuit, without port valves arrangement

2 Spool page 160

TYPE	CODE	DESCRIPTION
Standard spools		
103	060103179499	Double acting, A and B closed in neutral position
	3CUG3197800	As previous one, for kick-out control
106	KR30106	Double acting for closed circuit
107	KR30107-108	Double acting, A to tank and B closed in neutral position
108	KR30107-108	Double acting, B to tank and A closed in neutral position
111	060103179599	Double acting, A and B to tank in neutral position
	KR30111K	As previous one, for kick-out control
101	3CUG3218000	Single acting on port A. G1/2 plug is required, see #3
102	3CUG3218002	Single acting on port B. G1/2 plug is required, see #3
116	3CUG3179200	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	3CUG3179201	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control

Special spools for cam, microswitch controls and other leverless controls

103	060103179099	Double acting, A and B closed in neutral position
111	060103179199	Double acting, A and B to tank in neutral position

3 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	060002792099	G1/2 plug

4 A side control page 161

Note: For other control type, see Q30/Q50 valves

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

For standard spools**With lever control:**

A1	03600A1-A2	M8 thread plastic lever box
A2	03600A1-A2	As A1 type, with lever box rotated 180°
A1/10	03610A1-A2/10	M8 thread aluminium lever box
A2/10	03610A1-A2/10	As A1/10 type, with lever box rotated 180°
A1/PM	03610A1-A2/PM	M10 thread aluminium lever box
A2/PM	03610A1-A2/PM	As A1/PM type, with lever box rotated 180°
A1/PMP	03610A1-A2/PMP	M10 thread plastic lever box
A2/PMP	03610A1-A2/PMP	As A1/PMP type, with lever box rotated 180°
A1/Z1	03610A1-A2/Z1	Plastic lever box, for 116 spool type
A2/Z1	03610A1-A2/Z1	As A1/Z1 type, with lever box rotated 180°

With safety lever control:

A1/S⁽¹⁾	03624A1-A2/S	M8 thread aluminium lever box
A2/S⁽¹⁾	03624A1-A2/S	As A1/S type, with lever box rotated 180°

Without lever control:

A4/Z1	03617A4/Z1	As A4 type, for 116 spool type
A6	03620A6	With flange
A6-H/Z1	03620A6-H/Z1SI	As A6 type, for 116 spool type
A8	03622A8/03	Arrangement for flexible cable control
A8/Z1	03622A8/Z1	As A8 type, for 116 spool type

4 A side control (cont.) page 161

Note: For other control type, see Q30/Q50 valves

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

Joystick controls for 2 section operation:

A35/1	03640A35-12	Joystick 1 type
A35/2	03640A35-12	Joystick 2 type
A35/3	03640A35-34	Joystick 3 type
A35/4	03640A35-34	Joystick 4 type

For types 103 and 111 special spools**With spool position microswitch:**

Note: To complete the control you must use the assembly kit at #6		
N1-A1	03641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
N1A-A1	03642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	03643N1BA1/A2L	Micro operation in pos. 2, with lever box
N1-A3	03648N1-A3L	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	03648N1A-A3L	Micro operation in pos. 1, without lever with cap
N1B-A3	03648N1B-A3L	Micro operation in pos. 2, without lever with cap

Without lever control:

A3	03614A3	Without lever, with cap
A4	03617A4	M8 thread male external pin with flange
A5⁽²⁾	03619A5	Flange with spherical spool end

5 B side control page 168

Note: For other control type, see Q30/Q50 valves

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

With spring return:

M1	03730M1	3 pos., spring return in neutral position
M1/01	03730M1/01	As M1 type, for joystick control
M1-B1	03753M1-B1	As M1 type, with microswitch arrangement
M1-U1	03701M1-U1	As M1 type, with M8 male thread external pin
M2	03732M2	2 pos. (0-1), spring return in neutral position
M2-U1	03702M2-U1	As M2 type, with M8 male thread external pin
M3	03733M3	2 pos. (0-2), spring return in neutral position
M3-U1	03703M3-U1	As M3 type, with M8 male thread external pin
M4	03734M4-2	2 pos. (1-2), spring return in position 1
	03735M4-2-1	2 pos. (2-1), spring return in position 2
M4-U1	03704M4-U11-2	As M4 type (1-2), with M8 male thread external pin

With flexible cable control arrangement:

M1-U2	03715M1-U2	3 pos., spring return in neutral position
M2-U2	03716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	03717M3-U2	2 pos. (0-2), spring return in neutral position

With detent:

R1	03741R1	3 pos., detent in position 1
R2	03742R2	3 pos., detent in position 2
R3	03743R3	3 pos., detent in all position
R4	03744R4	2 pos., detent in position 0-1
R5	03745R5	2 pos., detent in position 0-2
R6	03746R6	2 pos., detent in position 1-2
R8	03748R8	4 pos., detent in 4 th pos., for 116 spool type
R10/Z1	03750R10/Z1	4 pos., detent in 4 th pos., for 126 spool type

With detent and kick out function:

R1K	03741R1K	3 pos., detent in position 1
R2K	03742R2K	3 pos., detent in position 2
R3K	03743R3K	3 pos., detent in all position

(*): Codes are referred to **BSP** thread

(¹): Always complete with lever knob

(²): To be assembled only with M4 control

Working section - parts ordering codes

5 B side control (cont.) page 168

Note: For other control type, see Q30/Q50 valves

With spool position microswitch:

Note: to complete the control you must use the assembly kit at #6

M1-N1	03766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
M1-N1A	03767M1-N1AL	As M1-N1 type, micro operation in pos. 1
M1-N1B	03768M1-N1BL	As M1-N1 type, micro operation in pos. 2
M2-N1	03769M2-N1L	2 pos. (0-1), spring return in neutral position
M3-N1	03772M3-N1L	2 pos. (0-2), spring return in neutral position

Pneumatic and electropneumatic controls:

P1NW	03661P1-NW	ON/OFF pneumatic control
P1NPW	03661P1-NPW	Proportional pneumatic control
D3W	03691D3-F-12DC	12 VDC, ON/OFF electropneumatic control
	03692D3-F-24DC	24 VDC, ON/OFF electropneumatic control

6 Microswitch assembly kit

CODE	DESCRIPTION
03650N1-01	Kit for 1 section
03650N1-02	Kit for 2 sections
03650N1-03	Kit for 3 sections
03650N1-04	Kit for 4 sections
03650N1-05	Kit for 5 sections
03650N1-06	Kit for 6 sections
03650N1-07	Kit for 7 sections
03650N1-08	Kit for 8 sections
03650N1-09	Kit for 9 sections
03650N1-10	Kit for 10 sections

7 Complete controls A+B sides page 173

TYPE	CODE	DESCRIPTION
For types 103 and 111 special spools		
C2	03792C2-C3	Cam control from pos. 1 to 2
C3	03792C2-C3	Cam control from pos. 2 to 1

8 Auxiliary port valve page 177

TYPE	CODE	DESCRIPTION
<u>Antishock valve:</u>		
V30-B	0380FV30-B	Setting range: from 50 to 100 bar <i>(from 725 to 1450 psi)</i>
V30-N	0380FV30-N	Setting range: from 101 to 200 bar <i>(from 1460 to 2900 psi)</i>
V30-R	0380FV30-R	Setting range: from 201 to 350 bar <i>(from 2910 to 5100 psi)</i>
<u>Antishock/anticavitation valve:</u>		
V33-B	0380FV33-B	Setting range: from 50 to 100 bar <i>(from 725 to 1450 psi)</i>
V33-N	0380FV33-N	Setting range: from 101 to 200 bar <i>(from 1460 to 2900 psi)</i>
V33-R	0380FV33-R	Setting range: from 201 to 350 bar <i>(from 2910 to 5100 psi)</i>
<u>Anticavitation valve:</u>		
V04	03808V04	Anticavitation valve
<u>Plug:</u>		
VC	060002846099	Valve blanking plug

For other configurations and positions, see page 177

Working section - parts ordering codes

Proportional hydraulic controls valve configuration example

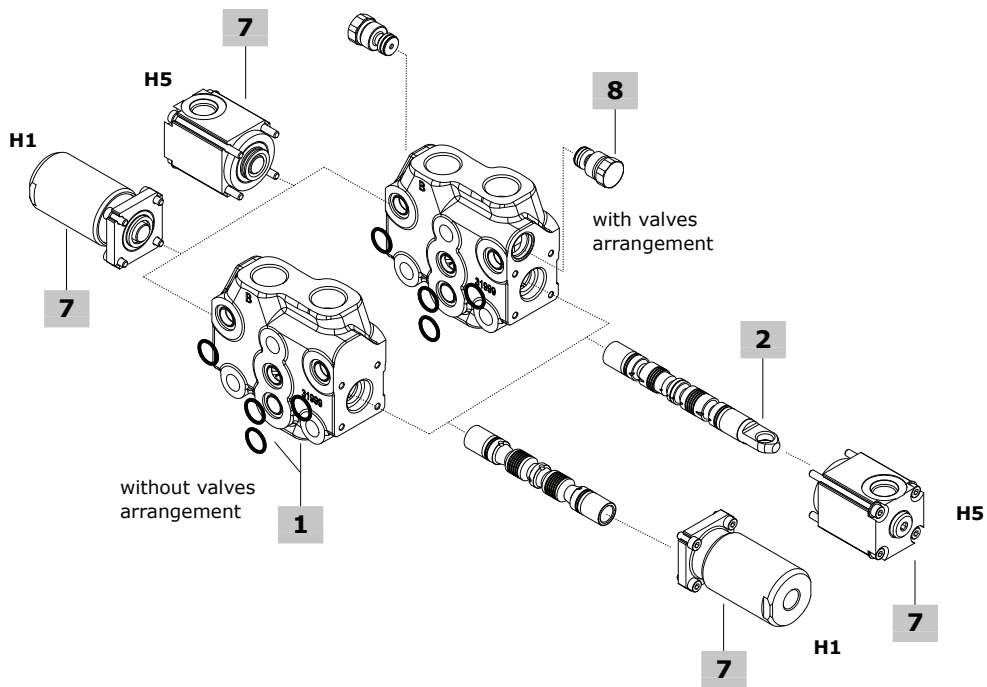
spring type and valve setting (bar)

EL GSV50 / 103 - H5 . V40(N)120 - S

1
 2
 7
 8
 aluminium controls

EL GSV50 / 103 - H1 . V40(N)120 - S

7



1 Working section body kit* page 159

The body kits listed below are for **H5** hydraulic control.
H1 hydraulic control requires standard body: see #1, page 155
 TYPE: **EL-GSV50-H5.VC** CODE: 5EL0600131743H5
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **EL-GSV50-H5** CODE: 5EL0600131742H5
 DESCRIPTION: Parallel circuit, without port valves arrangement

2 Spool page 160

TYPE	CODE	DESCRIPTION
For H5 hydraulic control		
103	060103179499	Double acting, A and B closed in neutral position
For H1 hydraulic control		
103	060103179099	Double acting, A and B closed in neutral position
111	060103179199	Double acting, A and B to tank in neutral position

7 Hydraulic controls A+B sides* page 174

TYPE	CODE	DESCRIPTION
H5	03785H5	Low pressure proportional type, upper ports
H1	03779H1	High pressure proportional type, side ports

8 Auxiliary port valve page 177

See #8, page 156

(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

One side - ON/OFF direct solenoid control valve: configuration example

spring type and valve setting (bar)

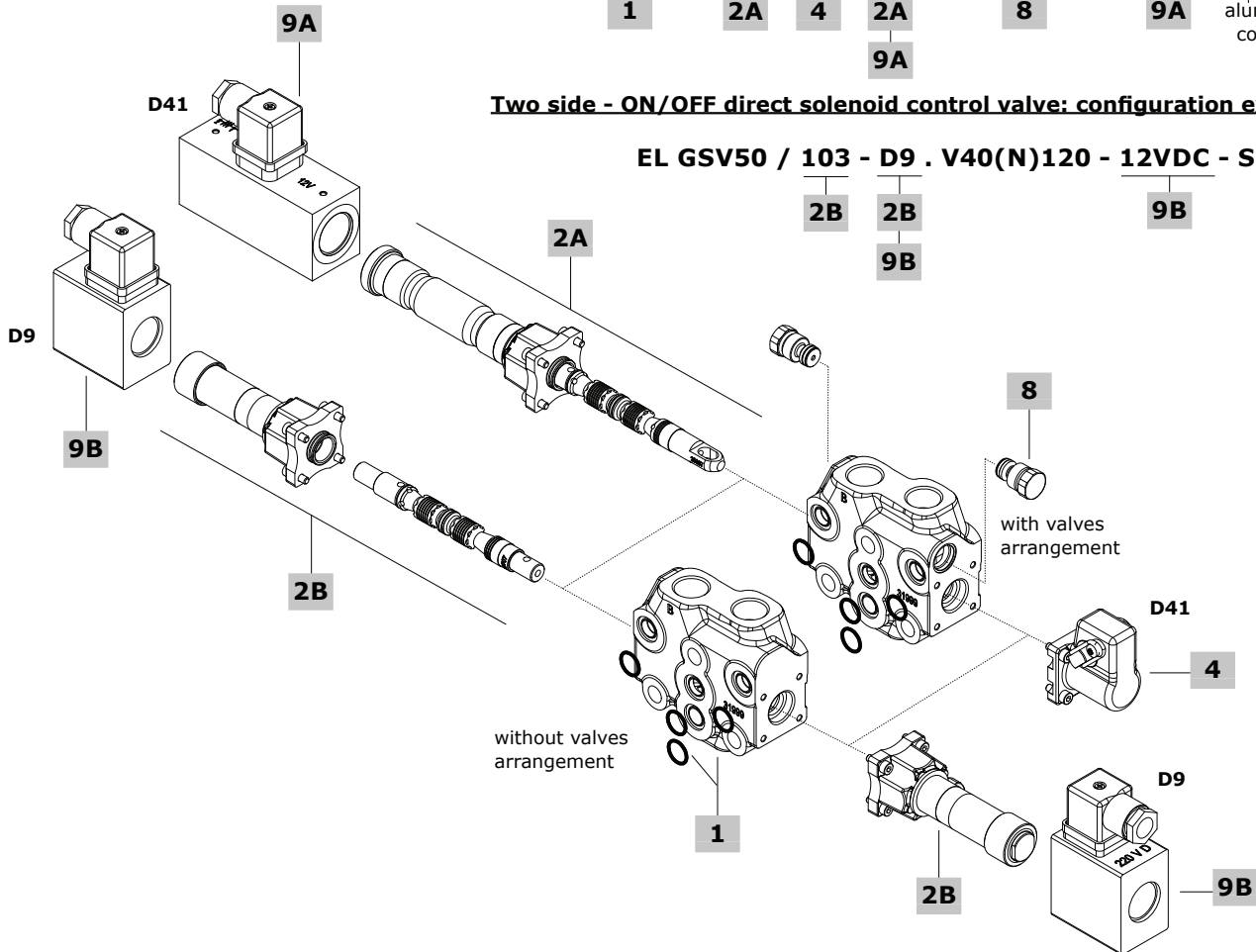
EL GSV50 / 103 - A1 - D41 . V40(N)120 - 12VDC - S

1
 2A
 4
 2A
 8
 9A
 aluminium controls

Two side - ON/OFF direct solenoid control valve: configuration example

EL GSV50 / 103 - D9 . V40(N)120 - 12VDC - S

2B
 2B
 9B



1 Working section body kit* page 159

See #1 for H5 hydraulic control, page 157

2A D41 solenoid control page 175

One side solenoid control

TYPE	CODE	DESCRIPTION
103	X060102889799	Double acting, A and B closed in neutral position
107	X060102938199	Double acting, A to tank and B closed in neutral position
111	X060102894299	Double acting, A and B to tank in neutral position

2B D9 solenoid control page 176

Two side solenoid control

TYPE	CODE	DESCRIPTION
103	X060102998299	Double acting, A and B closed in neutral position
111	X060103000499	Double acting, A and B to tank in neutral position

4 A side control for D41 page 175

TYPE	CODE	DESCRIPTION
A1	060003236899	M8 thread cast iron lever box
A2	060003236899	As A1 type, with lever box rotated 180°

8 Auxiliary port valve page 177

See #8, page 156

9A/B Coil page 175

D41 coil

TYPE	CODE	DESCRIPTION
-	ZEB012	12 VDC ISO4400 coil
-	ZEB024	24 VDC ISO4400 coil

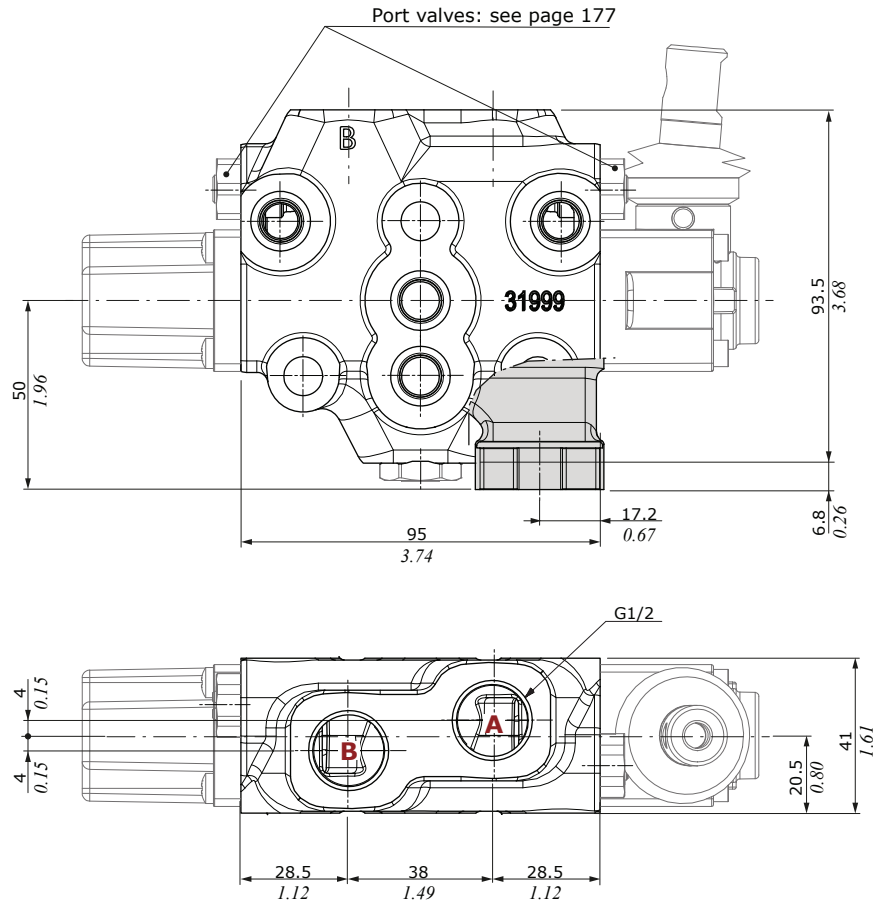
D9 coil

-	ZDB212	12 VDC ISO4400 coil
-	ZDB224	24 VDC ISO4400 coil

Note: The connector is included

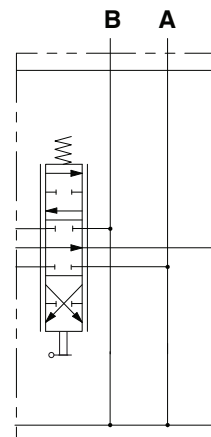
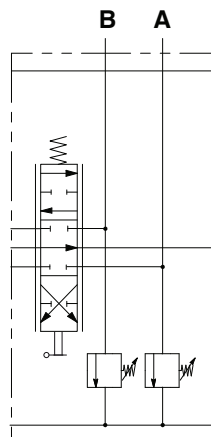
(*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits



GSV50.V40(N)120 configuration
Parallel circuit, mechanical control with aux valves

GSV50 configuration
Parallel circuit, mechanical control without aux valves



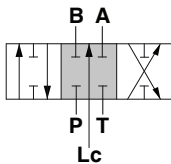
Working section

Spool

103 type

A and B closed in neutral position

2 0 1



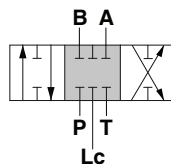
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

106 type

A, B and Lc closed in neutral position. For closed center

2 0 1



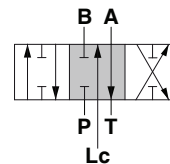
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

107 type

A to tank, B closed in neutral position

2 0 1



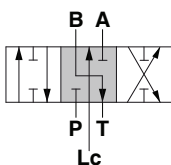
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

108 type

B to tank, A closed in neutral position

2 0 1



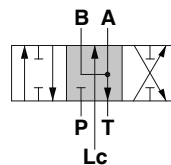
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

111 type

A and B to tank in neutral position

2 0 1



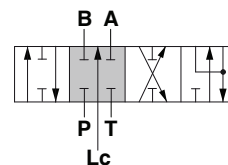
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

116 type

With floating in the 4th position (spool in)

2 0 1 3



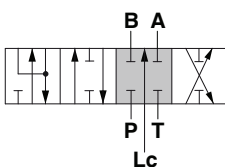
Stroke

Position 1: - 4 mm (- 0.15 in)
Position 2: + 5 mm (+ 0.19 in)
Position 3: - 8.6 mm (- 0.33 in)

126 type

With floating in the 4th position (spool out)

3 2 0 1



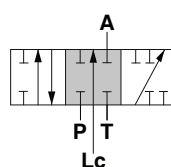
Stroke

Position 1: + 4 mm (+ 0.15 in)
Position 2: - 5 mm (- 0.19 in)
Position 3: + 8.6 mm (+ 0.33 in)

101 type

Single acting on A, B plugged

2 0 1



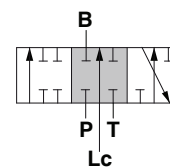
Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

102 type

Single acting on B, A plugged

2 0 1



Stroke

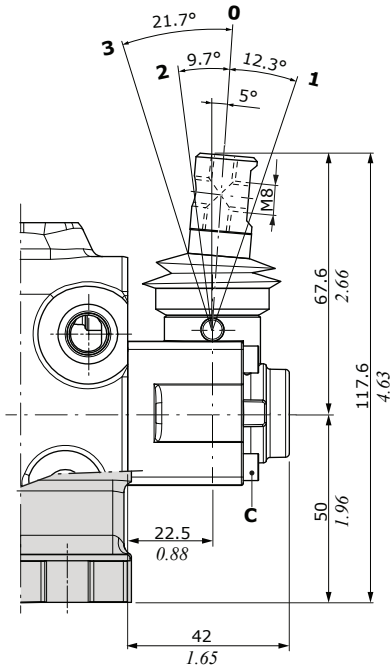
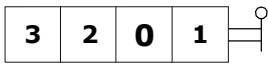
Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

A side controls

With lever control

A1 type

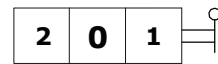
M8 thread plastic lever box



A1/10 type

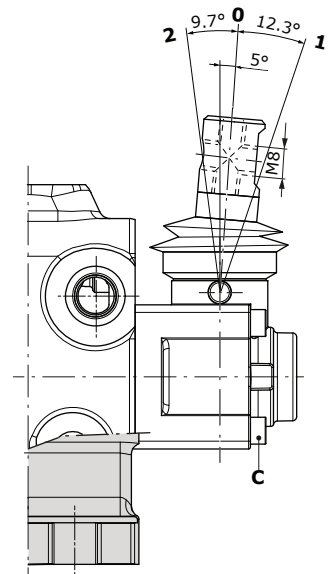
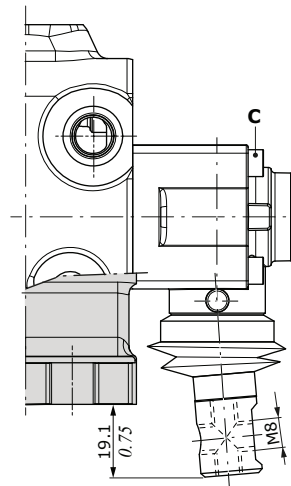
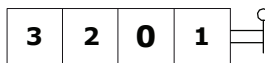
M8 thread aluminium lever box.
Dimensions are the same of A1 type

A2/10 type
As A1/10 type, rotated 180°



A2 type

As A1 type, rotated 180°



Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf_t)

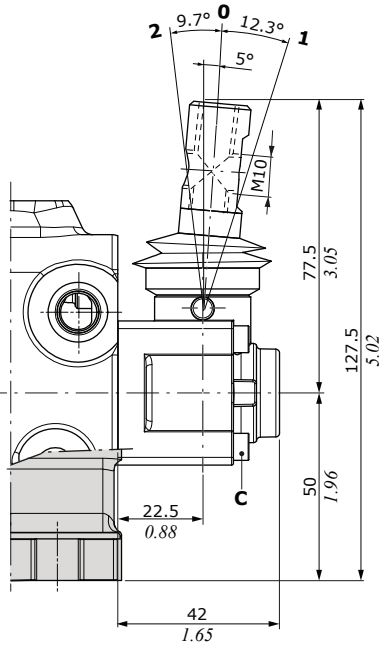
Working section

A side controls

With lever control

A1/PM type

M10 thread aluminium lever box



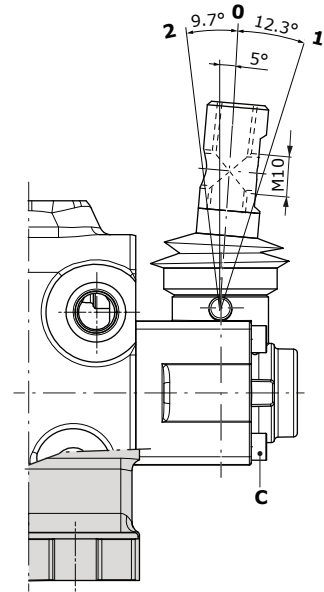
A1/PMP type

M10 thread plastic lever box.

A2/PMP type

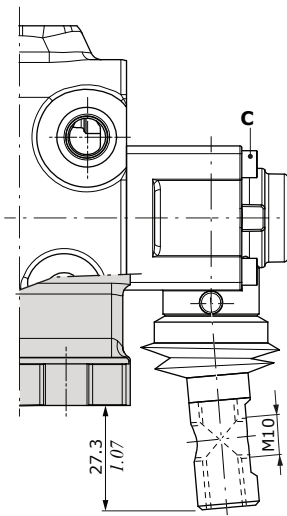
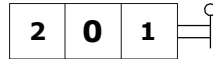
Dimensions are the same of A1/PM type

As A1/PMP type, rotated 180°



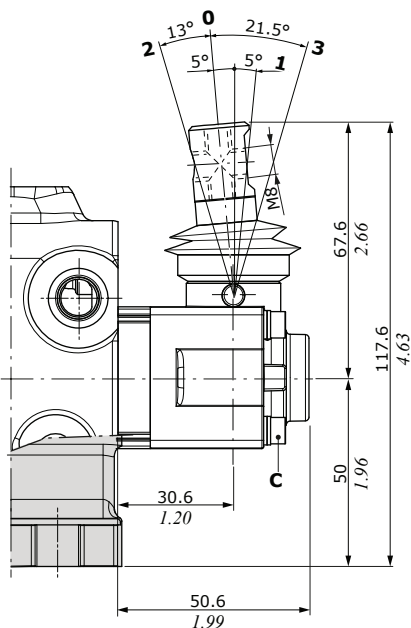
A2/PM type

As A1/PM type, rotated 180°



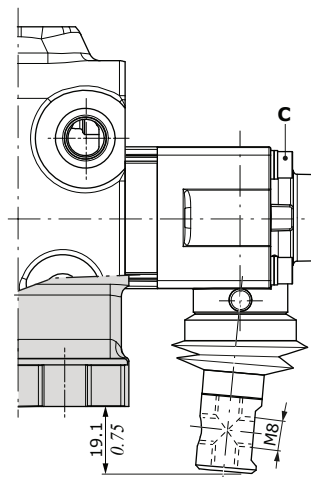
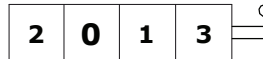
A1/Z1 type

M8 thread, for 116 floating spool type



A2/Z1 type

As A1/Z1 type, rotated 180°



Wrenches and tightening torques

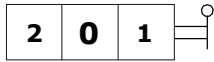
C = allen wrench 3 - 3 Nm (2.2 lbf_t)

A side controls

With safety lever control

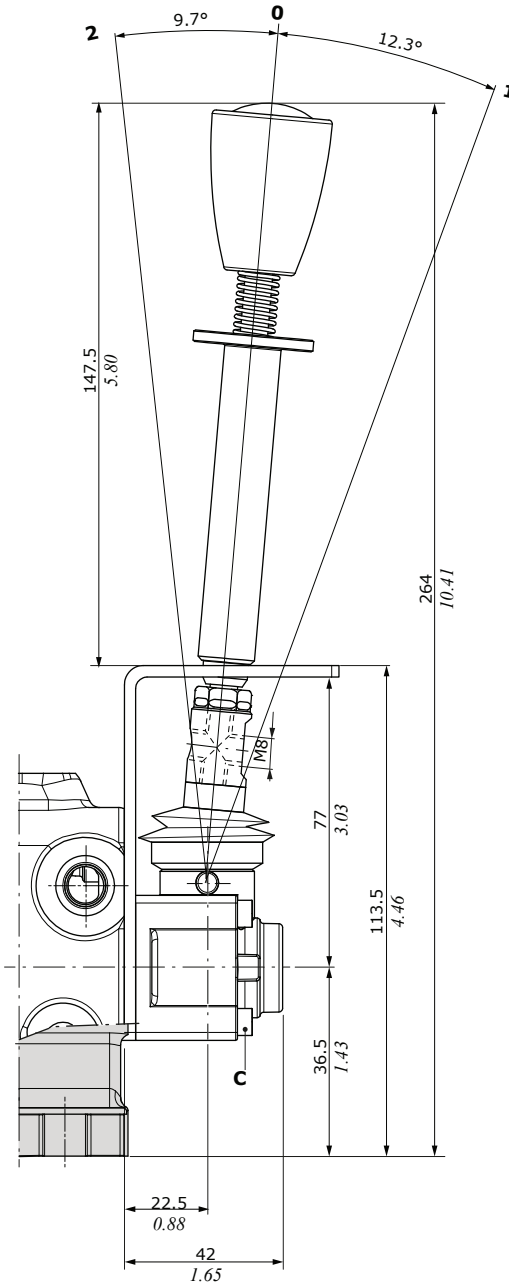
A1/S type

M8 thread, aluminium lever box

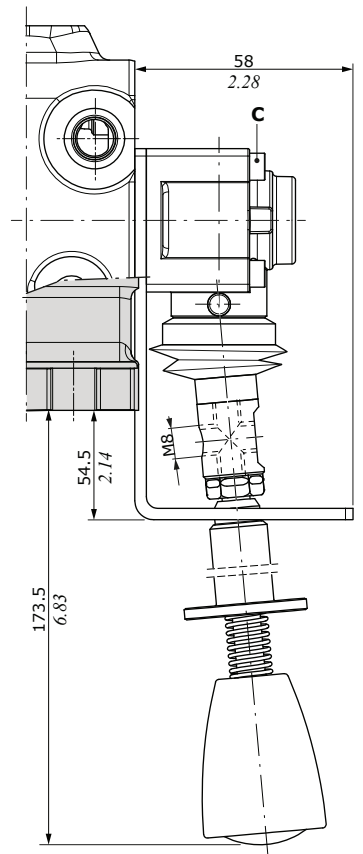
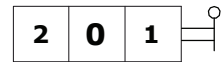


Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)



A2/S type
As A1/S type, rotated 180°

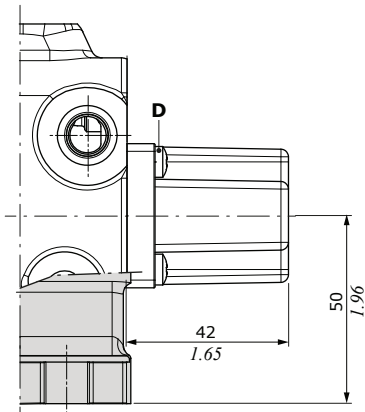
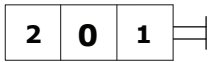


Working section

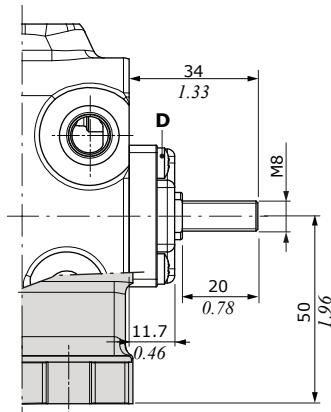
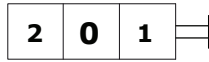
A side controls

Without lever control

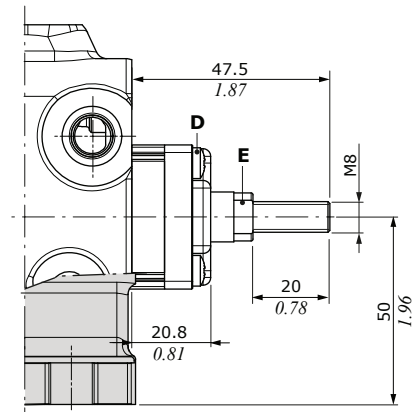
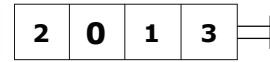
A3 type
With cap



A4 type
M8 thread male external pin with flange

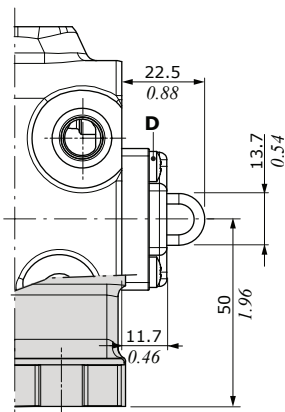
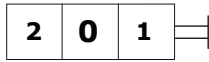


A4/Z1 type
As A4 type,
for 116 floating spool type



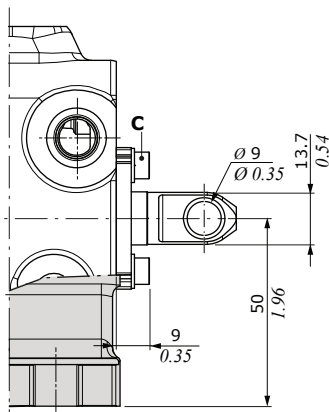
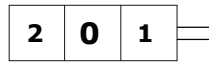
A5 type

Flange with spherical spool end



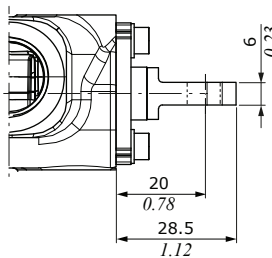
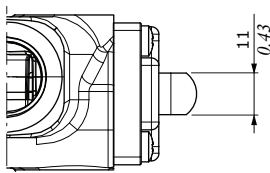
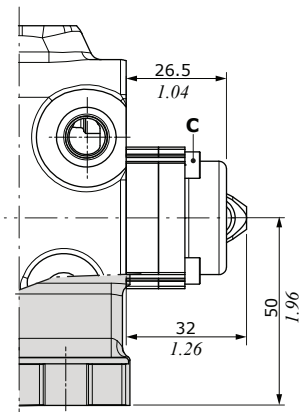
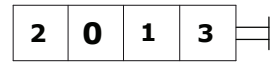
A6 type

Flange with spool eye end



A6-H/Z1 type

As A6 type, for 116 floating spool type



Wrenches and tightening torques

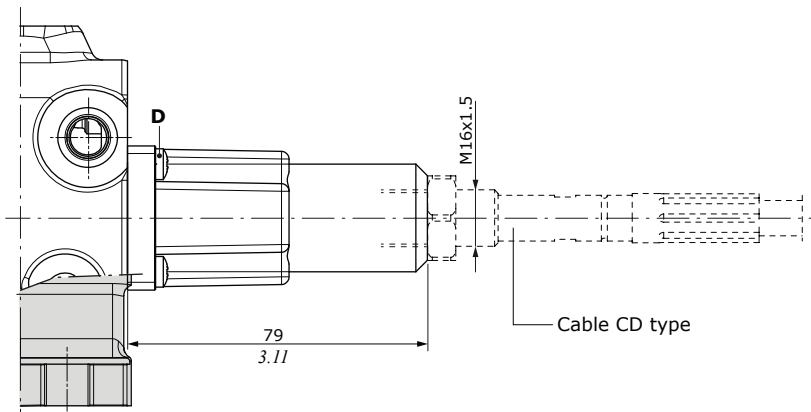
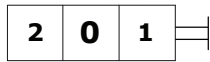
- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = cross-head - 3 Nm (2.2 lbf_t)
- E = wrench 9 - 9.8 Nm (7.2 lbf_t)

A side controls

With flexible cable control arrangement

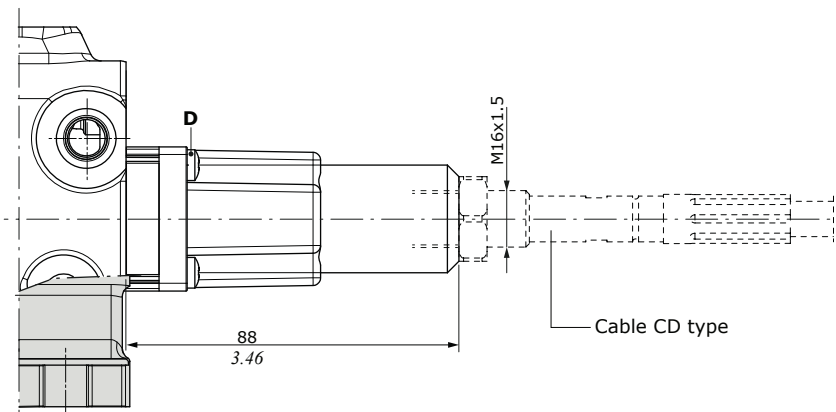
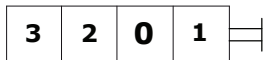
A8 type

Flexible cable control arrangement



A8/Z1 type

As A8 type, for 116 floating spool type



Wrenches and tightening torques

D = cross-head - 3 Nm (2.2 lbf^t)

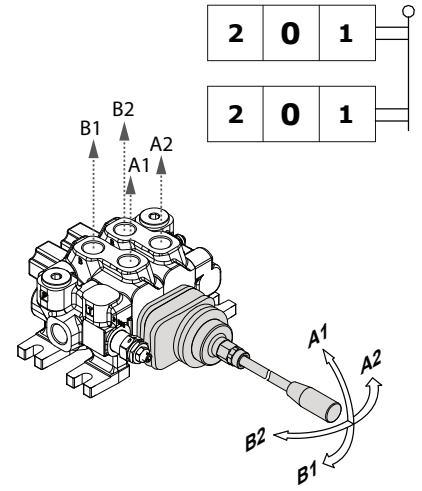
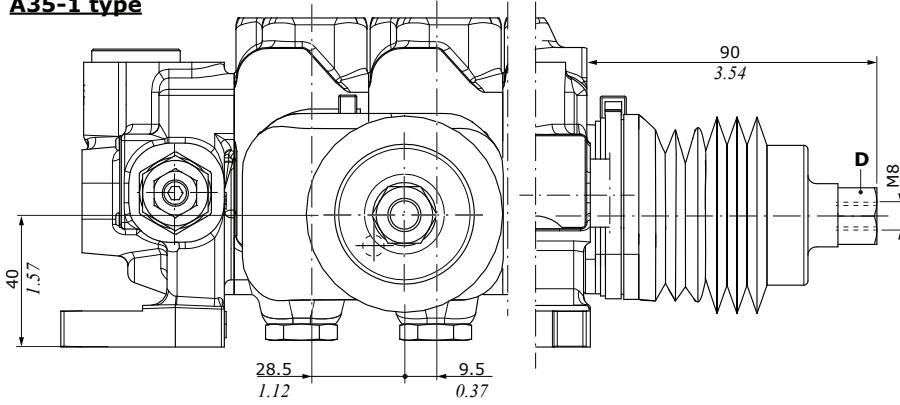
Working section

A side controls

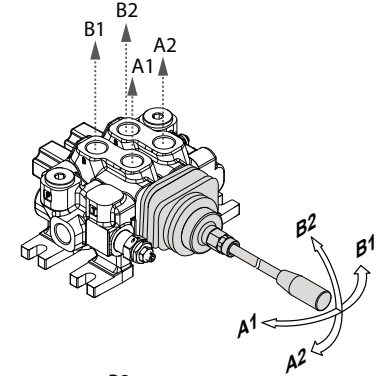
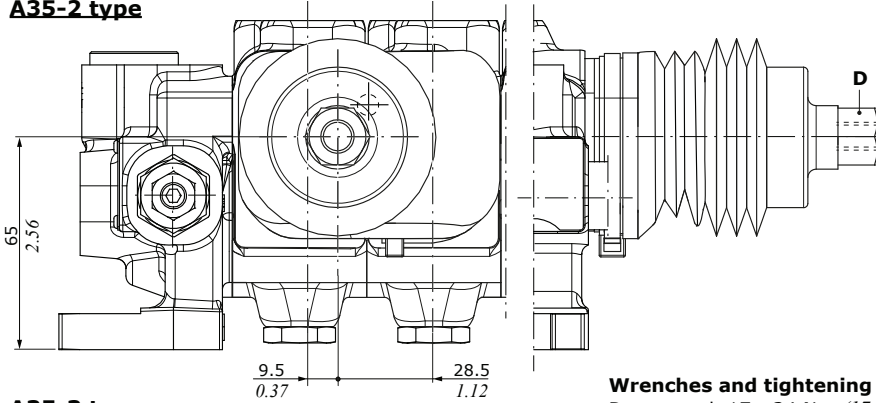
Joystick control

For operating the joystick control in the floating position, contact Sales Department.

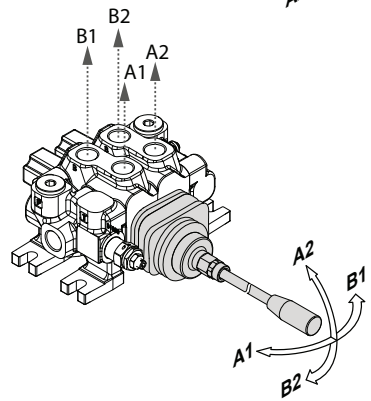
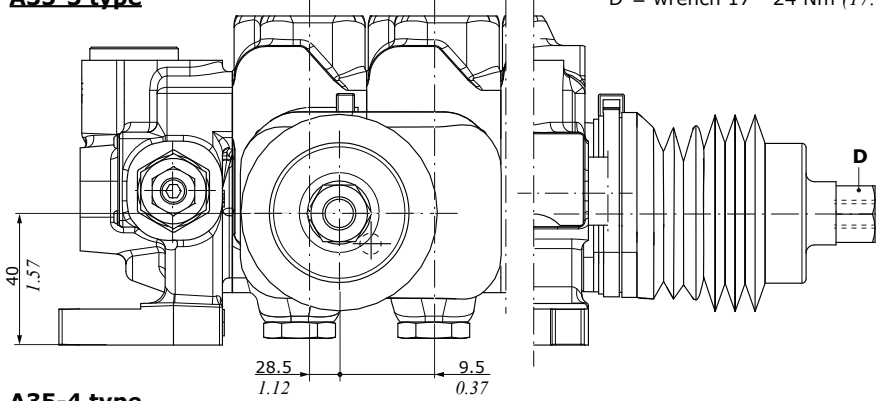
A35-1 type



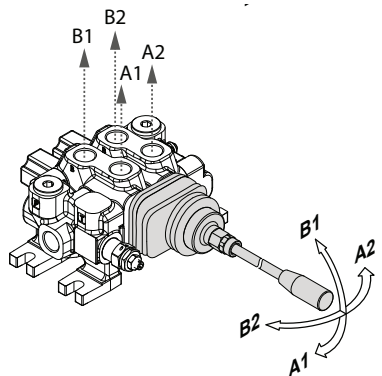
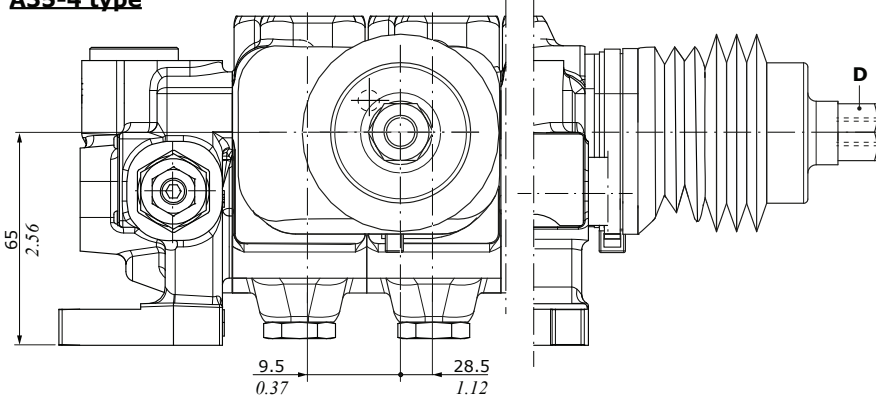
A35-2 type



A35-3 type



A35-4 type

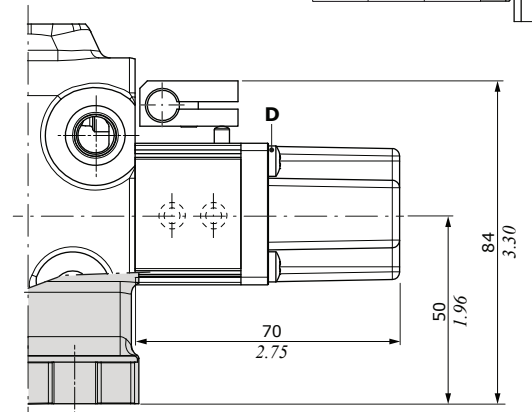
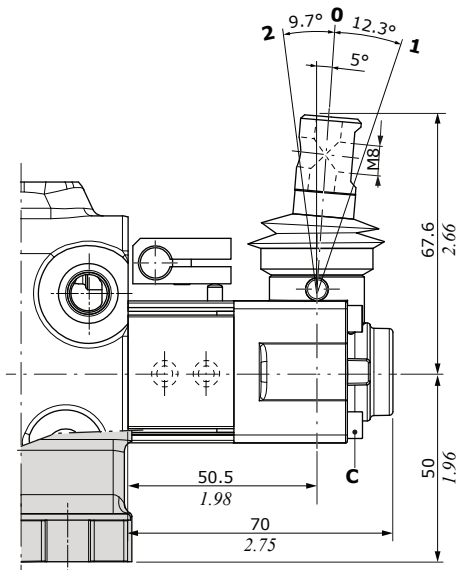
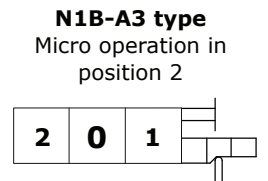
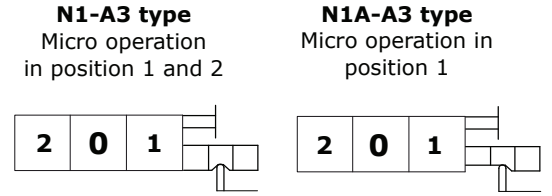
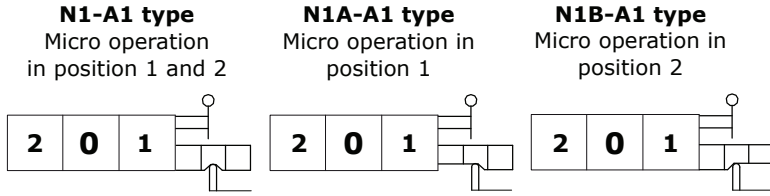


Wrenches and tightening torques
D = wrench 17 - 24 Nm (17.7 lbft)

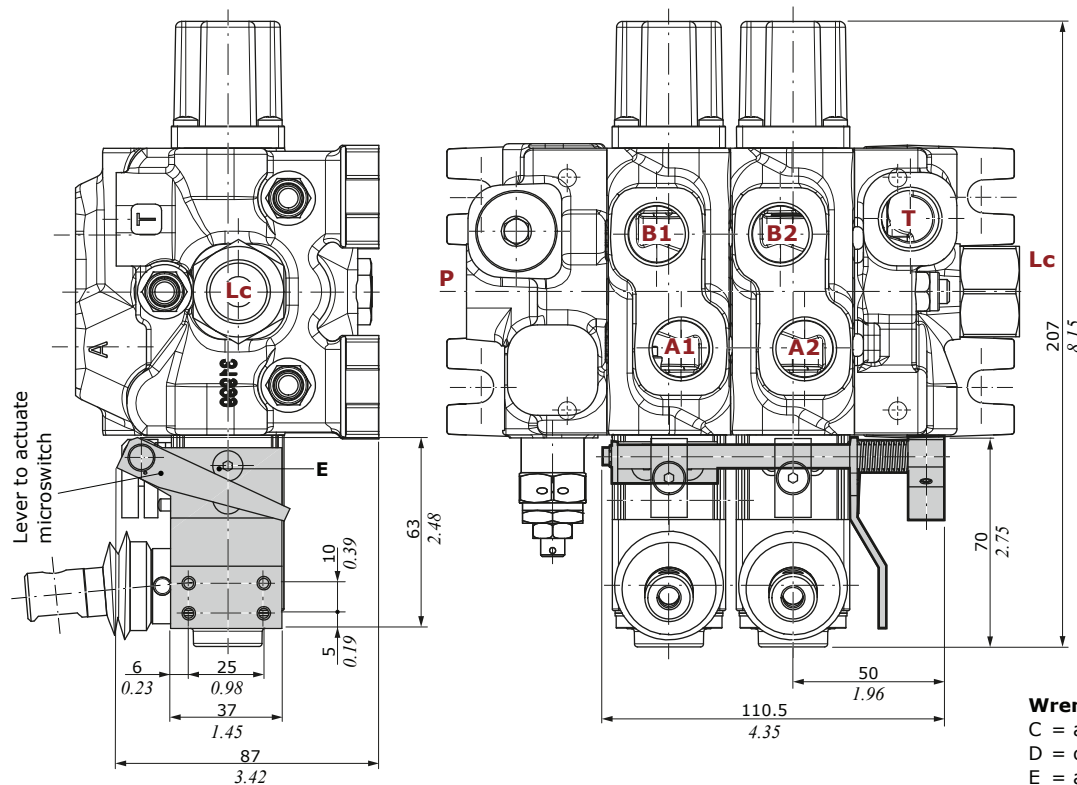
A side controls

With spool position microswitch, with lever

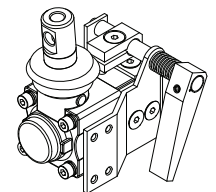
With spool position microswitch, with cap



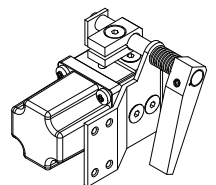
Microswitch assembly kit for 2 working section (N1-A1 type)



with lever box



with cap



Wrenches and tightening torques
 C = allen wrench 3 - 3 Nm (2.2 lbft)
 D = cross-head - 3 Nm (2.2 lbft)
 E = allen wrench 3 - 6.6 Nm (4.8 lbft)

Working section

B side controls

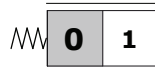
With spring return control

M1 type
3 position, spring return
in neutral position

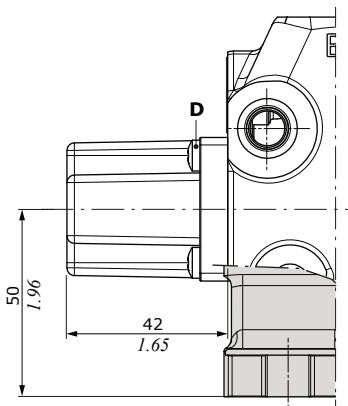
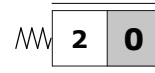


M1/01 type
As M1 type,
for joystick control

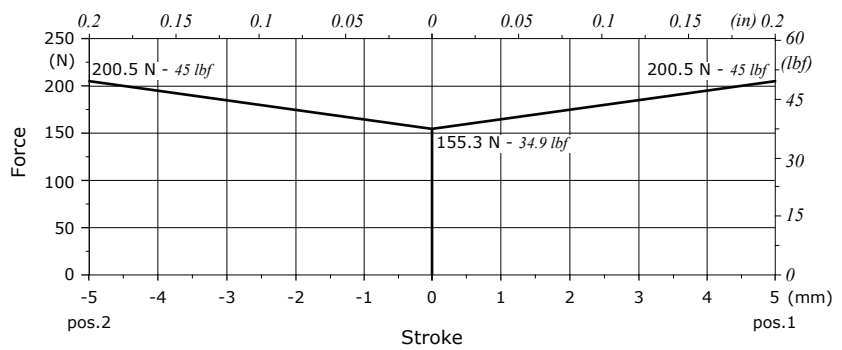
M2 type
2 position (0-1), spring return
in neutral position



M3 type
2 position (0-2), spring return
in neutral position

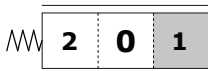


M1 control type - Force vs. Stroke diagram

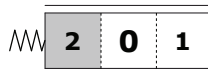


M4 types

2 position (1-2),
spring return in position 1

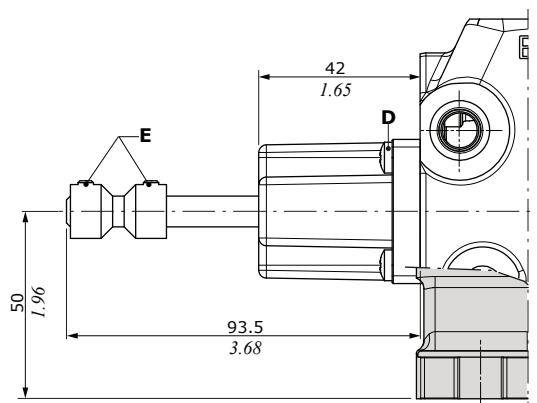
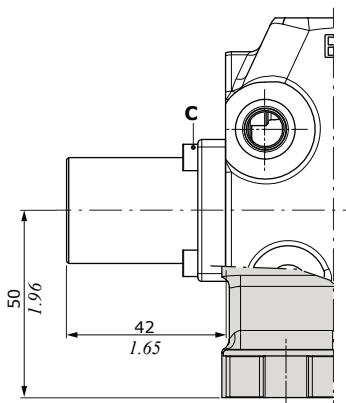
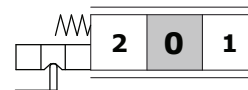


2 position (2-1),
spring return in position 2



M1-B1 type

3 position, microswitch arrangement



Wrenches and tightening torques

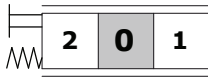
- C = allen wrench 3 - 3 Nm (2.2 lbf_t)
- D = cross-head - 3 Nm (2.2 lbf_t)
- E = allen wrench 3 - 5 Nm (3.68 lbf_t)

B side controls

With spring return control

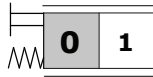
M1-U1 type

3 position, with M8 male thread external pin



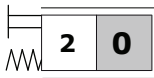
M2-U1 type

2 position (0-1), with M8 male thread external pin



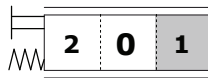
M3-U1 type

2 position (0-2), with M8 male thread external pin



M4-U1 type

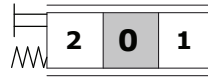
2 position (1-2), with M8 male thread external pin



With flexible cable control arrangement

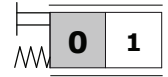
M1-U2 type

3 position, spring return in neutral position



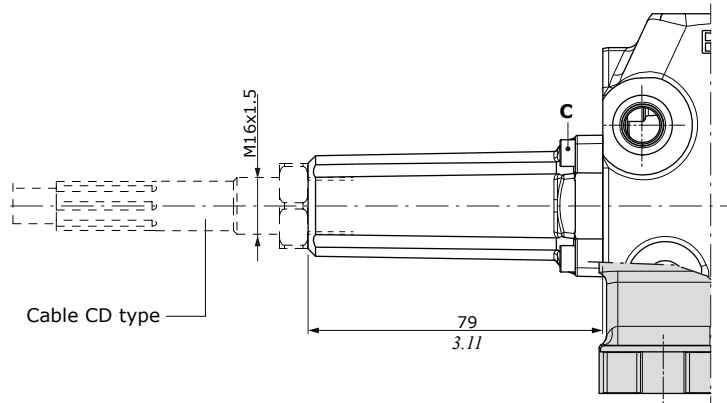
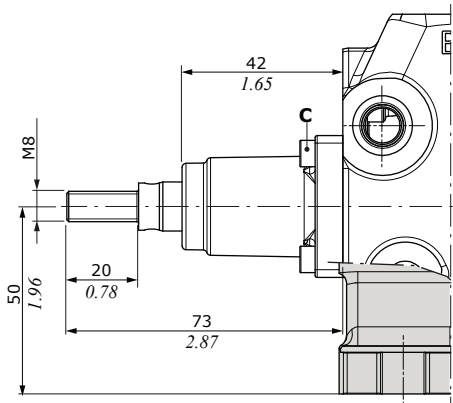
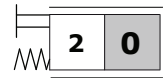
M2-U2 type

2 position (0-1), spring return in neutral position



M3-U2 type

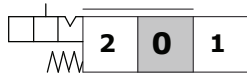
2 position (0-2), spring return in neutral position



With detent control

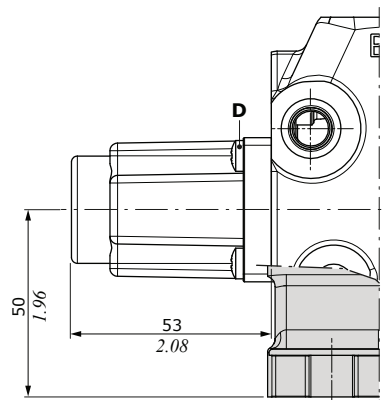
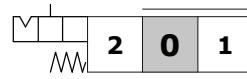
R1 type

3 position, detent in position 1



R2 type

3 position, detent in position 2



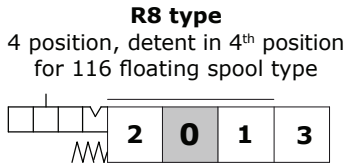
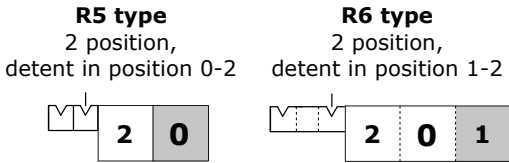
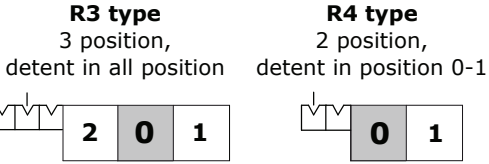
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbft)
D = cross-head - 3 Nm (2.2 lbft)

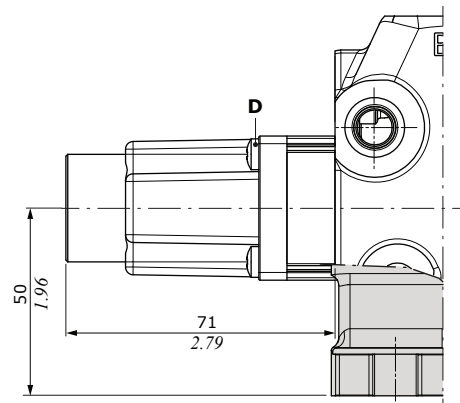
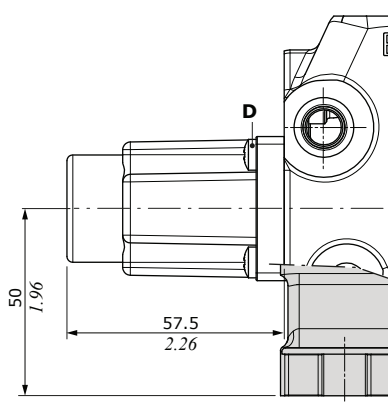
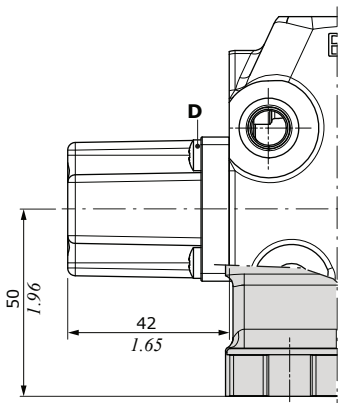
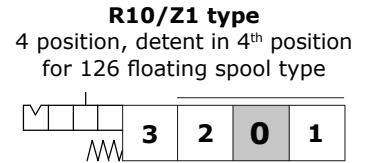
Working section

B side controls

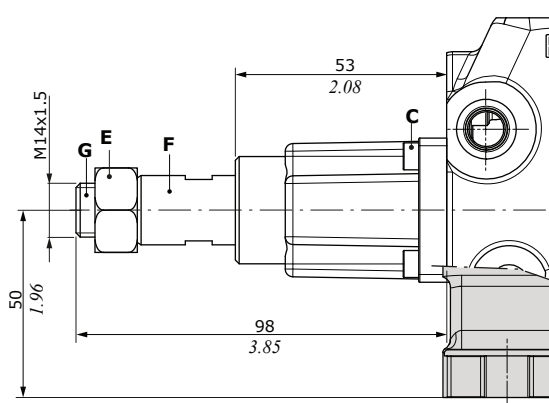
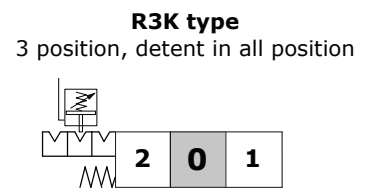
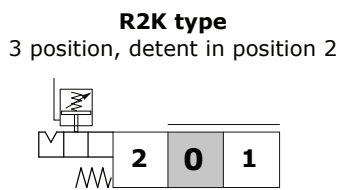
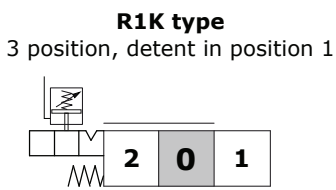
With detent control



Wrenches and tightening torques
 C = allen wrench 3 - 3 Nm (2.2 lbf)
 D = cross-head - 3 Nm (2.2 lbf)
 E = wrench 22 - 32 Nm (23.6 lbf)
 F = wrench 16
 G = allen wrench 10 - 32 Nm (23.6 lbf)



With detent control and kick out function

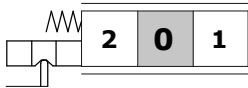


B side controls

With spool position microswitch

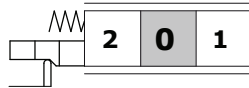
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position



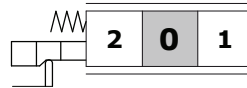
M1-N1A type

3 position, micro operation in position 1



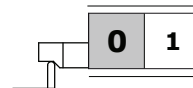
M1-N1B type

3 position, micro operation in position 2



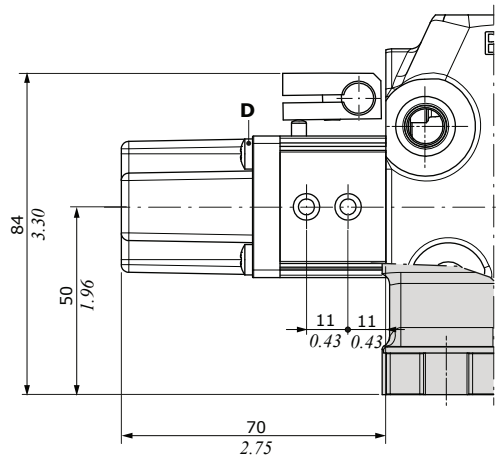
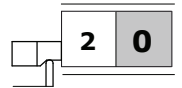
M2-N1 type

2 position (0-1), spring return in neutral position



M3-N1 type

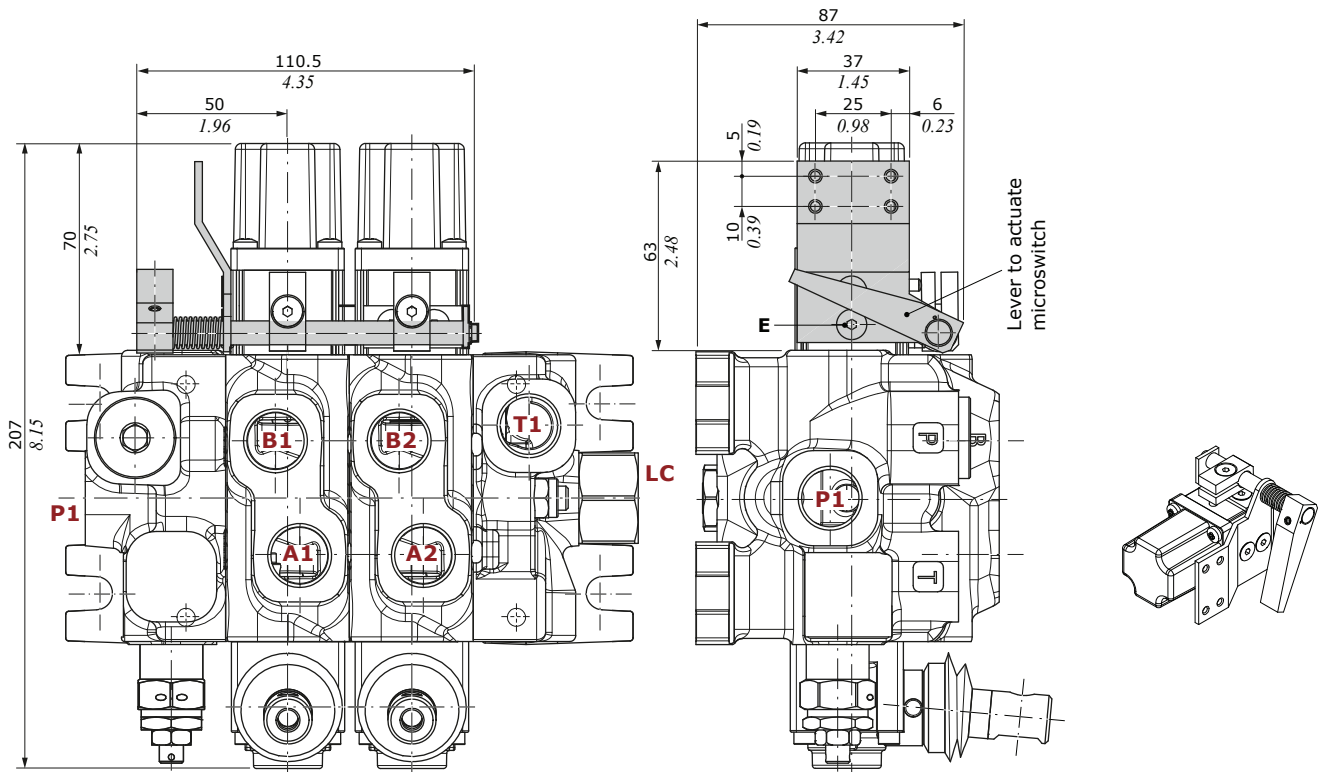
2 position (0-2), spring return in neutral position



Wrenches and tightening torques

D = cross-head - 3 Nm (2.2 lbft)
E = allen wrench 3 - 6.6 Nm (4.8 lbft)

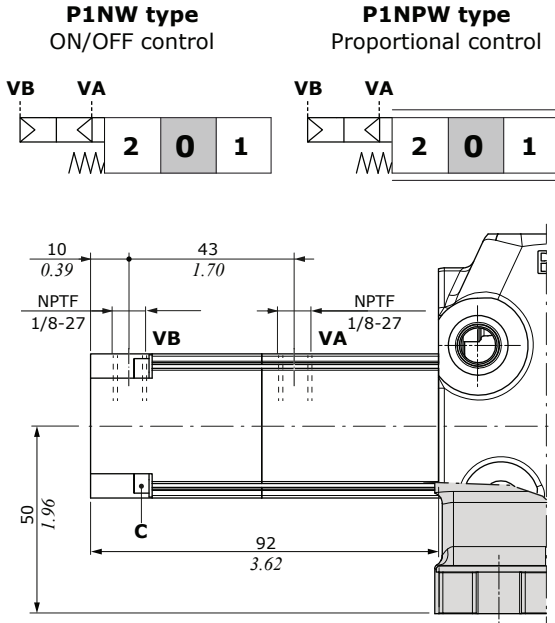
Microswitch assembly kit for 2 working section (M1-N1 type)



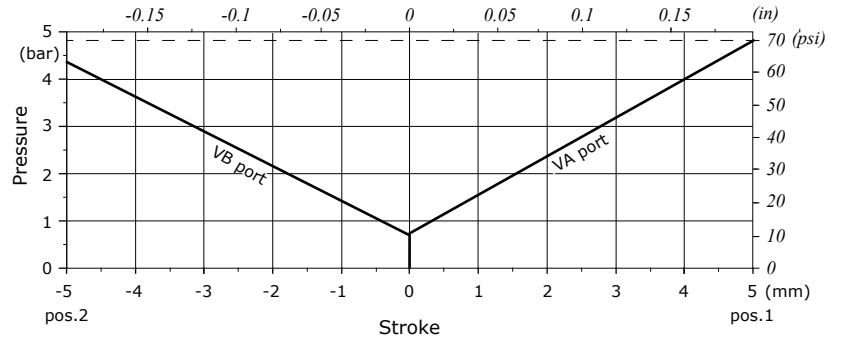
Working section

B side controls

With pneumatic control



Proportional pilot pressure curves



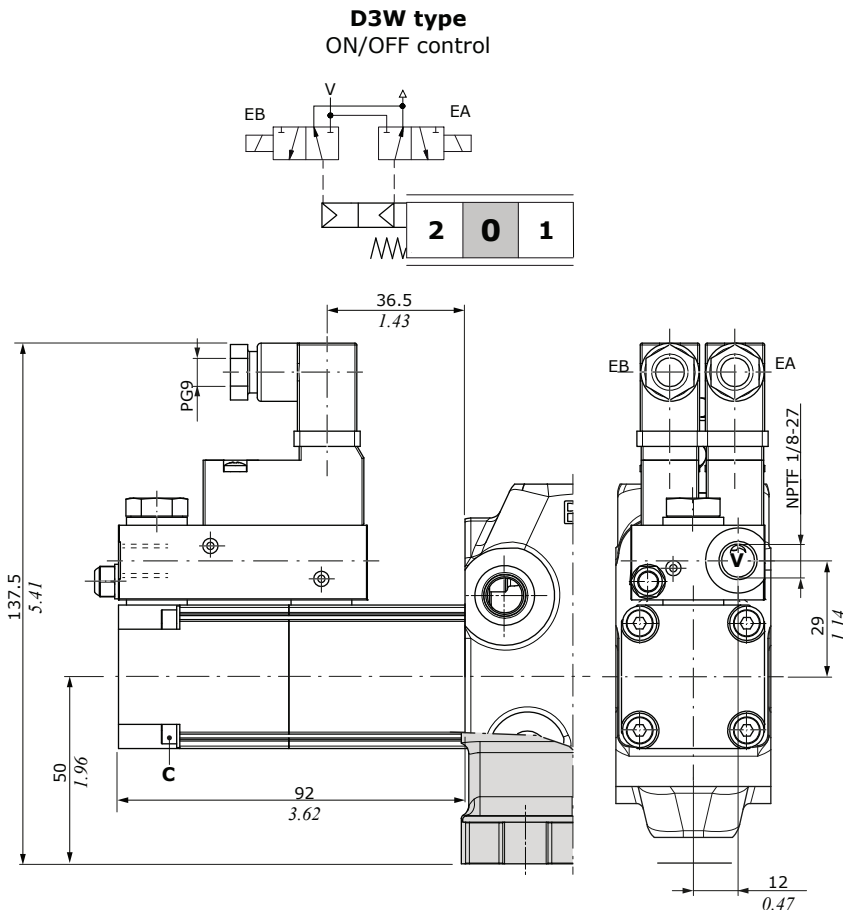
Operating features

Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
 Pilot volume..... : 4 cm³/min (0.24 in³/min)

Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbft)

With ON/OFF electropneumatic control



Operating features

Pilot pressure..... : min. 1 bar (14.5 psi)
 max. 10 bar (145 psi)

COILS

Nominal voltage tolerance..... : -5% +10%
 Power rating..... : 2.3 W
 Nominal current..... : 12 VDC - 24VDC
 Coil insulation..... : Class F
 Weather protection..... : IP65
 Duty cycle..... : 100%

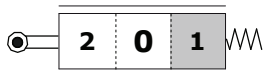
Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbft)

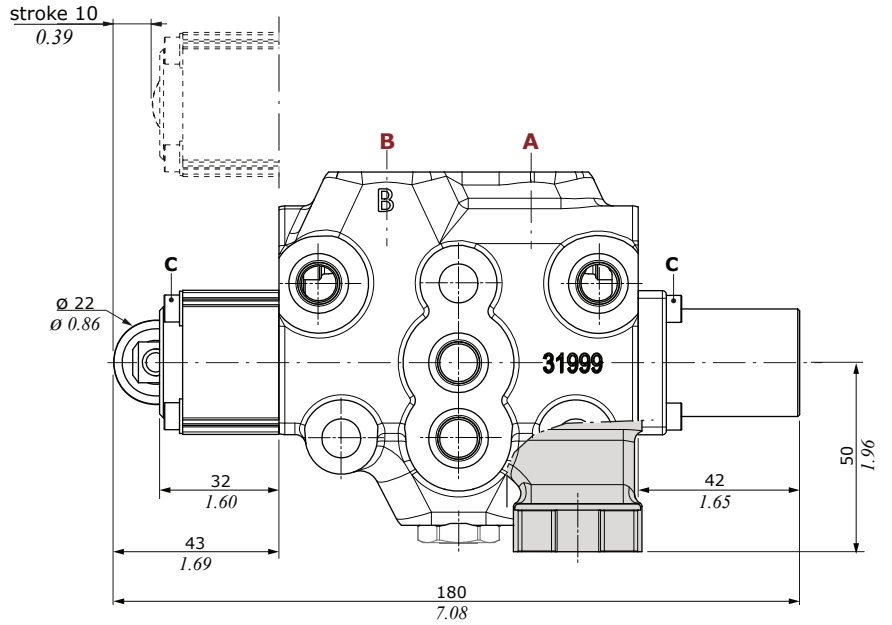
A+B side controls

With cam control

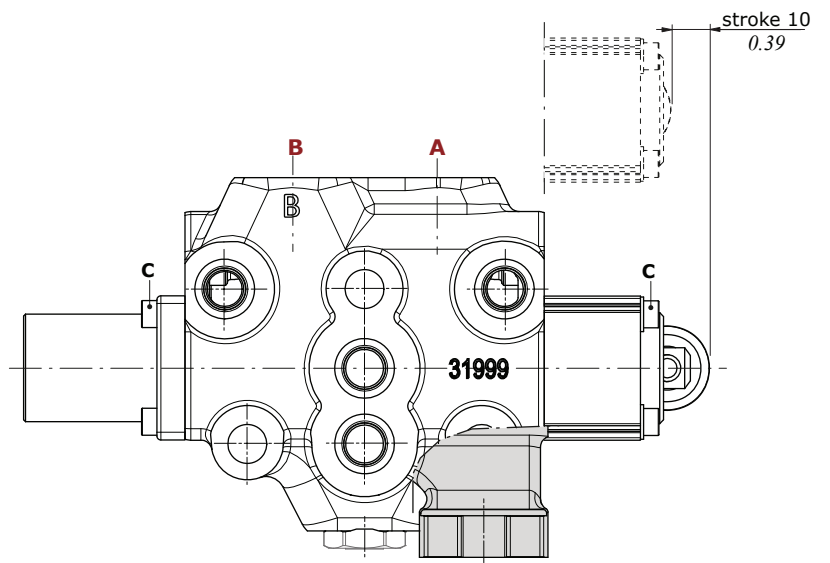
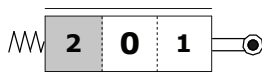
C2 type
From position 1 to position 2,
spring return in position 1



Wrenches and tightening torques
C = allen wrench 3 - 3 Nm (2.2 lbf^t)



C3 type
From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type

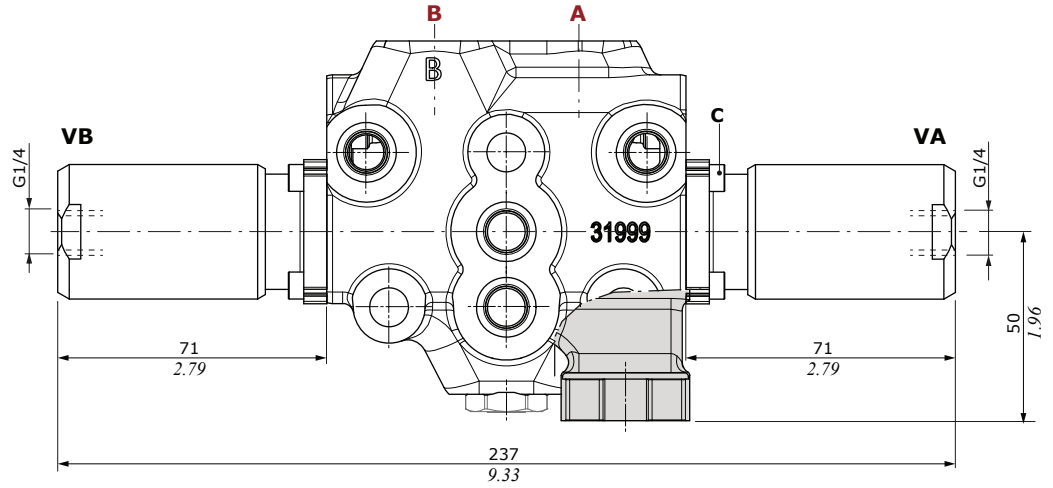
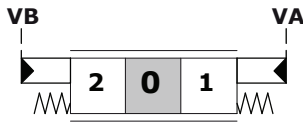


Working section

A+B side controls

With proportional hydraulic controls

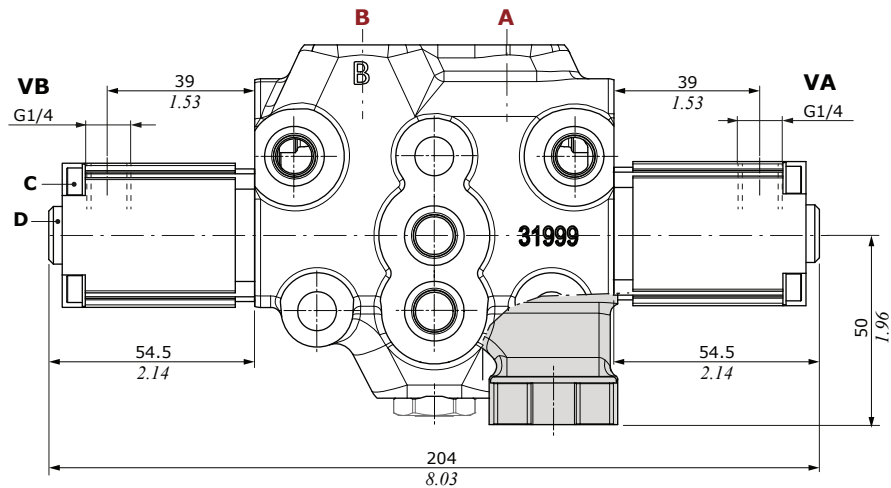
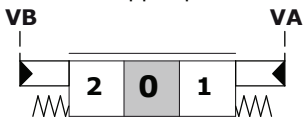
H1 type
High pressure control
with side ports



Operating features

Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)

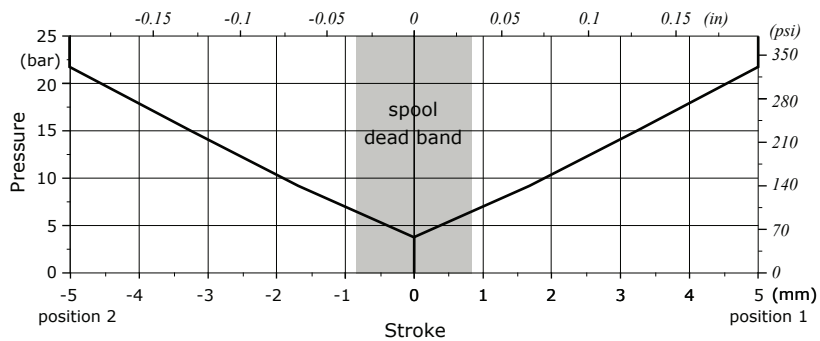
H5 type
Low pressure control
with upper ports



Operating features

Pilot pressure..... : max. 100 bar (1450 psi)

Stroke vs. Pressure diagram for H5 type control

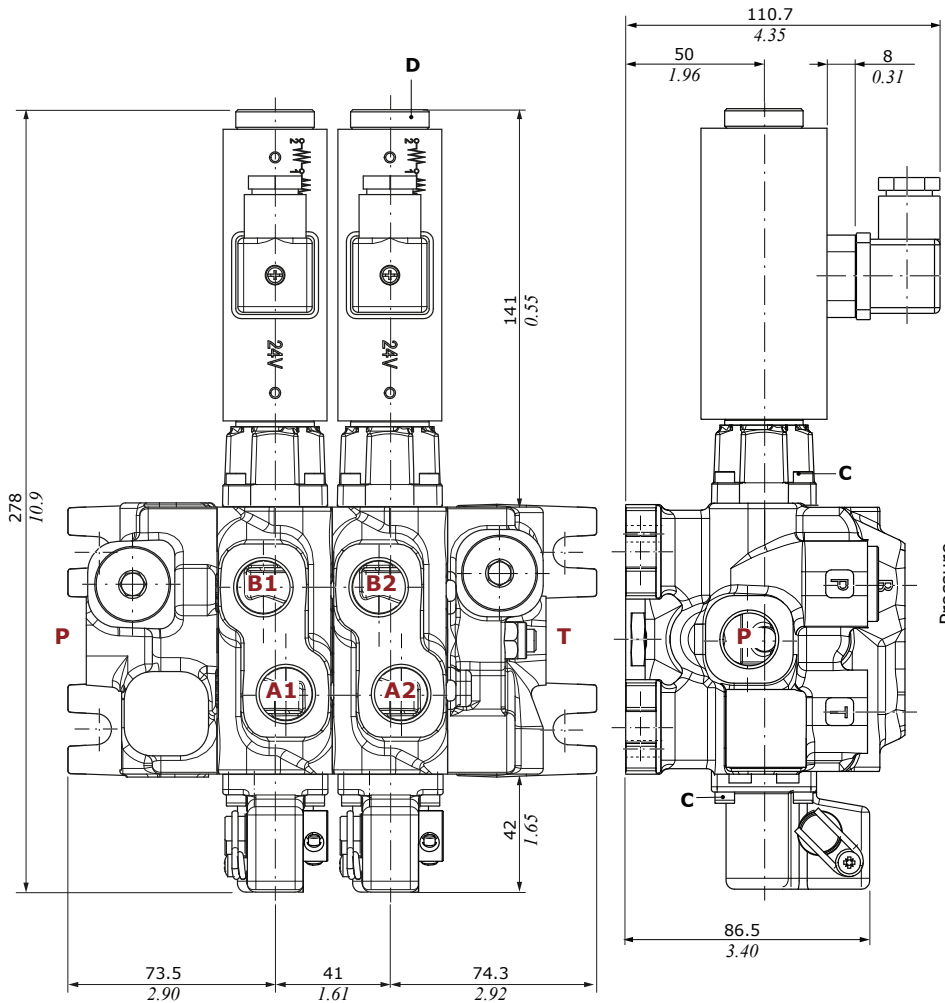
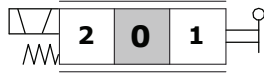


Wrenches and tightening torques

C = allen wrench 3 - 3 Nm (2.2 lbf^t)
D = allen wrench 4 - 9.8 Nm (7.2 lbf^t)

Direct solenoid control

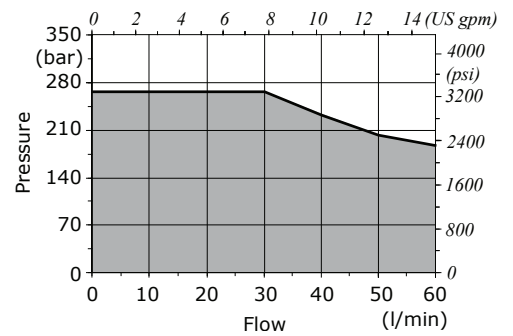
D41 type: ON/OFF one side



D41 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	52 W
Insulation	Class H
Weather protection	IP65

Connector type: ISO4400 3P+T-PG11

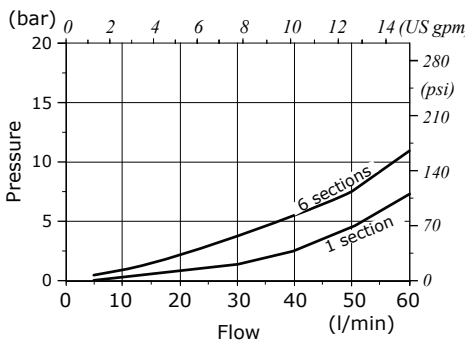
Dynamic conditions



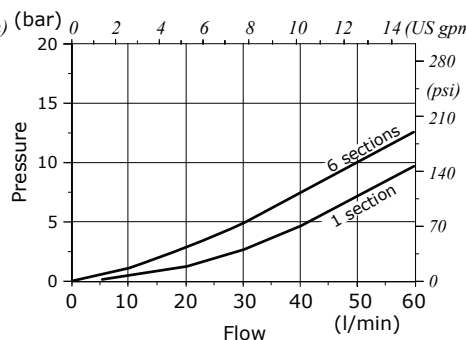
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbft)
- D = manual tightening - 6.6 Nm (4.8 lbft)

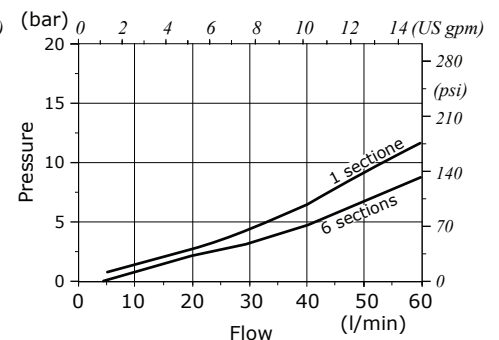
P⇒T pressure drops



P⇒A(B) pressure drops



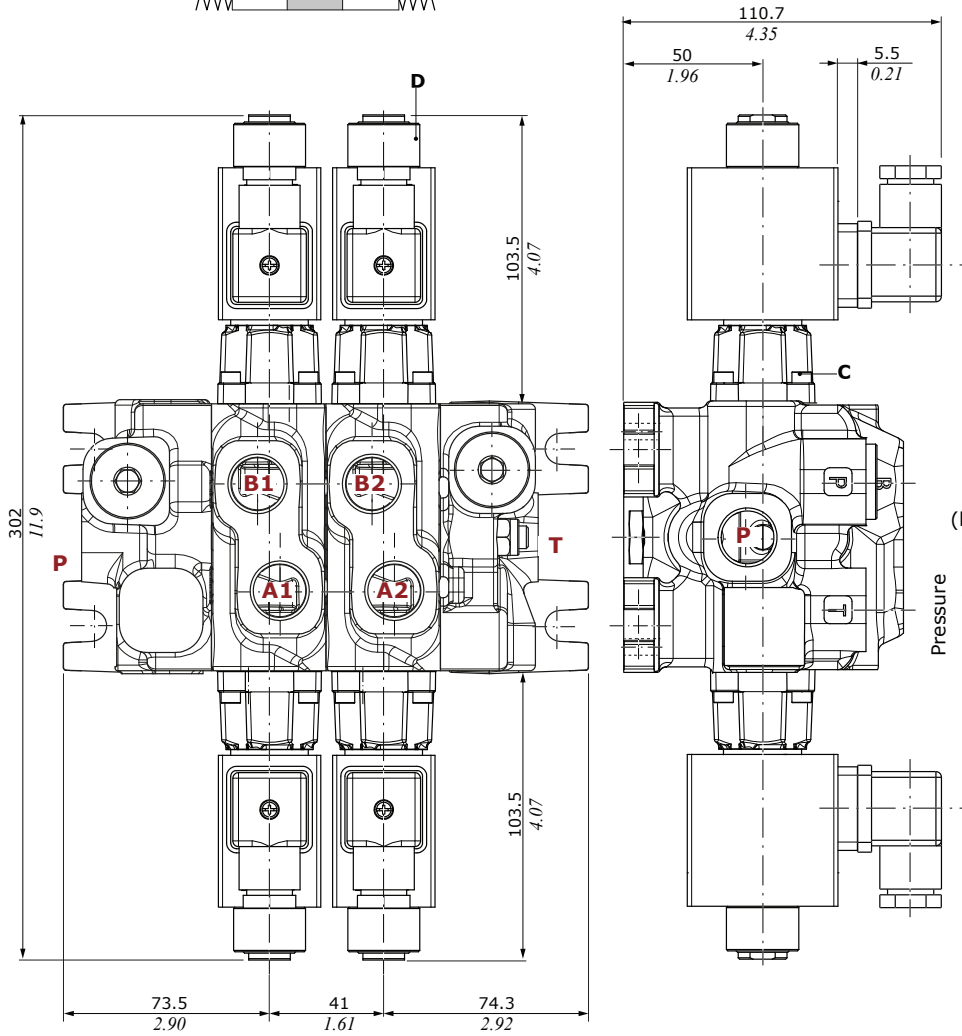
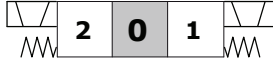
A(B)⇒T pressure drops



Working section

Direct solenoid control

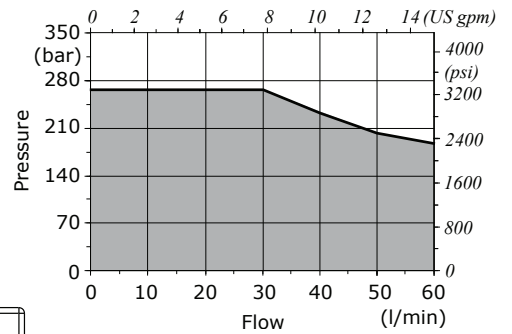
D9 type: ON/OFF two side



D9 coil	
Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	58 W
Insulance	Class H
Weather protection	IP65

Connector type: ISO4400 3P+T-PG11

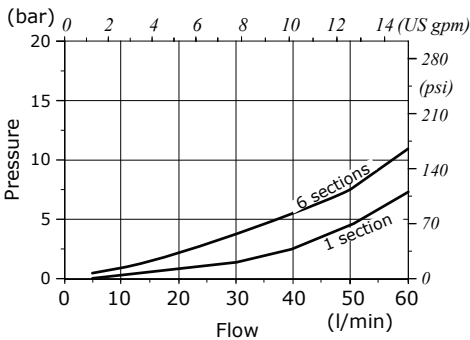
Dynamic conditions



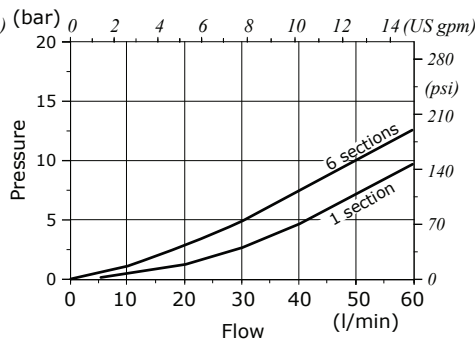
Wrenches and tightening torques

- C = allen wrench 3 - 3 Nm (2.2 lbf)
- D = manual tightening - 6.6 Nm (4.8 lbf)

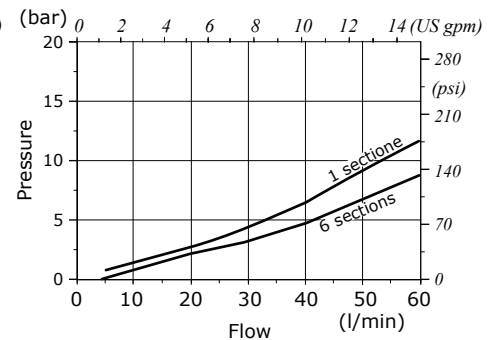
P⇒T pressure drops



P⇒A(B) pressure drops



A(B)⇒T pressure drops



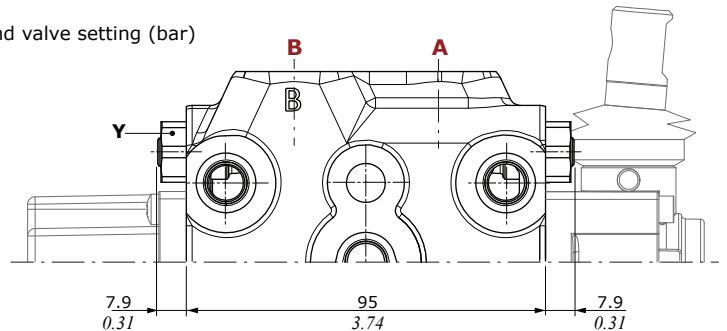
Auxiliary valve configuration

Dimensional data, hydraulic circuits and performance data

Description example

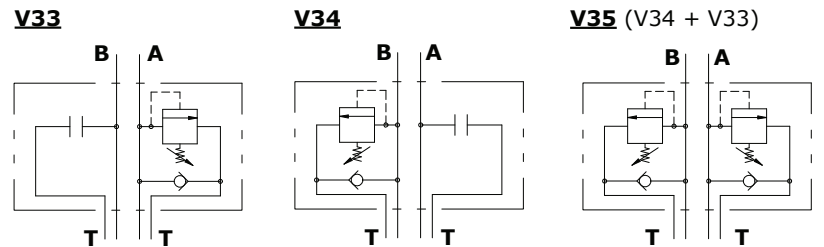
GSV50 / 1 / ... / 103 - A1 - M1 - ^{aux valve} **V32(N)** ^{spring type and valve setting (bar)} **120** / ...

Wrenches and tightening torques
 Y = wrench 16 - 20 Nm (14.7 lbf)



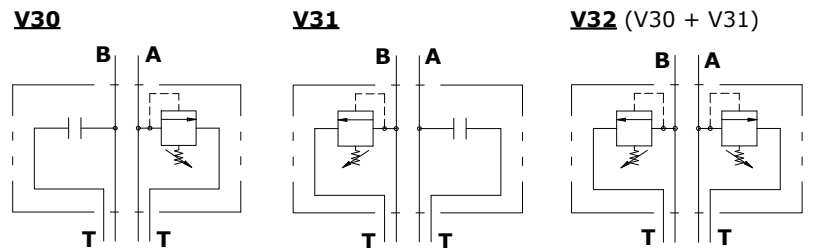
Antishock/anticavitation valve example

A side configuration: B side configuration: A+B side configuration:



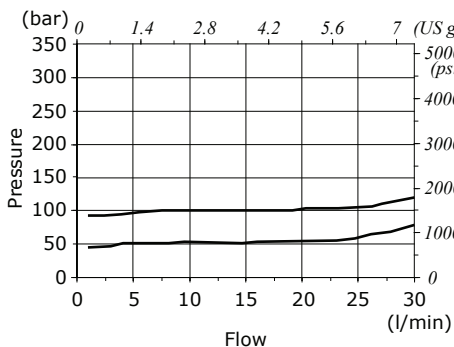
Antishock valve example

A side configuration: B side configuration: A+B side configuration:

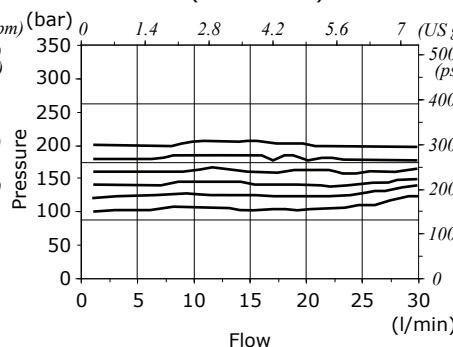


Spring type	Setting ranges (bar - psi)
B (white)	From 50 to 100 - from 725 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 350 - from 2910 to 5100

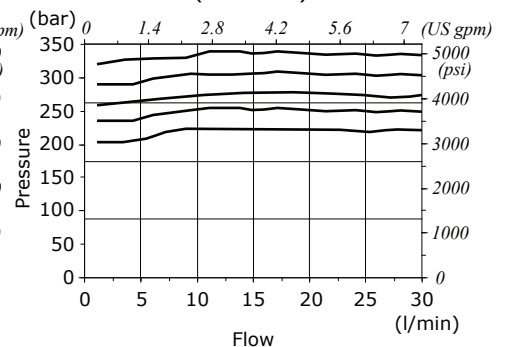
Setting range example (white band)



Setting range example (black band)



Setting range example (red band)

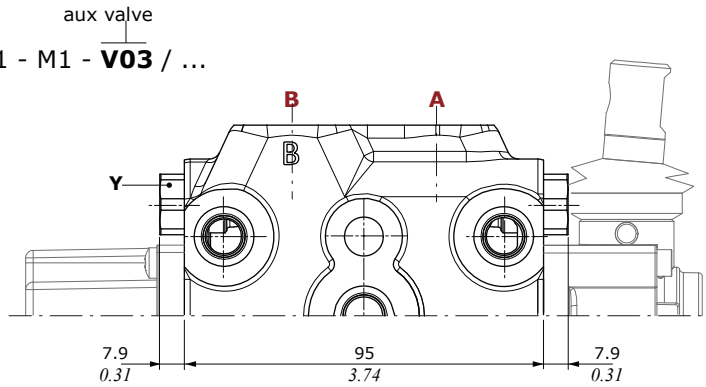


Auxiliary valve configuration

Dimensional data and hydraulic circuits

Anticavitation valve example

Q30 / 1 / ... / 103 - A1 - M1 - **V03** / ...



Wrenches and tightening torques
Y = wrench 16 - 20 Nm (14.7 lbf)

A side configuration:

B side configuration:

A+B side configuration:

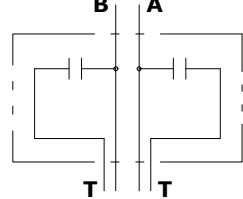
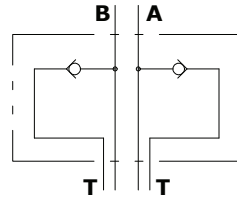
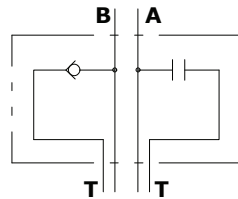
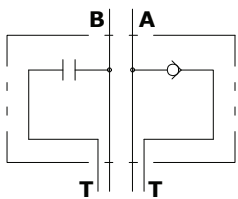
Plug valve:

V04

V05

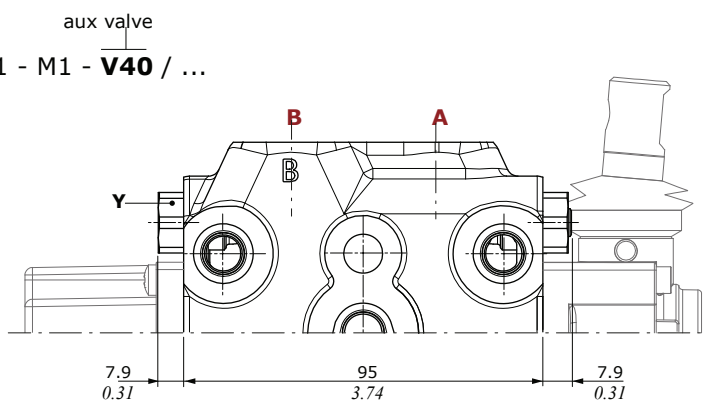
V03 (V04 + V05)

VC



Antishock and anticavitation combining valves example

Q30 / 1 / ... / 103 - A1 - M1 - **V40** / ...

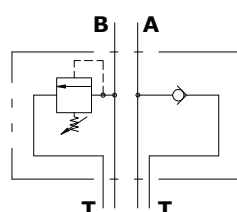
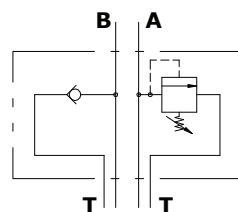


A side configuration:

B side configuration:

V40 (V30 + V05)

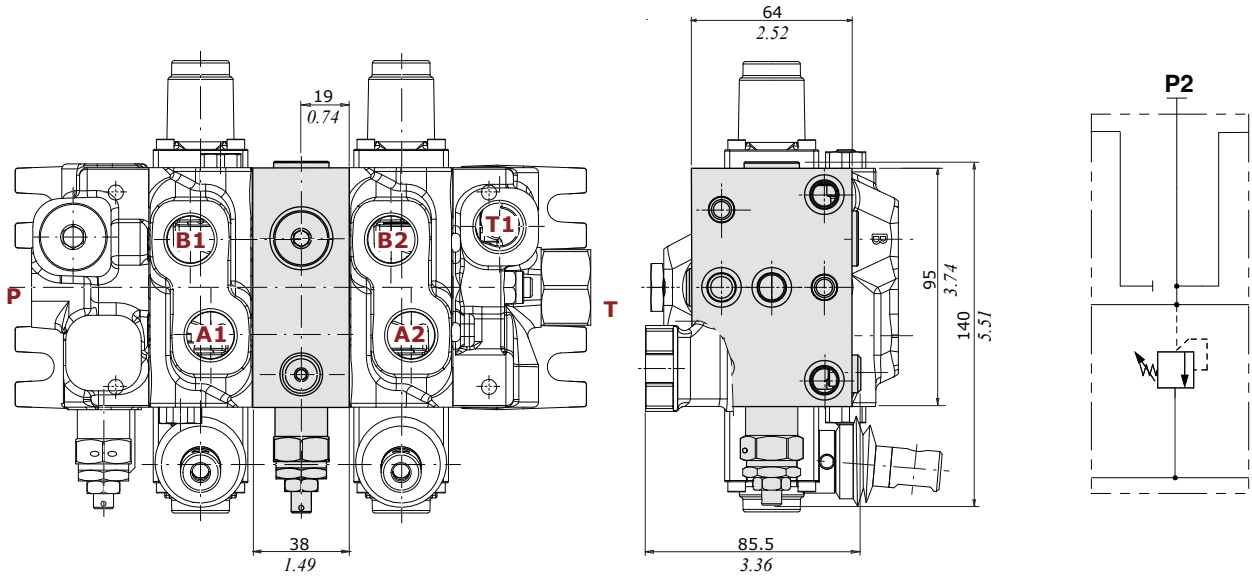
V41 (V31 + V04)



Dimensional data and hydraulic circuit

E50 type

Intermediate inlet section with pressure relief valve

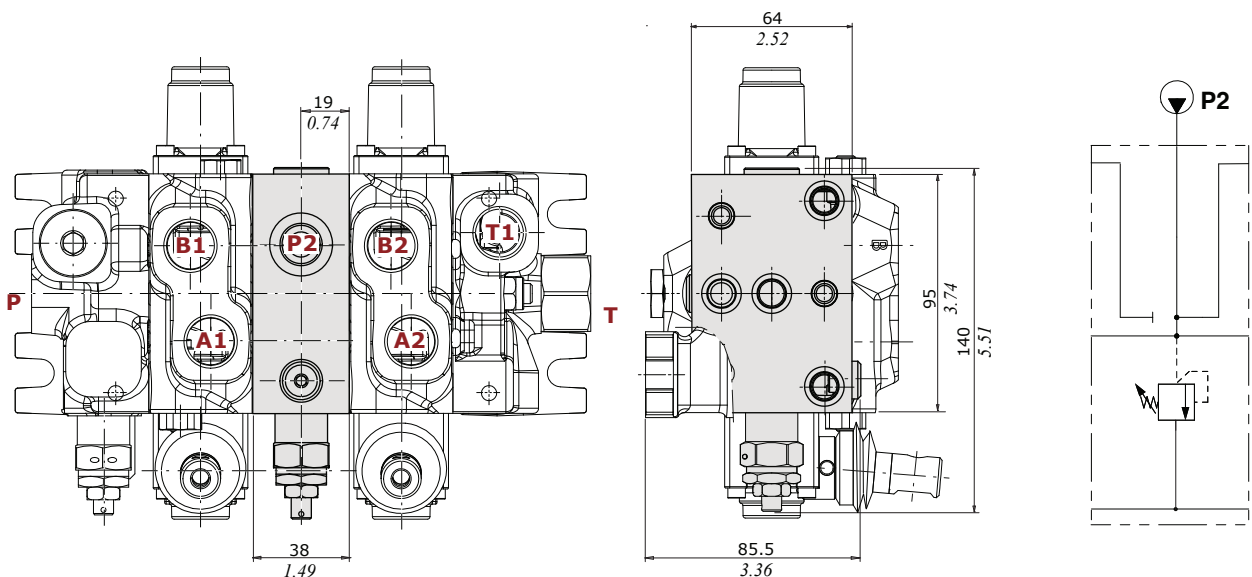


Description example: GSV50/2/F7S(N150)/103-A1-M1.VC/**E50(N150)**/103-A1-M1/F3D-S

intermediate section spring type and valve setting (bar)

E53 type

Intermediate inlet section with pressure relief valve and P2 port open



Description example: GSV50/2/F7S(N150)/103-A1-M1.VC/**E53(N150)**/103-A1-M1/F3D-S

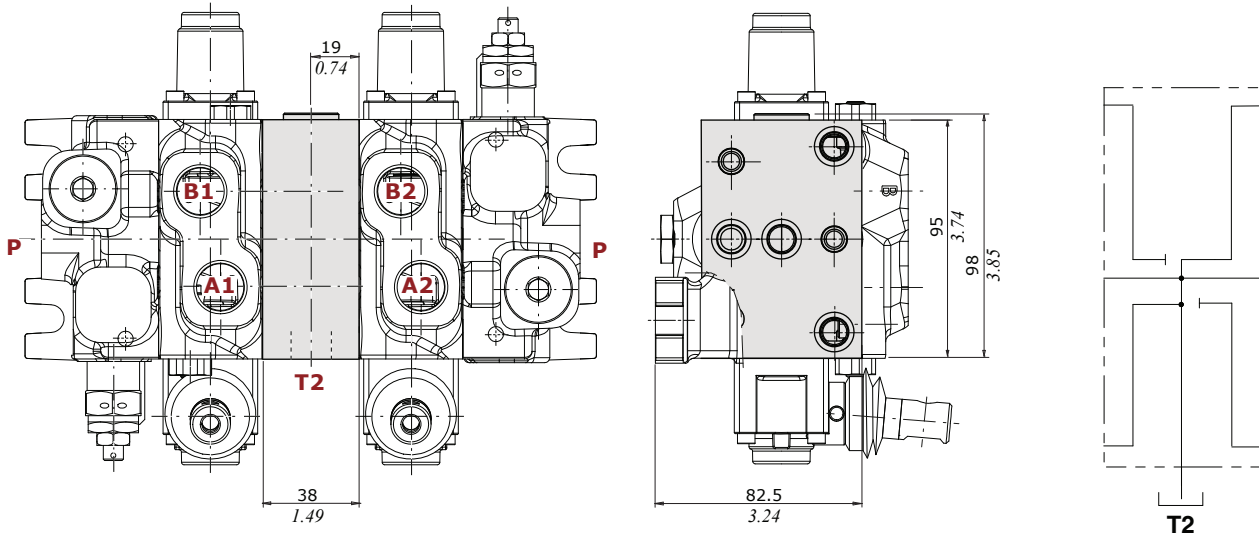
intermediate section spring type and valve setting (bar)

Intermediate section

Dimensional data and hydraulic circuit

E51 type

Intermediate outlet section, T2 port open

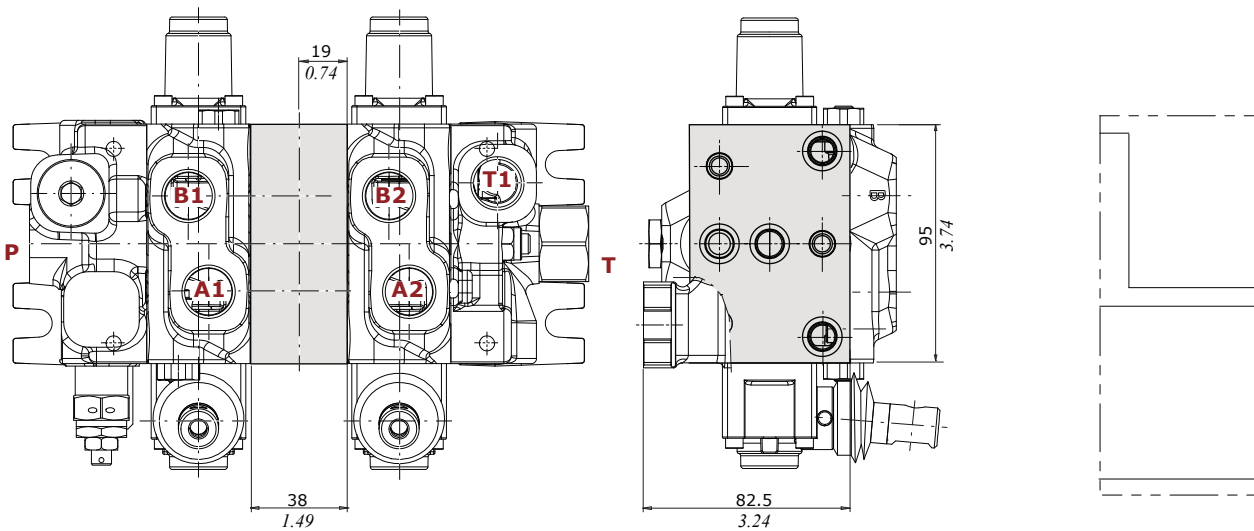


Description example: GSV50/2/F7S(N150)/103-A1-M1.VC/**E51**/103-A1-M1/F3D-S

intermediate section

E61 type

Intermediate spacer section

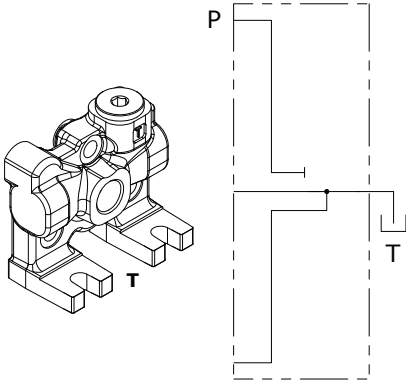


Description example: GSV50/2/F7S(N150)/103-A1-M1.VC/**E61**/103-A1-M1/F3D-S

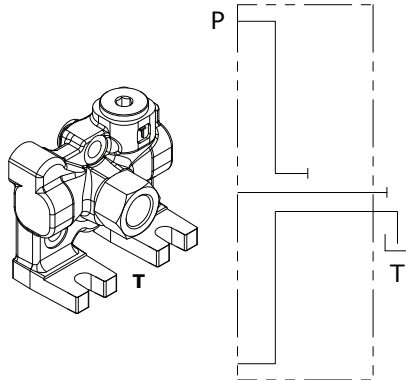
intermediate section

Outlet section

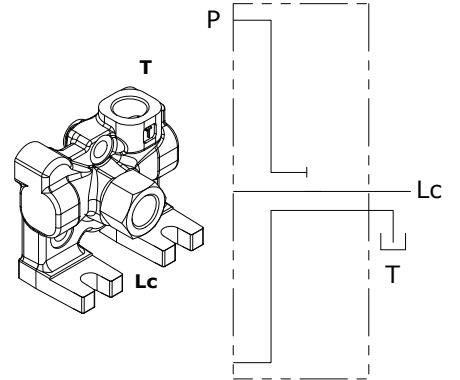
F3D configuration
Open center configuration



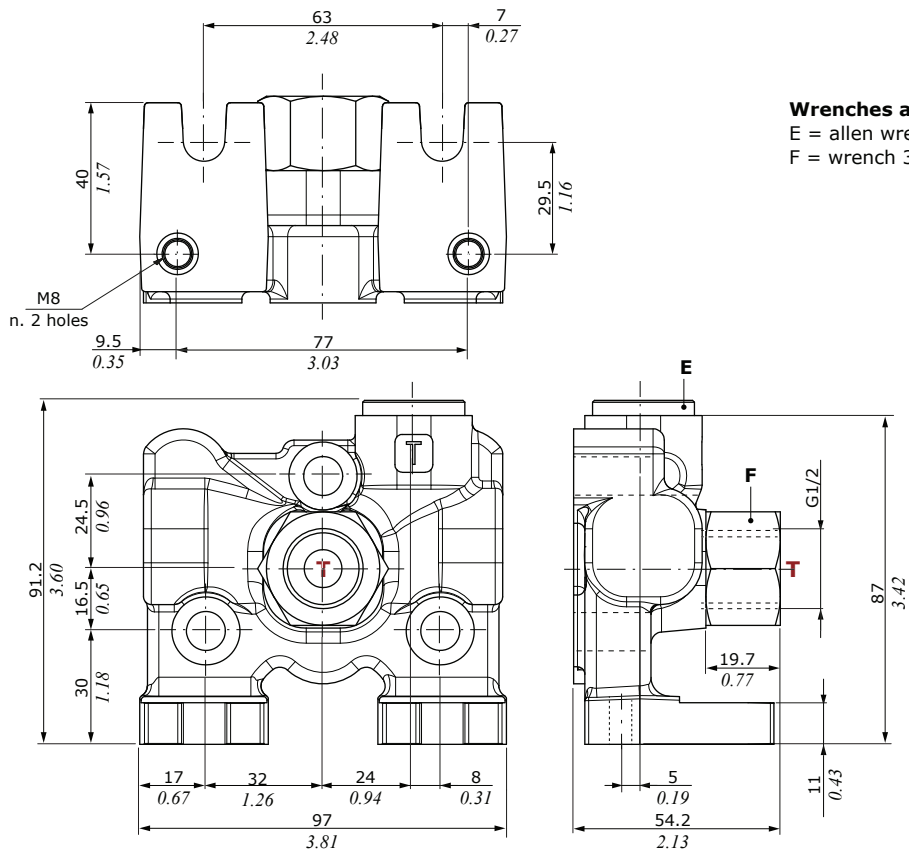
F16D configuration
Closed center configuration



F6D configuration
Carry-over configuration



F16D configuration example





Q80

Sectional directional control valve

- Available with parallel, tandem or series circuit
- Optional carry over port
- A wide range of antishock + anticavitation port valves
- Intermediate sections for several types of circuit
- Manual, pneumatic, electropneumatic, hydraulic, direct solenoid and electrohydraulic on-off controls

Working conditions

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

Nominal flow rating		80 l/min - (21.1 Us gpm)
Max. pressure		300 bar (4350 psi)
Max. back pressure on outlet T port		25 bar (360 psi)
Number sections		from 1 to 10
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	6 cm ³ /min (0.36 in ³ /min)
Fluid		Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt
Max. contamination level		16/14/12 - ISO 4406 - NAS1638 class 6
Ambient temperature	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F

NOTE - For different conditions please contact our Sales Department.

REFERENCE STANDARD

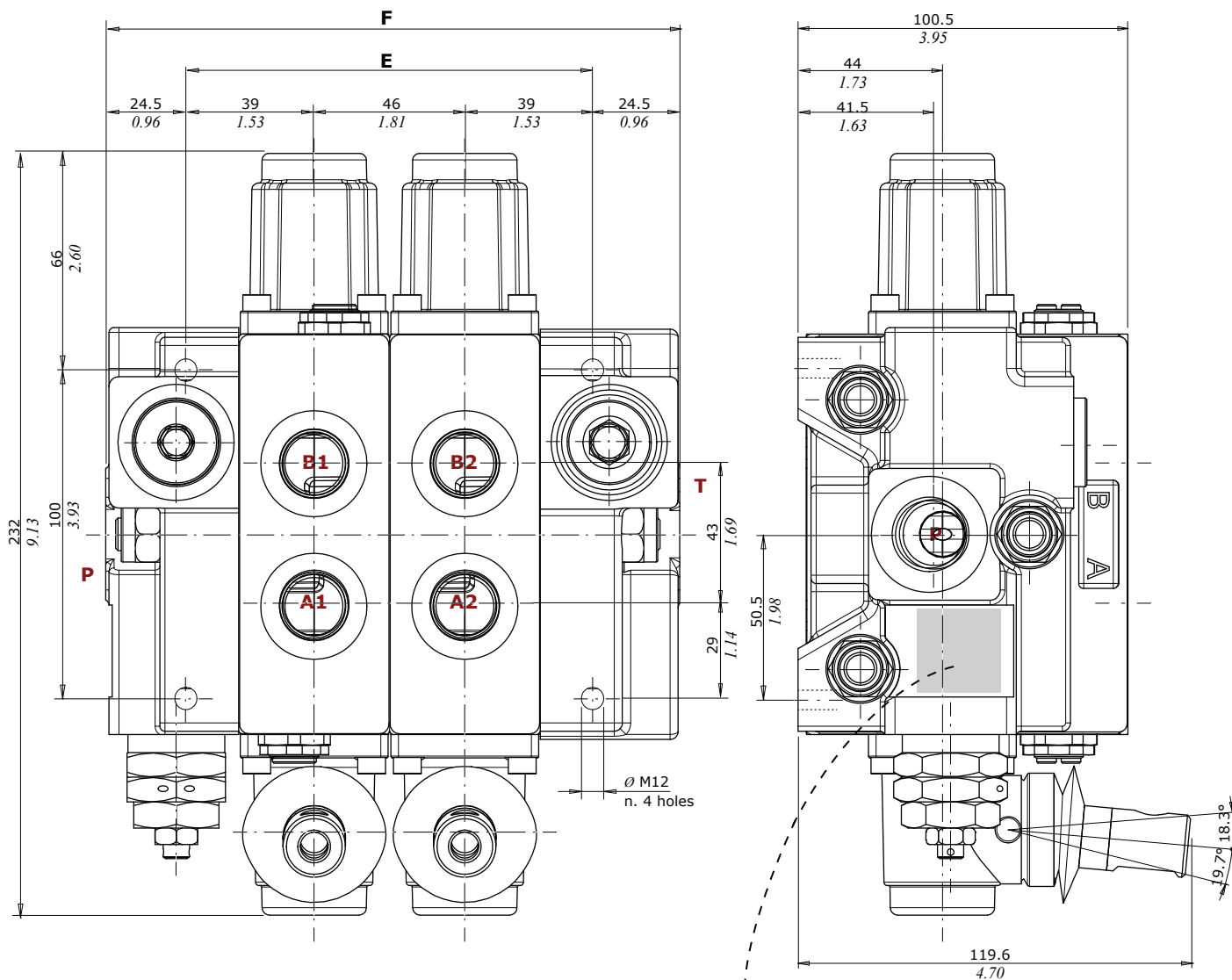
		BSP	UN-UNF
THREAD ACCORDING TO		ISO 228/1	ISO 263
		BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926
	SAE		J11926
	DIN	3852-2 shape X or Y	

PORT THREADING

PORTS	BSP (standard)	BSP (G 3/4)	UN-UNF
P Inlet	G 1/2	G 3/4	7/8-14 (SAE 10)
P1 Inlet	G 1/2	G 3/4	7/8-14 (SAE 10)
A and B ports	G 1/2	G 3/4	3/4-16 (SAE 8)
T Outlet	G 3/4	G 3/4	1" 1/16-12 (SAE12)
T1 Outlet	G 3/4	G 3/4	7/8-14 (SAE 10)
Lc port (Carry-over plug - T port)	G 1/2-G 3/4	G 3/4	7/8-14 (SAE 10)
Hydraulic controls	G 1/4	G 3/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

Standard configuration*

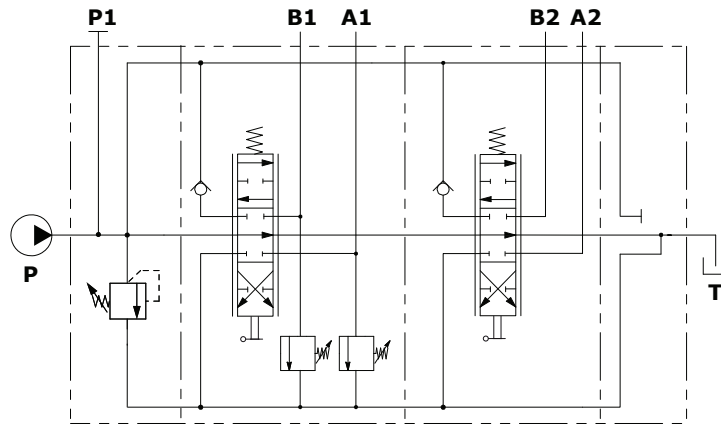


Type	E		F	
	mm	in	mm	in
Q80/1	78	3.07	127	5
Q80/2	124	4.88	173	6.81
Q80/3	170	6.69	219	8.62
Q80/4	216	8.50	265	10.43
Q80/5	262	10.31	311	12.24
Q80/6	308	12.12	357	14.05
Q80/7	354	13.93	403	15.86
Q80/8	400	15.74	449	17.67
Q80/9	446	17.56	495	19.48
Q80/10	492	19.37	541	21.3



- MADE IN ITALY
1GB75040009 ----- Product code
- DISTRIBUTORE
Q80/2 ----- Code description
- MD1600464-001 ----- Product allotment
- [Datamatrix] ----- Datamatrix with product allotment

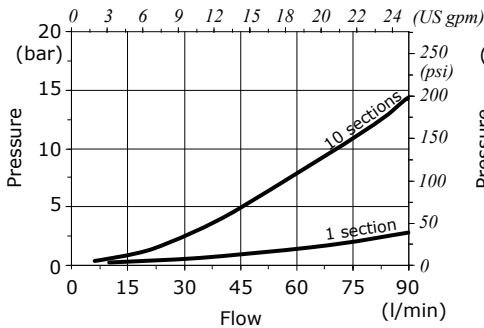
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.
 (*): For other configurations, see page 217



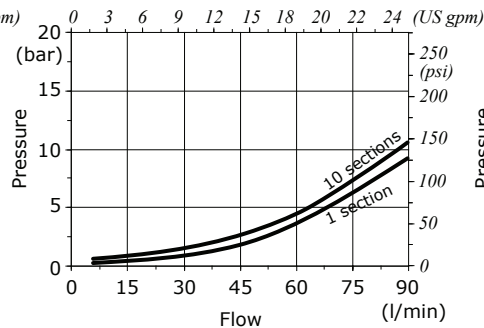
Description example (parallel circuit):
 Q80/2/F7S(N150)/103-A1-M1.V32(N105\N105)/103-A1-M1/F3D

Performance data

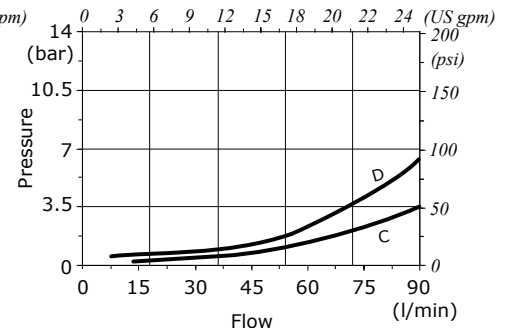
P⇒T pressure drops



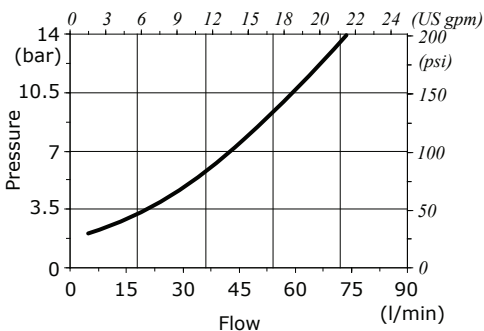
P⇒A(B) pressure drops



A(B)⇒T pressure drops



A1(B1)⇒A2(B2) pressure drops
 (with series circuit)



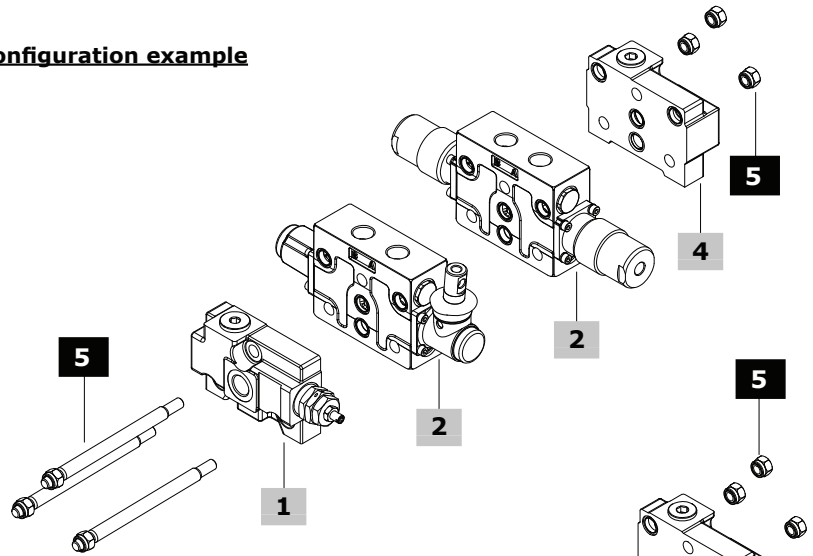
Legenda

- C= 10th section
- D= 1st section

Complete section ordering codes

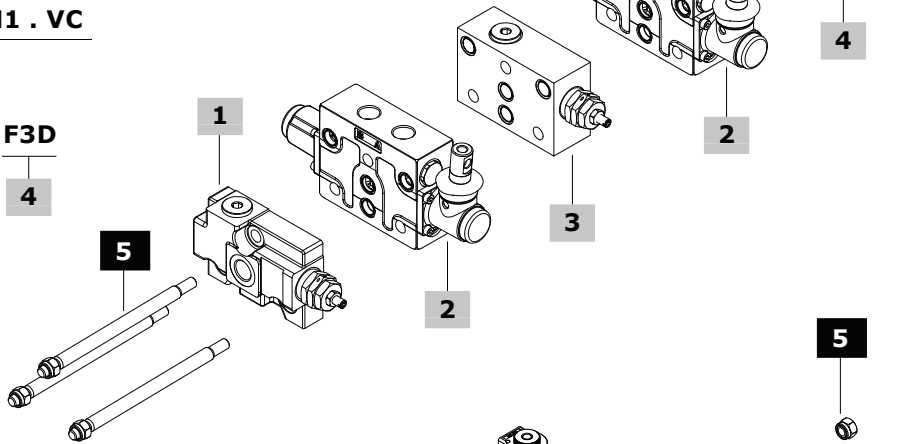
Valve with mechanical and hydraulic controls configuration example

valve setting (bar)
Q80 / 2 / F7S(N150) / 103 - A1 - M1 . VC
 N. of section **1** **2**
 / **103 - H1 . VC / F3D**
 2 **4**



Valve with intermediate section and mechanical control configuration example

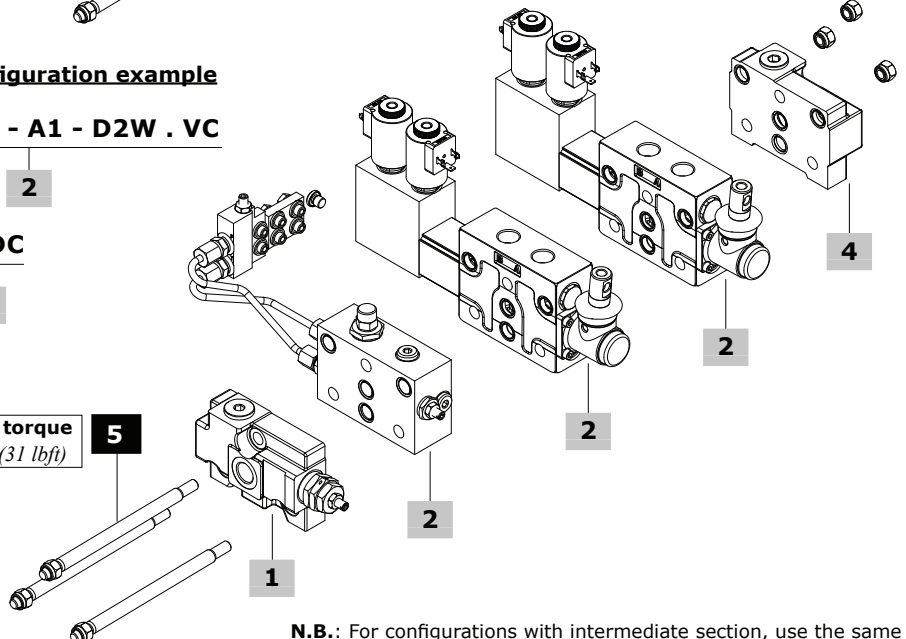
valve setting (bar)
Q80 / 2 / F7S(N150) / 103 - A1 - M1 . VC
 1 **2**
 / **E50(N150) / 103 - A1 - M1 . VC / F3D**
 3 **2** **4**



Valve with electrohydraulic control configuration example

Q80 / 2 / F7S(N150) / KE2R / 103 - A1 - D2W . VC
 1 **2**
 / **103 - A1 - D2W . VC / F3D - 12VDC**
 2 **4** **2**

Tie rod tightening torque
 wrench 17 - 42 Nm (31 lbft)



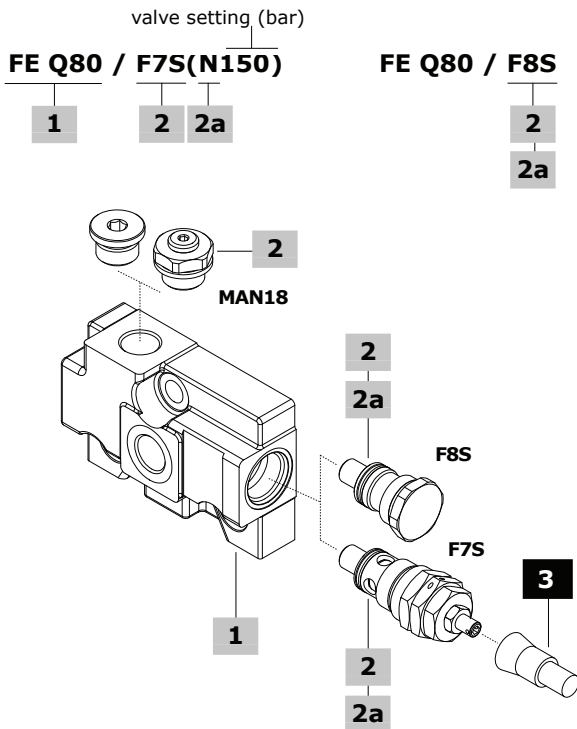
N.B.: For configurations with intermediate section, use the same tie rods for std. configuration (example: for 2 working sections + 1 intermediate section, use tie rods for 3 working sections)

Complete section ordering codes

<p>1 Inlet section* page 188</p> <p>TYPE: FE-Q80/F7S(N150) CODE: 08000F7S/D-N DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve, setting range 101-200 bar (1460-2900 psi) TYPE: FE-Q80/F8S CODE: 08003F8S/D DESCRIPTION: As previous one, without valves (pressure relief valve plugged port)</p>	<p>3 Intermediate section* page 217</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>CODE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>E50</td> <td>08850E50-B</td> <td>With pressure relief valve setting range 10-100 bar (145-1450 psi)</td> </tr> <tr> <td></td> <td>08850E50-N</td> <td>As previous one, setting range 101-200 bar (1460-2900 psi)</td> </tr> <tr> <td></td> <td>08850E50-R</td> <td>As previous one, setting range 201-380 bar (2910-5500 psi)</td> </tr> <tr> <td>E53</td> <td>08854E53-B</td> <td>With pressure relief valve setting range 10-100 bar (145-1450 psi) and P2 port open for 2nd pump</td> </tr> <tr> <td></td> <td>08854E53-N</td> <td>As previous one, setting range 101-200 bar (1460-2900 psi)</td> </tr> <tr> <td></td> <td>08854E53-R</td> <td>As previous one, setting range 201-380 bar (2910-5500 psi)</td> </tr> <tr> <td>E51</td> <td>08853E51</td> <td>Intermediate outlet section, T2 port open</td> </tr> <tr> <td>E61</td> <td>08877E61</td> <td>Intermediate spacer section</td> </tr> </tbody> </table>	TYPE	CODE	DESCRIPTION	E50	08850E50-B	With pressure relief valve setting range 10-100 bar (145-1450 psi)		08850E50-N	As previous one, setting range 101-200 bar (1460-2900 psi)		08850E50-R	As previous one, setting range 201-380 bar (2910-5500 psi)	E53	08854E53-B	With pressure relief valve setting range 10-100 bar (145-1450 psi) and P2 port open for 2 nd pump		08854E53-N	As previous one, setting range 101-200 bar (1460-2900 psi)		08854E53-R	As previous one, setting range 201-380 bar (2910-5500 psi)	E51	08853E51	Intermediate outlet section, T2 port open	E61	08877E61	Intermediate spacer section							
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E51	08853E51	Intermediate outlet section, T2 port open																																	
E61	08877E61	Intermediate spacer section																																	
<p>2 Working section* page 190</p> <p>With mechanical controls TYPE: EL-Q80/103-A1-M1.VC CODE: SGL800007 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position TYPE: EL-Q80/103-A1-M1 CODE: 080000103001000 DESCRIPTION: As previous one, without valve arrangement With proportional hydraulic controls TYPE: EL-Q80/103-H1.VC CODE: SGL800008 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, high pressure hydraulic controls, spring return to neutral position TYPE: EL-Q80/103-H1 CODE: SGL800009 DESCRIPTION: As previous one, without valve arrangement TYPE: EL-Q80/103-H5.VC CODE: SGL800011 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, low pressure hydraulic controls, spring return to neutral position TYPE: EL-Q80/103-H5 CODE: SGL800012 DESCRIPTION: As previous one, without valve arrangement With electric solenoid controls - one side type TYPE: EL-Q80/103-A1-D41.VC-12VDC CODE: SGL800010 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC electric direct ON/OFF control with lever TYPE: EL-Q80/103-A1-D41-12VDC CODE: SGL800013 DESCRIPTION: As previous one, without valve arrangement With electrohydraulic ON/OFF controls - one side type TYPE: EL-Q80/KE1S/103-A1-D2W.VC -12VDC CODE: SGL800014 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC one-side electrohydraulic ON/OFF control, internal pilot and drain, lever control and spring return to neutral position TYPE: EL-Q80/KE1S/103-A1-D2W-12VDC CODE: SGL800015 DESCRIPTION: As previous one, without valve arrangement</p>	<p>4 Outlet section* page 219</p> <table border="0"> <tbody> <tr> <td>TYPE: FS-Q80-F3D</td> <td>CODE: 08012F3D</td> </tr> <tr> <td colspan="2">DESCRIPTION: T port open, T1 port plugged. For open center circuit</td> </tr> <tr> <td>TYPE: FS-Q80-F16D</td> <td>CODE: 08016F16D</td> </tr> <tr> <td colspan="2">DESCRIPTION: T port open, T1 port plugged. For closed center circuit</td> </tr> <tr> <td>TYPE: FS-Q80-F6D</td> <td>CODE: 08014F6D</td> </tr> <tr> <td colspan="2">DESCRIPTION: Lc port and T1 port open. With joint for carry-over (HPCO) circuit</td> </tr> </tbody> </table> <p>5 Tie rod kit</p> <table border="0"> <thead> <tr> <th>CODE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>08901TX1</td> <td>For 1 section valve</td> </tr> <tr> <td>08902TX2</td> <td>For 2 sections valve</td> </tr> <tr> <td>08903TX3</td> <td>For 3 sections valve</td> </tr> <tr> <td>08904TX4</td> <td>For 4 sections valve</td> </tr> <tr> <td>08905TX5</td> <td>For 5 sections valve</td> </tr> <tr> <td>08906TX6</td> <td>For 6 sections valve</td> </tr> <tr> <td>08907TX7</td> <td>For 7 sections valve</td> </tr> <tr> <td>08908TX8</td> <td>For 8 sections valve</td> </tr> <tr> <td>08909TX9</td> <td>For 9 sections valve</td> </tr> <tr> <td>08910TX10</td> <td>For 10 sections valve</td> </tr> </tbody> </table>	TYPE: FS-Q80-F3D	CODE: 08012F3D	DESCRIPTION: T port open, T1 port plugged. For open center circuit		TYPE: FS-Q80-F16D	CODE: 08016F16D	DESCRIPTION: T port open, T1 port plugged. For closed center circuit		TYPE: FS-Q80-F6D	CODE: 08014F6D	DESCRIPTION: Lc port and T1 port open. With joint for carry-over (HPCO) circuit		CODE	DESCRIPTION	08901TX1	For 1 section valve	08902TX2	For 2 sections valve	08903TX3	For 3 sections valve	08904TX4	For 4 sections valve	08905TX5	For 5 sections valve	08906TX6	For 6 sections valve	08907TX7	For 7 sections valve	08908TX8	For 8 sections valve	08909TX9	For 9 sections valve	08910TX10	For 10 sections valve
TYPE: FS-Q80-F3D	CODE: 08012F3D																																		
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08907TX7	For 7 sections valve																																		
08908TX8	For 8 sections valve																																		
08909TX9	For 9 sections valve																																		
08910TX10	For 10 sections valve																																		

(*): Codes are referred to **BSP** thread

Inlet section - parts ordering codes



1 Inlet body section* page 188

TYPE: **FE-Q80** CODE: 060012741799
 DESCRIPTION: Side inlet port, upper inlet plugged, pressure relief valve arrangement

2 Configuration coding* page 188

TYPE	DESCRIPTION
F7S	With pressure relief valve
F8S	Without valves (pressure relief valve plugged port)

Note: Inlet configurations require upper P port:
 n. 1 G1/2 plug code 060002792099, or n. 1 pressure gauge arrangement code 5MAN627240

2a Main pressure relief valve page 189

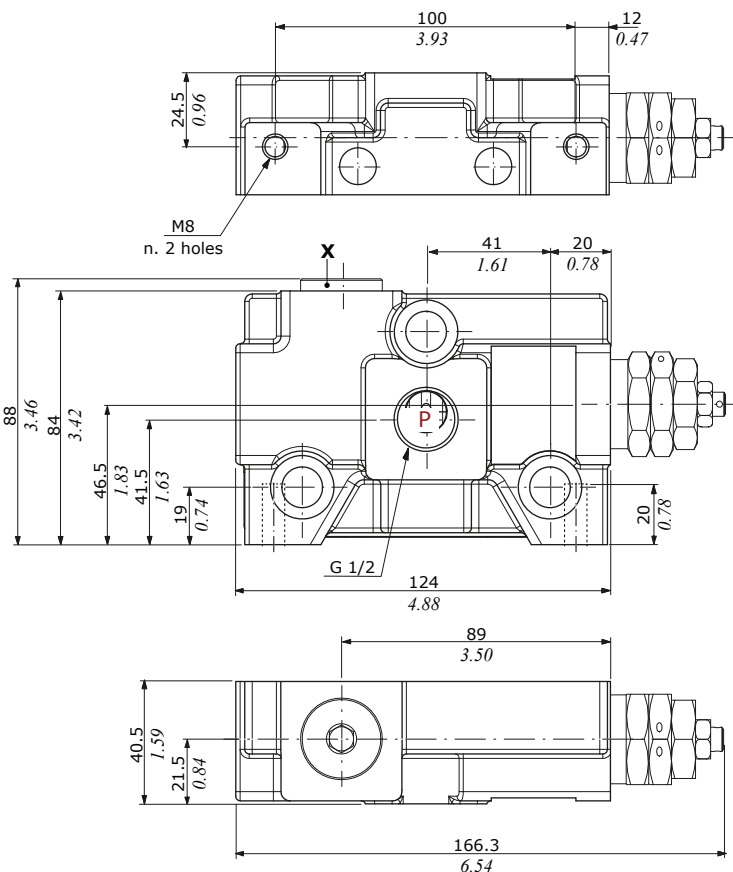
TYPE: B	CODE: 700065205000000
DESCRIPTION: VLP65S valve, setting range 10-100 bar (145-1450 psi)	
TYPE: N	CODE: 700065105000000
DESCRIPTION: VLP65S valve, setting range 101-200 bar (1460-2900 psi)	
TYPE: R	CODE: 700065305000000
DESCRIPTION: VLP65S valve, setting range 201-380 bar (2910-5500 psi)	
TYPE: -	CODE: 060002788999
DESCRIPTION: Relief valve blanking plug	

3 Accessory

TYPE	CODE	DESCRIPTION
-	4COP120420	Antitamper cap for pressure relief valve

(*): Codes are referred to **BSP** thread

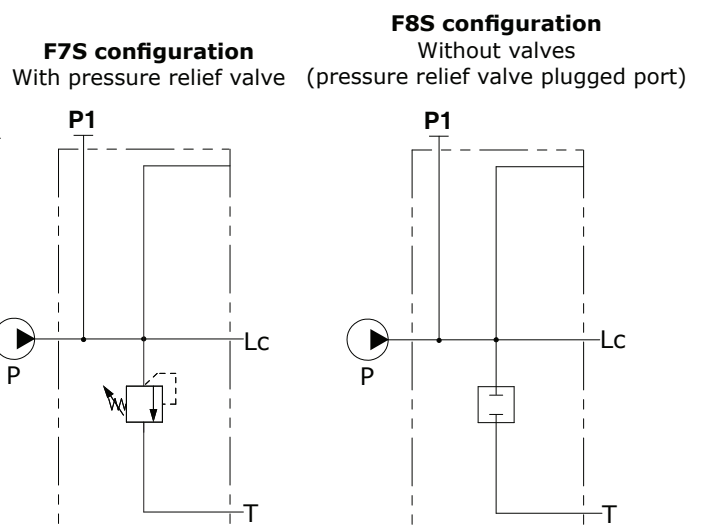
Dimensional data and hydraulic circuits



Wrenches and tightening torques

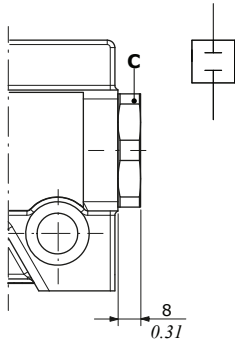
X = allen wrench 8 - 42 Nm (31 lbf_t)

Note: For valves wrench and torque, see related pages

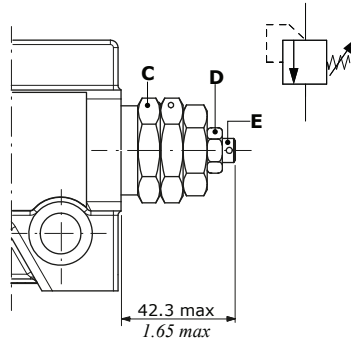


Main pressure relief valve

Relief valve blanking plug



Main pressure relief valve

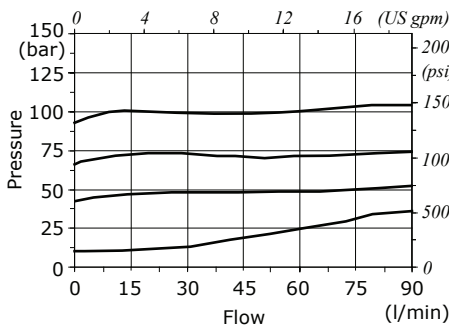


Wrenches and tightening torques

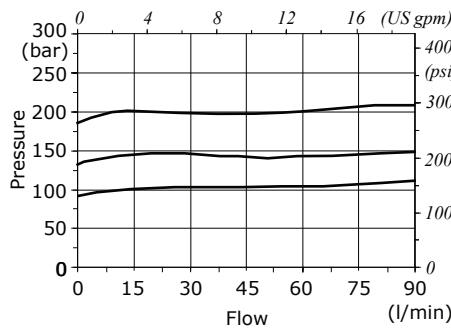
- C = wrench 30 - 80 Nm (59 lbf)
- D = wrench 13 - 24 Nm (17.7 lbf)
- E = allen wrench 4

Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

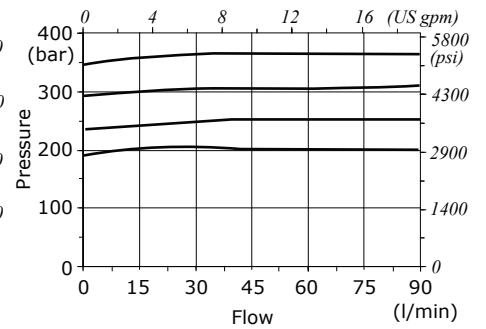
Setting example (B type spring)



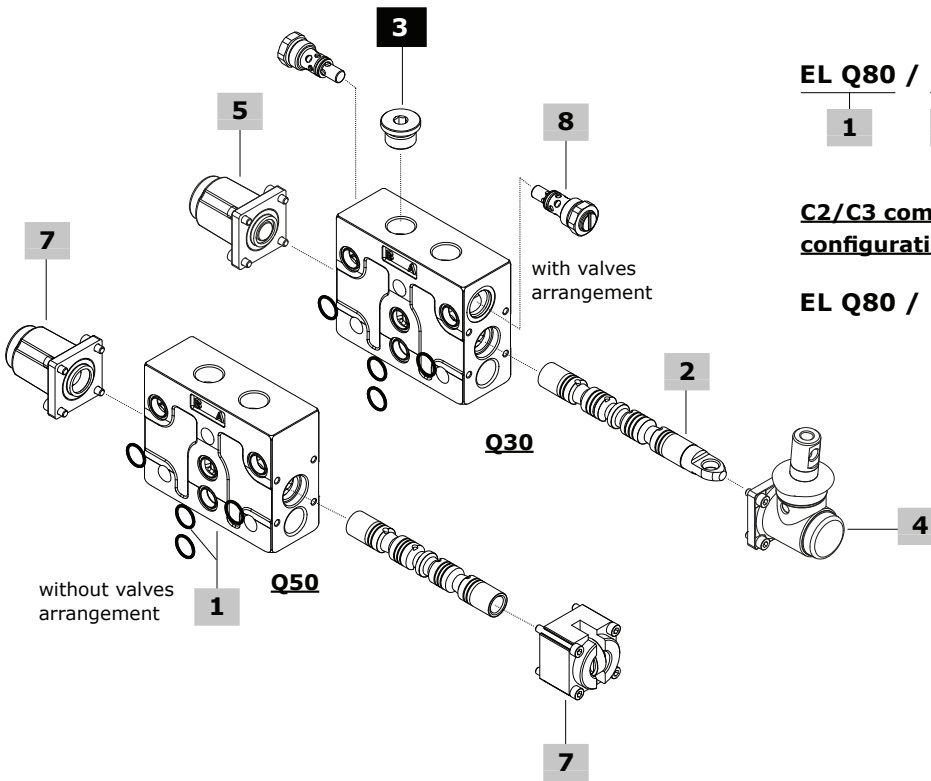
Setting example (N type spring)



Setting example (R type spring)



Working section - parts ordering codes



Mechanical control valve configuration example

spring type and valve setting (bar)

EL Q80 / 102 - A1 - M1 . V40(N)120

1	2	4	5	8
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C2/C3 complete mechanical control configuration example

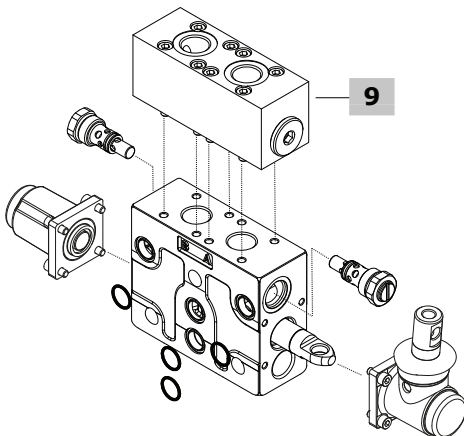
EL Q80 / 103 - C3 . V40(N)120 8

7

Mechanical control valve with arrangement for secondary aux valves block: configuration example

EL Q80 / 103 - A1 - M1 . V40(N)120 / VC03

9



Working section - parts ordering codes

1 Working section body kit* page 196

TYPE: EL-Q80.VC	CODE: 5EL0600127860
DESCRIPTION: Parallel circuit, with port valves arrangement	
TYPE: EL-Q80	CODE: 5EL0600127723
DESCRIPTION: Parallel circuit, without port valves arrangement	
TYPE: EL-Q80.VC.VPC	CODE: 5EL0600128363
DESCRIPTION: Parallel circuit with port valves arrangement, for secondary aux valves block	
TYPE: EL-Q80.VC	CODE: 5EL0600127563
DESCRIPTION: Series circuit, with port valves arrangement	

2 Spool page 197

TYPE	CODE	DESCRIPTION
Standard spools		
103	060102894999	Double acting, A and B closed in neutral position
	3CUG3051600	As previous one, for kick-out control
106	KR80106	Double acting for closed circuit
107	KR80107-108	Double acting, A to tank and B closed in neutral position
108	KR80107-108	Double acting, B to tank and A closed in neutral position
111	060102996799	Double acting, A and B to tank in neutral position
114	KR80114	Double acting, A and B to tank in neutral position, for closed circuit
101	3CUG2891900	Single acting on port A. G1/2 plug is required, see #3
102	3CUG2891901	Single acting on port B. G1/2 plug is required, see #3
116	3CUG2897800	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
126	3CUG2897801	Double acting, with floating in the 4 th position (spool out): requires dedicated spool control
403	KR80403	Double acting, A and B closed in neutral position, for series circuit
411	KR80411	Double acting, A and B to tank in neutral position, for series circuit
Special spools for cam, microswitch controls and other leverless controls		
103	060102879199	Double acting, A and B closed in neutral position
111	060102864199	Double acting, A and B to tank in neutral position

3 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	060002792099	G1/2 plug

4 A side control page 198

TYPE	CODE	DESCRIPTION
For standard spools		
<u>With lever control:</u>		
A1	08600A1-A2	M10 thread aluminium lever box
A2	08600A1-A2	As A1 type, with lever box rotated 180°
A1/06	08606A1-A2/06	Aluminium lever box with stroke limiter
A2/06	08606A1-A2/06	As A1/06 type, with lever box rotated 180°
A1/Z1	08610A1-A2/Z1	Aluminium lever box for 116 spool type
A2/Z1	08610A1-A2/Z1	As A1/Z1 type, with lever box rotated 180°
<u>With safety lever control:</u>		
A1/S⁽¹⁾	08624A1-A2/S	M10 thread aluminium lever box
A2/S⁽¹⁾	08624A1-A2/S	As A1/S type, with lever box rotated 180°
<u>Without lever control:</u>		
A6	08620A6	With flange
A8	08622A8	Arrangement for flexible cable control
A8/Z1	08622A8/Z1	As A8 type, for 116 spool type

4 A side control (cont.) page 198

TYPE	CODE	DESCRIPTION
<u>Joystick controls for 2 section operation:</u>		
A35/1	08637A35-12	Joystick 1 type
A35/2	08637A35-12	Joystick 2 type
A35/3	08637A35-34	Joystick 3 type
A35/4	08637A35-34	Joystick 4 type
For types 103 and 111 special spools		
<u>With spool position microswitch:</u>		
Note: to complete the control you must use the assembly kit at #6		
N1-A1	08641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
N1A-A1	08642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	08643N1B-A1/A2	Micro operation in pos. 2, with lever box
N1-A3	08648N1-A3	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	08648N1A-A3	Micro operation in pos. 1, without lever with cap
N1B-A3	08648N1B-A3	Micro operation in pos. 2, without lever with cap
<u>Without lever control:</u>		
A3	08614A3	Without lever, with cap
A4	08617A4	M10 thread male external pin with flange
A5⁽²⁾	08619A5	Flange with spherical spool end

5 B side control page 203

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	08730M1	3 pos., spring return in neutral position
M1/01	08730M1/01	As M1 type, for joystick control
M1/02	08730M1/02	As M1 type, with stroke limiter
M1/05	08730M1/05	As M1 type, for series spool
M1/07	08730M1/07	As M1 type, for joystick control with series spool
M1-B1	08753M1-B1	As M1 type, with microswitch arrangement
M1-U1	08701M1-U1	As M1 type, with M10 male thread external pin
M2	08732M2	2 pos. (0-1), spring return in neutral position
M2-U1	08702M2-U1	As M2 type, with M10 male thread external pin
M3	08733M3	2 pos. (0-2), spring return in neutral position
M3-U1	08703M3-U1	As M3 type, with M10 male thread external pin
M4	08734M4-1-2	2 pos. (1-2), spring return in position 1
	08735M4-2-1	2 pos. (2-1), spring return in position 2
M4-U1	08734M4-U11-2	As M4 type (1-2), with M10 male thread external pin
<u>With flexible cable control arrangement:</u>		
M1-U2	08715M1-U2	3 pos., spring return in neutral position
M2-U2	08716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	08717M3-U2	2 pos. (0-2), spring return in neutral position

With friction:

R0 08740R0 Adjustable friction control

With detent:

R1	08741R1	3 pos., detent in position 1
R2	08742R2	3 pos., detent in position 2
R3	08743R3	3 pos., detent in all position
R4	08744R4	2 pos., detent in position 0-1
R5	08745R5	2 pos., detent in position 0-2
R6	08746R6	2 pos., detent in position 1-2
R8	08748R8	4 pos., detent in 4 th pos., for 116 spool type
R10/Z1	08750R10/Z1	4 pos., detent in 4 th pos., for 126 spool type

(*): Codes are referred to **BSP** thread

(¹): Always complete with lever knob

(²): To be assembled only with M4 control

Working section - parts ordering codes

5 B side control (cont.) page 203

TYPE	CODE	DESCRIPTION
<u>With detent and kick out function:</u>		
R1K	08741R1K	3 pos., detent in position 1
R2K	08742R2K	3 pos., detent in position 2
R3K	08743R3K	3 pos., detent in all position
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #6		
M1-N1	08766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
M1-N1A	08767M1-N1A	As M1-N1 type, micro operation in pos. 1
M1-N1B	08768M1-N1B	As M1-N1 type, micro operation in pos. 2
M2-N1	08769M2-N1	2 pos. (0-1), spring return in neutral position
M3-N1	08772M3-N1	2 pos. (0-2), spring return in neutral position
<u>Pneumatic and electropneumatic controls:</u>		
P1N	08561P1-N	ON/OFF pneumatic control
P1NP	08561P1-NP	Proportional pneumatic control
D3	08591D3-V-12DC	12 VDC, ON/OFF electropneumatic control
	08592D3-V-24DC	24 VDC, ON/OFF electropneumatic control

6 Microswitch assembly kit

CODE	DESCRIPTION
08650N1-01	Kit for 1 section
08650N1-02	Kit for 2 sections
08650N1-03	Kit for 3 sections
08650N1-04	Kit for 4 sections
08650N1-05	Kit for 5 sections
08650N1-06	Kit for 6 sections
08650N1-07	Kit for 7 sections
08650N1-08	Kit for 8 sections
08650N1-09	Kit for 9 sections
08650N1-10	Kit for 10 sections

7 Complete controls A+B sides page 209

TYPE	CODE	DESCRIPTION
For types 103 and 111 spools		
C2	08792C2-C3	Cam control from pos. 1 to 2
C3	08792C2-C3	Cam control from pos. 2 to 1

8 Auxiliary port valve page 214

TYPE	CODE	DESCRIPTION
<u>Antishock valve:</u>		
V30-B	08800V30-B	Setting range: from 30 to 80 bar (from 435 to 1150 psi)
V30-N	08800V30-N	Setting range: from 81 to 200 bar (from 1170 to 2900 psi)
V30-R	08800V30-R	Setting range: from 201 to 370 bar (from 2910 to 5400 psi)
<u>Antishock/anticavitation valve:</u>		
V33-B	08803V33-B	Setting range: from 30 to 80 bar (from 435 to 1150 psi)
V33-N	08803V33-N	Setting range: from 81 to 200 bar (from 1170 to 2900 psi)
V33-R	08803V33-R	Setting range: from 201 to 370 bar (from 2910 to 5400 psi)
<u>Anticavitation valve:</u>		
V04	08808V04	Anticavitation valve
<u>Plug:</u>		
VC	060002758699	Valve blanking plug
For other configurations and positions, see page 215		

9 Secondary aux valves* page 216

TYPE	CODE	DESCRIPTION
VRP-VC01	08835V01C	Single piloted check valve on A port, 250 bar (3600 psi)
VRP-VC03	08837V03C	Double piloted check valve on A and B ports, 250 bar (3600 psi)

(*) : Codes are referred to **BSP** thread

Working section - parts ordering codes

Proportional hydraulic controls valve configuration example

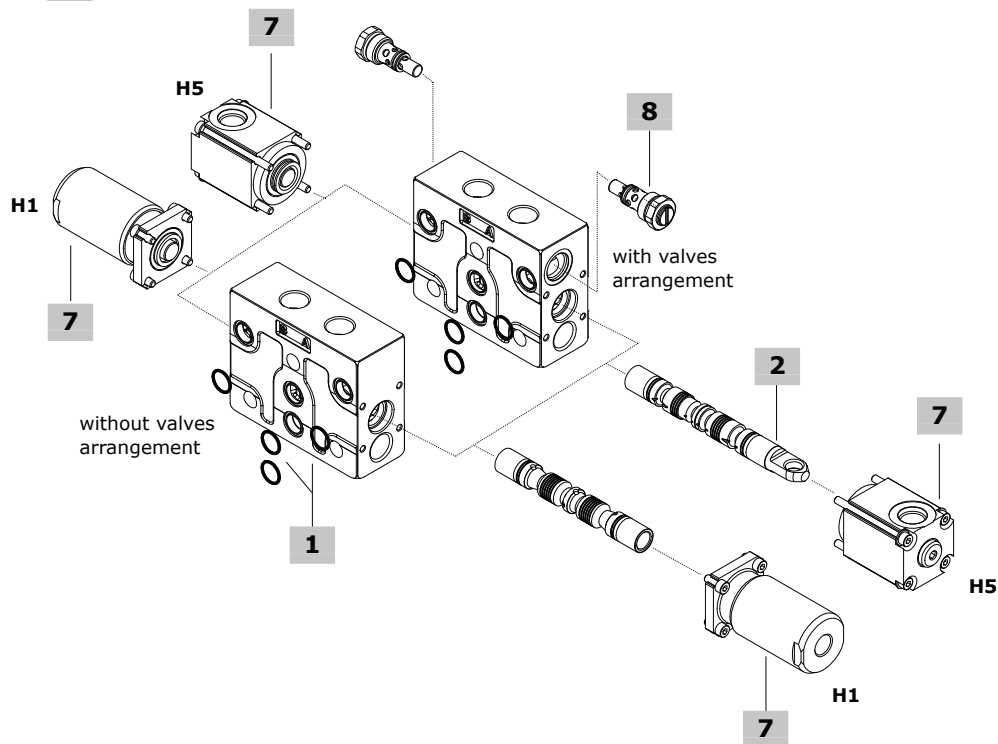
spring type and valve setting (bar)

EL Q80 / 103 - H5 . V40(N)120

1 2 7 8

EL Q80 / 103 - H1 . V40(N)120

7



1 Working section body kit* page 196

The body kits listed below are for **H5** hydraulic control.

H1 hydraulic control requires standard body: see #1, page 191

TYPE: **EL-Q80-H5.VC** CODE: 5EL0600127860H5

DESCRIPTION: Parallel circuit, with port valves arrangement

TYPE: **EL-Q80-H5** CODE: 5EL0600127723H5

DESCRIPTION: Parallel circuit, without port valves arrangement

2 Spool page 197

TYPE	CODE	DESCRIPTION
For H5 hydraulic control		
103	060102894999	Double acting, A and B closed in neutral position

TYPE	CODE	DESCRIPTION
For H1 hydraulic control		
103	060102879199	Double acting, A and B closed in neutral position

7 Hydraulic controls A+B sides* page 210

TYPE	CODE	DESCRIPTION
H5	08785H5	Low pressure proportional type, upper ports
H1	08779H1	High pressure proportional type, side ports

8 Auxiliary port valve page 214

See #8, page 192

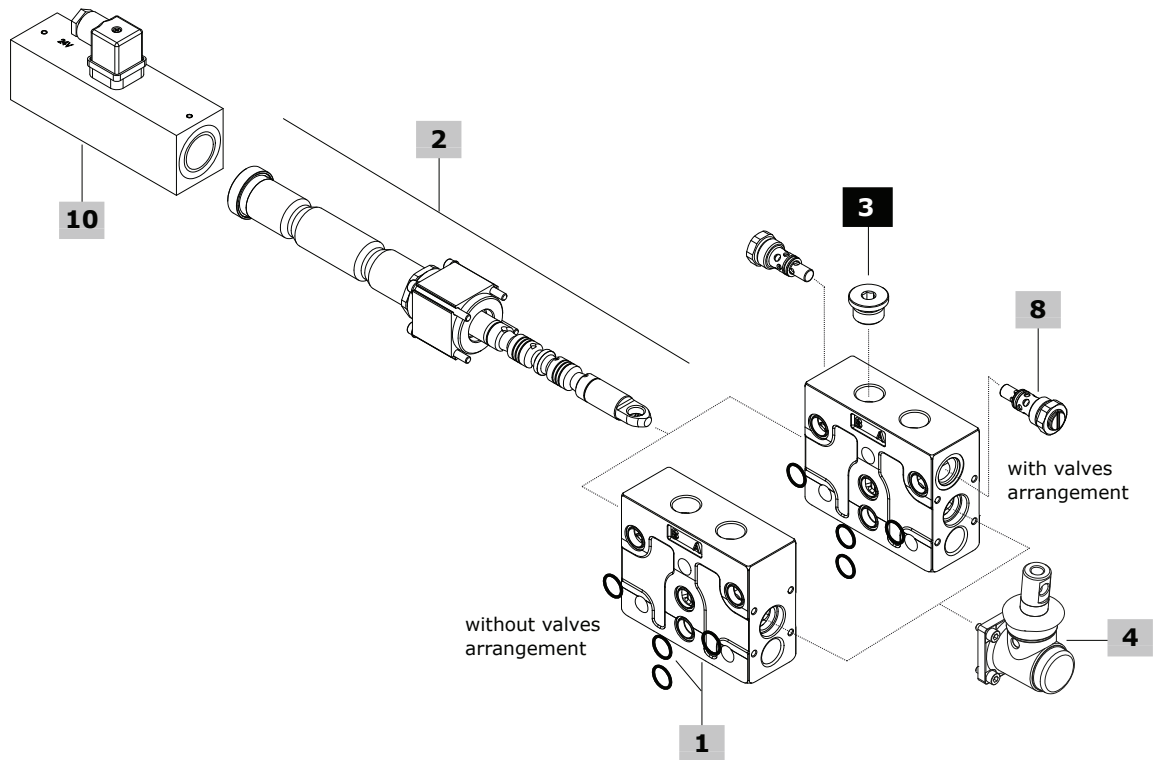
(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

One side - ON/OFF direct solenoid control valve: configuration example

spring type and valve setting (bar)

EL Q80 / 103 - A1 - D41 . V40(N)120 - 12VDC



1 Working section body kit* page 196

TYPE: **EL-Q80.VC** CODE: 5EL0600127860D41
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **EL-Q80** CODE: 5EL0600127723D41
 DESCRIPTION: Parallel circuit, without port valves arrangement

2 Solenoid control page 211

TYPE	CODE	DESCRIPTION
103	X0601030059	Double acting, A and B closed in neutral position
111	X0601030043	Double acting, A and B to tank in neutral position
101	X0601030060A	Single acting on port A. G1/2 plug is required, see #3
102	X0601030060B	Single acting on port B. G1/2 plug is required, see #3

3 Plug for single acting spool*

See #3, page 191

4 A side control page 211

TYPE	CODE	DESCRIPTION
A1	08600A1-A2	M10 thread aluminium lever box
A2	08600A1-A2	As A1 type, with lever box rotated 180°

8 Auxiliary port valve page 214

See #8, page 192

10 Coil

TYPE	CODE	DESCRIPTION
-	ZEB112	12 VDC ISO4400 coil
-	ZEB124	24 VDC ISO4400 coil

Note: The connector is included

(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

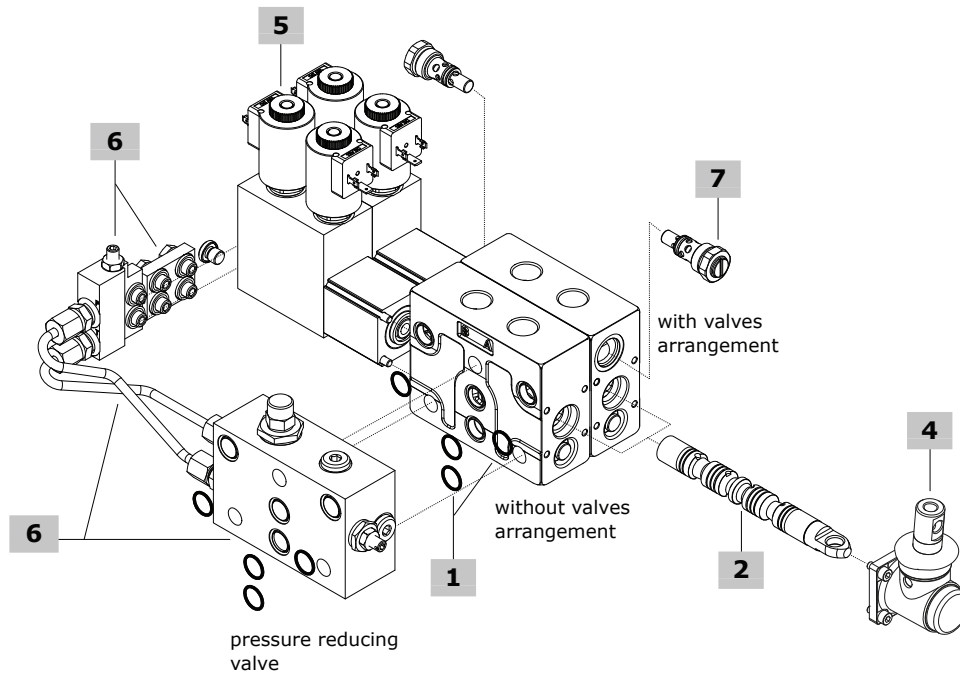
One side - ON/OFF electrohydraulic control valve configuration example

R = with pressure reducing valve
 S = without pressure reducing valve

spring type and valve setting (bar)

EL Q80 / KE2R / 103 - A1 - D2W . V40(N)120 - 12VDC

1 6 2 4 5 7 5



1 Working section body kit* page 196

See #1, page 191

2 Spool page 197

See #2, page 191

4 A side control page 198

See #4, page 191

5 B side electrohydraulic control page 212

TYPE	CODE	DESCRIPTION
D2W-12VDC	08681D2W1200	3 pos., 12VDC ON/OFF electrohydraulic control
D2W-24VDC	08681D2W2400	3 pos., 24VDC ON/OFF electrohydraulic control

Note: For BT type coils, see page 257

6 Connector kit page 213

TYPE	CODE	DESCRIPTION
Without pressure reducing valve		
KE1S	5GKE08S010	Kit for 1 section
KE2S	5GKE08S020	Kit for 2 sections
KE3S	5GKE08S030	Kit for 3 sections
KE4S	5GKE08S040	Kit for 4 sections
KE5S	5GKE08S050	Kit for 5 sections
KE6S	5GKE08S060	Kit for 6 sections
KE7S	5GKE08S070	Kit for 7 sections
KE8S	5GKE08S080	Kit for 8 sections
KE9S	5GKE08S090	Kit for 9 sections
KE10S	5GKE08S100	Kit for 10 sections

Note: Connector kit are included collector and feeding block

With pressure reducing valve

KE1R	5GKE08R010	Kit for 1 section
KE2R	5GKE08R020	Kit for 2 sections
KE3R	5GKE08R030	Kit for 3 sections
KE4R	5GKE08R040	Kit for 4 sections
KE5R	5GKE08R050	Kit for 5 sections
KE6R	5GKE08R060	Kit for 6 sections
KE7R	5GKE08R070	Kit for 7 sections
KE8R	5GKE08R080	Kit for 8 sections
KE9R	5GKE08R090	Kit for 9 sections
KE10R	5GKE08R100	Kit for 10 sections

Note: Connector kit are included collector and feeding block, drain lines and pressure reducing valve

7 Auxiliary port valve page 214

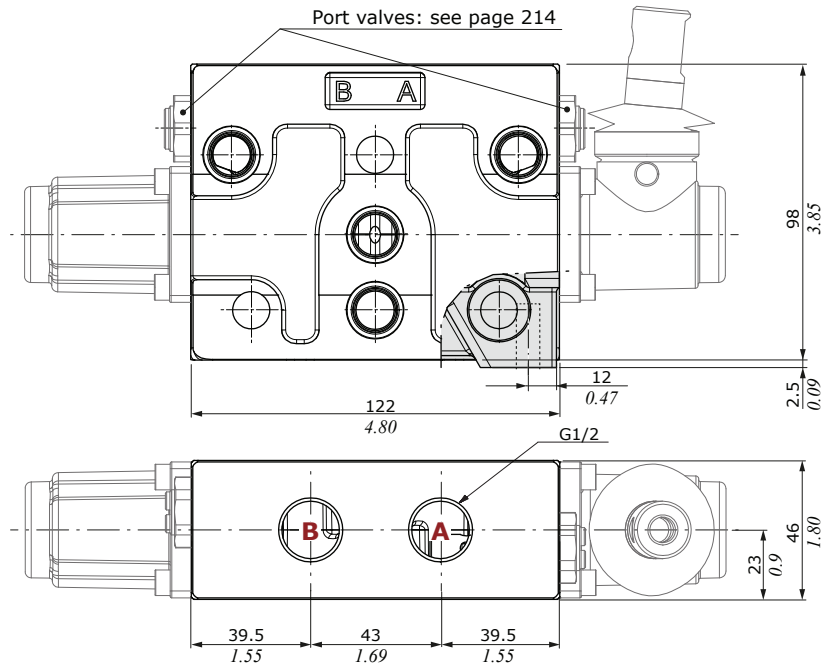
See #8, page 192

(*): Codes are referred to BSP thread

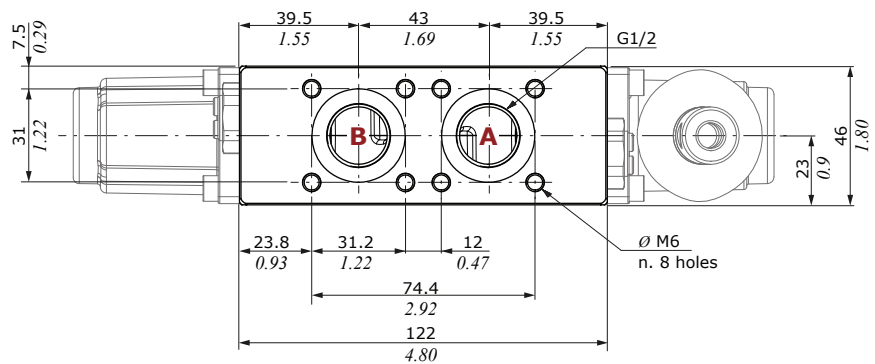
Working section

Dimensional data and hydraulic circuits

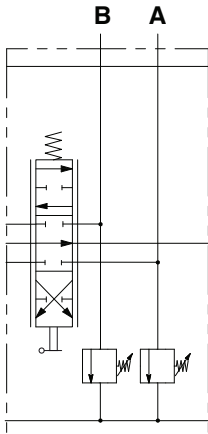
Standard working section



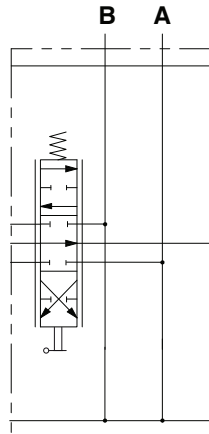
Working section for secondary aux valves block



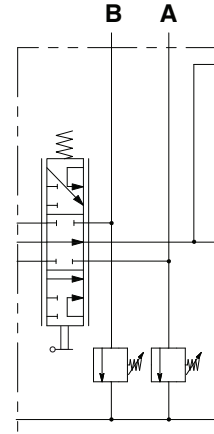
Q80.V40(N)120 configuration
Parallel circuit,
mechanical control with aux valves



Q80 configuration
Parallel circuit,
mechanical control without aux valves



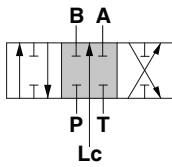
Q80.V40(N)120 configuration
Series circuit,
mechanical control with aux valves



Spool

103 type
A and B closed
in neutral position

2 0 1

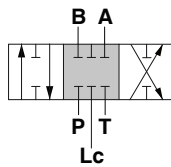


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

106 type
A, B and Lc closed in
neutral position. For closed center

2 0 1

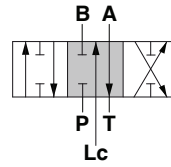


Stroke

Position 1: + 5 mm (+ 0.19 in)
Position 2: - 5 mm (- 0.19 in)

107 type
A to tank, B closed
in neutral position

2 0 1

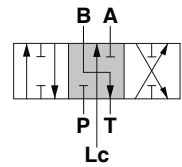


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

108 type
B to tank, A closed
in neutral position

2 0 1

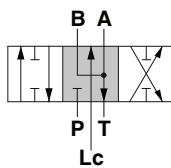


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

111 type
A and B to tank
in neutral position

2 0 1

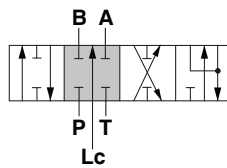


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

116 type
With floating in the 4th position
(spool in)

2 0 1 3

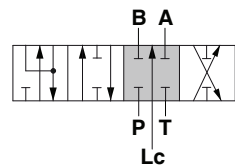


Stroke

Position 1: - 4.5 mm (- 0.17 in)
Position 2: + 7 mm (+ 0.27 in)
Position 3: - 10.25 mm (- 0.40 in)

126 type
With floating in the 4th position
(spool out)

3 2 0 1

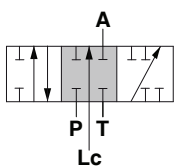


Stroke

Position 1: + 4.5 mm (+ 0.17 in)
Position 2: - 7 mm (- 0.27 in)
Position 3: + 10.25 mm (+ 0.40 in)

101 type
Single acting on A,
B plugged

2 0 1

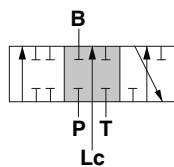


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

102 type
Single acting on B,
A plugged

2 0 1

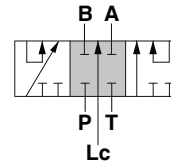


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

403 type
A and B closed in neutral
position. For series circuit

2 0 1

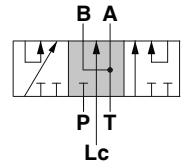


Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

411 type
A and B to tank in neutral
position. For series circuit

2 0 1



Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

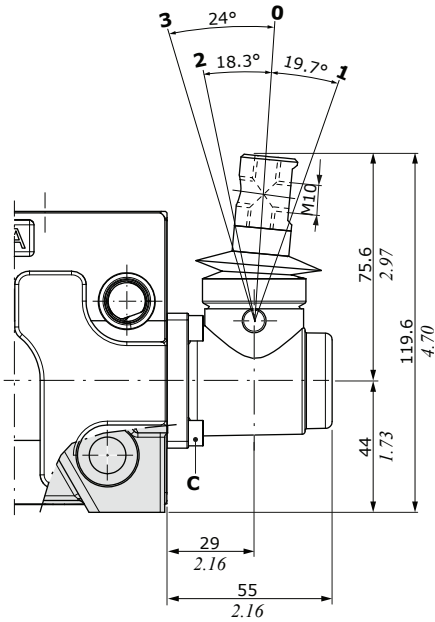
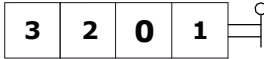
Working section

A side controls

With lever control

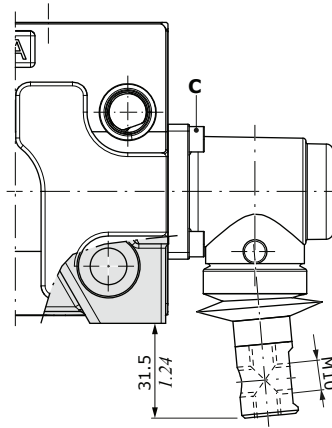
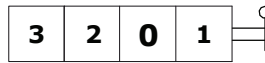
A1 type

M10 thread aluminium lever box



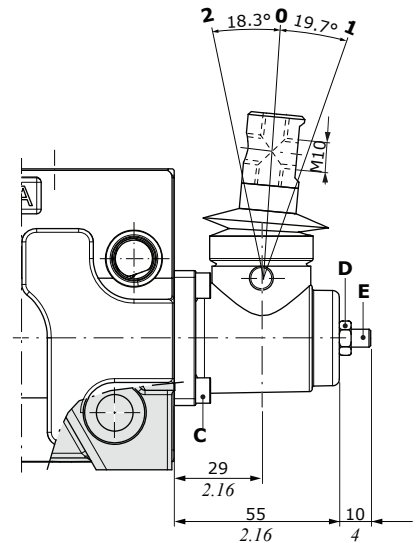
A2 type

As A1 type, rotated 180°



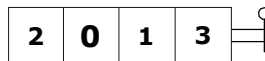
A1/06 type

M10 thread, with stroke limiter



A1/Z1 type

M10 thread, for 116 floating spool type



Wrenches and tightening torques

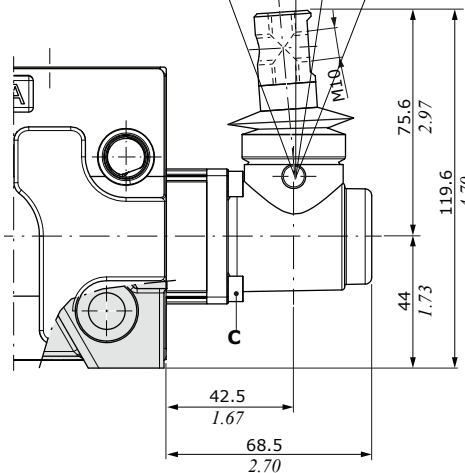
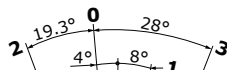
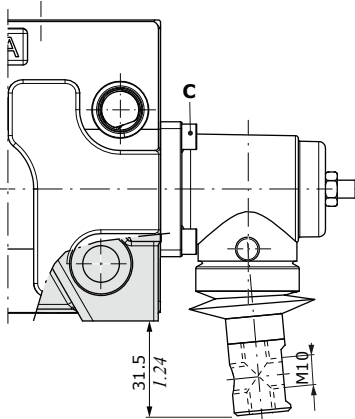
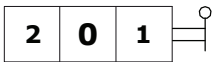
C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)

D = wrench 10 - 9.8 Nm (7.2 lbf_t)

E = allen wrench 4 - 9.8 Nm (7.2 lbf_t)

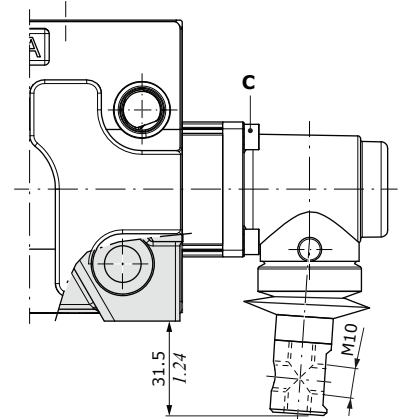
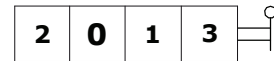
A2/06 type

As A1/06 type, rotated 180°



A2/Z1 type

As A1/Z1 type, rotated 180°

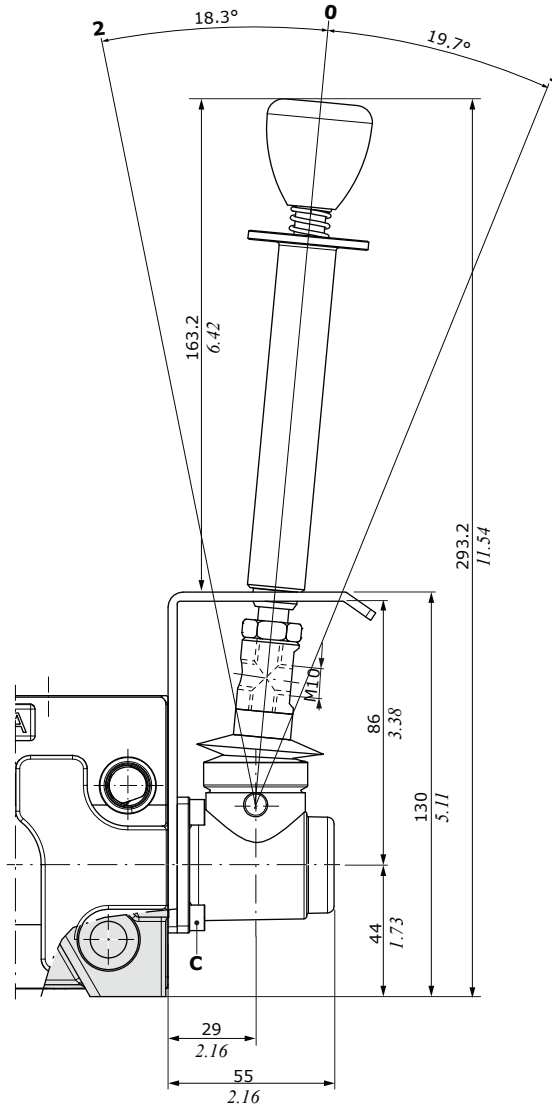
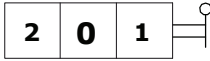


A side controls

With safety lever control

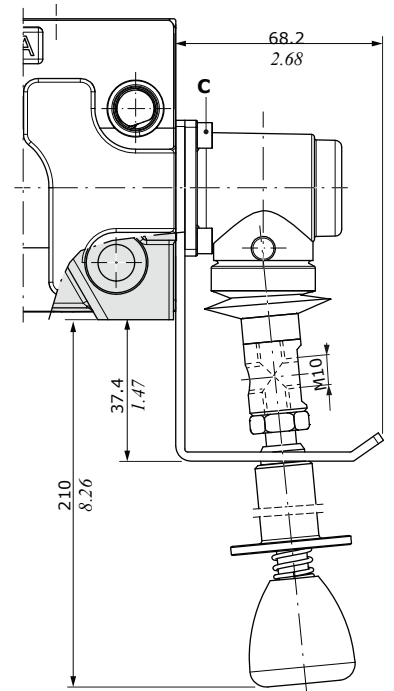
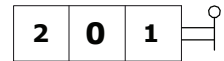
A1/S type

M10 thread, aluminium lever box



A2/S type

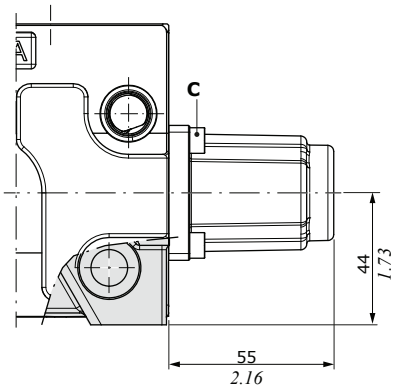
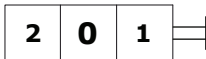
As A1/S type, rotated 180°



Without lever control

A3 type

With cap



Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbft)

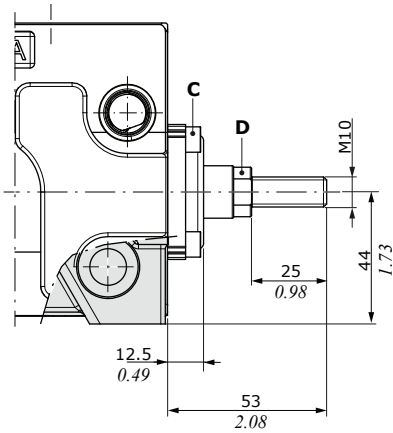
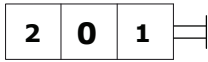
Working section

A side controls

Without lever control

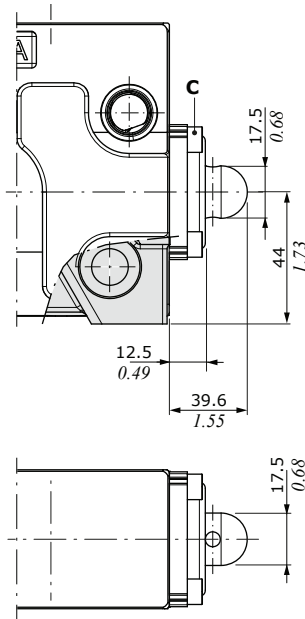
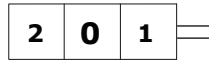
A4 type

M10 male thread external pin with flange



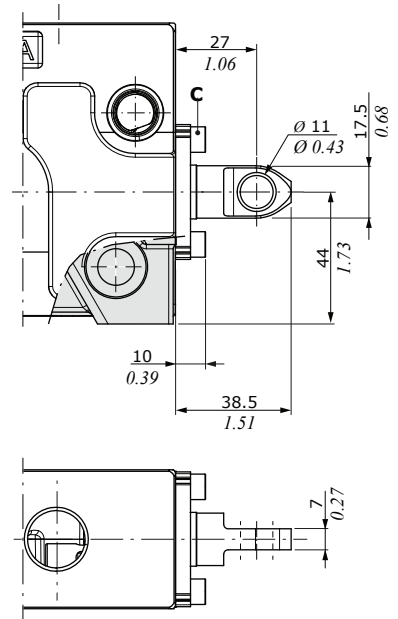
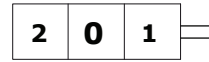
A5 type

Flange with spherical spool end



A6 type

With flange



Wrenches and tightening torques

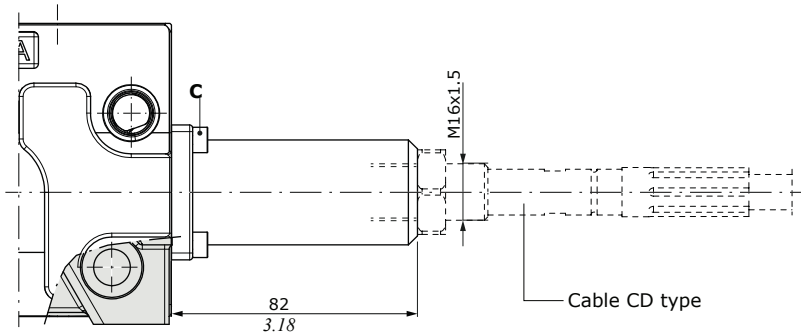
C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)

D = wrench 13 - 9.8 Nm (7.2 lbf_t)

With flexible cable control arrangement

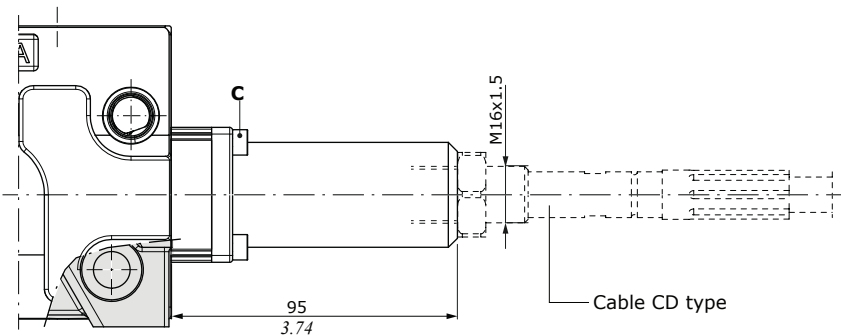
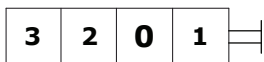
A8 type

Flexible cable control arrangement



A8/Z1 type

As A8 type, for 116 floating spool type

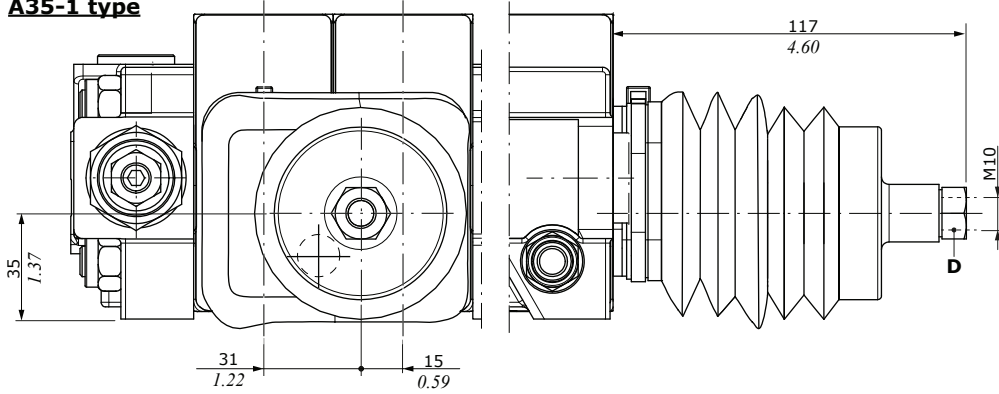


A side controls

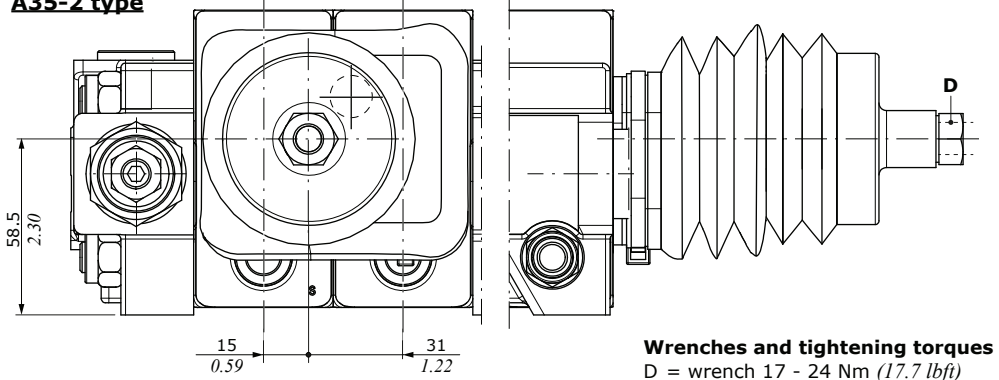
Joystick control

For operating the joystick control in the floating position, contact Sales Department.

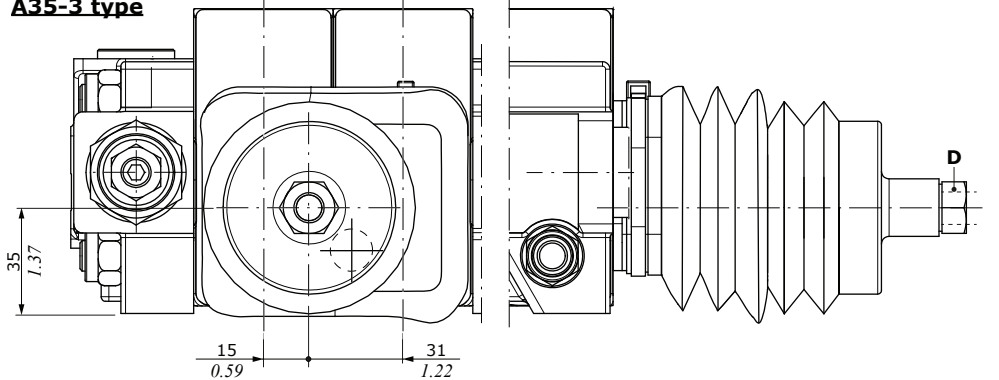
A35-1 type



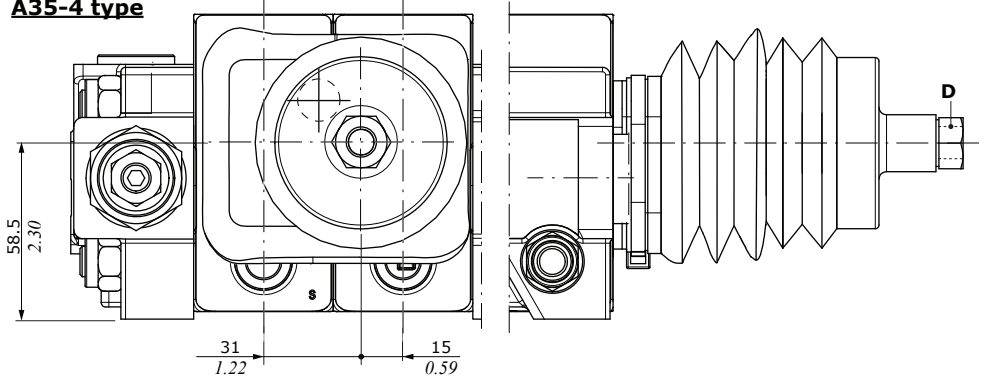
A35-2 type



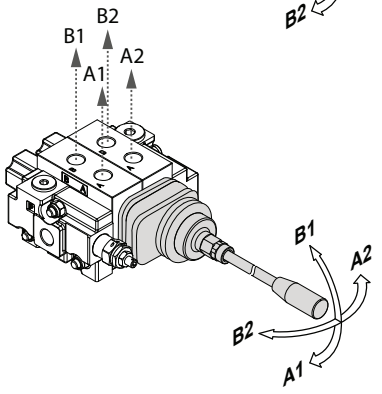
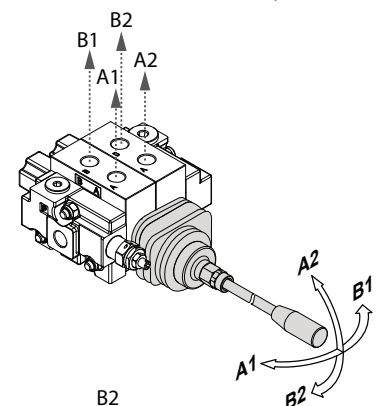
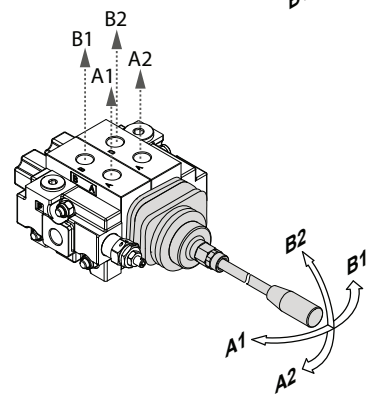
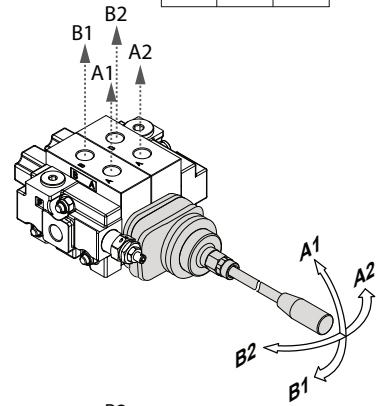
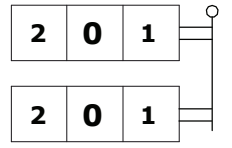
A35-3 type



A35-4 type



Wrenches and tightening torques
D = wrench 17 - 24 Nm (17.7 lbf_t)

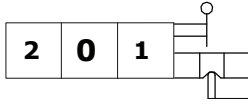


Working section

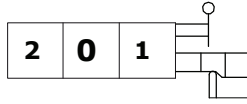
A side controls

With spool position microswitch, with lever

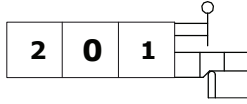
N1-A1 type
Micro operation
in position 1 and 2



N1A-A1 type
Micro operation in
position 1

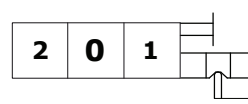


N1B-A1 type
Micro operation in
position 2

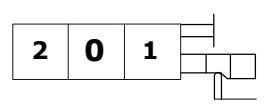


With spool position microswitch, with cap

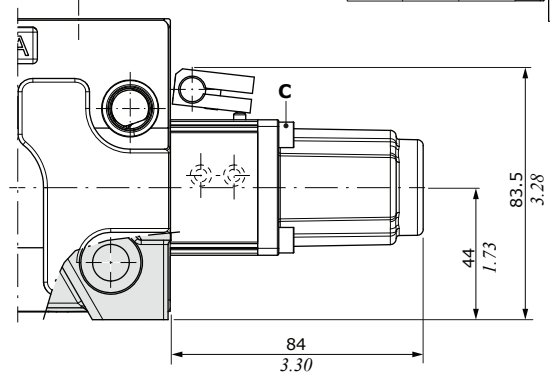
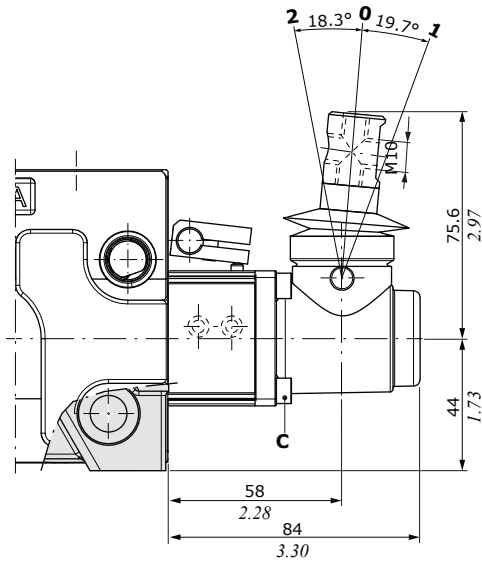
N1-A3 type
Micro operation
in position 1 and 2



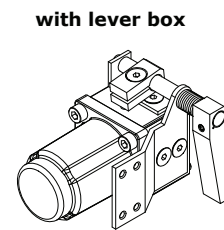
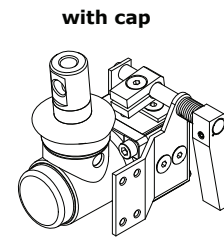
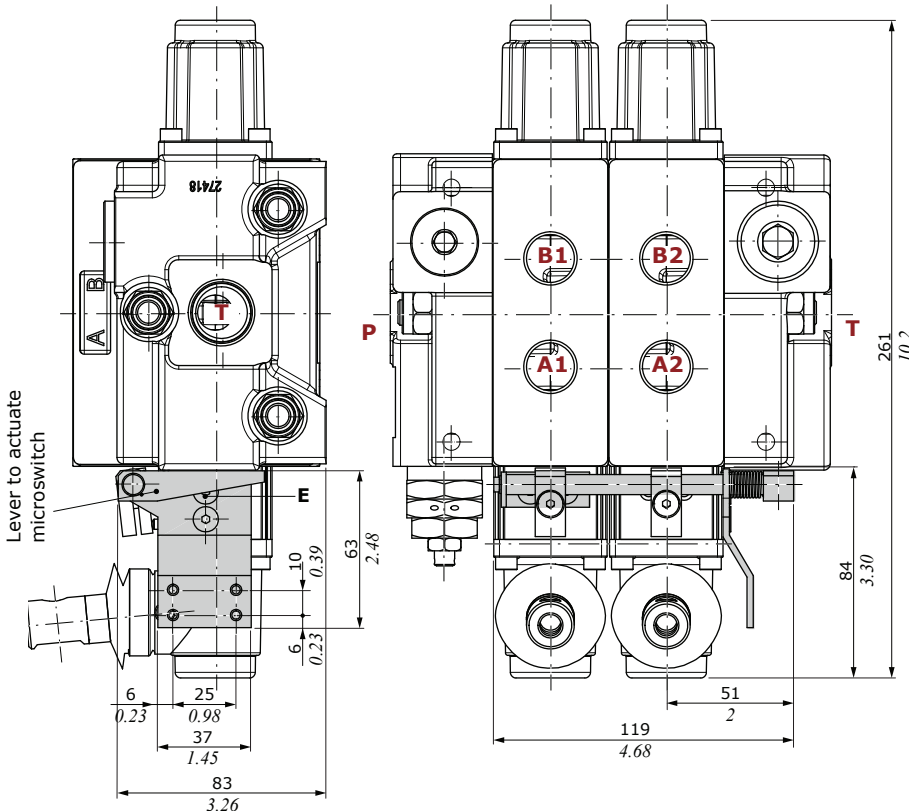
N1A-A3 type
Micro operation in
position 1



N1B-A3 type
Micro operation in
position 2



Microswitch assembly kit for 2 working section (N1-A1 type)



Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbft)
E = allen wrench 3 - 6.6 Nm (4.8 lbft)

B side controls

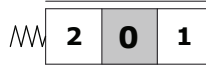
With spring return control

M1 type
3 position, spring return
in neutral position

M1/01 type
As M1 type,
for joystick control

M1/05 type
As M1 type,
for series spool

M1/07 type
As M1 type, for
joystick series spool

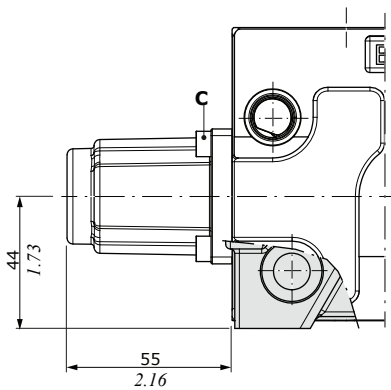
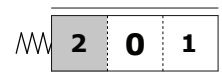
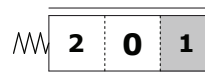
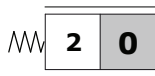
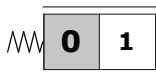


M2 type
2 position (0-1), spring return
in neutral position

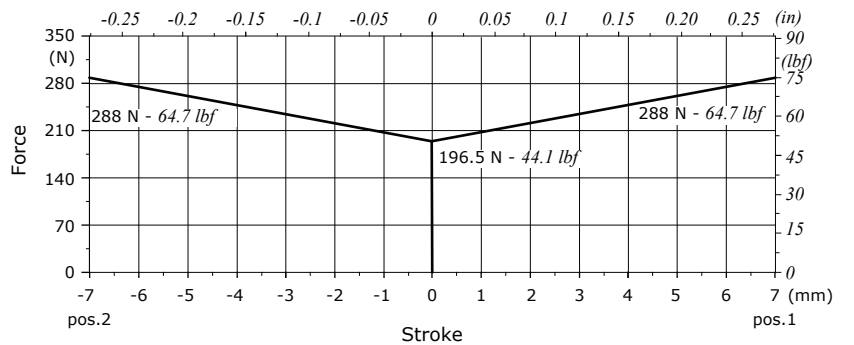
M3 type
2 position (0-2), spring return
in neutral position

M4 types
2 position (1-2),
spring return in position 1

2 position (2-1),
spring return in position 2

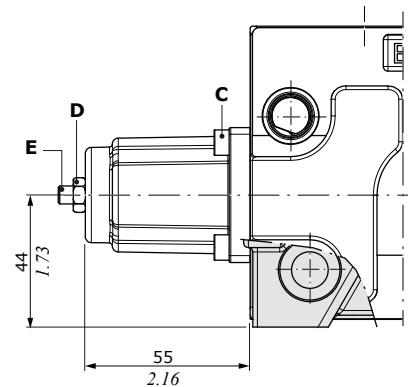
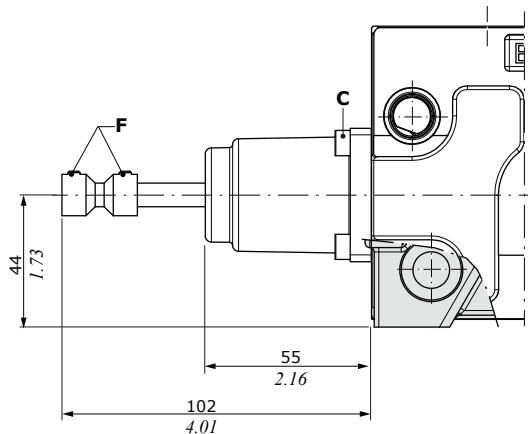
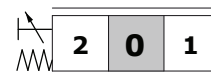
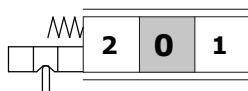


M1 control type - Force vs. Stroke diagram



M1-B1 type
3 position, microswitch arrangement

M1/02 type
As M1 type, with stroke limiter



Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbf ft)
D = wrench 10 - 9.8 Nm (7.2 lbf ft)
E = allen wrench 4 - 9.8 Nm (7.2 lbf ft)
F = allen wrench 3 - 5 Nm (3.68 lbf ft)

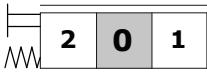
Working section

B side controls

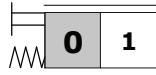
With spring return control

With flexible cable control arrangement

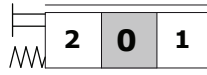
M1-U1 type
3 position, with M10 male thread external pin



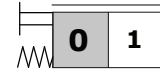
M2-U1 type
2 position (0-1), with M10 male thread external pin



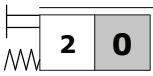
M1-U2 type
3 position, spring return in neutral position



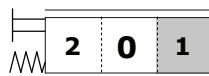
M2-U2 type
2 position (0-1), spring return in neutral position



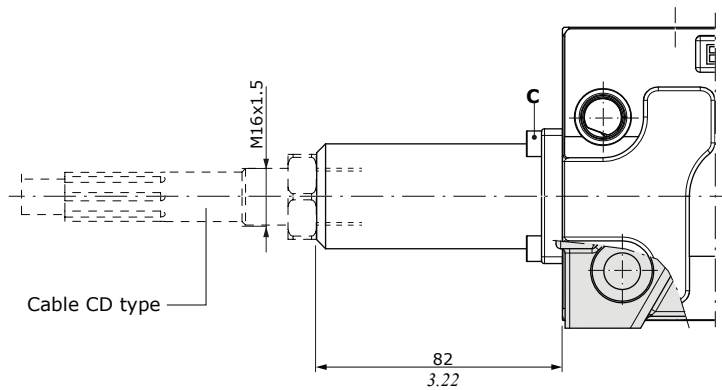
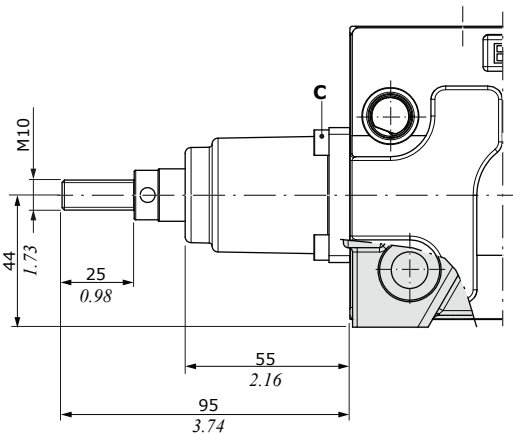
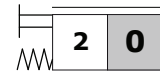
M3-U1 type
2 position (0-2), with M10 male thread external pin



M4-U1 type
2 position (1-2), with M10 male thread external pin

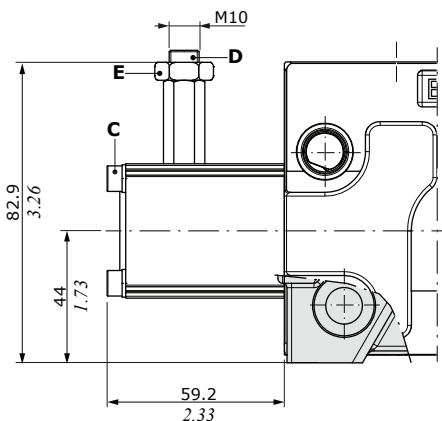
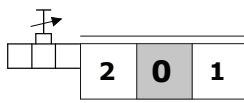


M3-U2 type
2 position (0-2), spring return in neutral position



With friction control

R0 type
Adjustable friction control

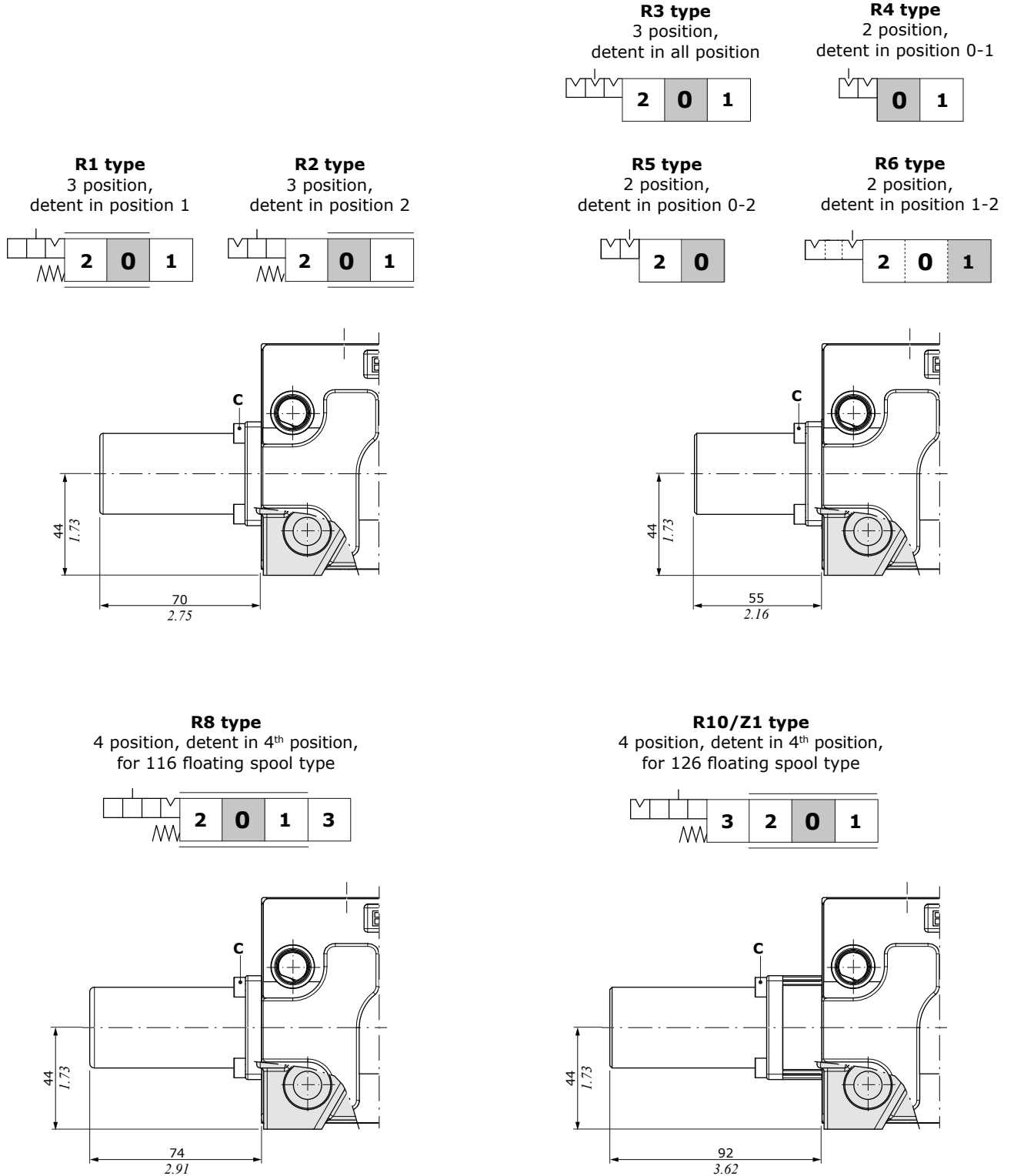


Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbft)
- D = allen wrench 5 - 15 Nm (11.1 lbft)
- E = wrench 17 - 9.8 Nm (7.2 lbft)

B side controls

With detent control



Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbft)

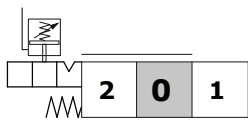
Working section

B side controls

With detent control and kick out function

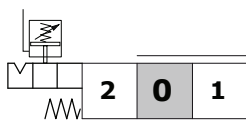
R1K type

3 position, detent in position 1



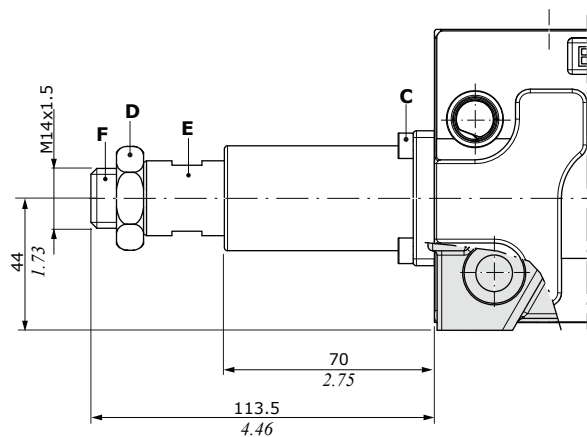
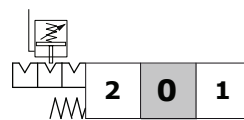
R2K type

3 position, detent in position 2



R3K type

3 position, detent in all position



Wrenches and tightening torques

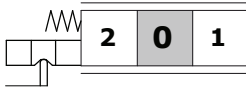
- C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
- D = wrench 30 - 42 Nm (30.9 lbf^t)
- E = wrench 22
- F = allen wrench 10 - 42 Nm (30.9 lbf^t)

B side controls

With spool position microswitch

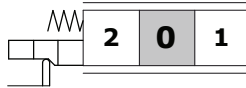
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position



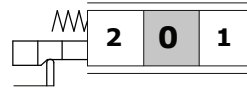
M1-N1A type

3 position, micro operation in position 1



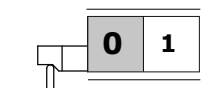
M1-N1B type

3 position, micro operation in position 2



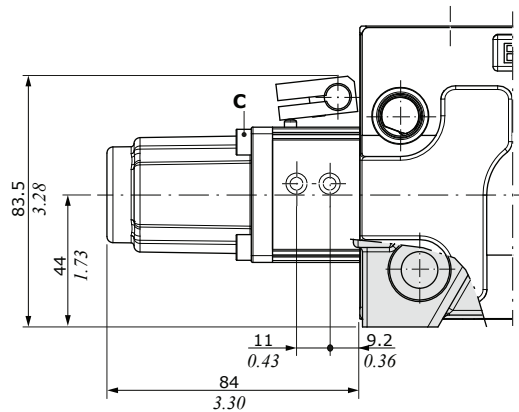
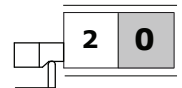
M2-N1 type

2 position (0-1), spring return in neutral position

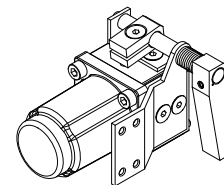
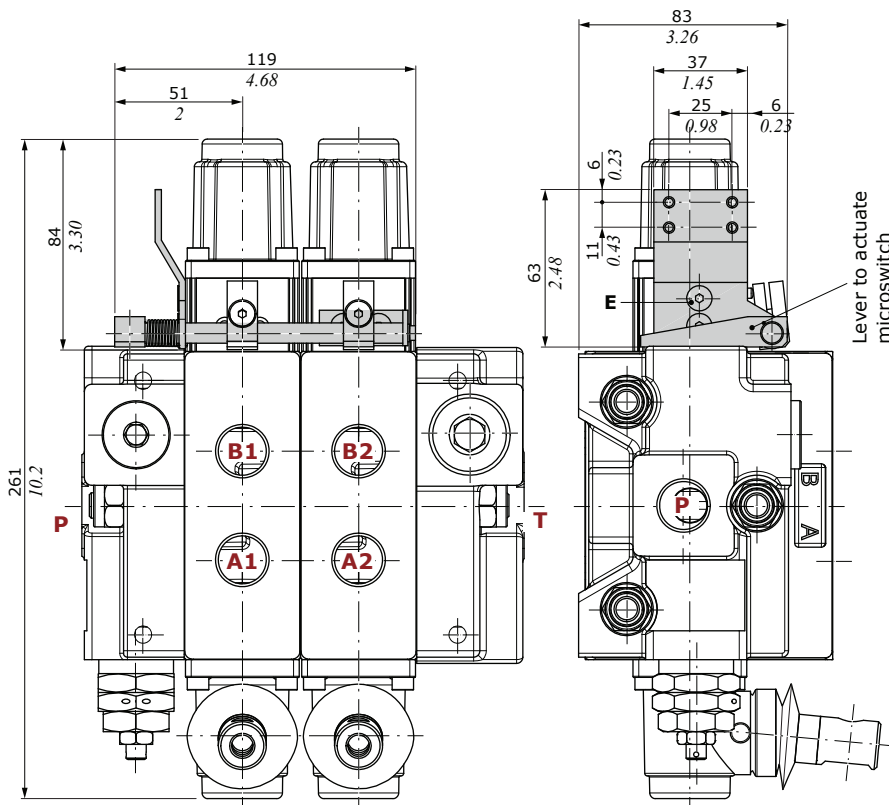


M3-N1 type

2 position (0-2), spring return in neutral position



Microswitch assembly kit for 2 working section (M1-N1 type)



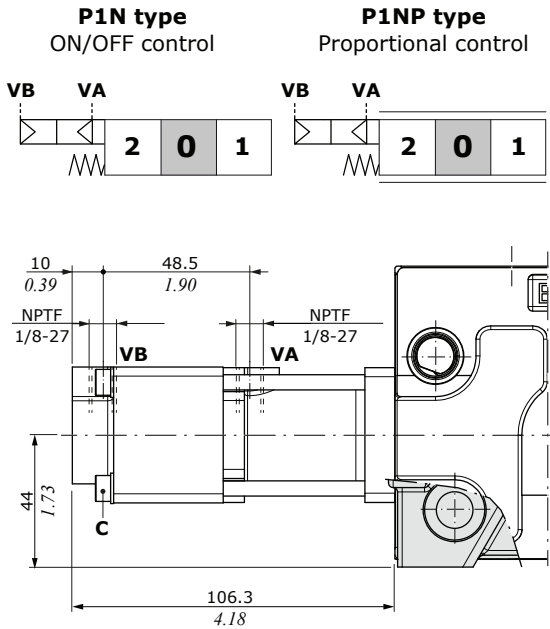
Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
E = allen wrench 3 - 6.6 Nm (4.8 lbf^t)

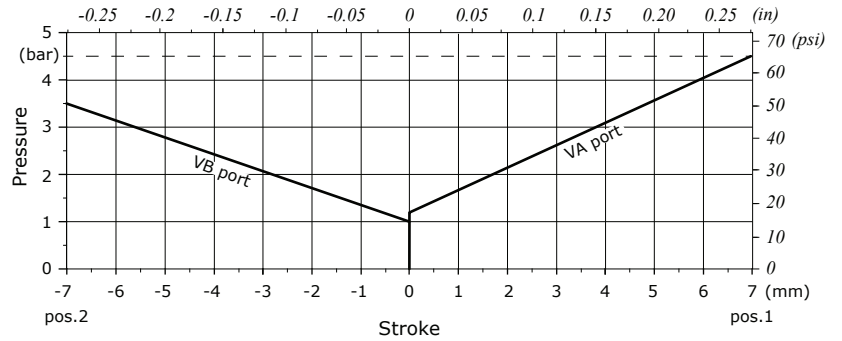
Working section

B side controls

With pneumatic control



Proportional pilot pressure curves



Operating features

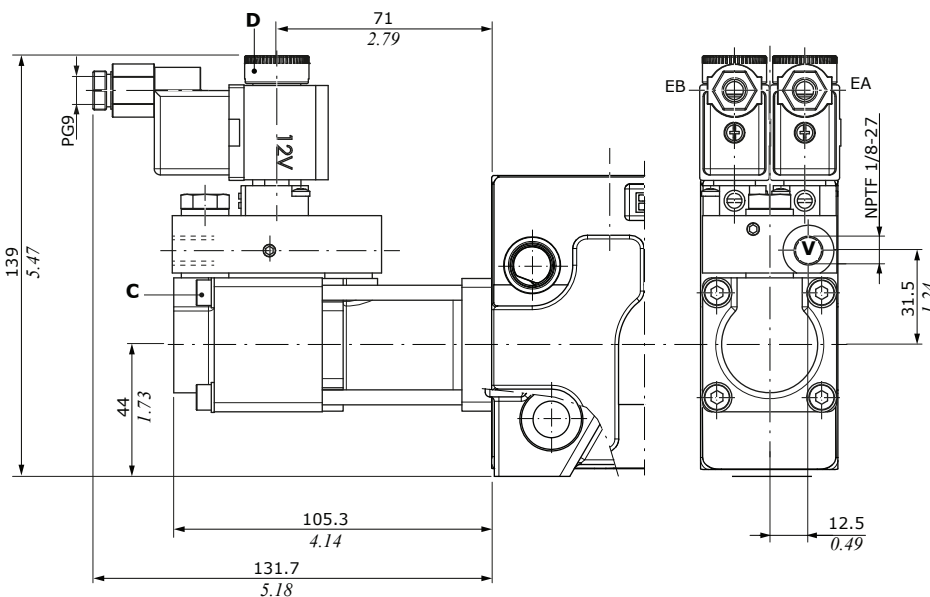
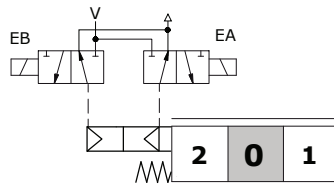
Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
 Pilot volume..... : 9 cm³/min (0.54 in³/min)

Wrenches and tightening torques

C = wrench 4 - 6.6 Nm (4.8 lbf^t)

With ON/OFF electropneumatic control

D3W type ON/OFF control



Operating features

Pilot pressure.....: min. 1 bar (14.5 psi)
 max. 10 bar (145 psi)

COILS

Nominal voltage tolerance.....: -5% +10%
 Power rating..... : 5 W
 Nominal current..... : 12 VDC - 24VDC
 Coil insulation..... : Class F
 Weather protection..... : IP65
 Duty cycle..... : 100%

Wrenches and tightening torques

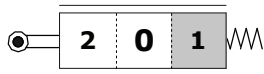
C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
 D = manual tightening - 6.6 Nm (4.8 lbf^t)

A+B side controls

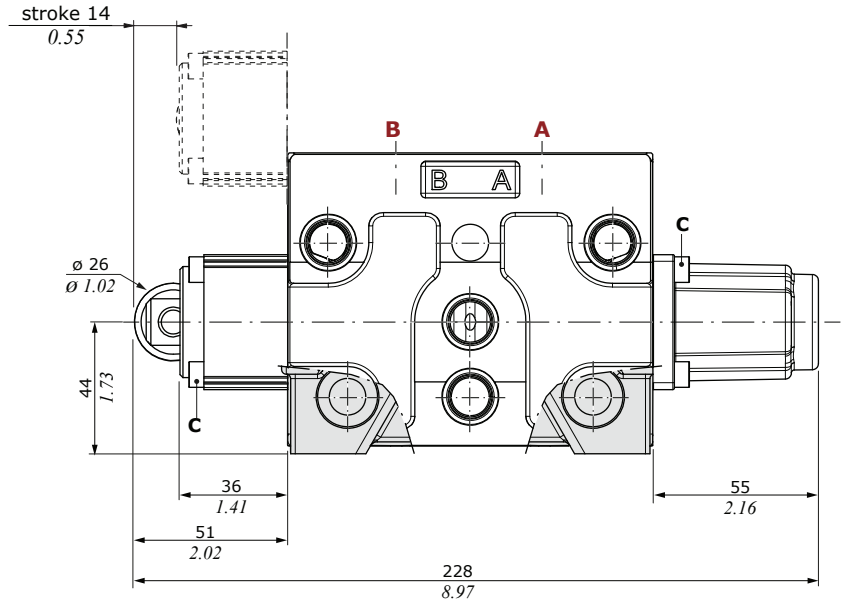
With cam control

C2 type

From position 1 to position 2,
spring return in position 1

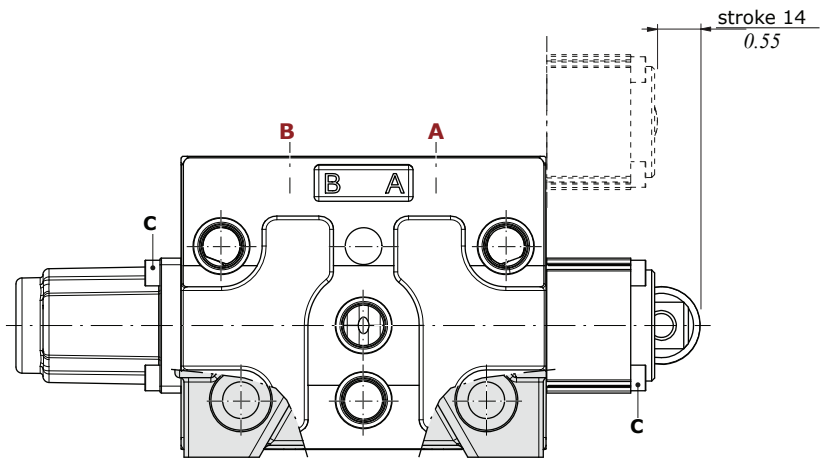
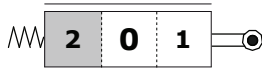


Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbf)



C3 type

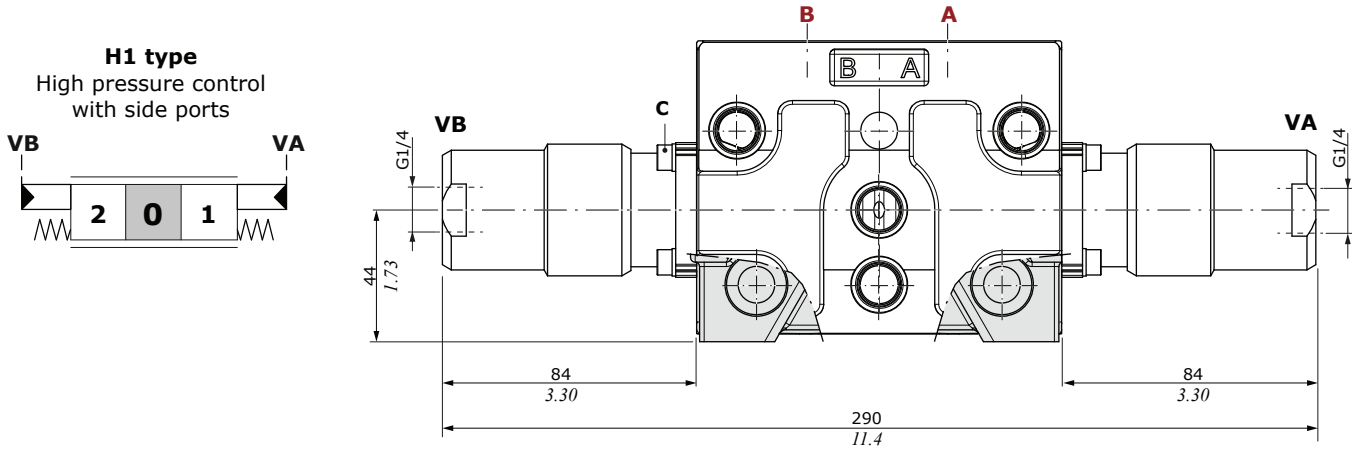
From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type



Working section

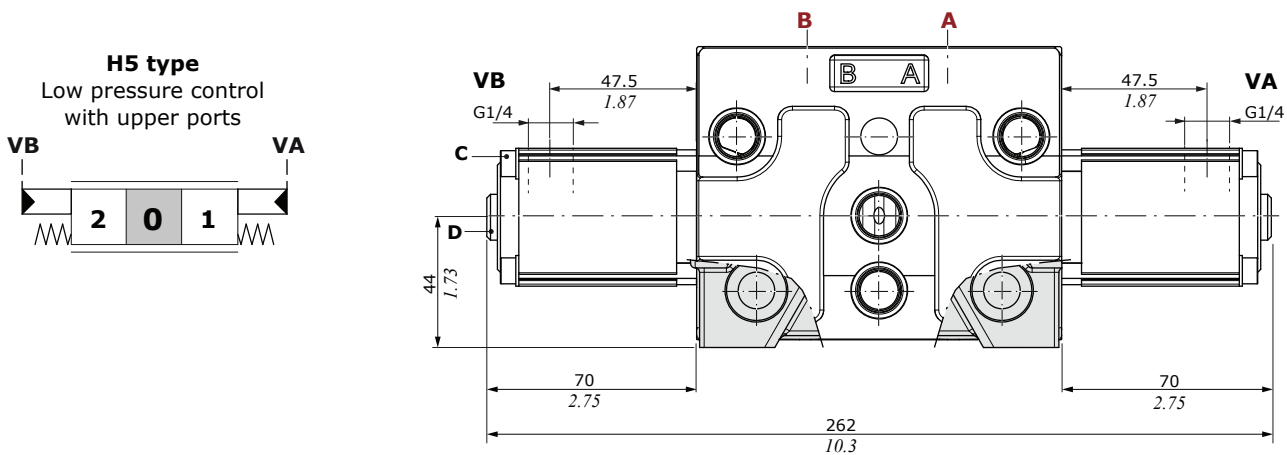
A+B side controls

With proportional hydraulic controls



Operating features

Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)



Operating features

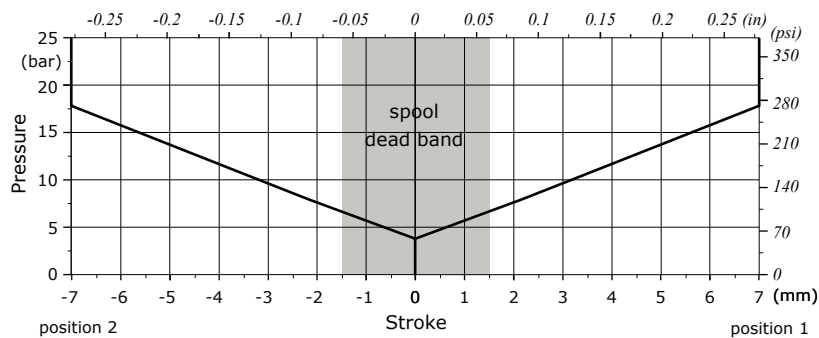
Pilot pressure..... : max. 100 bar (1450 psi)

Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbft)

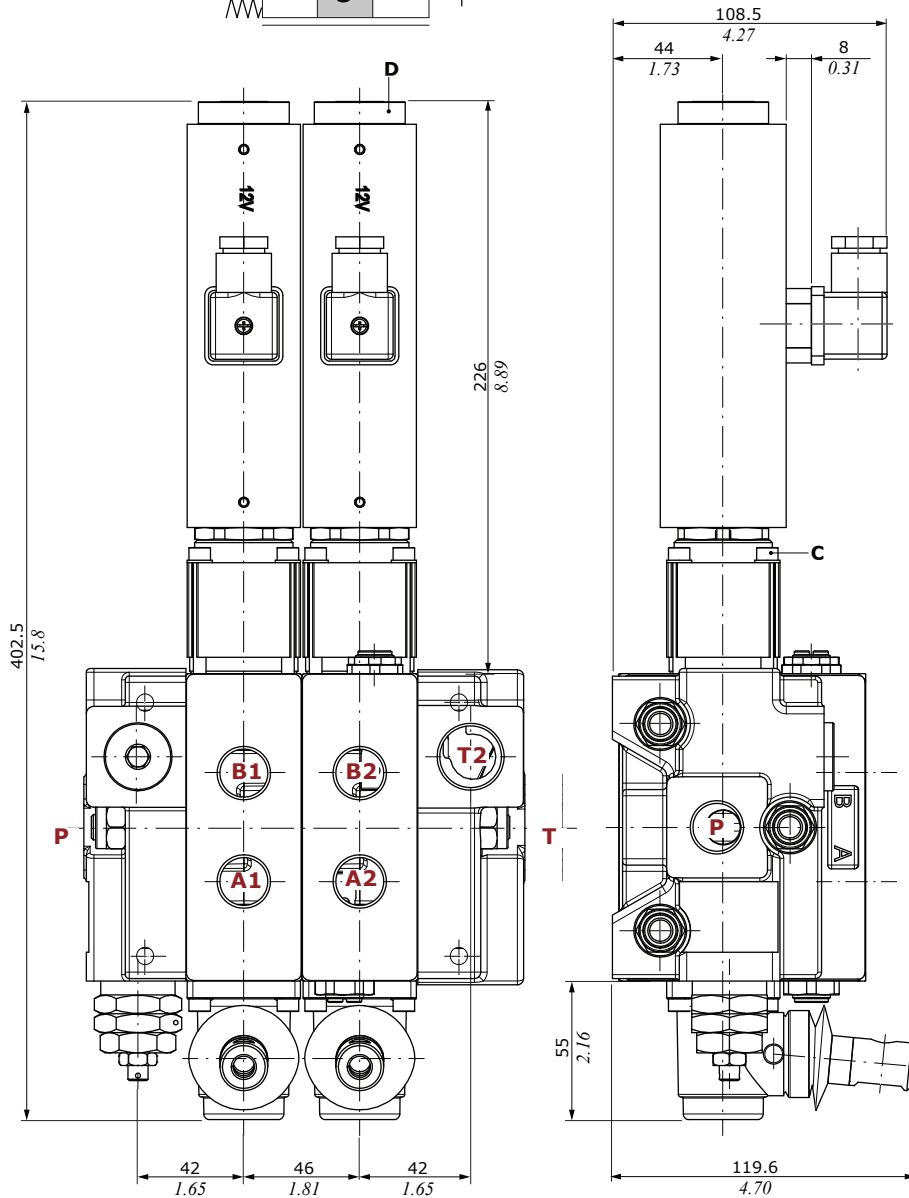
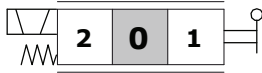
D = allen wrench 4 - 9.8 Nm (7.2 lbft)

Stroke vs. Pressure diagram for H5 type control



Direct solenoid control

D41 type: ON/OFF one side

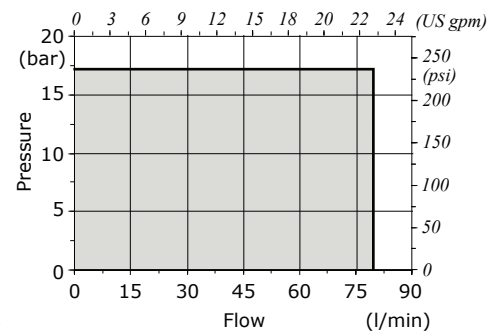


D41 coil

Nominal voltage	12 VDC 24 VDC
Nominal voltage tolerance	±10%
Power rating	80 W
Insulation	Class H
Weather protection	IP65

Connector type: ISO4400 3P+T-PG11

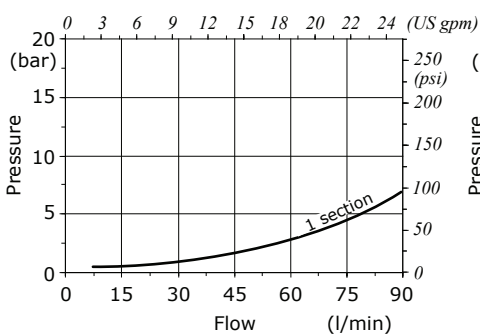
Dynamic conditions



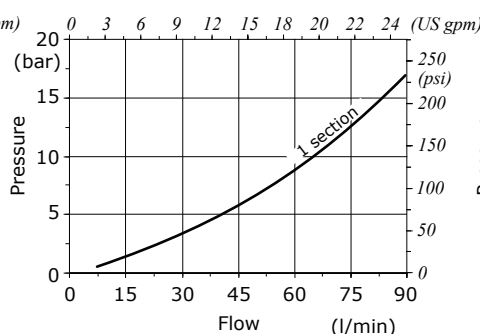
Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbft)
- D = manual tightening - 6.6 Nm (4.8 lbft)

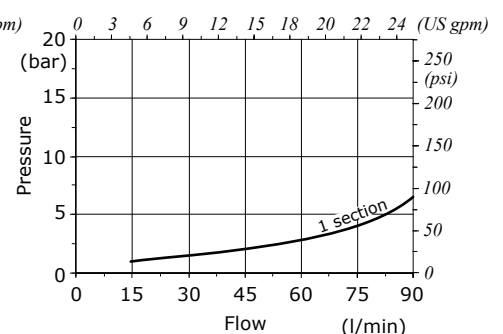
P⇒T pressure drops



P⇒A(B) pressure drops



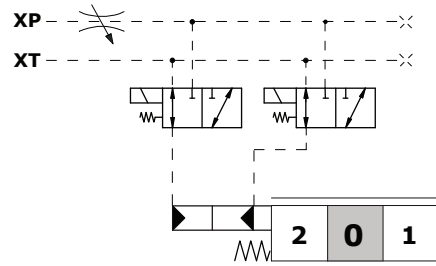
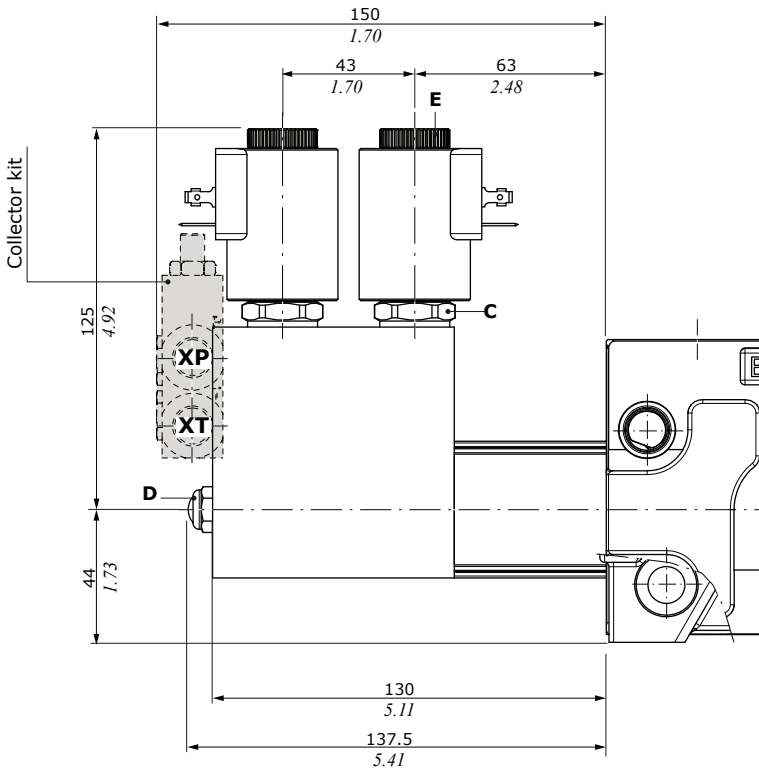
A(B)⇒T pressure drops



Working section

Electrohydraulic control

D2W type: ON/OFF one side

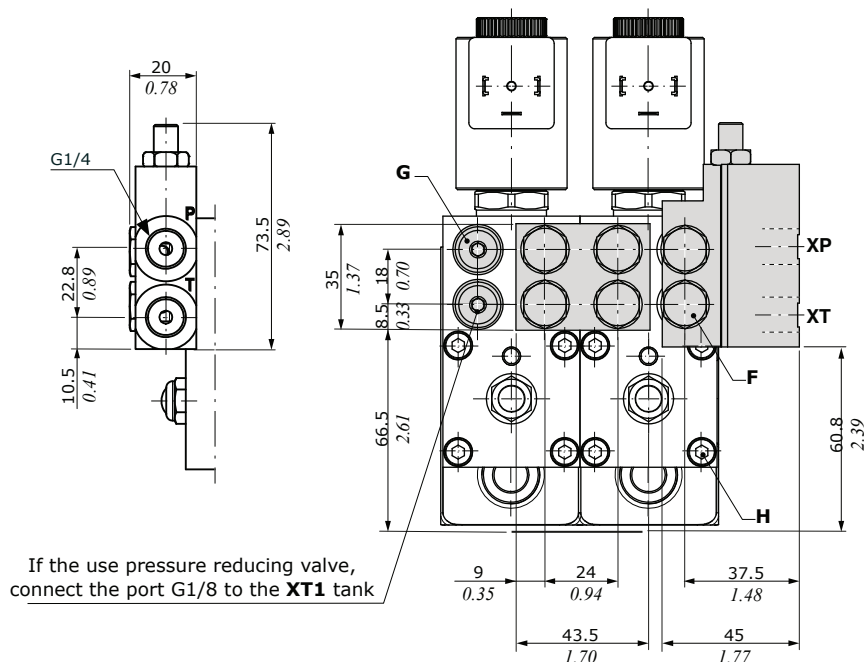


Features

Pilot pressure on XP..... : min. 20 bar (290 psi)
 : max. 35 bar (500 psi)
 Max backpressure on XT..... : 4 bar (58 psi)

For **BT** type coils and mating connectors, see page 257

KE2S connector kit



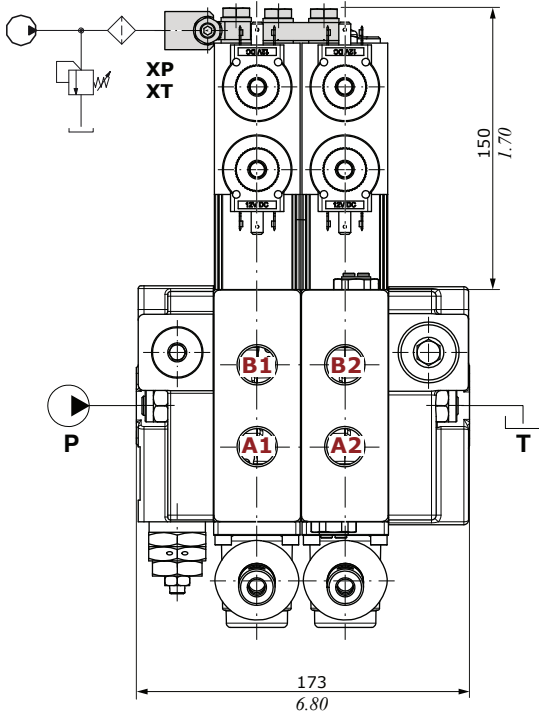
If the use pressure reducing valve, connect the port G1/8 to the **XT1** tank

Wrenches and tightening torques

- C = wrench 24 - 30 Nm (22.1 lbft)
- D = wrench 13 - 9 Nm (6.6 lbft)
- E = wrench 6.6 - 9.8 Nm (7.2 lbft)
- F = wrench 14 - 24 Nm (17.7 lbft)
- G = allen wrench 4 - 9.8 Nm (6.6 lbft)
- H = allen wrench 4 - 3 Nm (2.2 lbft)

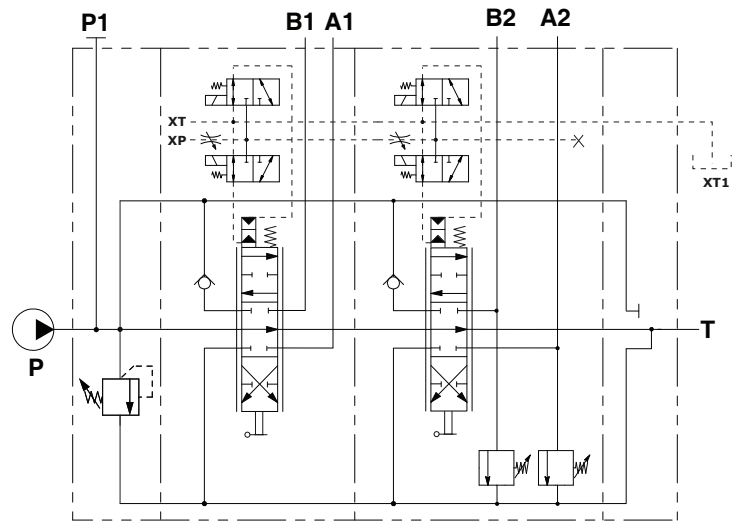
Electrohydraulic control

Connector kit for external pilot and drain



CONNECTOR KIT CODES		
Type	Code*	Description
KE2S	5GKE08S020	Kit for 2 section

For other connector kit codes, see page 195

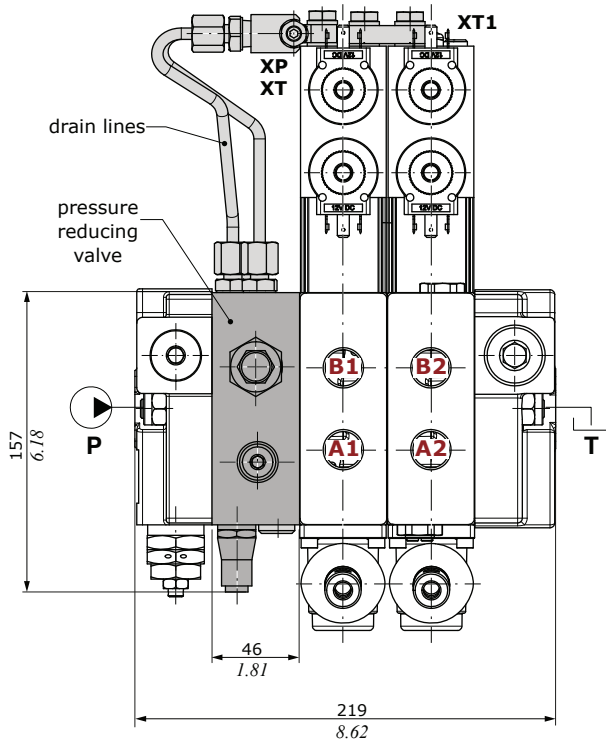


Description example:

Q80/2/F7S(N120)/KE2S/103-A1-D2W.V40(N)120/
103-A1-D2W.V40(N)120/F3D-12VDC-S

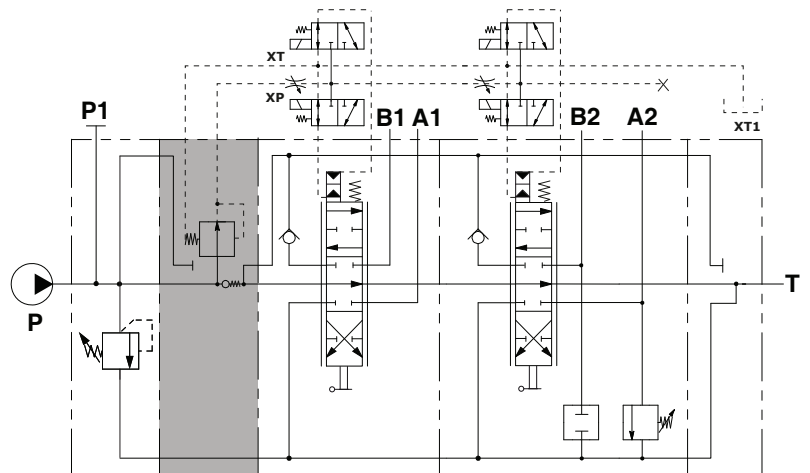
Connector kit for internal pilot and drain

The kit is made of collector, pressure reducing valve and drain lines.



CONNECTOR KIT CODES		
Type	Code*	Description
KE2R	5GKE08R020	Kit for 2 section

For other connector kit codes, see page 195



Description example:

Q80/2/F7S(N120)/KE2R/103-A1-D2W.V40(N)120/
103-A1-D2W.V40(N)120/F3D-12VDC-S

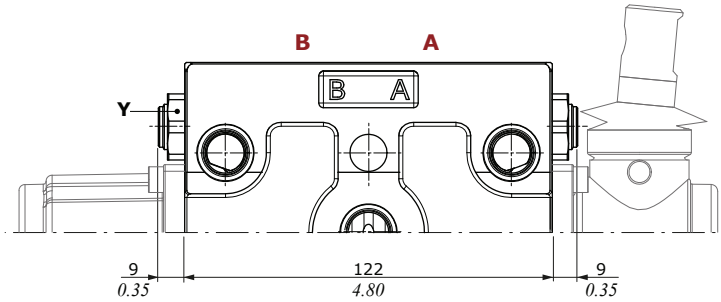
Pressure reducing valve

Auxiliary valve configuration

Dimensional data and hydraulic circuits

Description example

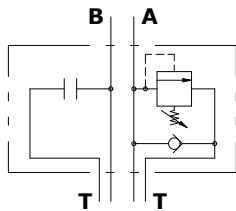
Q80 / 1 / ... / 103 - A1 - M1 - ^{aux valve} **V32(N)120** / ... ^{spring type and valve setting (bar)}



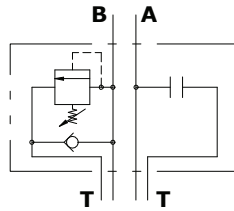
Antishock/anticavitation valve example

A side configuration: **B side configuration:** **A+B side configuration:**

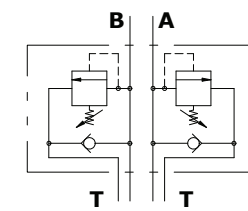
V33



V34



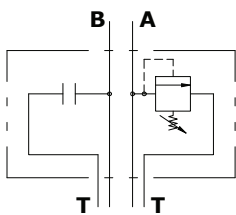
V35 (V34 + V33)



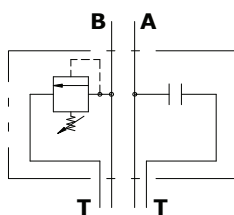
Antishock valve example

A side configuration: **B side configuration:** **A+B side configuration:**

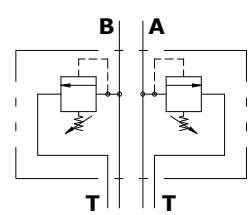
V30



V31



V32 (V30 + V31)



Spring type	Setting ranges (bar - psi)
B (white)	From 30 to 80 - from 435 to 1150
N (black)	From 81 to 200 - from 1170 to 2900
R (red)	From 201 to 370 - from 2910 to 5400

Wrenches and tightening torques

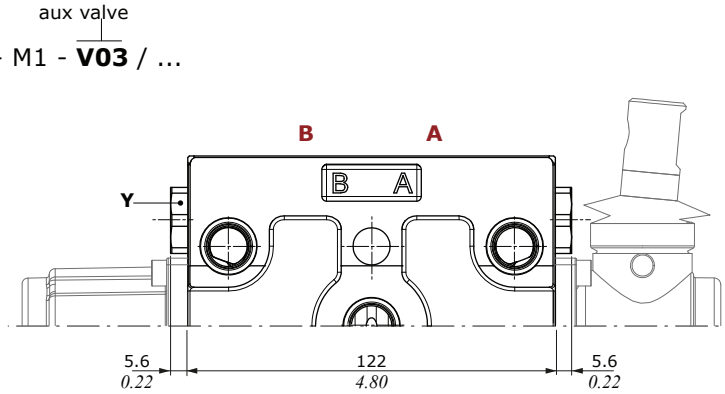
Y = wrench 22 - 42 Nm (30.9 lbf)

Auxiliary valve configuration

Dimensional data and hydraulic circuits

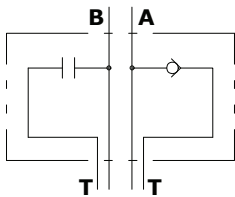
Anticavitation valve example

Q80 / 1 / ... / 103 - A1 - M1 - **V03** / ...



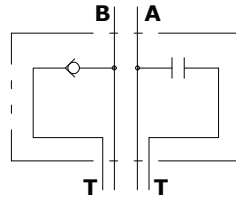
A side configuration:

V04



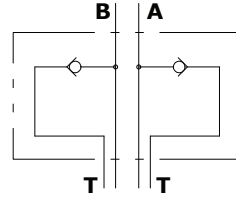
B side configuration:

V05



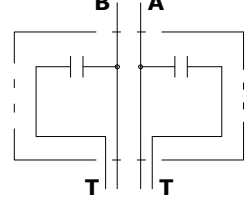
A+B side configuration:

V03 (V04 + V05)



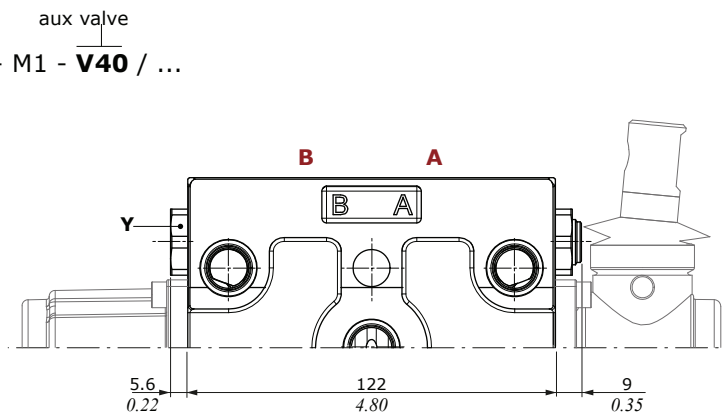
Plug valve:

VC



Antishock and anticavitation combining valves example

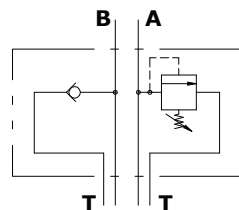
Q80 / 1 / ... / 103 - A1 - M1 - **V40** / ...



Wrenches and tightening torques
Y = wrench 22 - 42 Nm (30.9 lbft)

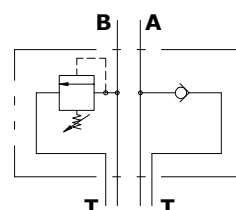
A side configuration:

V40 (V30 + V05)



B side configuration:

V41 (V31 + V04)

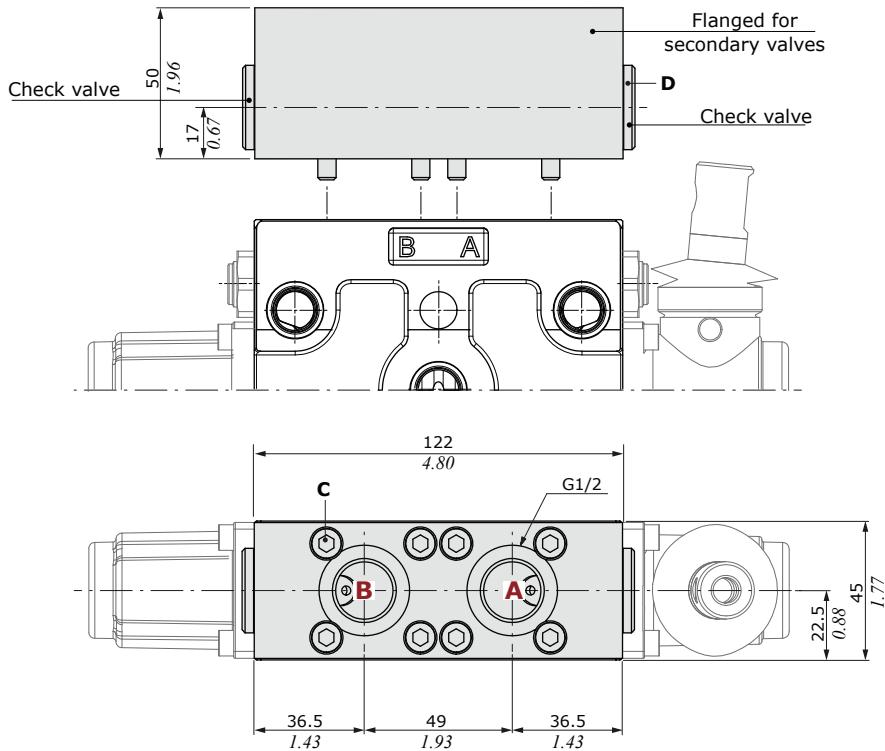


Secondary valve configuration

Dimensional data and hydraulic circuits

Description example

Q80 / 1 / ... / 103 - A1 - M1 - V32(N)120 / **VC03**
secondary aux valve valves block

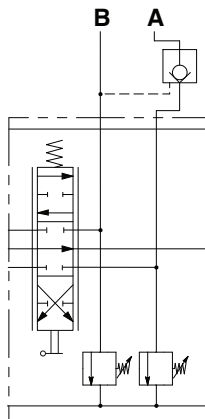


Wrenches and tightening torques

C = allen wrench 5 - 9.8 Nm (7.2 lbf ft)
 D = allen wrench 8 - 60 Nm (44.2 lbf ft)

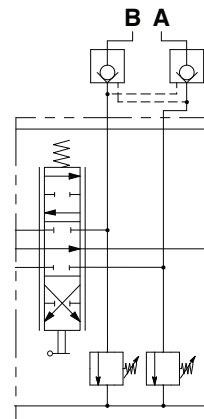
Q80.V40(N)120/VC01 configuration

Parallel circuit, mechanical control with aux valves and flanged for single piloted check valve on A port



Q80.V40(N)120/VC03 configuration

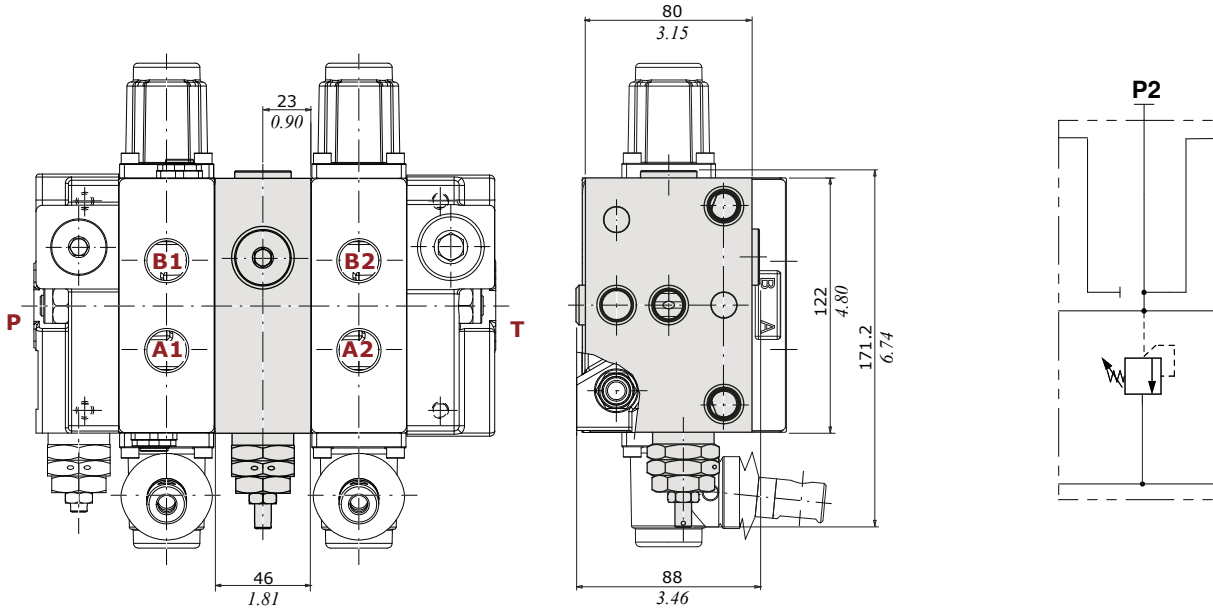
Parallel circuit, mechanical control with aux valves and flanged for double piloted check valve on A and B ports



Dimensional data and hydraulic circuit

E50 type

Intermediate inlet section with pressure relief valve

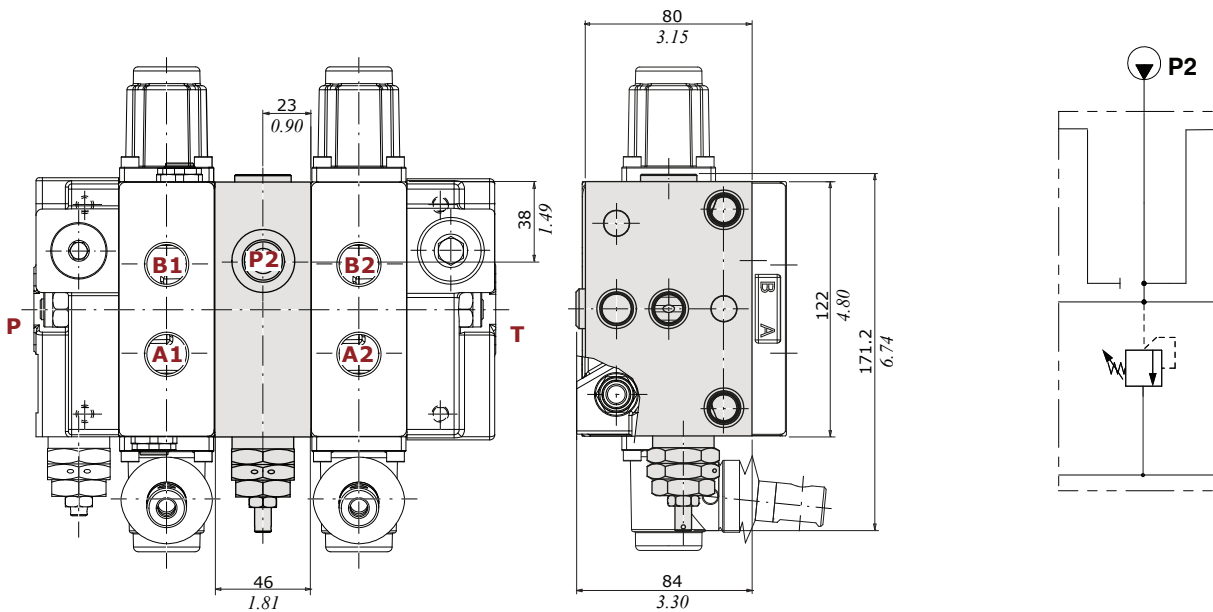


Description example: Q80/2/F7S(N150)/103-A1-M1.VC/**E50(N150)**/103-A1-M1/F3D

intermediate section spring type and valve setting (bar)

E53 type

Intermediate inlet section with pressure relief valve and P2 port open



Description example: Q80/2/F7S(N150)/103-A1-M1.VC/**E53(N150)**/103-A1-M1/F3D

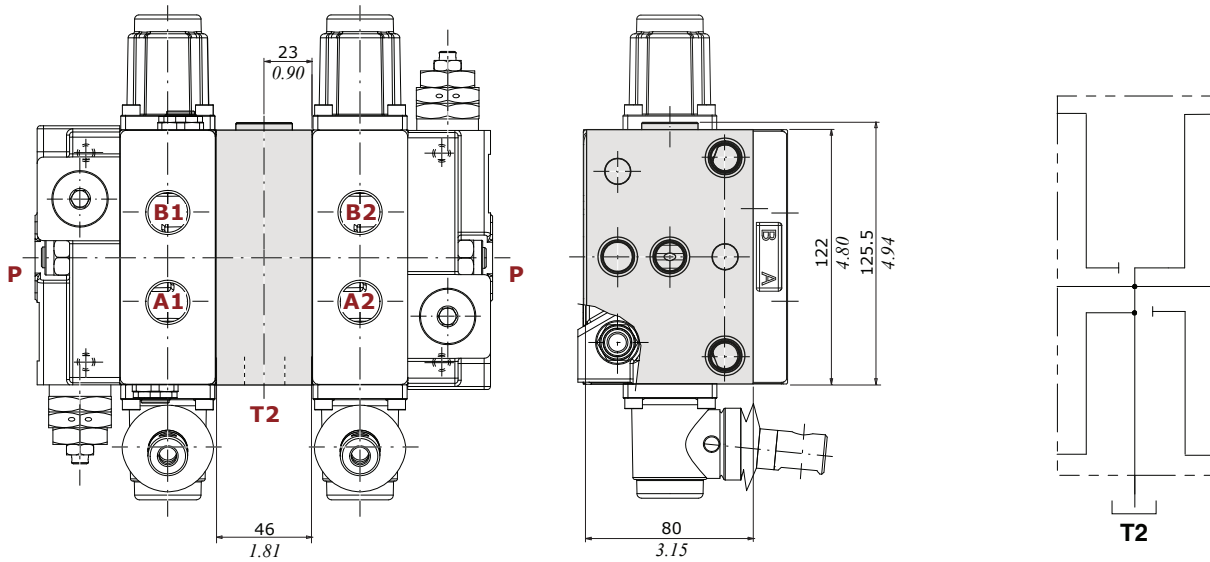
intermediate section spring type and valve setting (bar)

Intermediate section

Dimensional data and hydraulic circuit

E51 type

Intermediate outlet section, T2 port open

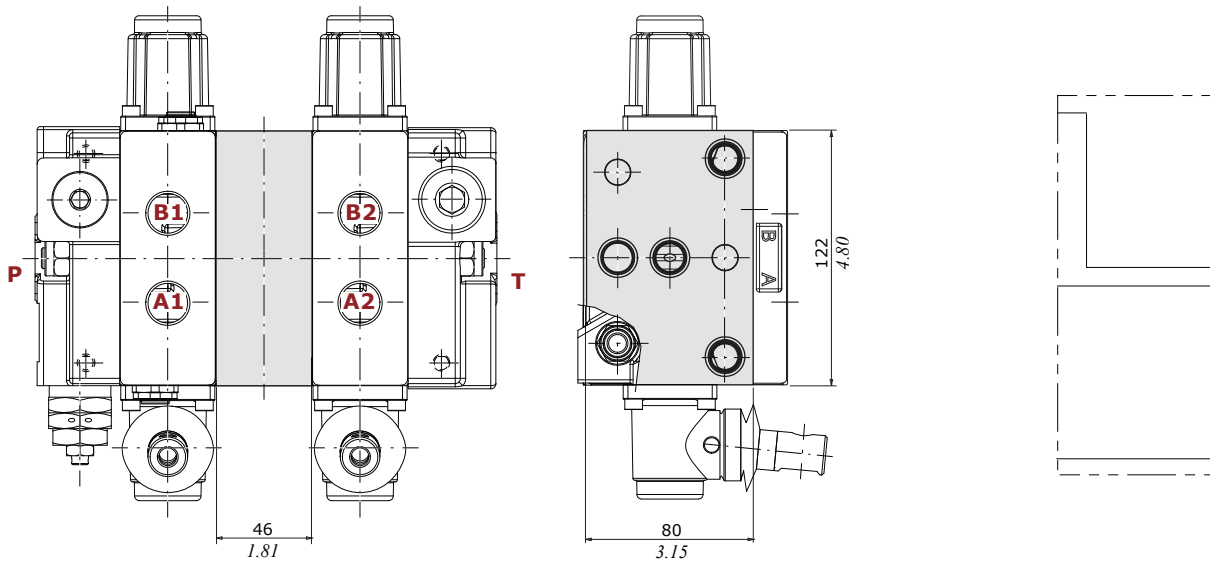


Description example: Q80/2/F7S(N150)/103-A1-M1.VC/**E51**/103-A1-M1/F3D

intermediate section

E61 type

Intermediate spacer section

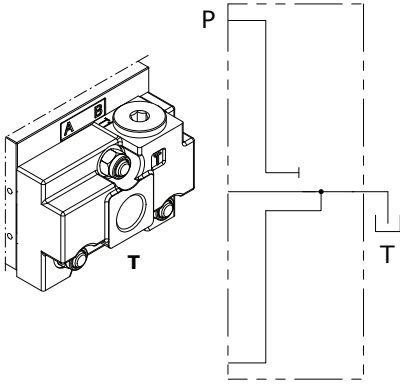


Description example: Q80/2/F7S(N150)/103-A1-M1.VC/**E61**/103-A1-M1/F3D

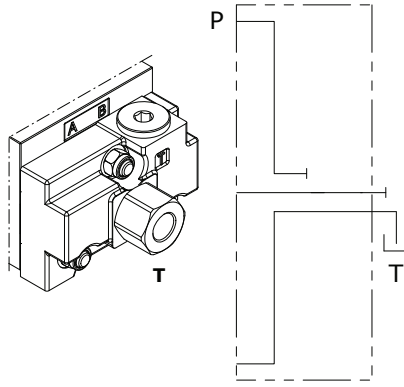
intermediate section

Outlet section

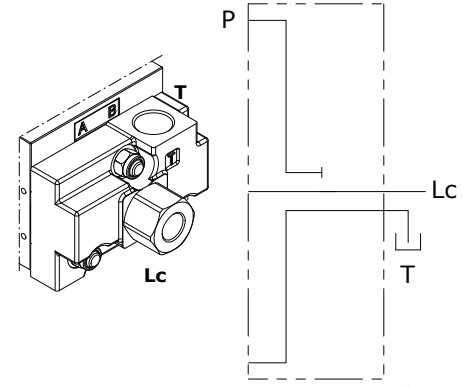
F3D configuration
Open center configuration



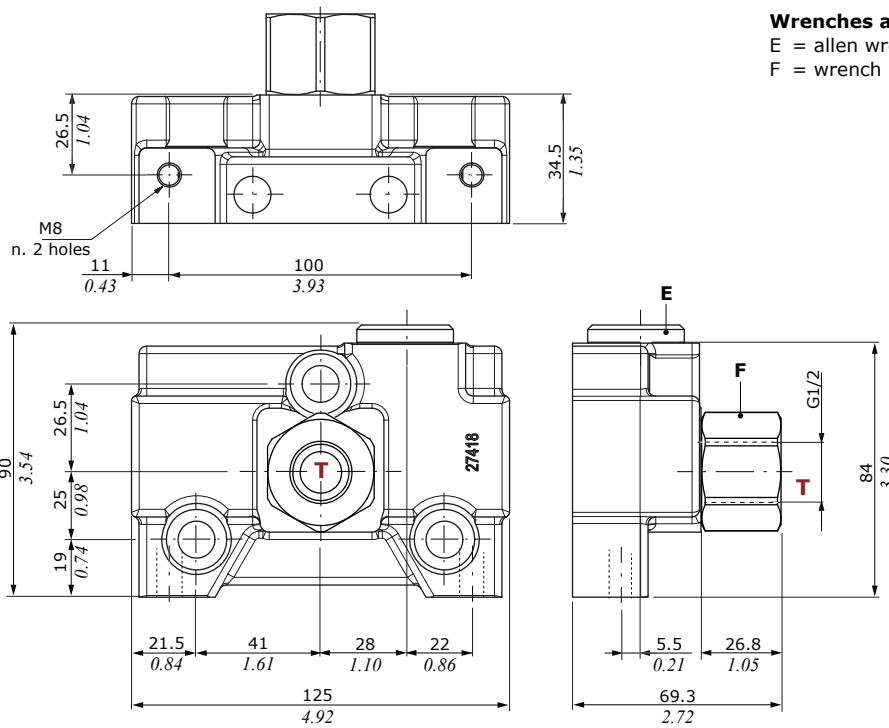
F16D configuration
Closed center configuration



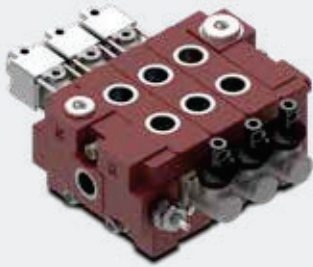
F6D configuration
Carry-over configuration



F16D configuration example



Wrenches and tightening torques
E = allen wrench 12 - 42 Nm (30.9 lbft)
F = wrench 36 - 80 Nm (59 lbft)



Q130

Sectional directional control valve

- Available with parallel, tandem or series circuit
- Optional carry over port
- A wide range of antishock + anticavitation port valves
- Intermediate sections for several types of circuit
- Manual, pneumatic, electropneumatic, hydraulic, direct solenoid and electrohydraulic on-off controls

Working conditions

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

Nominal flow rating		130 l/min - (34.3 Us gpm)
Max. pressure		300 bar (4350 psi)
Max. back pressure on outlet T port		25 bar (360 psi)
Number sections		from 1 to 10
Internal leakage A(B)⇒T	Δp = 100 bar (1450 psi)	10 cm ³ /min (0.61 in ³ /min)
Fluid		Mineral oil
Fluid temperature	with NBR (BUNA-N) seals	from -30°C to 80°C - from -22 °F to 176 °F
Viscosity	operating range	from 10 to 400 mm ² /s - from 10 to 400 cSt
Max. contamination level		16/14/12 - ISO 4406 - NAS1638 class 6
Ambient temperature	without electric devices	from -40°C to 60°C - from 40 °F to 140 °F
	with electric devices	from -20°C to 50°C - from -4 °F to 122 °F

NOTE - For different conditions please contact our Sales Department.

REFERENCE STANDARD

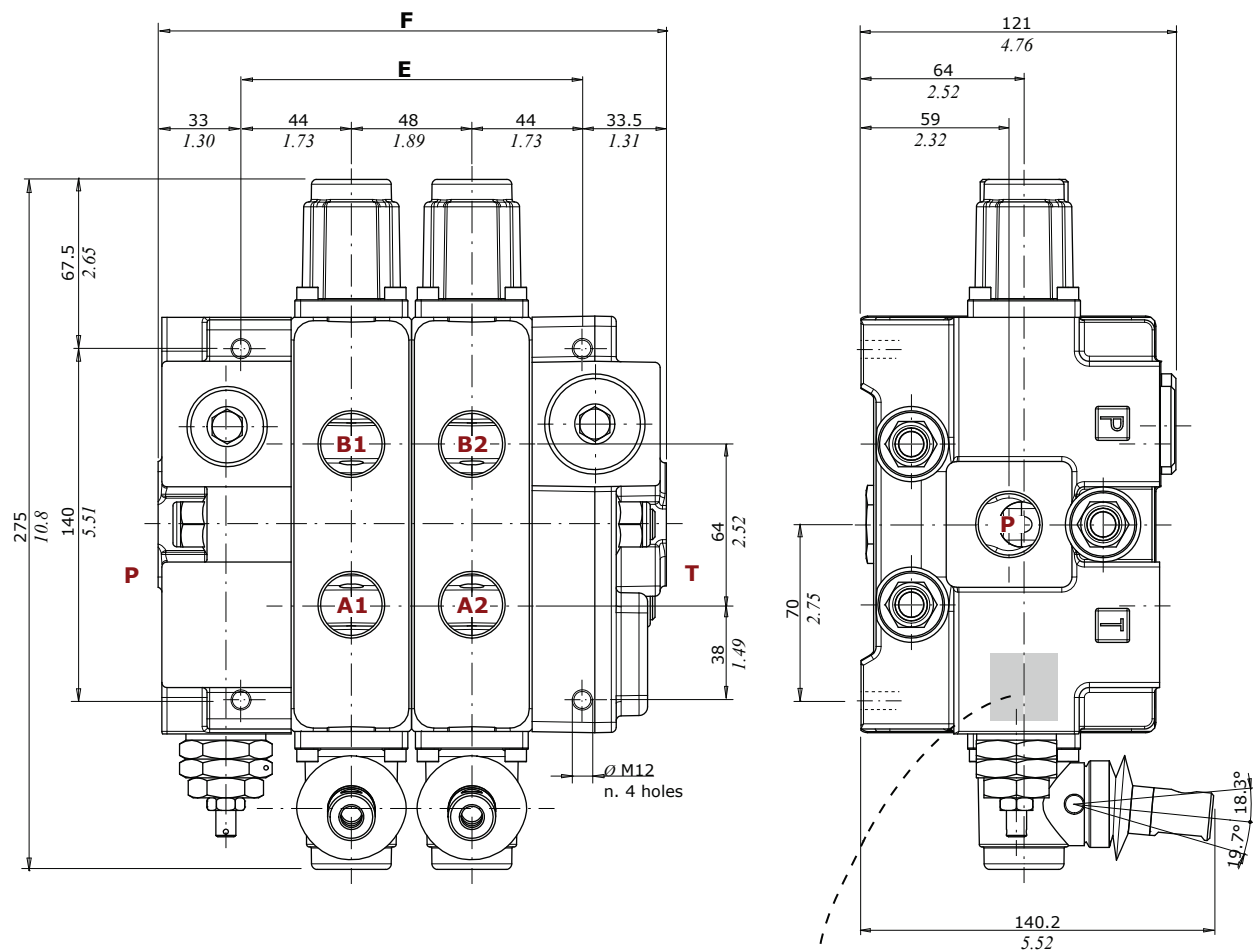
	BSP	UN-UNF
THREAD ACCORDING TO	ISO 228/1	ISO 263
	BS 2779	ANSI B1.1 unified
CAVITY DIMENSION ACCORDING TO	ISO	11926
	SAE	J11926
	DIN	3852-2 shape X or Y

PORT THREADING

PORTS	BSP (standard)	BSP (G 1")	UN-UNF
P Inlet	G 3/4	G 1"	1" 5/16-12 (SAE16)
P1 Inlet	G 3/4	G 1"	1" 5/16-12 (SAE16)
A and B ports	G 3/4	G 1"	1" 5/16-12 (SAE16)
T Outlet	G 1"	G 1"	1" 5/16-12 (SAE16)
T1 Outlet	G 1"	G 1"	1" 5/16-12 (SAE16)
Lc port (Carry-over plug - T port)	G 3/4-G 1"	G 1"	1" 1/16-12 (SAE12)
Hydraulic controls	G 1/4	G 3/4	9/16-18 (SAE 6)
Pneumatic controls	NPTF 1/8-27	NPTF 1/8-27	NPTF 1/8-27

Dimensional data

Standard configuration*



Type	E		F	
	mm	in	mm	in
Q130/1	88	3.46	154.5	6.08
Q130/2	136	5.35	202.5	7.97
Q130/3	184	7.24	250.5	9.86
Q130/4	232	9.13	298.5	11.75
Q130/5	280	11	346.5	13.64
Q130/6	328	12.91	394.5	15.53
Q130/7	376	14.80	442.5	17.42
Q130/8	424	16.70	490.5	19.31
Q130/9	472	18.58	538.5	21.20
Q130/10	520	20.47	586.5	23.09

walvoil

MADE IN ITALY
1GB75040009

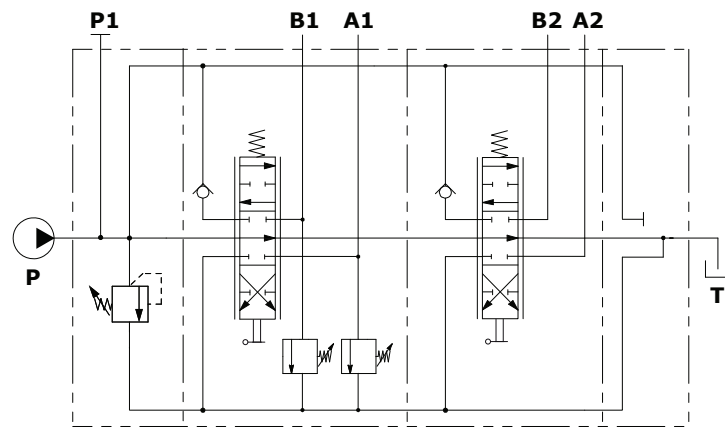
DISTRIBUTORE
Q130/2
MD1600464-001

Datamatrix with product allotment

- Product code
- Code description
- Product allotment
- Datamatrix with product allotment

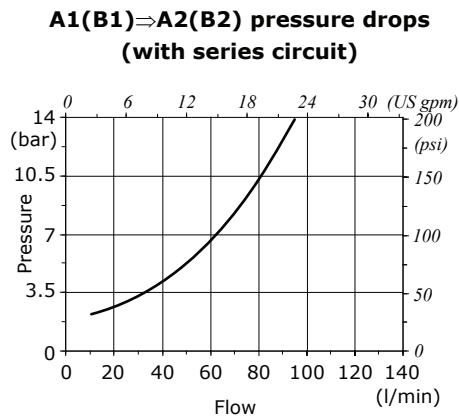
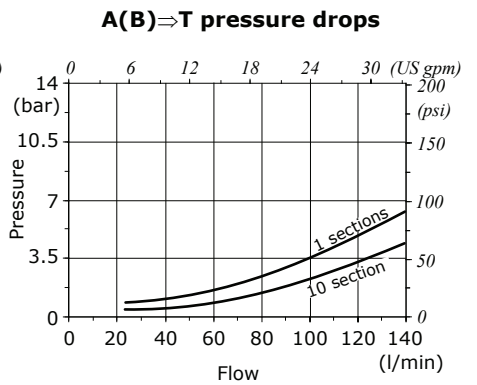
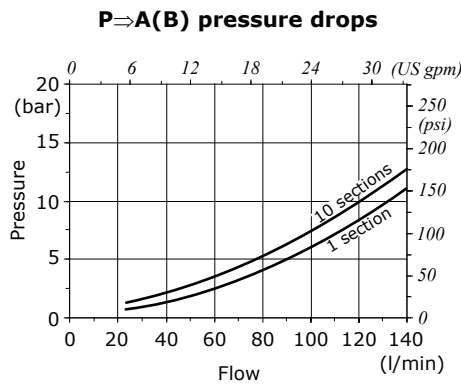
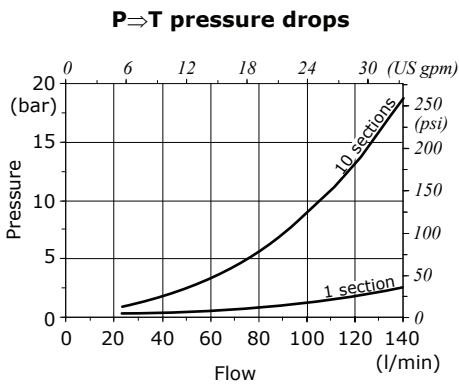
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration.

(*): For other configurations, see page 254



Description example (parallel circuit):
 Q130/2/F7S(N150)/103-A1-M1.V32(N105\N105)/103-A1-M1/F3D

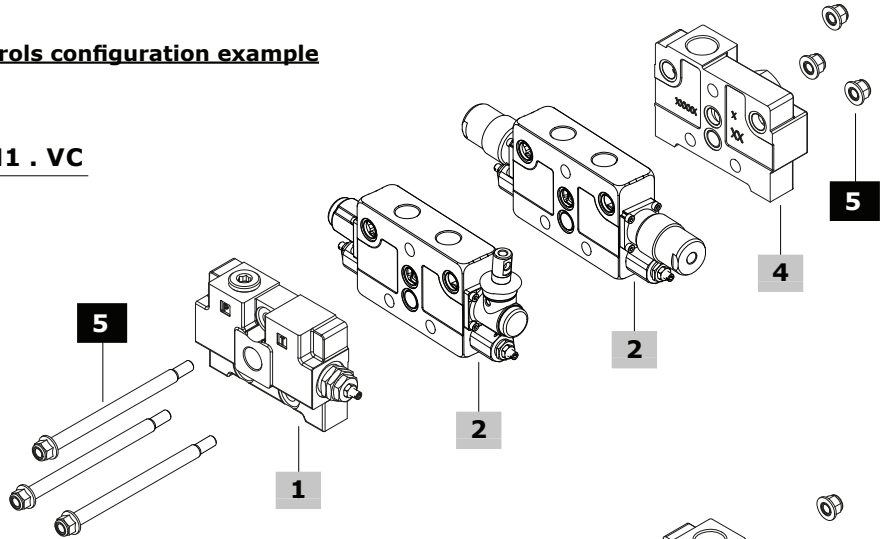
Performance data



Complete section ordering codes

Valve with mechanical and hydraulic controls configuration example

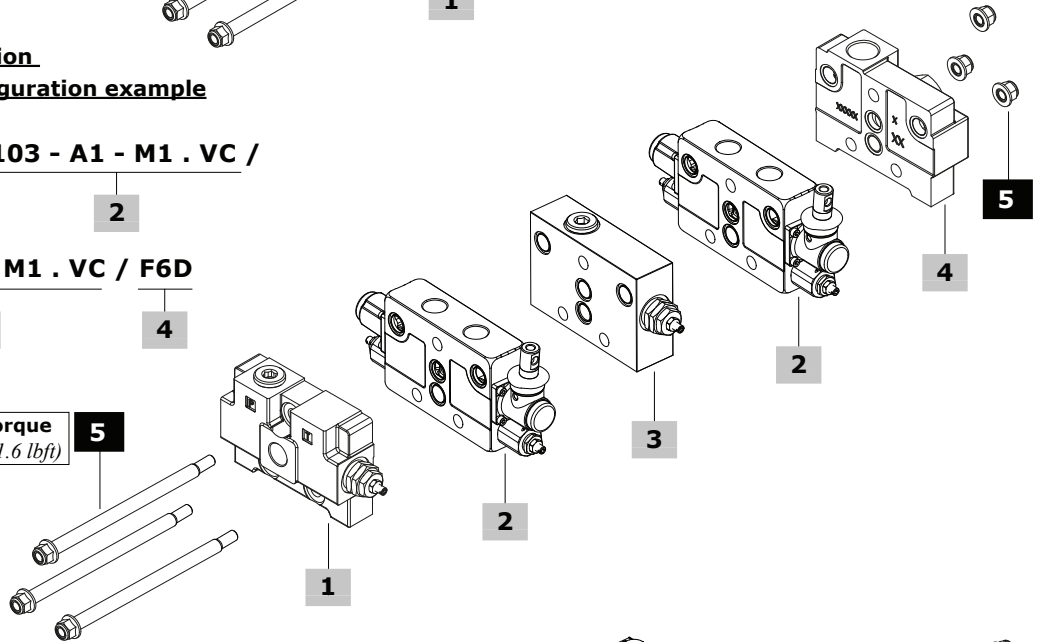
valve setting (bar)
Q130 / 2 / F7S(N150) / 103 - A1 - M1 . VC
 N. of section **1** **2**
/ 103 - H1 . VC / F6D
 2 **4**



Valve with intermediate section and mechanical control configuration example

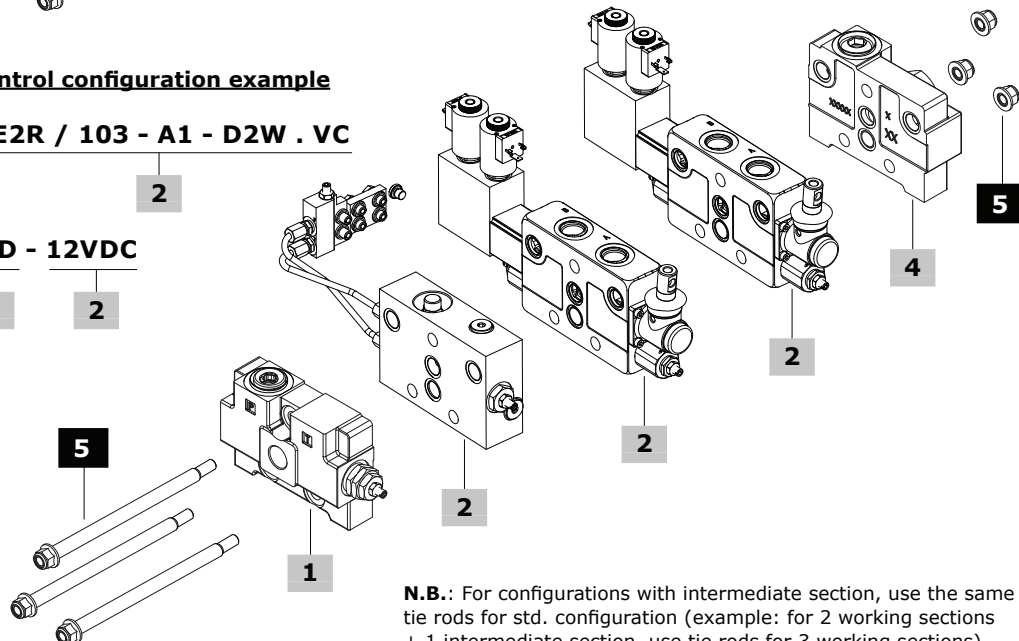
valve setting (bar) **1** **2**
Q130 / 2 / F7S(N150) / 103 - A1 - M1 . VC /
/ E50(N150) / 103 - A1 - M1 . VC / F6D
 3 **2** **4**

Tie rod tightening torque
wrench 18 - 70 Nm (51.6 lbf_t)



Valve with electrohydraulic control configuration example

Q130 / 2 / F7S(N150) / KE2R / 103 - A1 - D2W . VC
 1 **2**
/ 103 - A1 - D2W . VC / F6D - 12VDC
 2 **4** **2**



N.B.: For configurations with intermediate section, use the same tie rods for std. configuration (example: for 2 working sections + 1 intermediate section, use tie rods for 3 working sections)

Complete section ordering codes

<p>1 Inlet section* page 226</p> <p>TYPE: FE-Q130/F7S(N150) CODE: 10000F7S/D-N DESCRIPTION: Side inlet open, upper inlet plugged, with pressure relief valve, setting range 101-200 bar (1460-2900 psi) TYPE: FE-Q130/F8S CODE: 10003F8S/D DESCRIPTION: As previous one, without valves (pressure relief valve plugged port)</p>	<p>3 Intermediate section* page 254</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>CODE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>E50</td> <td>10850E50-B</td> <td>With pressure relief valve setting range 10-100 bar (145-1450 psi)</td> </tr> <tr> <td></td> <td>10850E50-N</td> <td>As previous one, setting range 101-200 bar (1460-2900 psi)</td> </tr> <tr> <td></td> <td>10850E50-R</td> <td>As previous one, setting range 201-380 bar (2910-5500 psi)</td> </tr> <tr> <td>E53</td> <td>10854E53-B</td> <td>With pressure relief valve setting range 10-100 bar (145-1450 psi) and P2 port open for 2nd pump</td> </tr> <tr> <td></td> <td>10854E53-N</td> <td>As previous one, setting range 101-200 bar (1460-2900 psi)</td> </tr> <tr> <td></td> <td>10854E53-R</td> <td>As previous one, setting range 201-380 bar (2910-5500 psi)</td> </tr> <tr> <td>E51</td> <td>10853E51</td> <td>Intermediate outlet section, T2 port open</td> </tr> <tr> <td>E61</td> <td>10877E61</td> <td>Intermediate spacer section</td> </tr> </tbody> </table>	TYPE	CODE	DESCRIPTION	E50	10850E50-B	With pressure relief valve setting range 10-100 bar (145-1450 psi)		10850E50-N	As previous one, setting range 101-200 bar (1460-2900 psi)		10850E50-R	As previous one, setting range 201-380 bar (2910-5500 psi)	E53	10854E53-B	With pressure relief valve setting range 10-100 bar (145-1450 psi) and P2 port open for 2 nd pump		10854E53-N	As previous one, setting range 101-200 bar (1460-2900 psi)		10854E53-R	As previous one, setting range 201-380 bar (2910-5500 psi)	E51	10853E51	Intermediate outlet section, T2 port open	E61	10877E61	Intermediate spacer section
TYPE	CODE	DESCRIPTION																										
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E51	10853E51	Intermediate outlet section, T2 port open																										
E61	10877E61	Intermediate spacer section																										
<p>2 Working section* page 229</p> <p>With mechanical controls TYPE: EL-Q130/103-A1-M1.VC CODE: SGL130004 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, lever control and spring return to neutral position TYPE: EL-Q130/103-A1-M1 CODE: 100000103001000 DESCRIPTION: As previous one, without valve arrangement</p> <p>With proportional hydraulic controls TYPE: EL-Q130/103-H1.VC CODE: SGL130005 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, high pressure hydraulic controls, spring return to neutral position TYPE: EL-Q130/103-H1 CODE: SGL130006 DESCRIPTION: As previous one, without valve arrangement TYPE: EL-Q130/103-H5.VC CODE: SGL130007 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, low pressure hydraulic controls, spring return to neutral position TYPE: EL-Q130/103-H5 CODE: SGL130008 DESCRIPTION: As previous one, without valve arrangement</p> <p>With electrohydraulic ON/OFF controls - one side type TYPE: EL-Q130/KE1S/103-A1-D2W.VC -12VDC CODE: SGL130011 DESCRIPTION: Parallel circuit with valve arrangement (seat plugged), 3 positions double acting spool, 12VDC one-side electrohydraulic ON/OFF control, internal pilot and drain, lever control and spring return to neutral position TYPE: EL-Q130/KE1S/103-A1-D2W-12VDC CODE: SGL130012 DESCRIPTION: As previous one, without valve arrangement</p>	<p>4 Outlet section* page 256</p> <p>TYPE: FS-Q130-F3D CODE: 10012F3D DESCRIPTION: T port open, T1 port plugged. For open center circuit TYPE: FS-Q130-F16D CODE: 10016F16D DESCRIPTION: T port open, T1 port plugged. For closed center circuit TYPE: FS-Q130-F6D CODE: 10014F6D DESCRIPTION: Lc port and T1 port open. With joint for carry-over (HPCO) circuit</p>																											
	<p>5 Tie rods kit</p> <table border="0"> <thead> <tr> <th>CODE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>10901TX1</td> <td>For 1 section valve</td> </tr> <tr> <td>10902TX2</td> <td>For 2 sections valve</td> </tr> <tr> <td>10903TX3</td> <td>For 3 sections valve</td> </tr> <tr> <td>10904TX4</td> <td>For 4 sections valve</td> </tr> <tr> <td>10905TX5</td> <td>For 5 sections valve</td> </tr> <tr> <td>10906TX6</td> <td>For 6 sections valve</td> </tr> <tr> <td>10907TX7</td> <td>For 7 sections valve</td> </tr> <tr> <td>10908TX8</td> <td>For 8 sections valve</td> </tr> <tr> <td>10909TX9</td> <td>For 9 sections valve</td> </tr> <tr> <td>10910TX10</td> <td>For 10 sections valve</td> </tr> </tbody> </table>	CODE	DESCRIPTION	10901TX1	For 1 section valve	10902TX2	For 2 sections valve	10903TX3	For 3 sections valve	10904TX4	For 4 sections valve	10905TX5	For 5 sections valve	10906TX6	For 6 sections valve	10907TX7	For 7 sections valve	10908TX8	For 8 sections valve	10909TX9	For 9 sections valve	10910TX10	For 10 sections valve					
CODE	DESCRIPTION																											
10901TX1	For 1 section valve																											
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10908TX8	For 8 sections valve																											
10909TX9	For 9 sections valve																											
10910TX10	For 10 sections valve																											

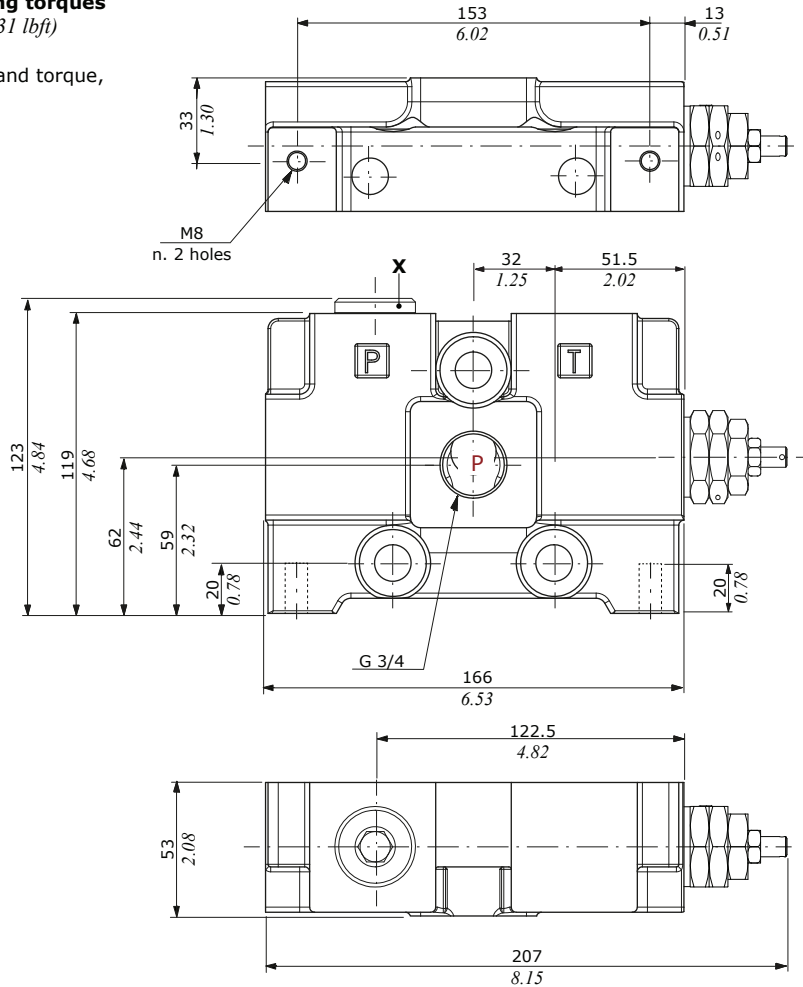
(*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

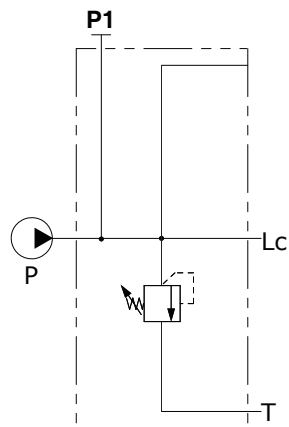
Wrenches and tightening torques

X = wrench 12 - 42 Nm (31 lbft)

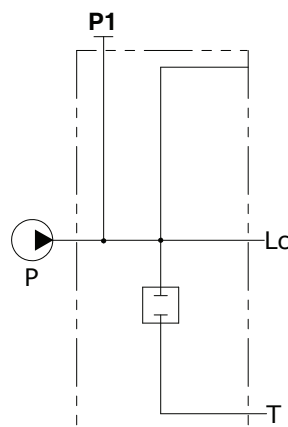
Note: For valves wrench and torque, see related pages



F7S configuration
With pressure relief valve



F8S configuration
Without valves
(pressure relief valve plugged port)



Inlet section

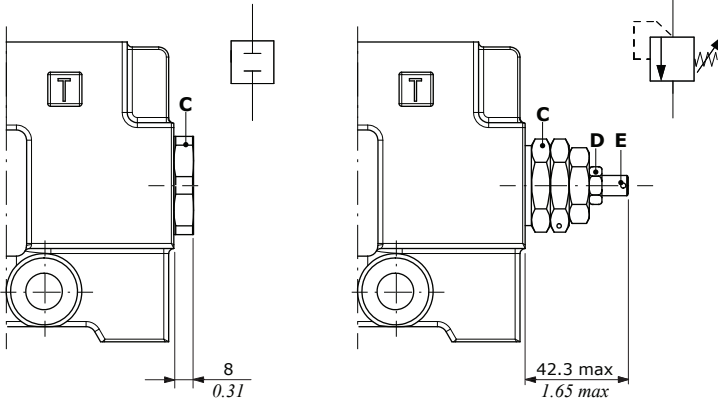
Main pressure relief valve

Relief valve blanking plug

Main pressure relief valve

Wrenches and tightening torques

- C = wrench 32 - 80 Nm (59 lbft)
- D = wrench 13 - 24 Nm (17.7 lbft)
- E = allen wrench 4

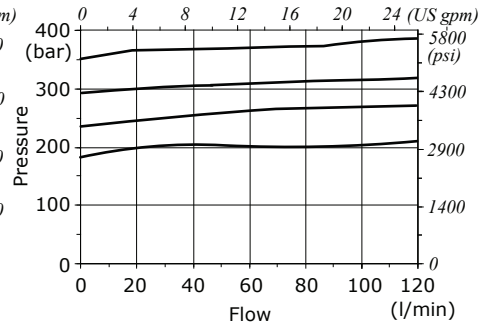
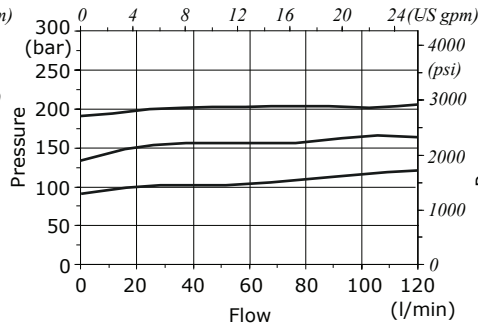
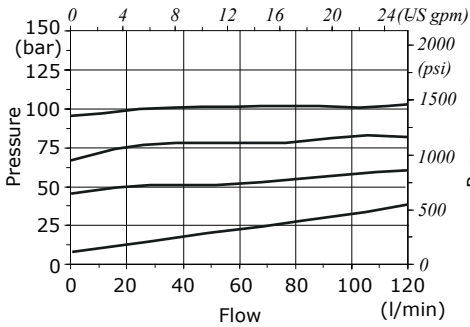


Spring type	Setting ranges (bar - psi)
B (white)	From 10 to 100 - from 145 to 1450
N (black)	From 101 to 200 - from 1460 to 2900
R (red)	From 201 to 380 - from 2910 to 5500

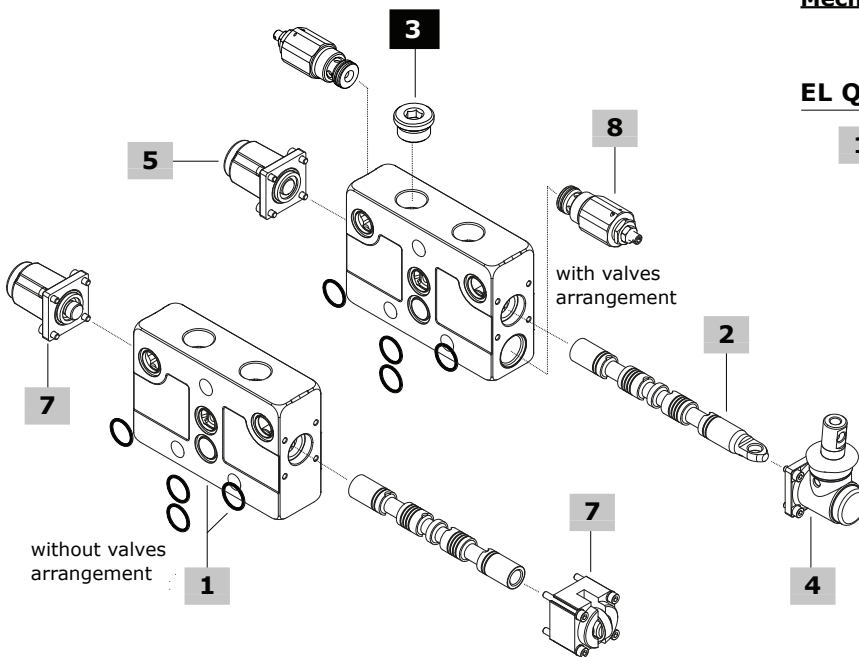
Setting example (B type spring)

Setting example (N type spring)

Setting example (R type spring)



Working section - parts ordering codes



Mechanical control valve configuration example

spring type and valve setting (bar)

EL Q130 / 102 - A1 - M1 . V40(N)120

1 2 4 5 8

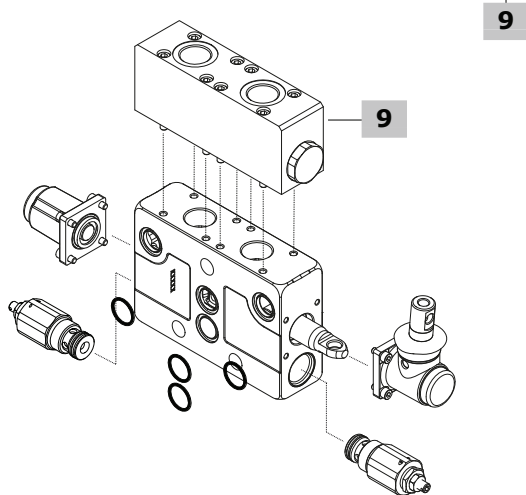
C2/C3 complete mechanical control configuration example

EL Q130 / 103 - C3 . V40(N)120

7

Mechanical control valve with arrangement for secondary aux valves block: configuration example

EL Q130 / 103 - A1 - M1 . V40(N)120 / VC03



1 Working section body kit* page 233

TYPE: **EL-Q130.VC** CODE: 5EL0600127898
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **EL-Q130.VC.VPC** CODE: 5EL0600128894
 DESCRIPTION: Parallel circuit with port valves arrangement, for secondary aux valves block
 TYPE: **EL-Q130** CODE: 5EL0600127893
 DESCRIPTION: Parallel circuit, without port valves arrangement
 TYPE: **EL-Q130.VC** CODE: 5EL0600127896
 DESCRIPTION: Series circuit, with port valves arrangement

2 Spool page 234

TYPE	CODE	DESCRIPTION
Standard spools		
103	060102983699	Double acting, A and B closed in neutral position
	KR130103K	As previous one, for kick-out control
106	KR130106	Double acting for closed circuit
107	KR130107-108	Double acting, A to tank and B closed in neutral position
108	KR130107-108	Double acting, B to tank and A closed in neutral position
111	060102996399	Double acting, A and B to tank in neutral position
	KR103111K	As previous one, for kick-out control
101	3CUG2996000	Single acting on port A. G3/4 plug is required, see #3
102	3CUG2996001	Single acting on port B. G3/4 plug is required, see #3
116	KR130116	Double acting, with floating in the 4 th position (spool in): requires dedicated spool control
603	060103218199	Double acting, A and B closed in neutral position, for series circuit
Special spools for cam, microswitch controls and other leverless controls		
103	060102996199	Double acting, A and B closed in neutral position
111	060102996299	Double acting, A and B to tank in neutral position
603	060103236499	Double acting, A and B to tank in neutral position, for series circuit

3 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	060002800899	G3/4 plug

(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

4 A side control page 235

TYPE	CODE	DESCRIPTION
For standard spools		
<u>With lever control:</u>		
A1	10600A1-A2	M10 thread aluminium lever box
A2	10600A1-A2	As A1 type, with lever box rotated 180°
A1/Z1	10610A1-A2/Z1	Aluminium lever box for 116 spool type
A2/Z1	10610A1-A2/Z1	As A1/Z1 type, with lever box rotated 180°
<u>With safety lever control:</u>		
A1/S⁽¹⁾	10624A1-A2/S	M10 thread aluminium lever box
A2/S⁽¹⁾	10624A1-A2/S	As A1/S type, with lever box rotated 180°
<u>Without lever control:</u>		
A6	10620A6	With flange
A6/Z1	10620A6/Z1	As A6 type, for 116 spool type
A6H	10620A6HH	As A6 type, with scraper
A8	10622A8	Arrangement for flexible cable control
A8/Z1	10622A8/Z1	As A8 type, for 116 spool type
<u>Joystick controls for 2 section operation:</u>		
A35/1	10637A35-12	Joystick 1 type
A35/2	10637A35-12	Joystick 2 type
A35/3	10637A35-34	Joystick 3 type
A35/4	10637A35-34	Joystick 4 type
For types 103, 111 and 603 special spools		
<u>With spool position microswitch:</u>		
Note: to complete the control you must use the assembly kit at #6		
N1-A1	10641N1-A1/A2	Micro operation in pos. 1 and 2, with lever box
N1A-A1	10642N1A-A1/A2	Micro operation in pos. 1, with lever box
N1B-A1	10643N1B-A1/A2	Micro operation in pos. 2, with lever box
N1-A3	10648N1-A3	Micro operation in pos. 1 and 2, without lever with cap
N1A-A3	10648N1A-A3	Micro operation in pos. 1, without lever with cap
N1B-A3	10648N1B-A3	Micro operation in pos. 2, without lever with cap
<u>Without lever control:</u>		
A3	10614A3	Without lever, with cap
A4	10617A4	M10 thread male external pin with flange
A5⁽²⁾	10619A5	Flange with spherical spool end

5 B side control page 242

TYPE	CODE	DESCRIPTION
<u>With spring return:</u>		
M1	10730M1	3 pos., spring return in neutral position
M1/01	10730M1/01	As M1 type, for joystick control
M1/B1	10753M1-B1	As M1 type, with microswitch arrangement
M1-U1	10701M1-U1	As M1 type, with M10 male thread external pin
M2	10732M2	2 pos. (0-1), spring return in neutral position
M2-U1	10702M2-U1	As M2 type, with M10 male thread external pin
M3	10733M3	2 pos. (0-2), spring return in neutral position
M3-U1	10702M3-U1	As M3 type, with M10 male thread external pin
M4	10735M42-1	2 pos. (2-1), spring return in position 2
<u>With flexible cable control arrangement:</u>		
M1-U2	10715M1-U2	3 pos., spring return in neutral position
M2-U2	10716M2-U2	2 pos. (0-1), spring return in neutral position
M3-U2	10717M3-U2	2 pos. (0-2), spring return in neutral position
<u>With friction:</u>		
R0	10740R0	Adjustable friction control
<u>With detent:</u>		
R1	10741R1	3 pos., detent in position 1
R2	10742R2	3 pos., detent in position 2
R3	10743R3	3 pos., detent in all position
R4	10744R4	2 pos., detent in position 0-1
R5	10745R5	2 pos., detent in position 0-2
R6	10746R6	2 pos., detent in position 1-2
R8	10748R8	4 pos., detent in 4 th pos., for 116 spool type

5 B side controls (cont.) page 242

TYPE	CODE	DESCRIPTION
<u>With detent and kick out function:</u>		
R1K	10741R1K	3 pos., detent in position 1
R2K	10742R2K	3 pos., detent in position 2
R3K	10743R3K	3 pos., detent in all position
<u>With spool position microswitch:</u>		
Note: To complete the control you must use the assembly kit at #6		
M1-N1	10766M1-N1	3 pos., micro operation in pos. 1 and 2, spring return in neutral position
M1-N1A	10767M1-N1A	As M1-N1 type, micro operation in pos. 1
M1-N1B	10768M1-N1B	As M1-N1 type, micro operation in pos. 2
M2-N1	10769M2-N1	2 pos. (0-1), spring return in neutral position
M3-N1	10772M3-N1	2 pos. (0-2), spring return in neutral position
<u>Pneumatic and electropneumatic controls:</u>		
P1N	10561P1-N	ON/OFF pneumatic control
P1NP	10561P1-NP	Proportional pneumatic control
D3	10591D3-O-12DC	12 VDC, ON/OFF electropneumatic control
	10592D3-O-24DC	24 VDC, ON/OFF electropneumatic control

6 Microswitch assembly kit

CODE	DESCRIPTION
10650N1-01	Kit for 1 section
10650N1-02	Kit for 2 sections
10650N1-03	Kit for 3 sections
10650N1-04	Kit for 4 sections
10650N1-05	Kit for 5 sections
10650N1-06	Kit for 6 sections
10650N1-07	Kit for 7 sections
10650N1-08	Kit for 8 sections
10650N1-09	Kit for 9 sections
10650N1-10	Kit for 10 sections

7 Complete controls A+B sides page 247

TYPE	CODE	DESCRIPTION
For types 103, 111 and 603 special spools		
C2	10792C2-C3	Cam control from pos. 1 to 2
C3	10792C2-C3	Cam control from pos. 2 to 1

8 Auxiliary port valve page 251

TYPE	CODE	DESCRIPTION
<u>Antishock valve:</u>		
V30-B	10800V30-B	Setting range: from 30 to 80 bar (from 435 to 1150 psi)
V30-N	10800V30-N	Setting range: from 81 to 200 bar (from 1170 to 2900 psi)
V30-R	10800V30-R	Setting range: from 201 to 350 bar (from 2910 to 5100 psi)
<u>Antishock/anticavitation valve:</u>		
V33-B	10803V33-B	Setting range: from 30 to 80 bar (from 435 to 1150 psi)
V33-N	10803V33-N	Setting range: from 81 to 200 bar (from 1170 to 2900 psi)
V33-R	10803V33-R	Setting range: from 201 to 350 bar (from 2910 to 5100 psi)
<u>Anticavitation valve:</u>		
V04	10808V04	Anticavitation valve
<u>Plug:</u>		
VC	060002798999	Valve blanking plug
For other configurations and positions, see page 251		

9 Secondary aux valves* page 253

TYPE	CODE	DESCRIPTION
VRP-VC01	10835V01	Single piloted check valve on A port, 250 bar (3600 psi)
VRP-VC03	10837V03	Double piloted check valve on A and B ports, 250 bar (3600 psi)

(*): Codes are referred to **BSP** thread
 (†): Always complete with lever knob
 (‡): To be assembled only with M4 control

Working section - parts ordering codes

Proportional hydraulic controls valve configuration example

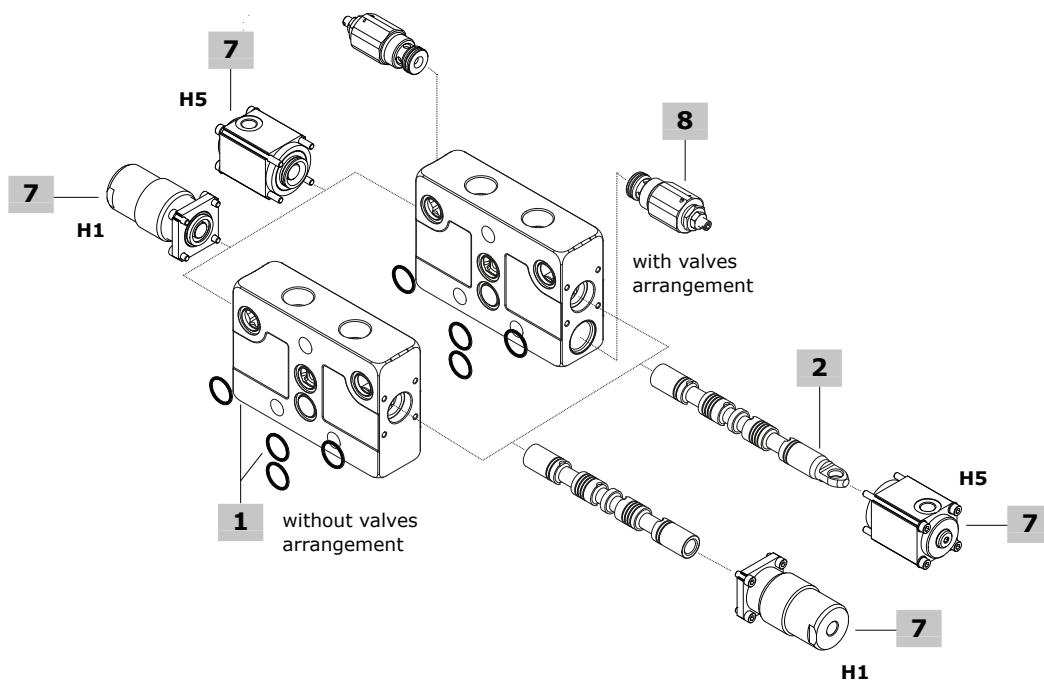
spring type and valve setting (bar)

EL Q130 / 103 - H5 . V40(N)120

1
 2
 7
 8

EL Q130 / 103 - H1 . V40(N)120

7



1 Working section body kit* page 233

The body kits listed below are for **H5** hydraulic control.
H1 hydraulic control requires standard body: see #1, page 229
 TYPE: **EL-Q130-H5.VC** CODE: 5EL0600127898H5
 DESCRIPTION: Parallel circuit, with port valves arrangement
 TYPE: **EL-Q130-H5** CODE: 5EL0600127893H5
 DESCRIPTION: Parallel circuit, without port valves arrangement

2 Spool page 234

TYPE	CODE	DESCRIPTION
For H5 hydraulic control		
103	060102983699	Double acting, A and B closed in neutral position
For H1 hydraulic control		
103	060102996199	Double acting, A and B closed in neutral position

7 Hydraulic controls A+B sides* page 248

TYPE	CODE	DESCRIPTION
H5	10785H5	Low pressure proportional type, upper ports
H1	10779H1	High pressure proportional type, side ports

8 Auxiliary port valve page 251

See #8, page 230

(*): Codes are referred to **BSP** thread

Working section - parts ordering codes

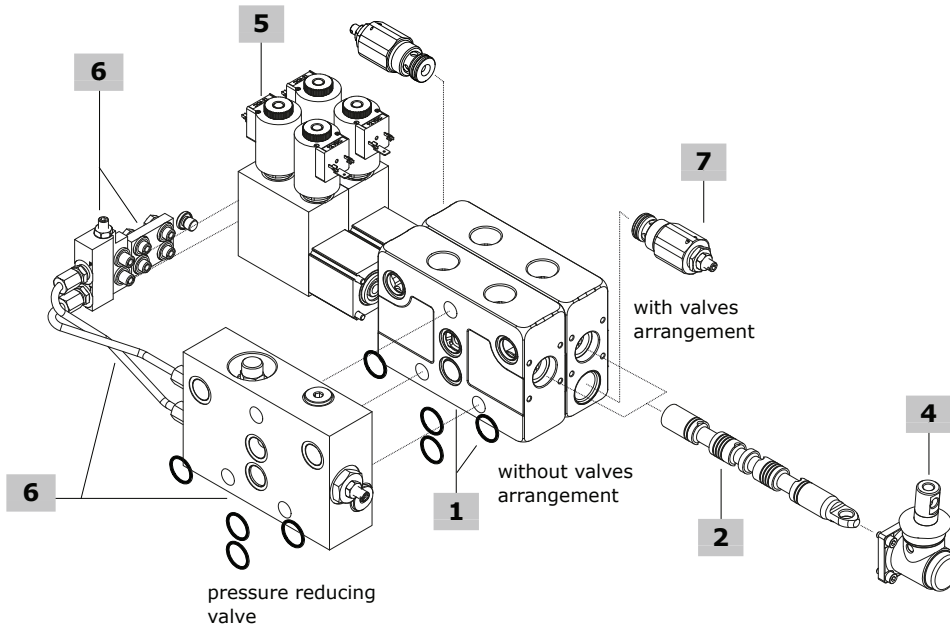
One side - ON/OFF electrohydraulic control valve configuration example

R = with pressure reducing valve
S = without pressure reducing valve

spring type and valve setting (bar)

EL Q130 / KE1R / 103 - A1 - D2W . V40(N)120 - 12VDC

1 6 2 4 5 7 5



1 Working section body kit* page 233

See #1, page 229

2 Spool page 234

See #2, page 229

4 A side control page 235

See #4, page 230

5 B side electrohydraulic control page 249

TYPE	CODE	DESCRIPTION
D2W-12VDC	10681D2W1200	3 pos., 12VDC ON/OFF electrohydraulic control
D2W-24VDC	10681D2W2400	3 pos., 24VDC ON/OFF electrohydraulic control

Note: For BT type coils, see page 257

6 Connector kit page 250

TYPE	CODE	DESCRIPTION
Without pressure reducing valve		
KE1S	5GKE13S010	Kit for 1 section
KE2S	5GKE13S020	Kit for 2 sections
KE3S	5GKE13S030	Kit for 3 sections
KE4S	5GKE13S040	Kit for 4 sections
KE5S	5GKE13S050	Kit for 5 sections
KE6S	5GKE13S060	Kit for 6 sections
KE7S	5GKE13S070	Kit for 7 sections
KE8S	5GKE13S080	Kit for 8 sections
KE9S	5GKE13S090	Kit for 9 sections
KE10S	5GKE13S100	Kit for 10 sections

Note: Connector kit are included collector and feeding block

With pressure reducing valve

KE1R	5GKE13R010	Kit for 1 section
KE2R	5GKE13R020	Kit for 2 sections
KE3R	5GKE13R030	Kit for 3 sections
KE4R	5GKE13R040	Kit for 4 sections
KE5R	5GKE13R050	Kit for 5 sections
KE6R	5GKE13R060	Kit for 6 sections
KE7R	5GKE13R070	Kit for 7 sections
KE8R	5GKE13R080	Kit for 8 sections
KE9R	5GKE13R090	Kit for 9 sections
KE10R	5GKE13R100	Kit for 10 sections

Note: Connector kit are included collector and feeding block, drain lines and pressure reducing valve

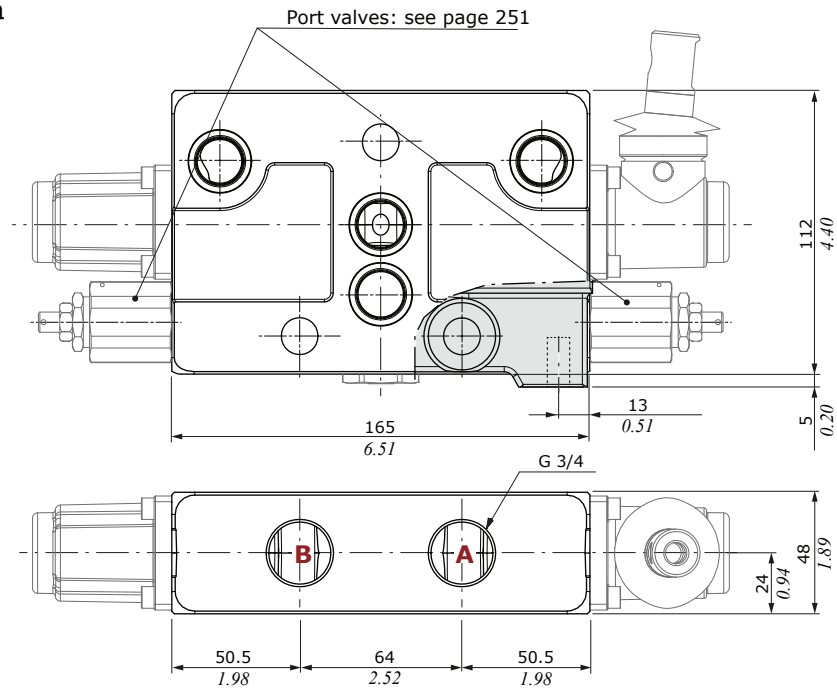
7 Auxiliary port valve page 251

See #8, page 230

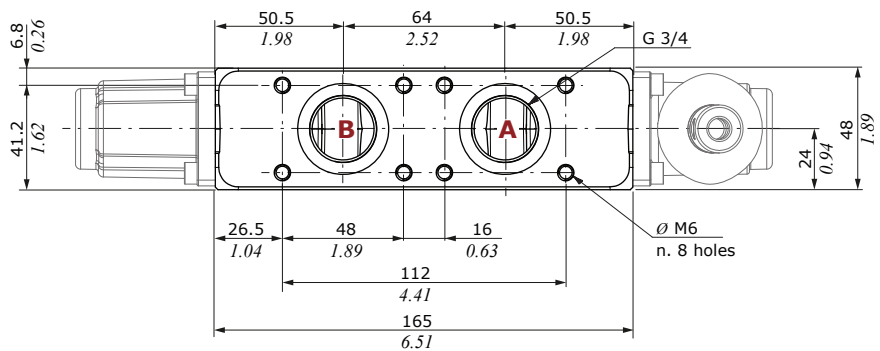
(*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

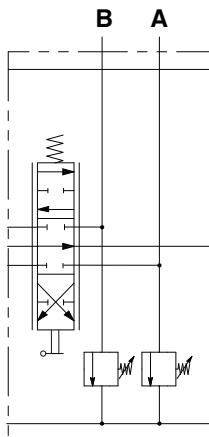
Standard working section



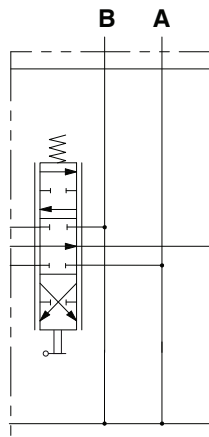
Working section for secondary aux valves block



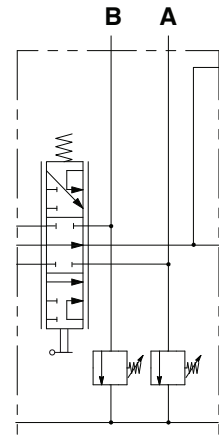
Q130.V40(N)120 configuration
Parallel circuit,
mechanical control with aux valves



Q130 configuration
Parallel circuit,
mechanical control without aux valves



Q130.V40(N)120 configuration
Series circuit,
mechanical control with aux valves



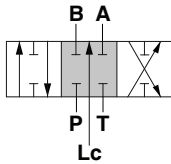
Working section

Spool

103 type

A and B closed
in neutral position

2 0 1



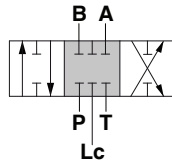
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

106 type

A, B and Lc closed in
neutral position. For closed center

2 0 1



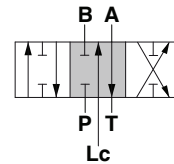
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

107 type

A to tank, B closed
in neutral position

2 0 1



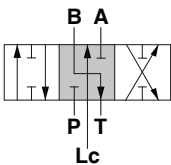
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

108 type

B to tank, A closed
in neutral position

2 0 1



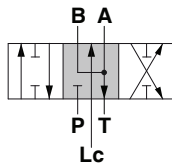
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

111 type

A and B to tank
in neutral position

2 0 1



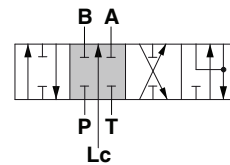
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

116 type

With floating in the 4th position
(spool in)

2 0 1 3



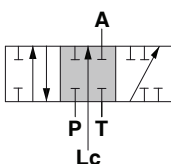
Stroke

Position 1: - 4.5 mm (- 0.17 in)
Position 2: + 7 mm (+ 0.27 in)
Position 3: - 10.25 mm (- 0.40 in)

101 type

Single acting on A,
B plugged

2 0 1



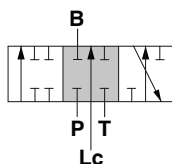
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

102 type

Single acting on B,
A plugged

2 0 1



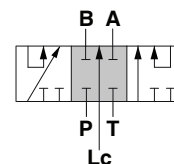
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

603 type

A and B closed in neutral
position. For series circuit

2 0 1



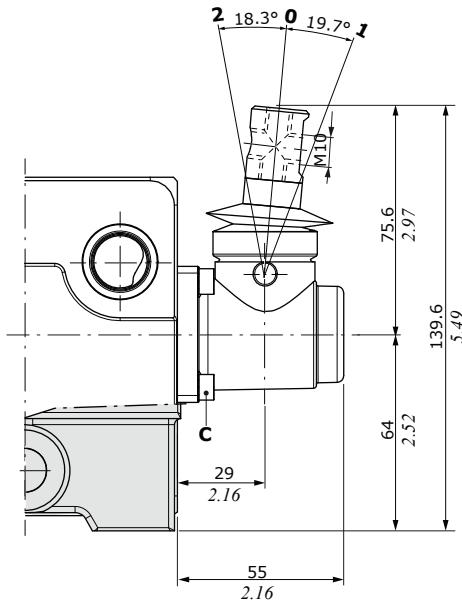
Stroke

Position 1: + 7 mm (+ 0.27 in)
Position 2: - 7 mm (- 0.27 in)

A side controls

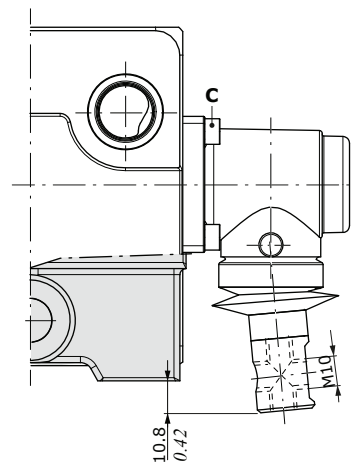
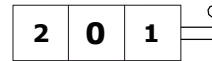
With lever control

A1 type
M10 thread aluminium lever box

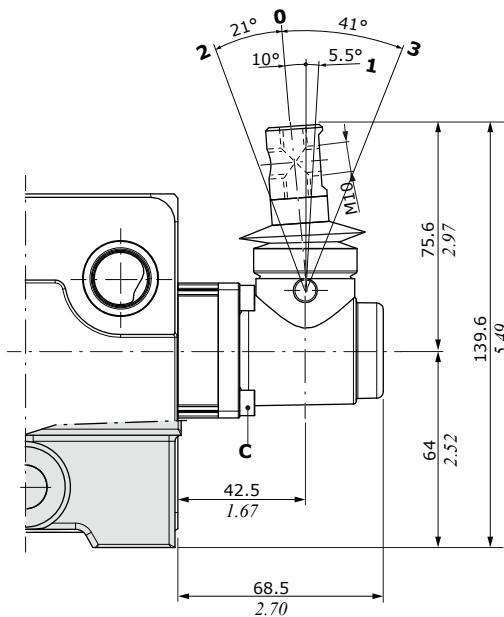
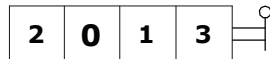


Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbf)

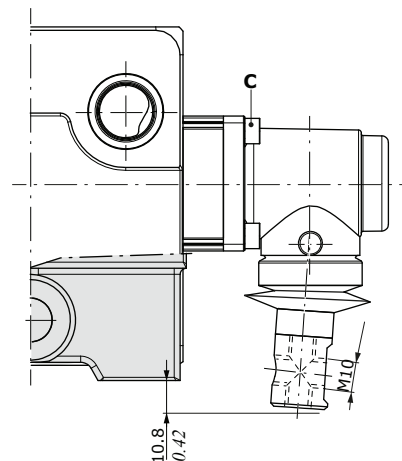
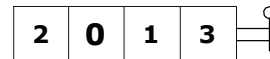
A2 type
As A1 type, rotated 180°



A1/Z1 type
M10 thread, for 116 floating spool type



A2/Z1 type
As A1/Z1 type, rotated 180°



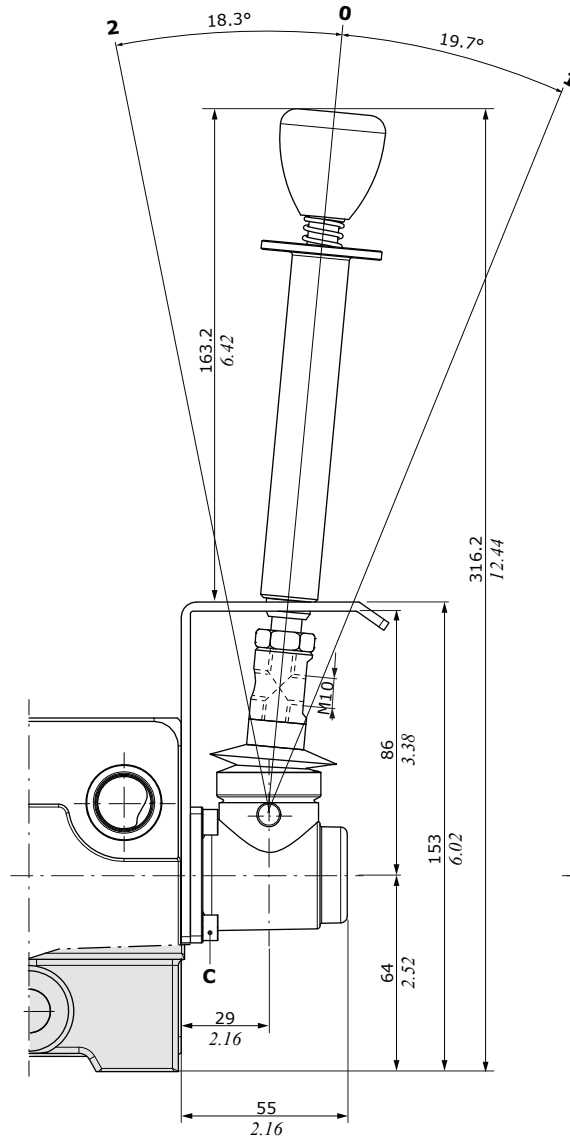
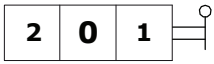
Working section

A side controls

With safety lever control

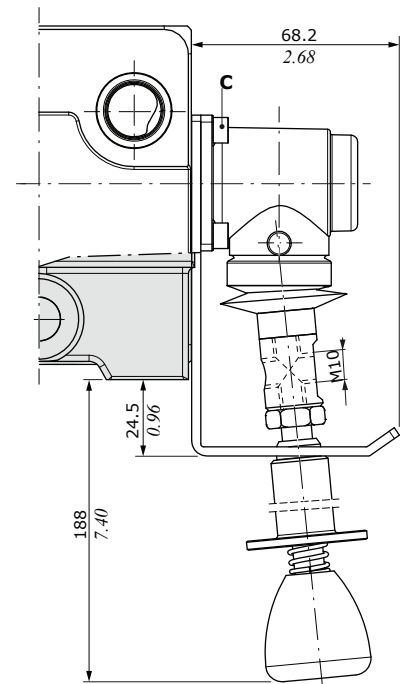
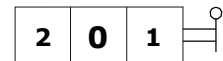
A1/S type

M10 thread, aluminium lever box



A2/S type

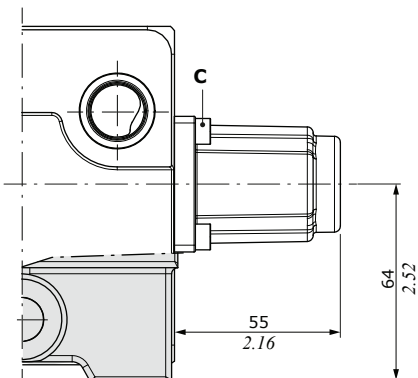
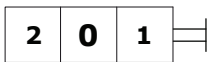
As A1/S type, rotated 180°



Without lever control

A3 type

With cap



Wrenches and tightening torques

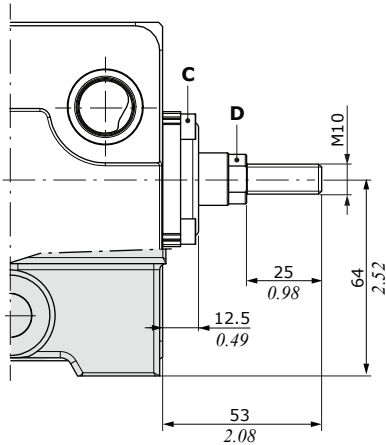
C = allen wrench 4 - 6.6 Nm (4.8 lbf)

A side controls

Without lever control

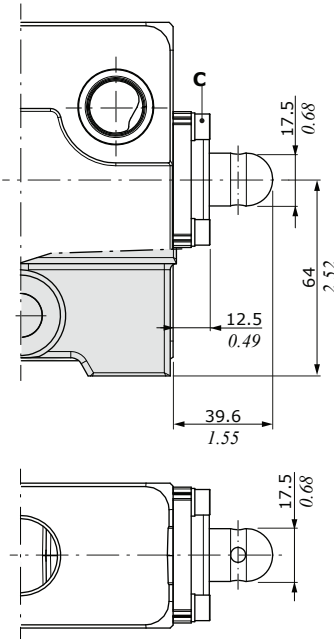
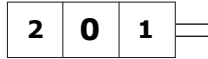
A4 type

M8 male thread external pin with flange



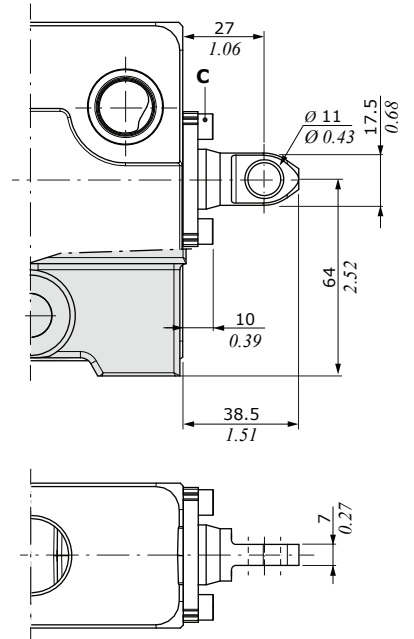
A5 type

Flange with spherical spool end



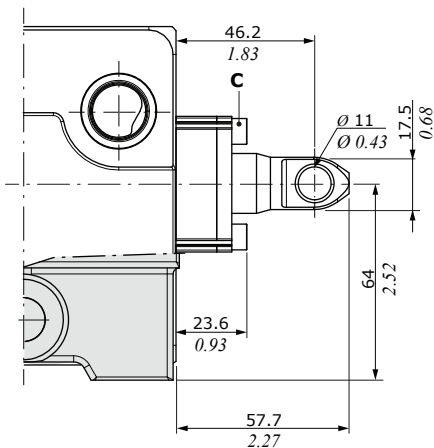
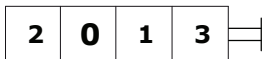
A6 type

With flange



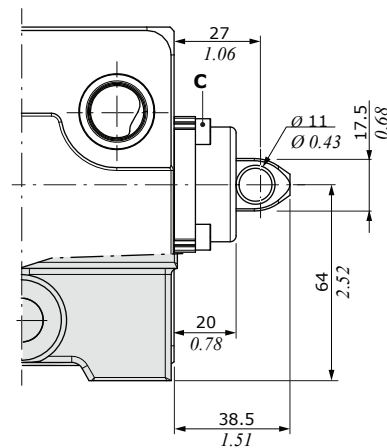
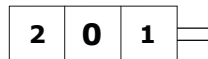
A6/Z1 type

As A6 type,
for 116 floating spool type



A6H type

As A6 type, with scraper



Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbft)

D = wrench 13 - 9.8 Nm (7.2 lbft)

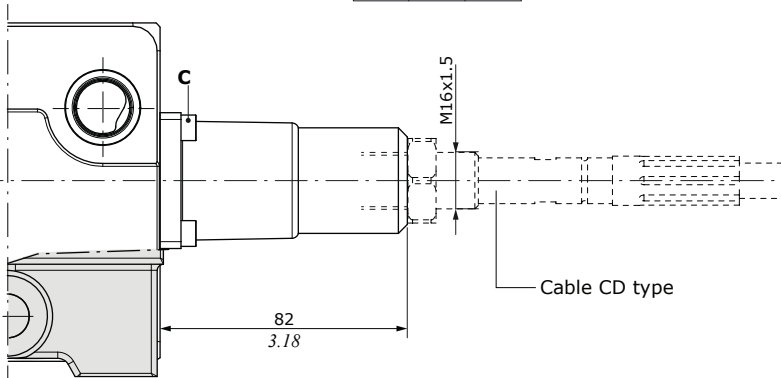
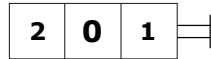
Working section

A side controls

With flexible cable control arrangement

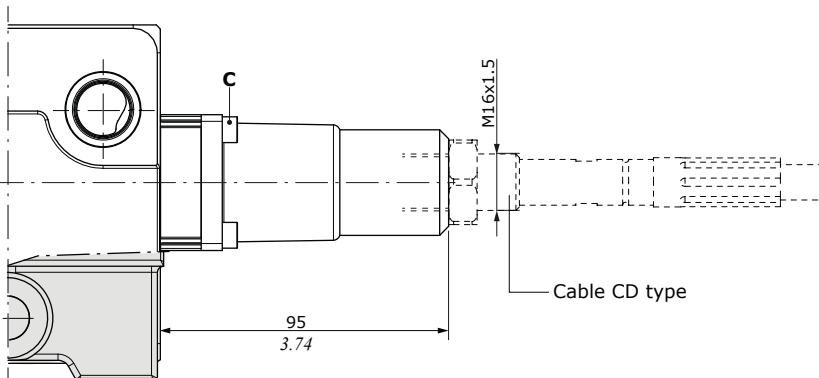
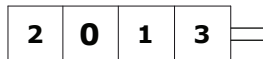
A8 type

Flexible cable control arrangement



A8/Z1 type

As A8 type,
for 116 floating spool type



Wrenches and tightening torques

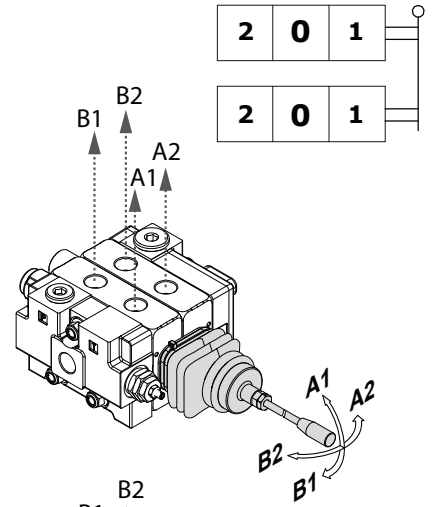
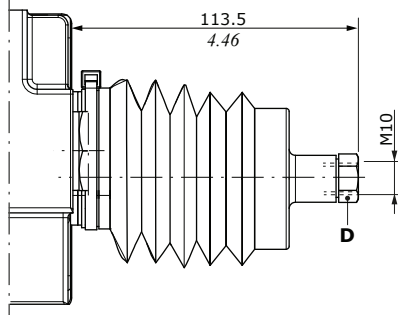
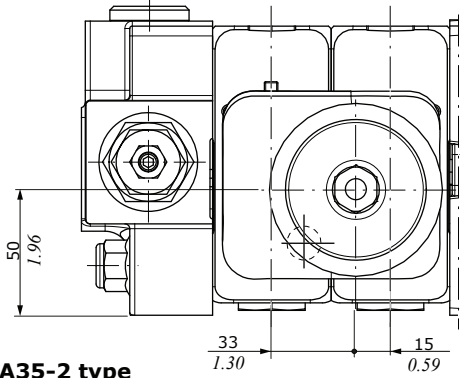
C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)

A side controls

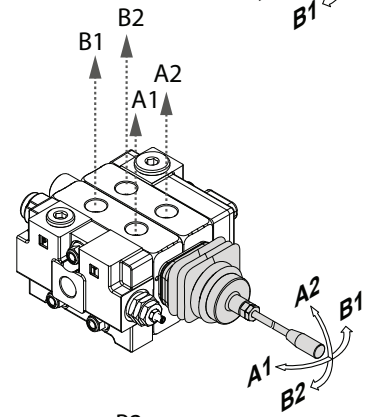
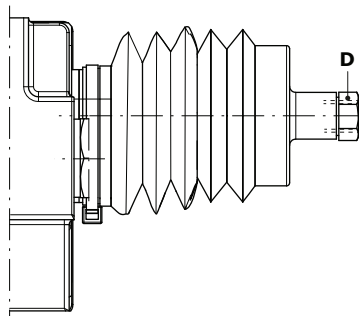
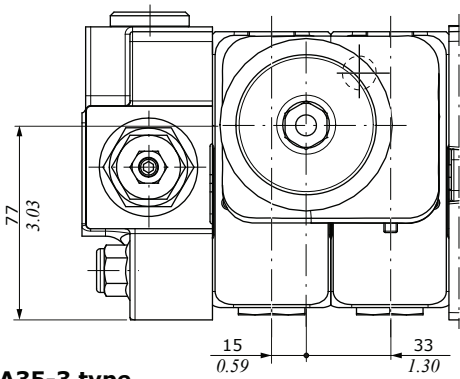
Joystick control

For operating the joystick control in the floating position, contact Sales Department.

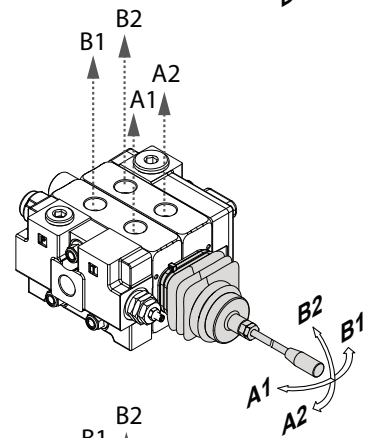
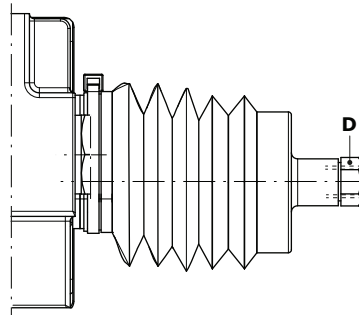
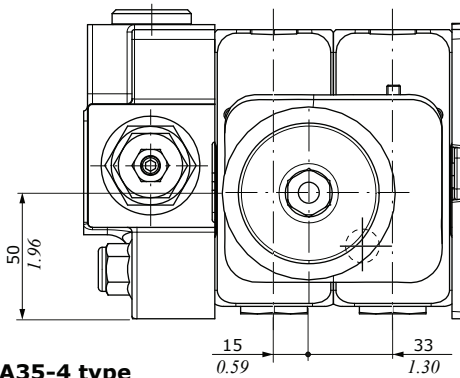
A35-1 type



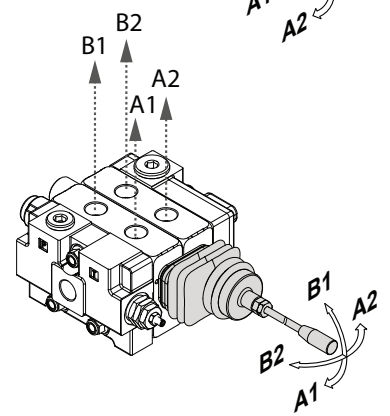
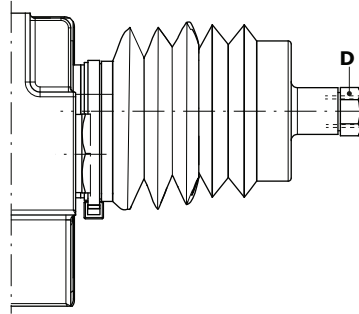
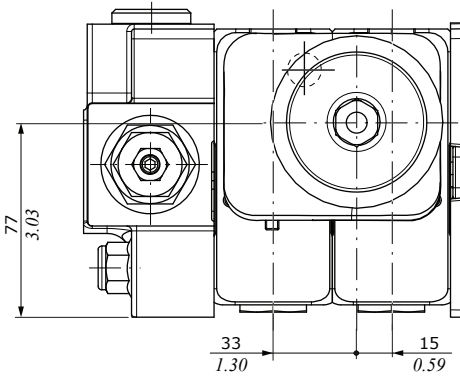
A35-2 type



A35-3 type



A35-4 type



Wrenches and tightening torques
D = wrench 17 - 24 Nm (17.7 lbf)

Working section

A side controls

With spool position microswitch, with lever

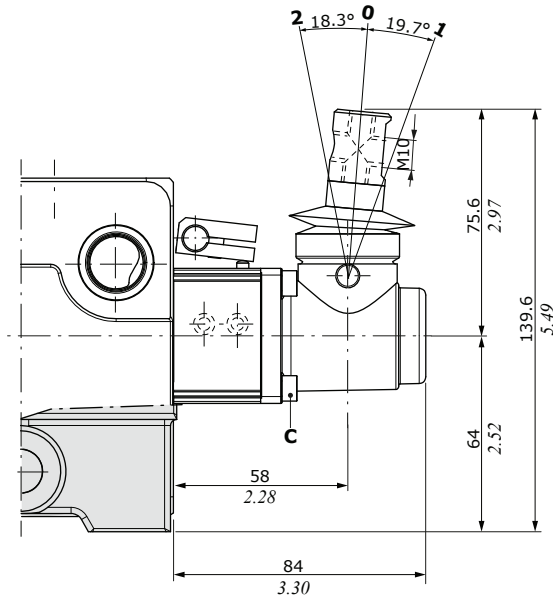
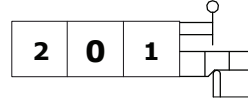
N1-A1 type
Micro operation
in position 1 and 2



N1A-A1 type
Micro operation in
position 1

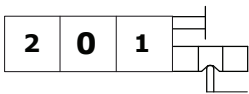


N1B-A1 type
Micro operation in
position 2

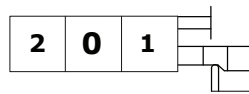


With spool position microswitch, with cap

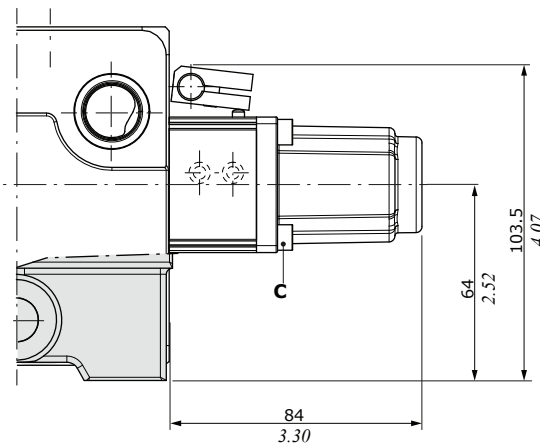
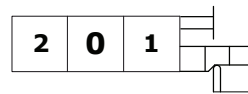
N1-A3 type
Micro operation
in position 1 and 2



N1A-A3 type
Micro operation in
position 1



N1B-A3 type
Micro operation in
position 2

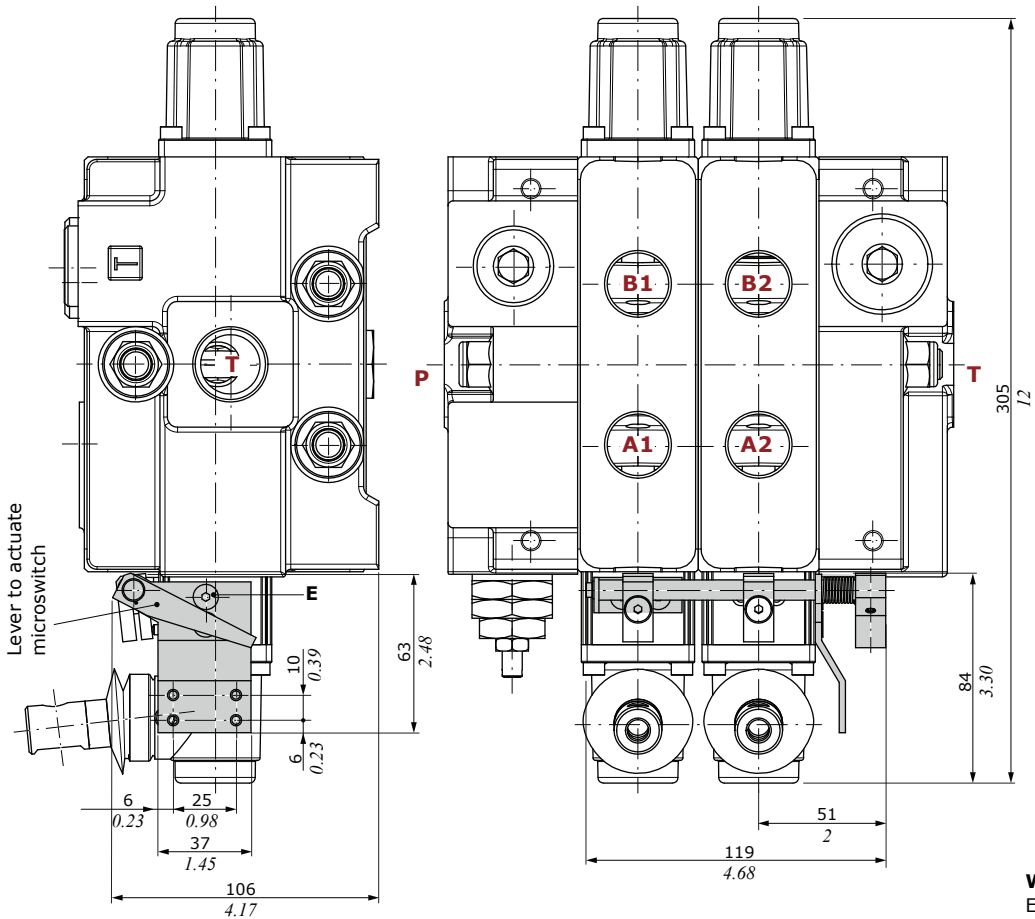


Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbft)

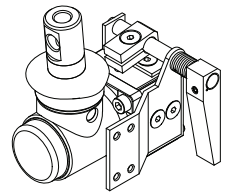
A side controls

With spool position microswitch

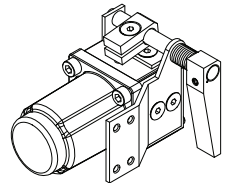
Microswitch assembly kit for 2 working section (N1-A1 type)



with cap



with lever box



Wrenches and tightening torques
 E = allen wrench 3 - 6.6 Nm (4.8 lbf)

Working section

B side controls

With spring return

M1 type

3 position, spring return
in neutral position

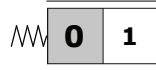


M1/01 type

As M1 type,
for joystick control

M2 type

2 position (0-1), spring return
in neutral position



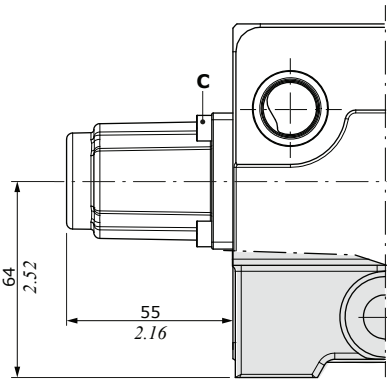
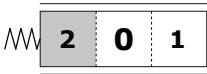
M3 type

2 position (0-2), spring return
in neutral position

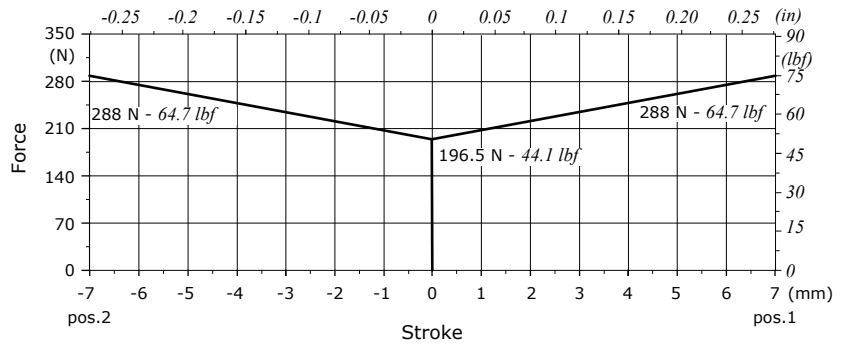


M4 type

2 position (2-1), spring return
in position 2



M1 control type - Force vs. Stroke diagram



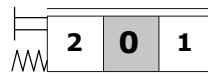
Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)

D = allen wrench 3 - 5 Nm (3.68 lbf^t)

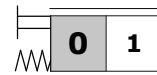
M1-U1 type

3 position, with M10 male
thread external pin



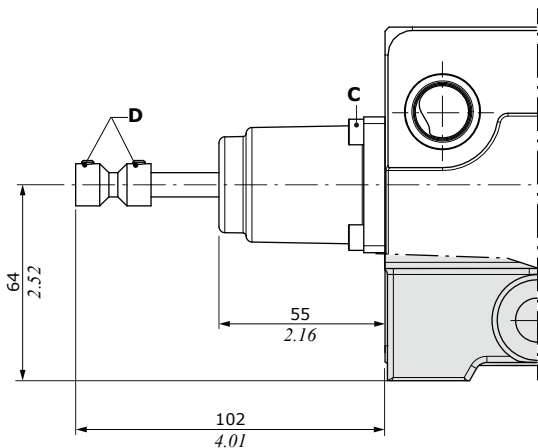
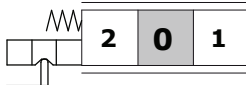
M2-U1 type

2 position (0-1), with M10 male
thread external pin



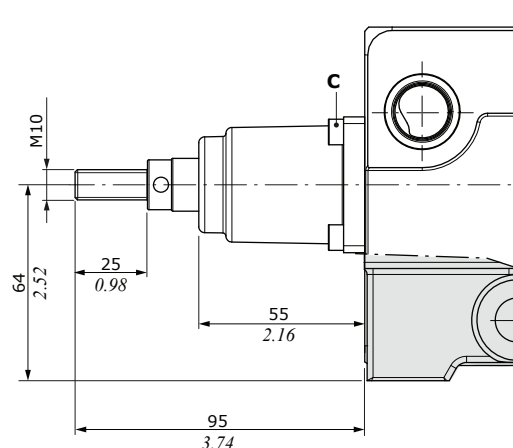
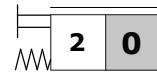
M1-B1 type

3 position, microswitch arrangement



M3-U1 type

2 position (0-2), with M10
male thread external pin

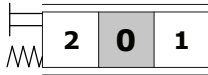


B side controls

With flexible cable control arrangement

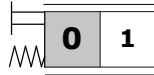
M1-U2 type

3 position, spring return in neutral position



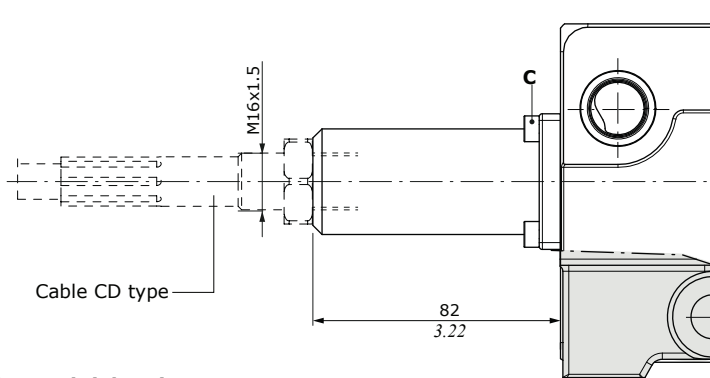
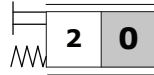
M2-U2 type

2 position (0-1), spring return in neutral position



M3-U2 type

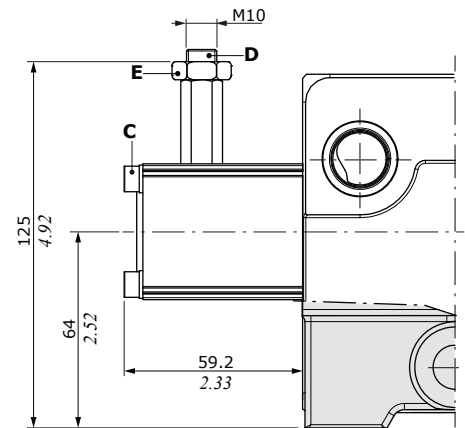
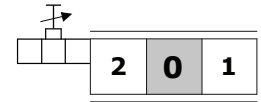
2 position (0-2), spring return in neutral position



With friction control

R0 type

Adjustable friction control



Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)

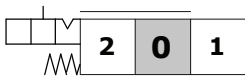
D = allen wrench 5 - 15 Nm (11.1 lbf_t)

E = wrench 17 - 9.8 Nm (7.2 lbf_t)

With detent control

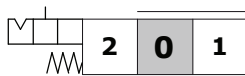
R1 type

3 position, detent in position 1



R2 type

3 position, detent in position 2



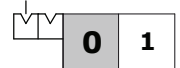
R3 type

3 position, detent in all position



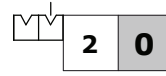
R4 type

2 position, detent in position 0-1



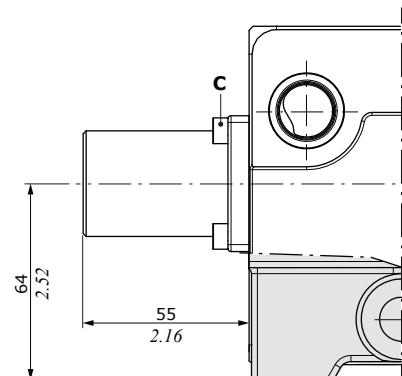
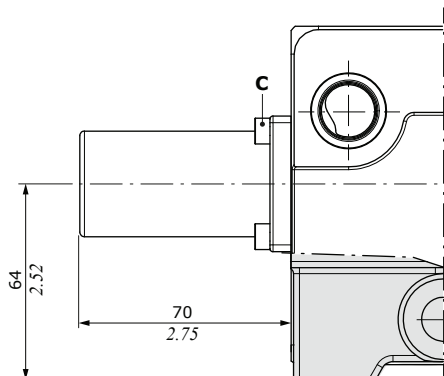
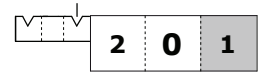
R5 type

2 position, detent in position 0-2



R6 type

2 position, detent in position 1-2



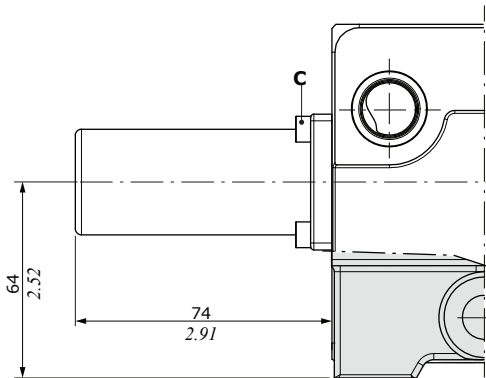
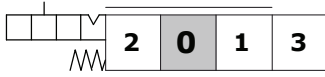
Working section

B side controls

With detent control

R8 type

4 position, detent in 4th position,
for 116 floating spool type



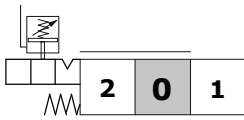
Wrenches and tightening torques

- C = allen wrench 4 - 6.6 Nm (4.8 lbf^t)
- D = wrench 30 - 42 Nm (30.9 lbf^t)
- E = wrench 22
- F = allen wrench 10 - 42 Nm (30.9 lbf^t)

With detent and kick out function

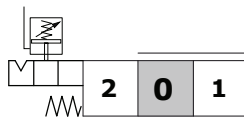
R1K type

3 position, detent in position 1



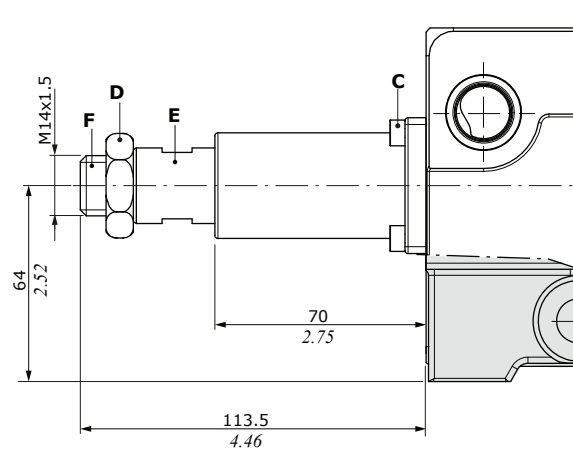
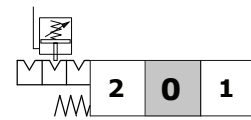
R2K type

3 position, detent in position 2



R3K type

3 position, detent in all position

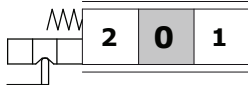


B side controls

With spool position microswitch

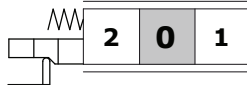
M1-N1 type

3 position, micro operation in position 1 and 2, spring return in neutral position



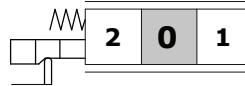
M1-N1A type

3 position, micro operation in position 1



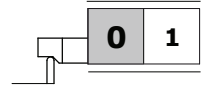
M1-N1B type

3 position, micro operation in position 2



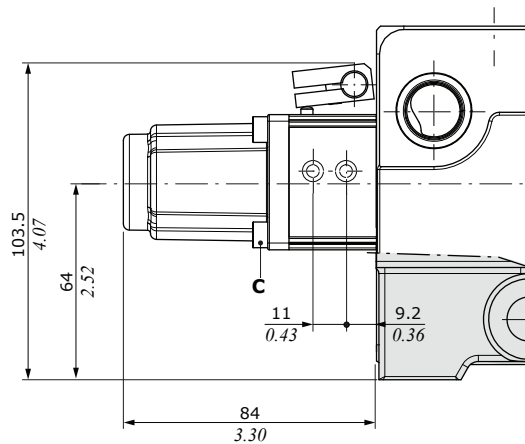
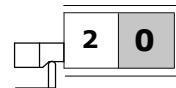
M2-N1 type

2 position (0-1), spring return in neutral position



M3-N1 type

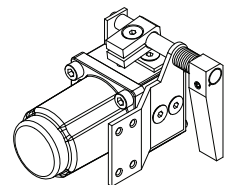
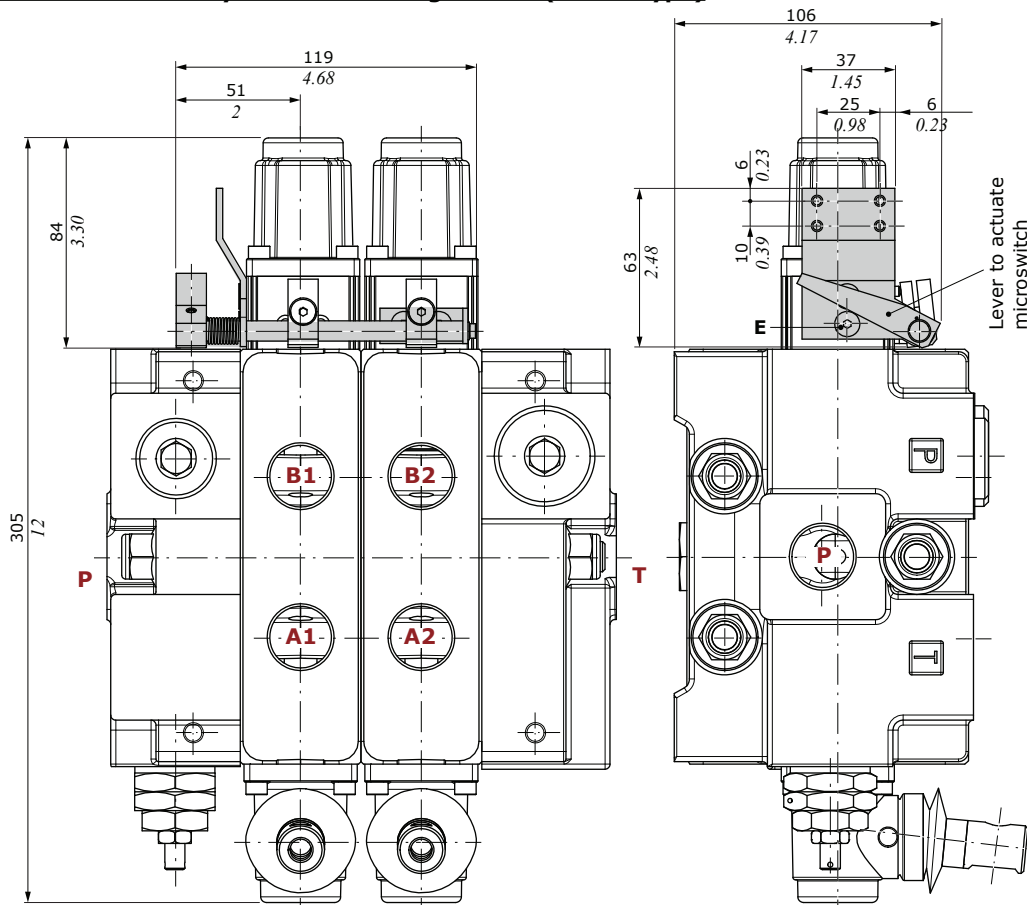
2 position (0-2), spring return in neutral position



Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbft)
E = allen wrench 3 - 6.6 Nm (4.8 lbft)

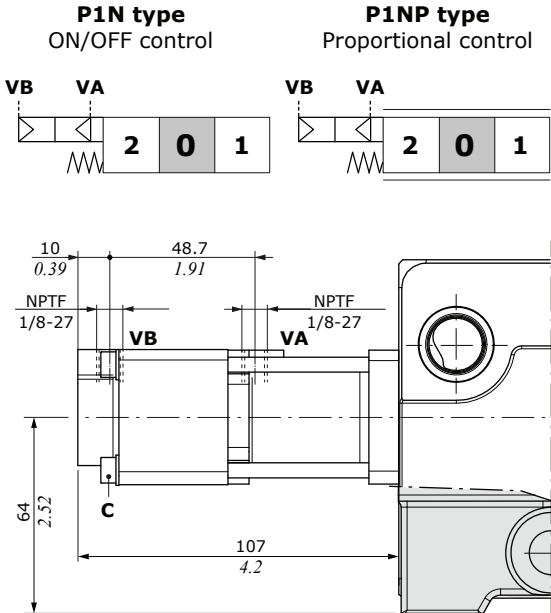
Microswitch assembly kit for 2 working section (M1-N1 type)



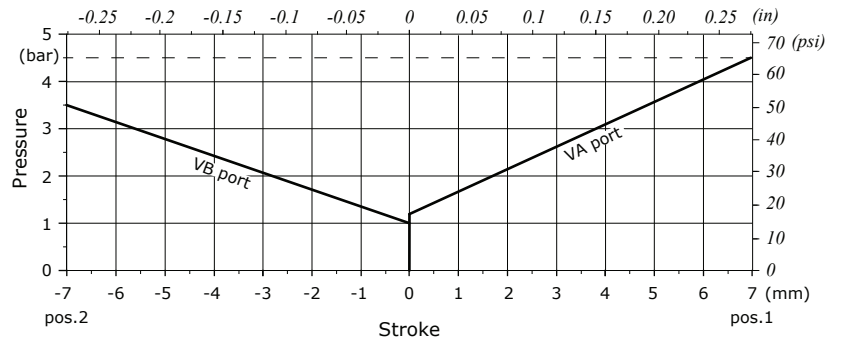
Working section

B side controls

With pneumatic control



Proportional pilot pressure curves



Operating features

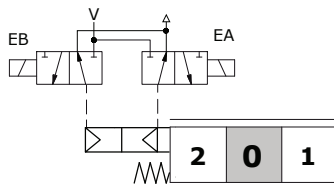
Pilot pressure..... : min. 5 bar (72.5 psi) - max. 30 bar (435 psi)
 Pilot volume..... : 9 cm³/min (0.54 in³/min)

Wrenches and tightening torques

C = wrench 4 - 6.6 Nm (4.8 lbft)

With ON/OFF electropneumatic control

D3 type
ON/OFF control

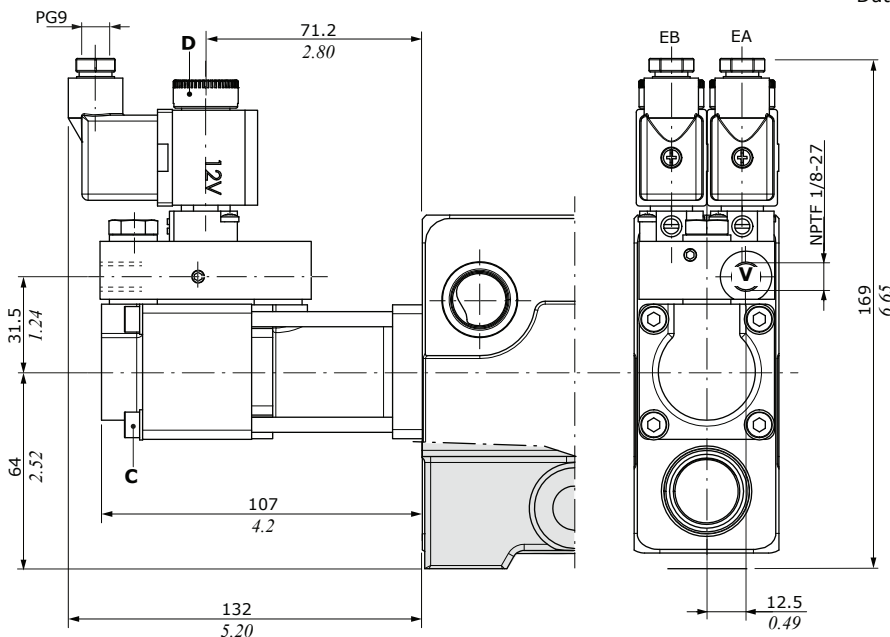


Operating features

Pilot pressure..... : min. 1 bar (14.5 psi)
 max. 10 bar (145 psi)

COILS

Nominal voltage tolerance..... : -5% +10%
 Power rating..... : 5 W
 Nominal current..... : 12 VDC - 24VDC
 Coil insulation..... : Class F
 Weather protection..... : IP65
 Duty cycle..... : 100%



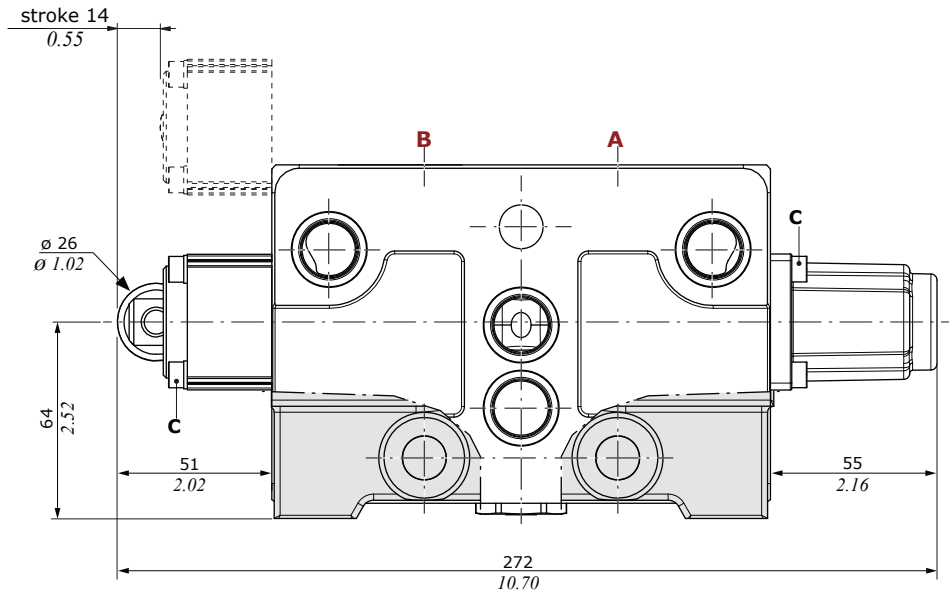
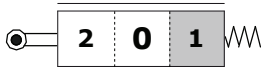
Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbft)
 D = manual tightening - 6.6 Nm (4.8 lbft)

A+B side controls

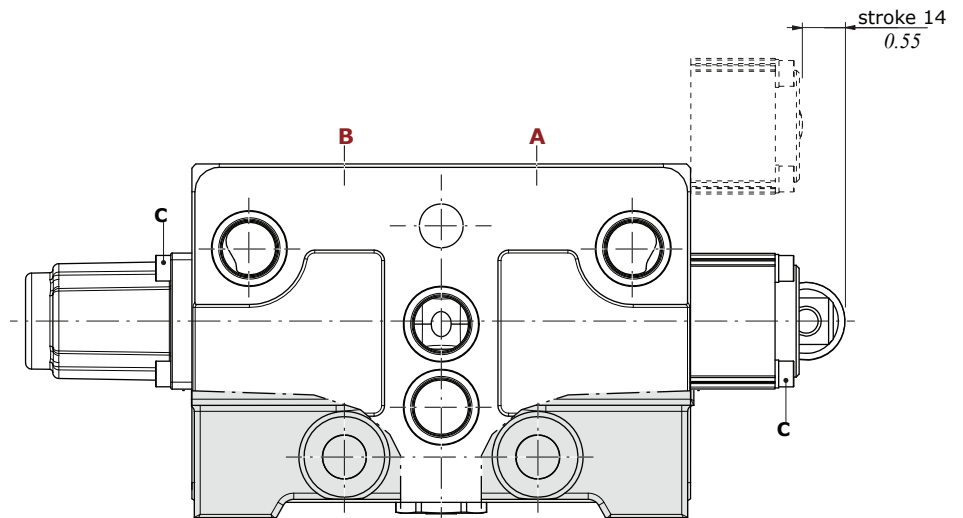
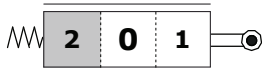
With cam control

C2 type
From position 1 to position 2,
spring return in position 1



Wrenches and tightening torques
C = allen wrench 4 - 6.6 Nm (4.8 lbf_t)

C3 type
From position 2 to position 1,
spring return in position 2.
Dimensions are the same of C2 type



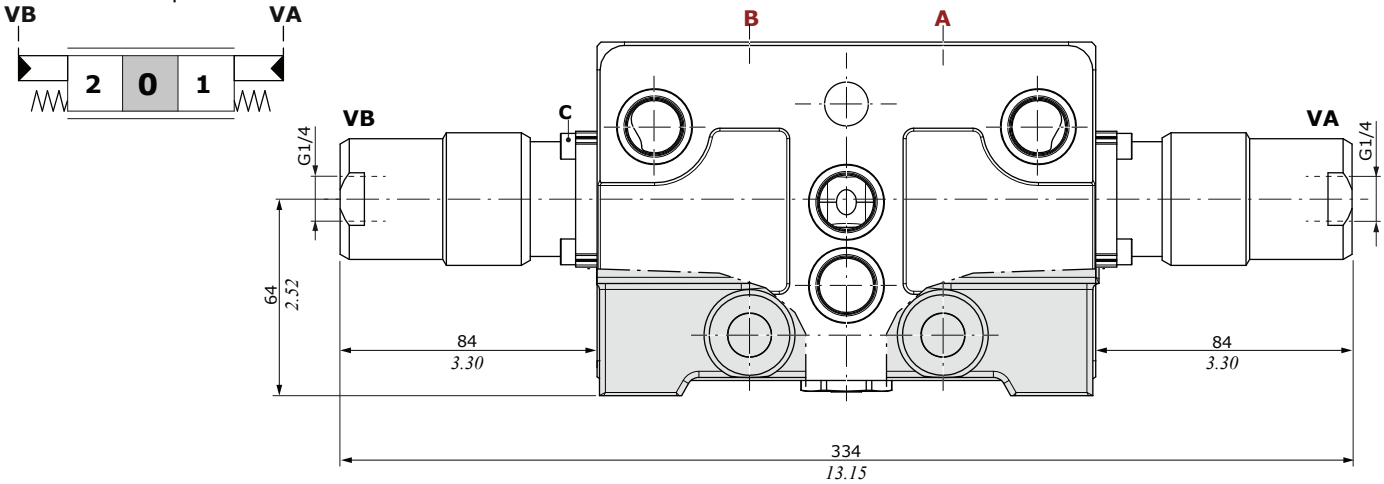
Working section

A+B side controls

With proportional hydraulic controls

H1 type

High pressure control
with side ports

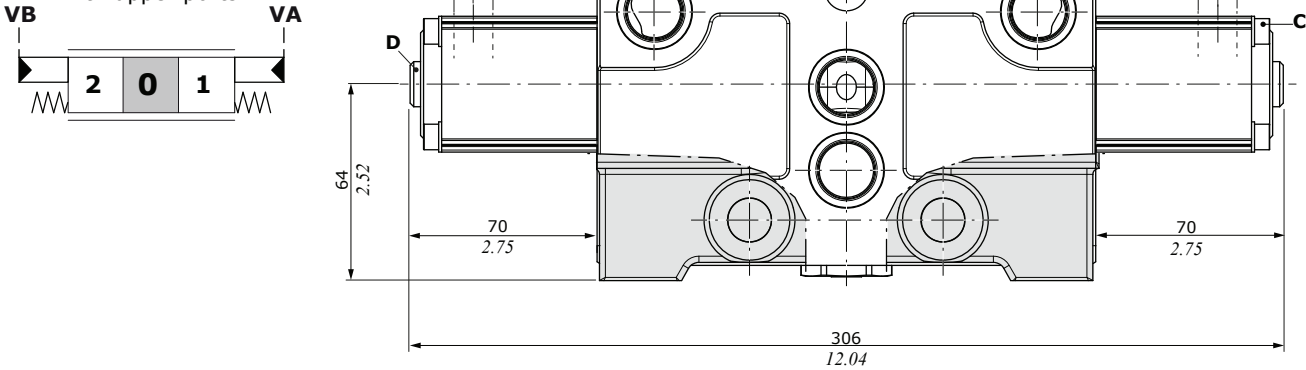


Operating features

Pilot pressure..... : min. 16 bar (232 psi) - max. 350 bar (5070 psi)

H5 type

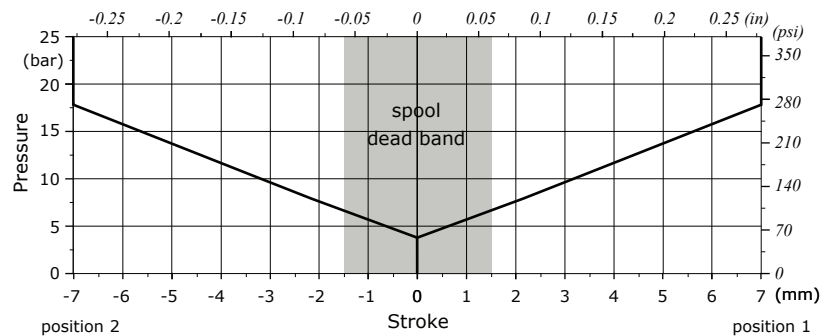
Low pressure control
with upper ports



Operating features

Pilot pressure..... : max. 100 bar (1450 psi)

Stroke vs. Pressure diagram for H5 type control



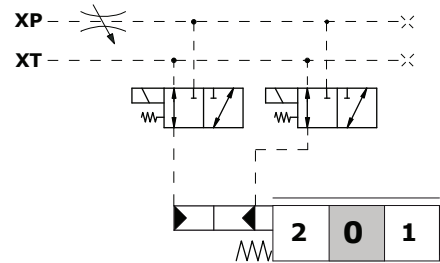
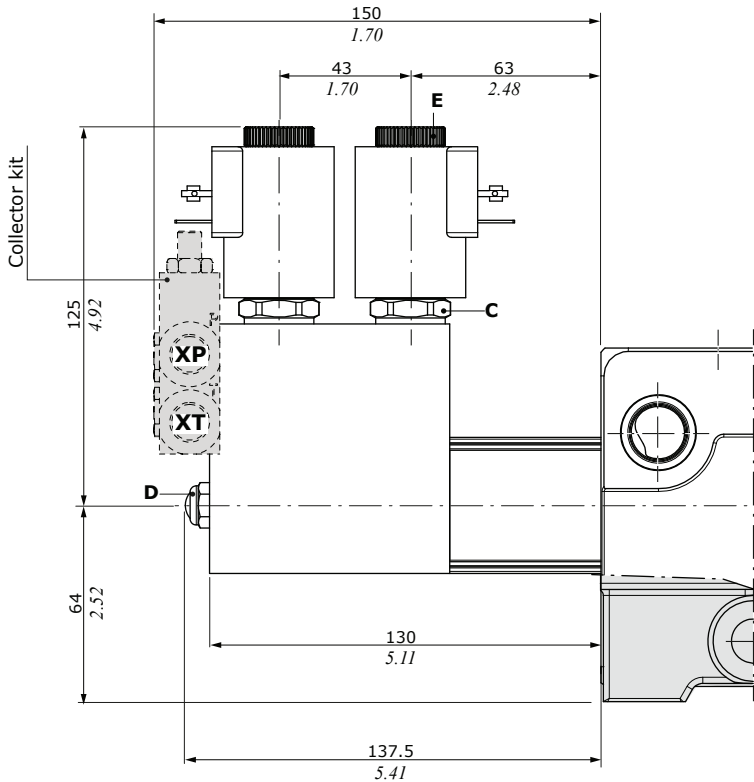
Wrenches and tightening torques

C = allen wrench 4 - 6.6 Nm (4.8 lbft)

D = allen wrench 4 - 9.8 Nm (7.2 lbft)

Electrohydraulic control

D2W type: ON/OFF one side

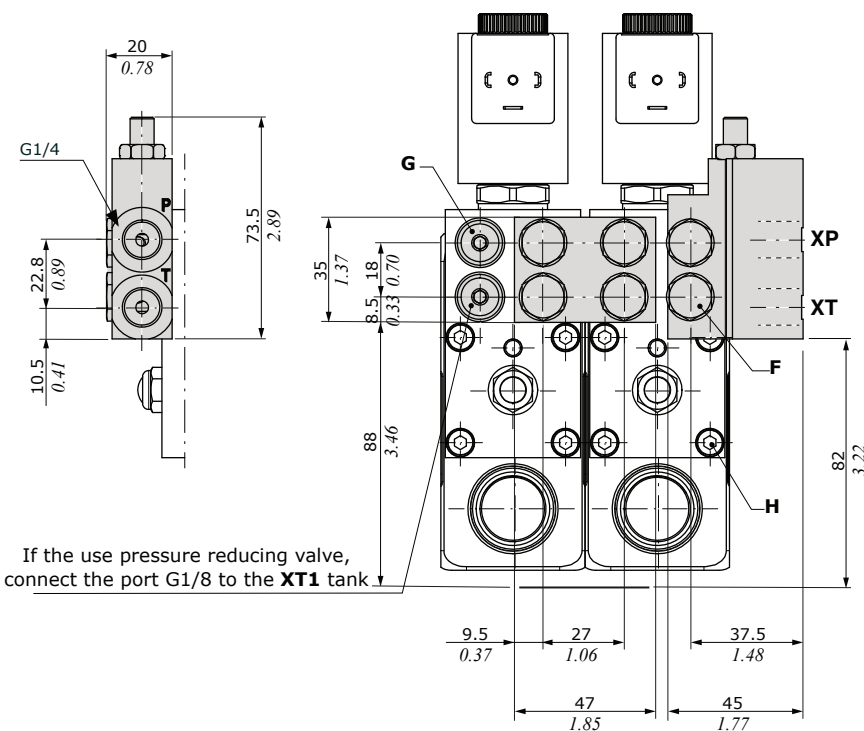


Features

- Pilot pressure on XP..... : min. 20 bar (290 psi)
: max. 35 bar (500 psi)
- Max backpressure on XT..... : 4 bar (58 psi)

For **BT** type coils and mating connectors see page 257

KE2S connector kit



If the use pressure reducing valve, connect the port G1/8 to the **XT1** tank

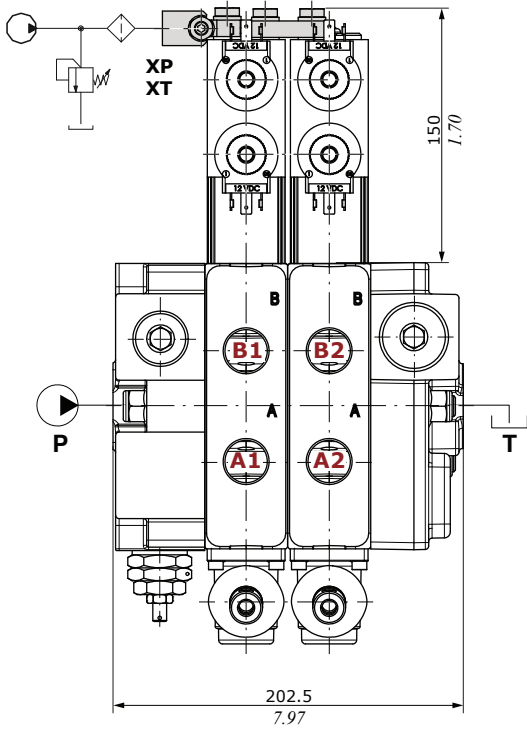
Wrenches and tightening torques

- C = wrench 24 - 30 Nm (22 lbft)
- D = wrench 13 - 9 Nm (6.6 lbft)
- E = wrench 6.6 - 9.8 Nm (7.2 lbft)
- F = wrench 14 - 24 Nm (17.7 lbft)
- G = allen wrench 4 - 9.8 Nm (6.6 lbft)
- H = allen wrench 4 - 3 Nm (2.2 lbft)

Working section

Electrohydraulic control

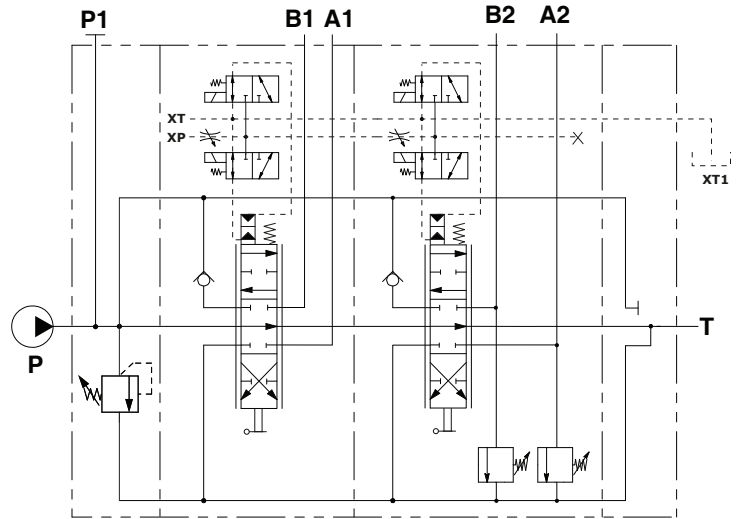
Connector kit for external pilot and drain



CONNECTOR KIT CODES

Type	Code*	Description
KE2S	5GKE13S020	Kit for 2 section

For other connector kit codes, see page 232

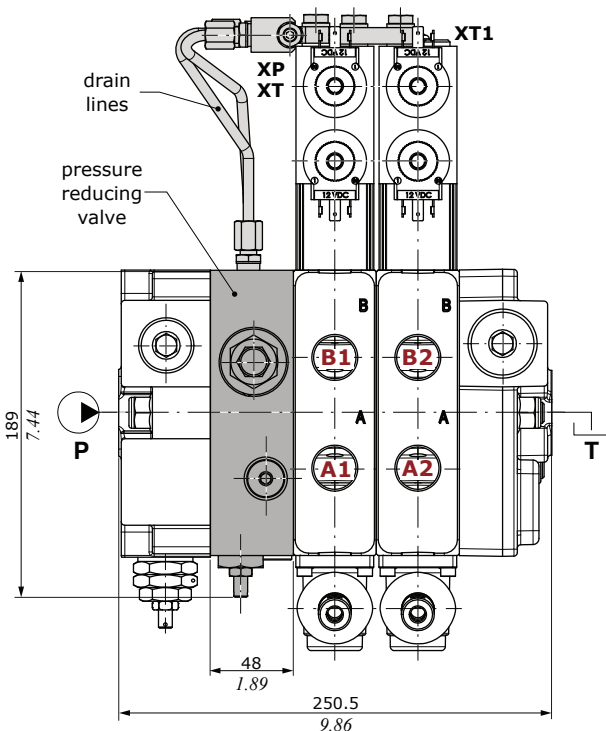


Description example:

Q130/2/F7S(N120)/**KE2S**/103-A1-D2W.V40(N)120/
103-A1-D2W.V40(N)120/F3D-12VDC-S

Connector kit for internal pilot and drain

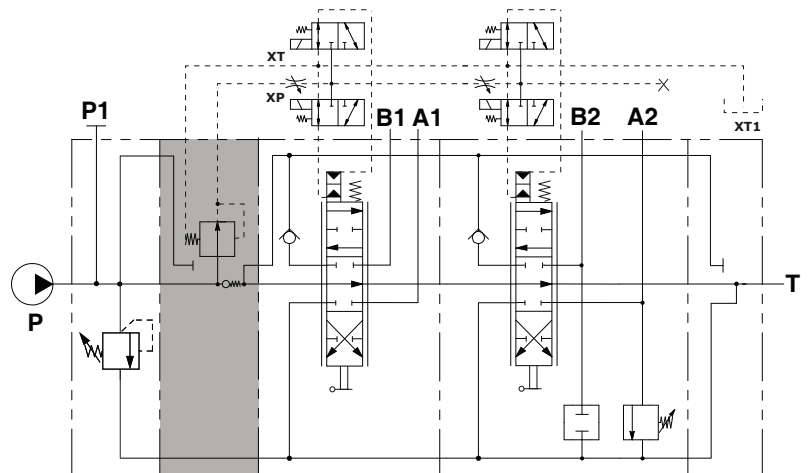
The kit is made of collector, pressure reducing valve and drain lines.



CONNECTOR KIT CODES

Type	Code*	Description
KE2R	5GKE13R020	Kit for 2 section

For other connector kit codes, see page 232



Description example:

Q130/2/F7S(N120)/**KE2R**/103-A1-D2W.V40(N)120/
103-A1-D2W.V40(N)120/F3D-12VDC-S

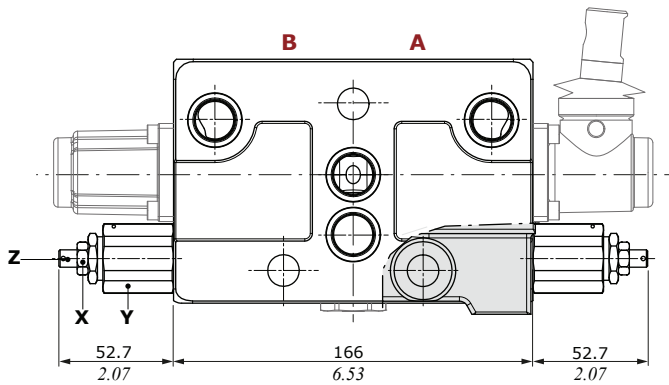
VRP pressure reducing valve

Auxiliary valve configuration

Dimensional data and hydraulic circuits

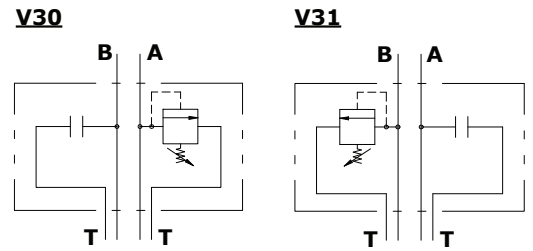
Antishock valve example

Q130 / 1 / ... / 103 - A1 - M1 - **V32(N)120** / ...
 aux valve and valve setting (bar) spring type



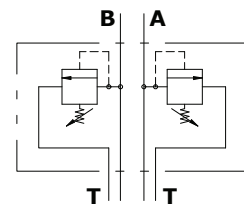
Spring type	Setting ranges (bar - psi)
B (white)	From 30 to 80 - from 435 to 1150
N (black)	From 81 to 200 - from 1170 to 2900
R (red)	From 201 to 350 - from 2910 to 5100

A side configuration: B side configuration:



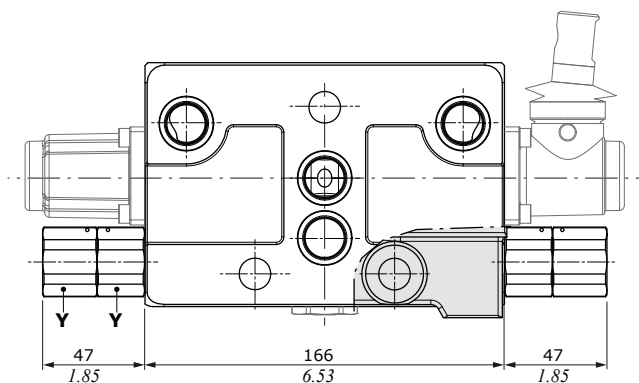
A+B side configuration:

V32 (V30 + V31)

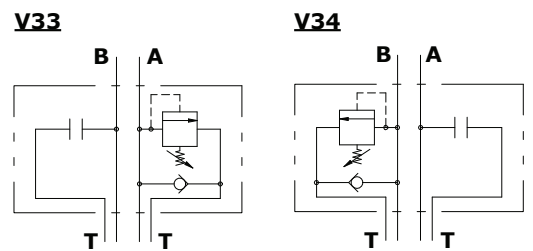


Antishock/anticavitation valve example

Q130 / 1 / ... / 103 - A1 - M1 - **V32(N)120** / ...
 aux valve and valve setting (bar) spring type

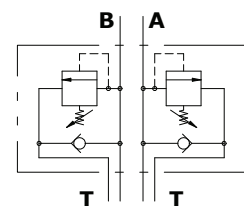


A side configuration: B side configuration:



A+B side configuration:

V35 (V34 + V33)



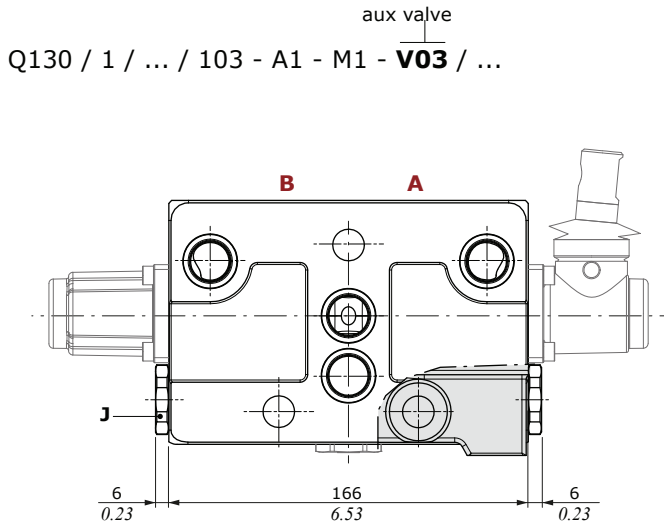
Wrenches and tightening torques

Y = wrench 30 - 80 Nm (59 lbf^t)
 X = wrench 20 - 24 Nm (17.7 lbf^t)
 Z = allen wrench 4

Auxiliary valve configuration

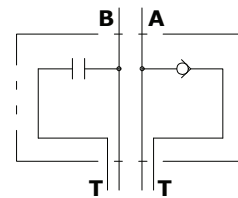
Dimensional data and hydraulic circuits

Anticavitation valve example



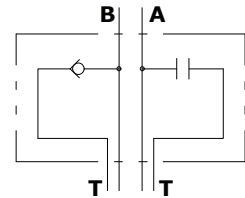
A side configuration:

V04



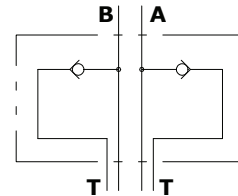
B side configuration:

V05



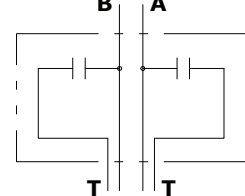
A+B side configuration:

V03 (V04 + V05)



Plug valve:

VC



Wrenches and tightening torques

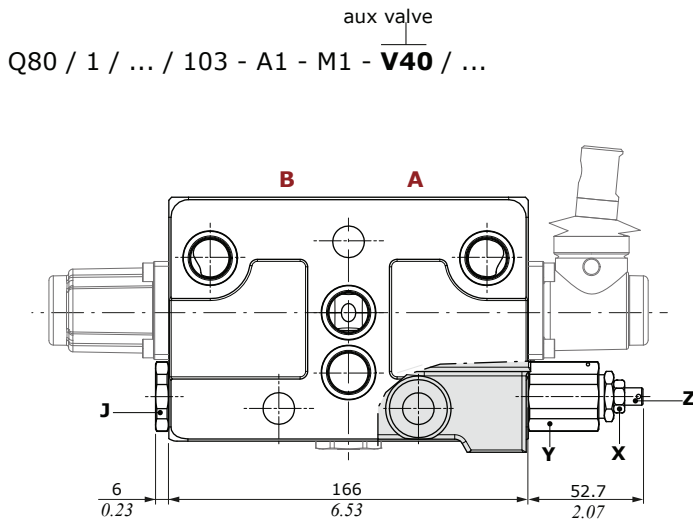
J = wrench 30 - 42 Nm (30.9 lbf·ft)

Y = wrench 30 - 80 Nm (59 lbf·ft)

X = wrench 20 - 24 Nm (17.7 lbf·ft)

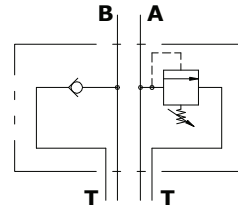
Z = allen wrench 4

Antishock and anticavitation combining valves example



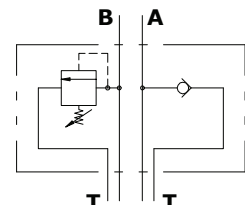
A side configuration:

V40 (V30 + V05)



B side configuration:

V41 (V31 + V04)



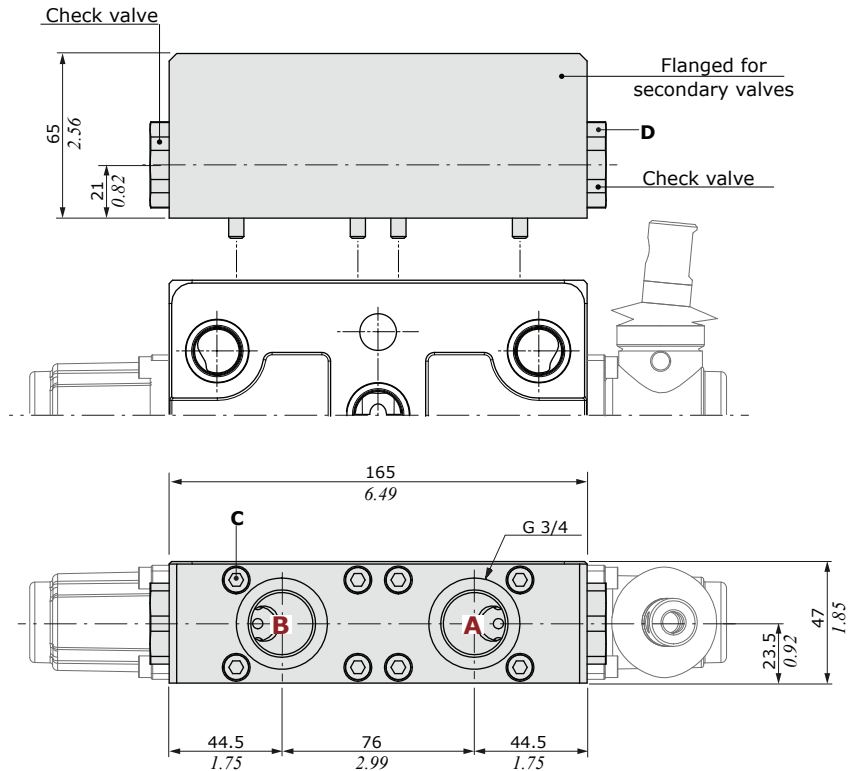
Secondary valve configuration

Dimensional data and hydraulic circuits

Description example

secondary aux valve valves block

Q130 / 1 / ... / 103 - A1 - M1 - V32(N)120 / **VC03**



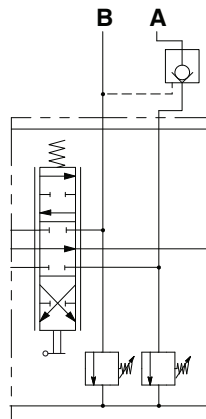
Wrenches and tightening torques

C = allen wrench 5 - 9.8 Nm (7.2 lbf·ft)

D = wrench 12 - 42 Nm (31 lbf·ft)

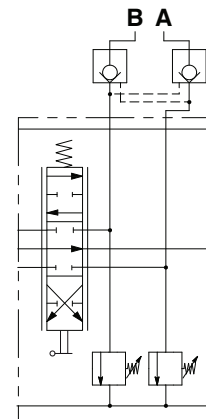
Q130.V40(N)120/VC01 configuration

Parallel circuit, mechanical control with aux valves and flanged for single piloted check valve on A port



Q130.V40(N)120/VC03 configuration

Parallel circuit, mechanical control with aux valves and flanged for double piloted check valve on A and B ports

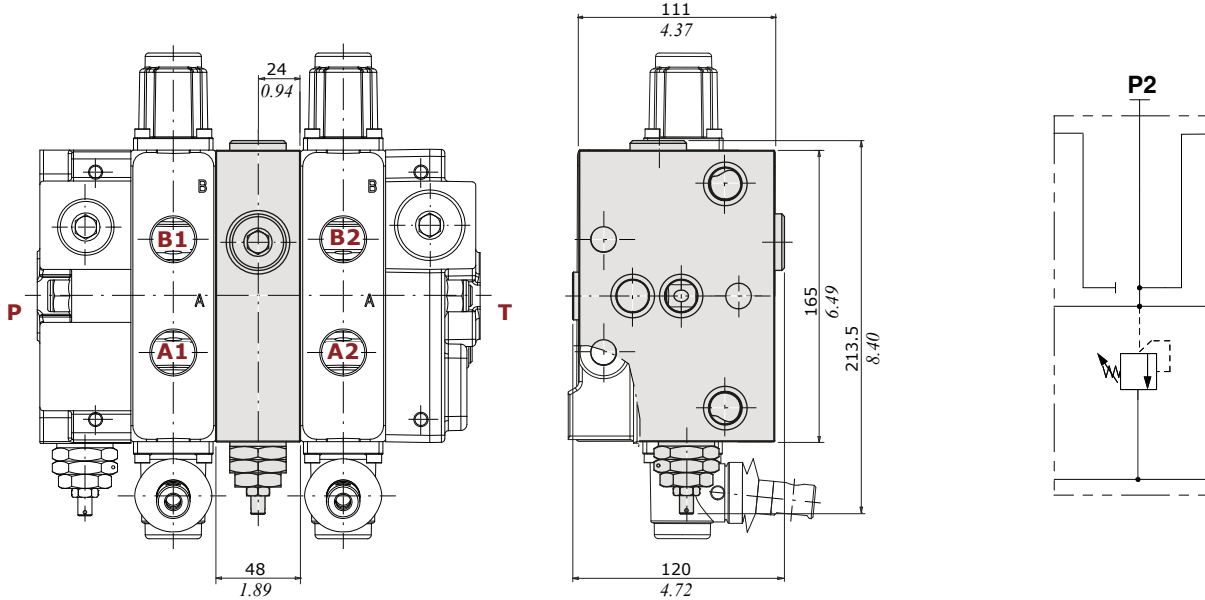


Intermediate section

Dimensional data and hydraulic circuit

E50 type

Intermediate inlet section with pressure relief valve

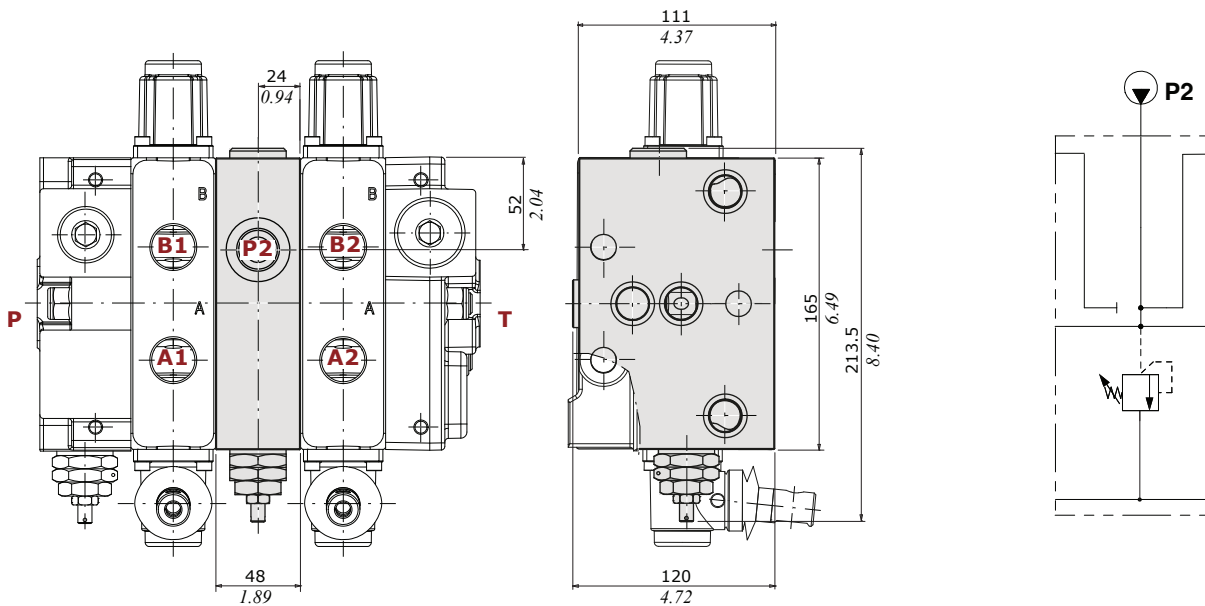


Description example: Q130/2/F7S(N150)/103-A1-M1/**E50(N150)**/103-A1-M1/F3D

intermediate section spring type and valve setting (bar)

E53 type

Intermediate inlet section with pressure relief valve and P2 port open



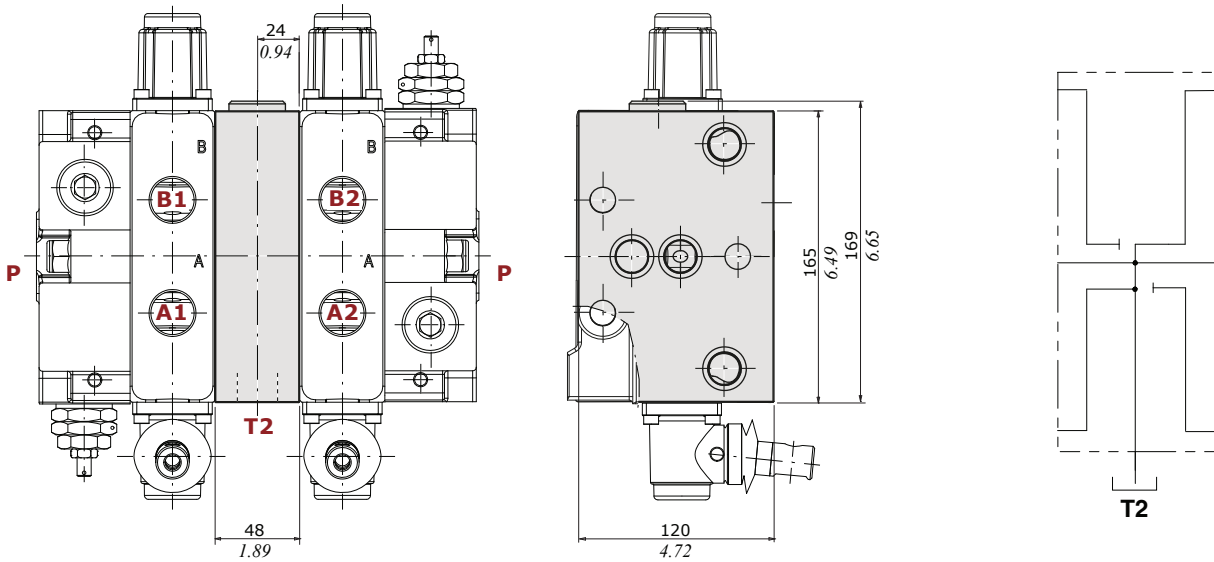
Description example: Q130/2/F7S(N150)/103-A1-M1/**E53(N150)**/103-A1-M1/F3D

intermediate section spring type and valve setting (bar)

Dimensional data and hydraulic circuit

E51 type

Intermediate outlet section, T2 port open

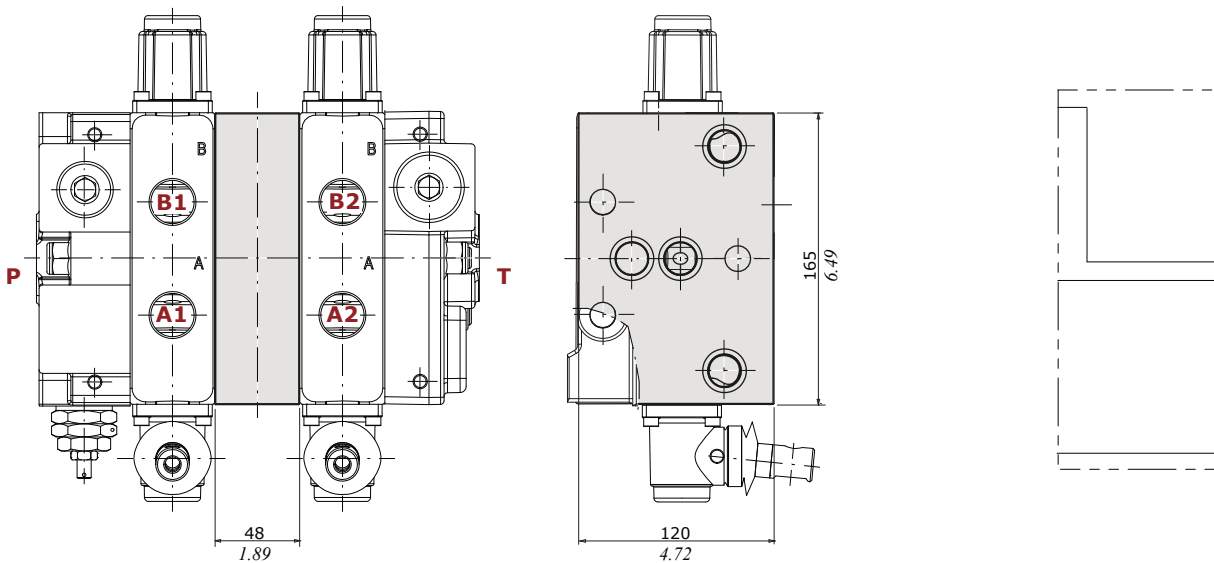


Description example: Q130/2/F7S(N150)/103-A1-M1/**E51**/103-A1-M1/F3D

intermediate section

E61 type

Intermediate spacer section

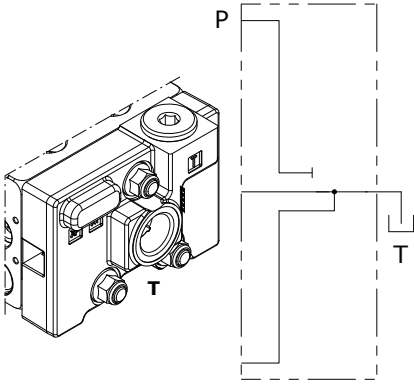


Description example: Q130/2/F7S(N150)/103-A1-M1/**E61**/103-A1-M1/F3D

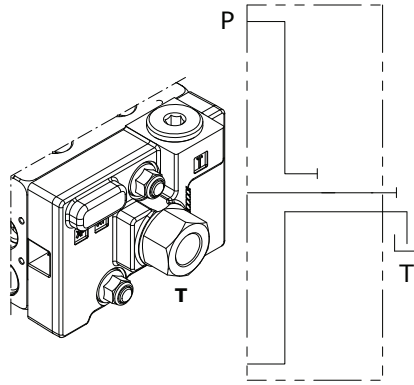
intermediate section

Outlet section

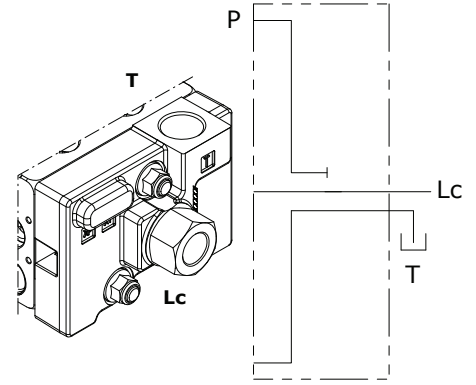
F3D configuration
Open center configuration



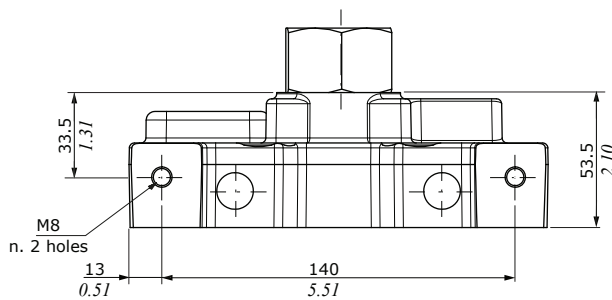
F16D configuration
Closed center configuration



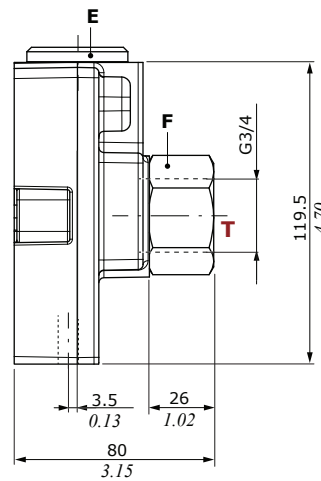
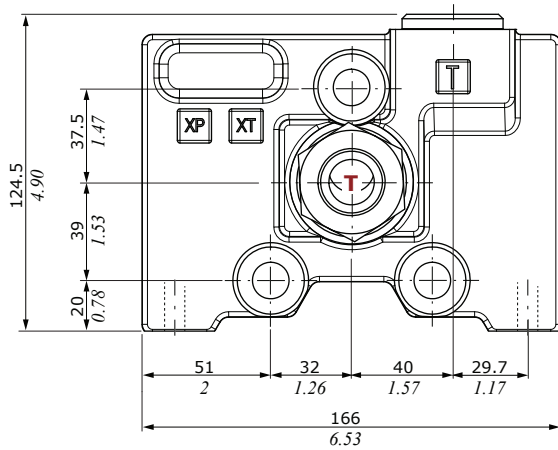
F6D configuration
Carry-over configuration



F16D configuration example



Wrenches and tightening torques
E = allen wrench 12 - 42 Nm (30.9 lbft)
F = wrench 41 - 80 Nm (59 lbft)



Dimensional data and features

Coil type	Voltage	Connectors							
		ISO4400	Deutsch DT	AMP JPT	Packard Weatherpack	Packard Metri-pack	Flying leads (without conn.)		
BER	10 VDC	4SLE001000A	-	-	-	-	-		
	12 VDC	4SLE001200A 4SLE001217A ⁽³⁾	4SLE001201A ⁽⁵⁾	4SLE001209A ⁽³⁻⁵⁾	4SLE001203A ⁽⁵⁾	4SLE001210A ⁽²⁾	4SLE001214A ⁽²⁾	4SLE001207A	
			4SLE001202A ⁽⁶⁾	4SLE001216A ⁽³⁻⁶⁾	4SLE001211A ⁽³⁻⁵⁾	-	-	-	
			4SLE001206A ⁽²⁾	4SLE001400A ⁽⁶⁾	4SLE001401A ⁽³⁻⁶⁾	4SLE001403A ⁽³⁻⁵⁾	-	-	-
			4SLE001402A ⁽³⁻⁵⁾	-	-	-	-	-	
	14 VDC	-	4SLE002400A	4SLE002401A ⁽⁵⁾	4SLE002403A ⁽⁵⁾	-	-	4SLE002404A	
	24 VDC	4SLE002408A ⁽³⁾ 4SLE302400A ⁽¹⁾	4SLE002407A ⁽³⁻⁵⁾	4SLE002402A ⁽⁶⁾	-	-	-	-	
			4SLE002802A ⁽⁶⁾	4SLE002800A ⁽⁵⁾	-	-	-	-	
	28 VDC	-	4SLE004800A	4SLE304800A ⁽¹⁾	-	-	-	-	
	48 VDC	-	4SLE011000A	4SLE311000A ⁽¹⁾	-	-	-	-	
110VDC	-	4SLE022000A	4SLE322000A ⁽¹⁾	-	-	-	-		
220 VDC	-	4CN1009995	5CON140031	5CON003	5CON001	5CON017	-		
Mating connectors (For connector with rectifier see last table)									

Coil type	Voltage	Connectors							
		ISO4400	Deutsch DT	AMP JPT	Packard Weatherpack	Packard Metri-pack	Flying leads (without conn.)		
BT	10 VDC	4SL3000100	-	-	-	-	-		
	12 VDC	4SL3000120 4SL3000126 ⁽⁴⁾	4SL3000130 ⁽⁶⁾	4SL3000134 ⁽³⁻⁶⁾	4SL3000122 ⁽⁵⁾	4SL3000124 ⁽²⁾	4SL3000127 ⁽²⁾	4SL300012C	
			4SL3000128 ⁽²⁾	4SL3000240 ⁽¹⁾	4SL3000249 ⁽⁶⁾	4SL3000248 ⁽⁵⁾	-	-	4SL3000246
			4SL300024C ⁽³⁻⁶⁾	4SL3000260	-	-	-	-	-
	24 VDC	-	4SL3000480	4SL3030480 ⁽¹⁾	-	-	-	-	
	26 VDC	-	4SL3001100	4SL3031100 ⁽¹⁾	-	-	-	-	
	48 VDC	-	4SLE022000A	4SLE322000A ⁽¹⁾	-	-	-	-	
	110VDC	-	4CN1009995	5CON140031	5CON003	5CON001	5CON017	-	
220 VDC	-	Mating connectors (For connector with rectifier see last table)							

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

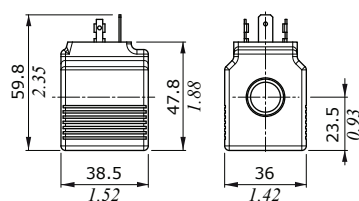
Voltage	ISO 4400 mating connector with rectifier	
	BER type coil	
24 VDC	4CN1010240	
48 VDC	4CN1010480	
110 VDC	4CN1011100	
220 VDC	4CN1012200	

Coils and connectors

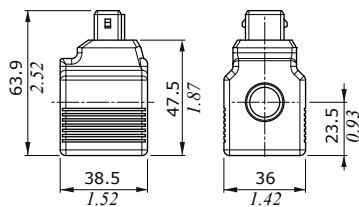
Dimensional data and features

BER type

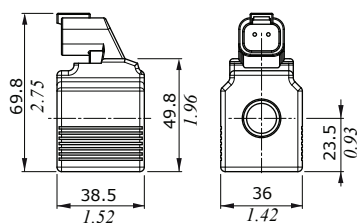
ISO4400 connector



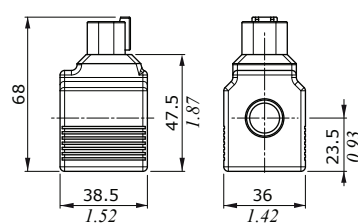
AMP JPT connector



DEUTSCH DT04 connector
(parallel type)



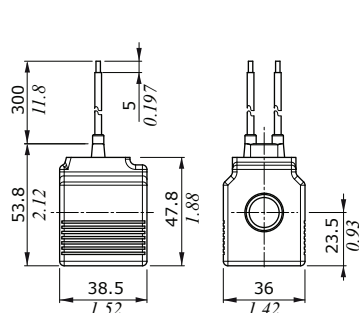
DEUTSCH DT04 connector
(perpendicular type)



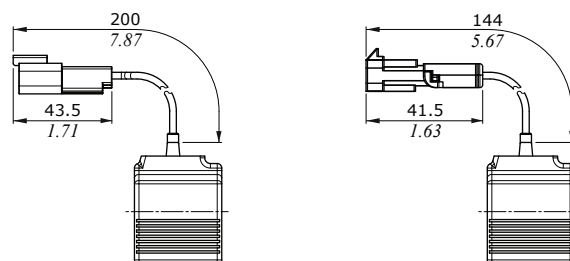
Features

- Nominal voltage tolerance : ±10%
- Power rating : 19.2 W - 12/24 VDC - 48 RAC
: 19.1 W - 28 VDC
: 19 W - 10/14/48/110/220 VDC
: 24/110/220 RAC
- Max. operating current . . . : 1.90 A - 10 VDC
: 1.60 A - 12 VDC
: 1.36 A - 14 VDC
: 0.80 A - 24 VDC
: 0.68 A - 28 VDC
: 0.40 A - 48 VDC
: 0.17 A - 110 VDC
: 0.09 A - 220 VDC
: 0.89 A - 24 RAC
: 0.45 A - 48 RAC
: 0.19 A - 110 RAC
: 0.09 A - 220 RAC
- Coil insulation : Class H (180°C - 356°F)
- Weather protection : IP65 - ISO4400
: IP69K - Deutsch DT
: IP65 - AMP JPT
: IP67 - Weatherpack
: IP67 - Metri-pack
- Insertion : 100%

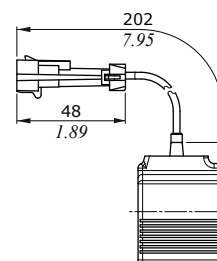
Flying leads with
DEUTSCH DT04 connector



Flying leads with PACKARD
WEATHER-PACK connector



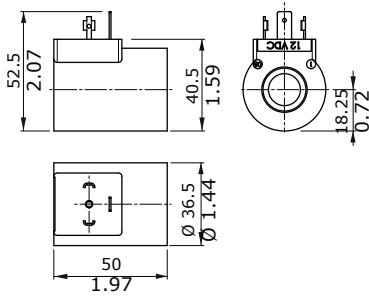
Flying leads with PACKARD
METRI-PACK connector



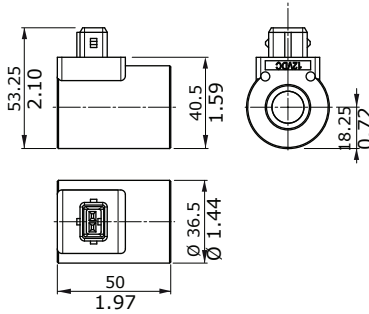
Dimensional data and features

BT type

ISO4400 connector



AMP JPT connector

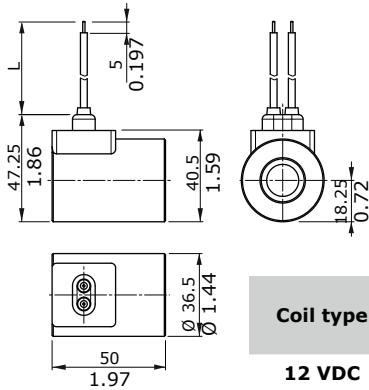
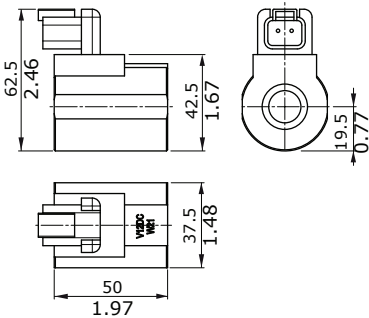


Features

- Nominal voltage tolerance : ±10%
- Power rating : 19 W - 10 VDC - 48 RAC
 : 21 W - 12/24/26 VDC
 : 20.3 W - 48 VDC
 : 17.3 W - 110 VDC
 : 17.7 W - 220 VDC
 : 19.9 W - 24 RAC
 : 20.7 W - 48 RAC
 : 20 W - 110/220 RAC
- Max. operating current . . . : 1.90 A - 10 VDC
 : 1.77 A - 12 VDC
 : 0.89 A - 24 VDC
 : 0.84 A - 26 VDC
 : 0.43 A - 48 VDC
 : 0.16 A - 110 VDC
 : 0.08 A - 220 VDC
 : 0.93 A - 24 RAC
 : 0.47 A - 48 RAC
 : 0.18 A - 110 RAC
 : 0.09 A - 220 RAC
- Coil insulation : Class F (155°C - 311°F)
- Weather protection : IP65 - ISO4400
 : IP69K - Deutsch DT
 : IP65 - AMP JPT
 : IP67 - Weatherpack
 : IP67 - Metri-pack
- Insertion : 100%

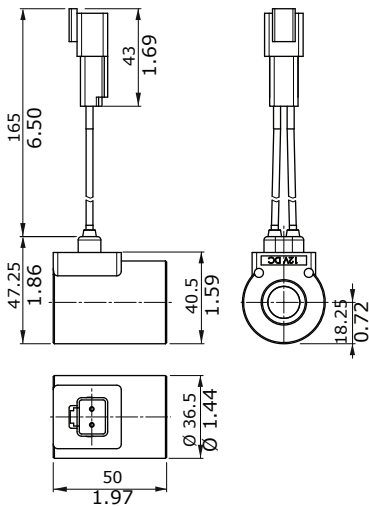
Flying leads

DEUTSCH DT04 connector
(parallel type)

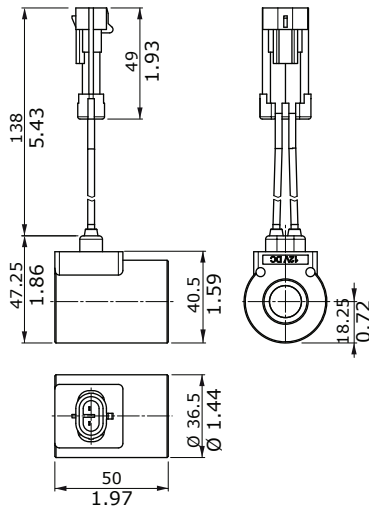


Coil type	L dimension	
	(mm)	(in)
12 VDC	240	9.45
24 VDC	600	23.62

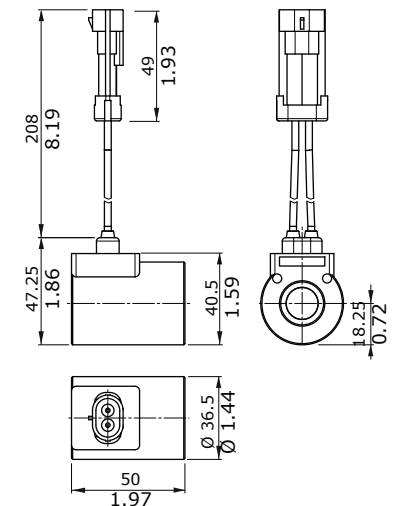
Flying leads with DEUTSCH DT04 connector



Flying leads with PACKARD METRI-PACK connector



Flying leads with PACKARD WEATHER-PACK connector



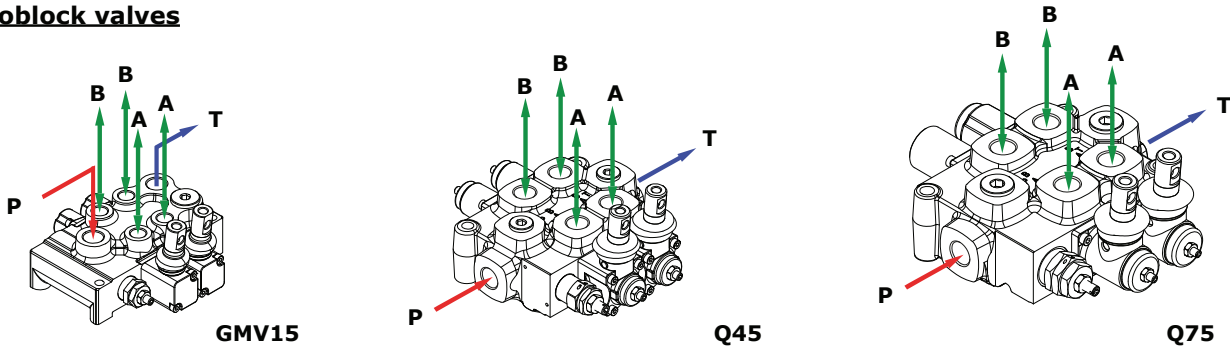
Main rules

The directional control valves range are assembled and tested as per the technical specifications of this catalogue.

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

- 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 spool control kit, do not use high pressure washdown directly on the valve;
- before painting, ensure plugs on normally open ports are tightly in place.

Monoblock valves

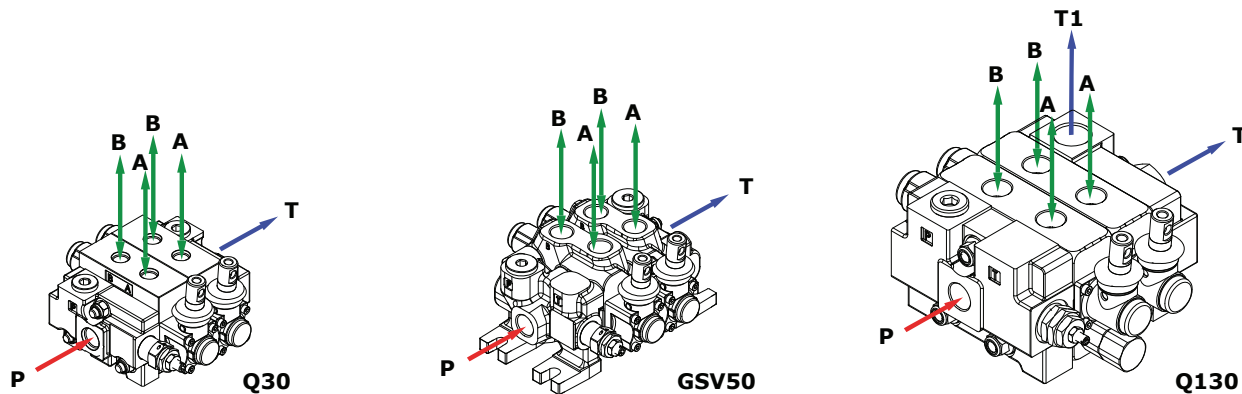


FITTING TIGHTENING TORQUE - Nm / lbft					
THREAD TYPE	P port	A and B ports	T port	Lc port	
Q35	BSP	G 3/8	G 3/8	-	
	With O-Ring seal	35 / 25.8	35 / 25.8	-	
	With copper washer	40 / 29.5	40 / 29.5	-	
	With steel and rubber washer	30 / 22.1	30 / 22.1	-	
	UN-UNF	3/4-16 (SAE 8)	3/4-16 (SAE 8)	3/4-16 (SAE 8)	-
GMV15	With O-Ring seal	50 / 36.9	50 / 36.9	-	
	BSP	G 3/8	G 1/4	G 3/8	
	With O-Ring seal	35 / 25.8	25 / 18.4	35 / 25.8	35 / 25.8
	With copper washer	40 / 29.5	30 / 22.1	40 / 29.5	40 / 29.5
	With steel and rubber washer	30 / 22.1	16 / 11.8	30 / 22.1	30 / 22.1
UN-UNF	3/4-16 (SAE 8)	9/16-18 (SAE 6)	3/4-16 (SAE 8)	3/4-16 (SAE 8)	
With O-Ring seal	35 / 25.8	30 / 22.1	35 / 25.8	35 / 25.8	

THREAD TYPE	P and P1 ports		A and B ports		T port	T1 and Lc ports		
	Q25	Q45	Q25	Q45	Q25/Q45	Q25	Q45	
Q25 - Q45	BSP	G 3/8	G 1/2	G 3/8	G 1/2	G 3/8	G 1/2	
	With O-Ring seal	35 / 25.8	50 / 36.9	35 / 25.8	50 / 36.9	50 / 36.9	35 / 25.8	50 / 36.9
	With copper washer	40 / 29.5	60 / 44.3	40 / 29.5	60 / 44.3	60 / 44.3	40 / 29.5	60 / 44.3
	With steel and rubber washer	30 / 22.1	60 / 44.3	30 / 22.1	60 / 44.3	60 / 44.3	30 / 22.1	60 / 44.3
	UN-UNF	9/16-18 (SAE 6)	3/4-16 (SAE 8)	9/16-18 (SAE 6)	3/4-16 (SAE 8)	7/8-14 (SAE 10)	3/4-16 (SAE 8)	3/4-16 (SAE 8)
With O-Ring seal	30 / 22.1	35 / 25.8	30 / 22.1	35 / 25.8	90 / 66.4	35 / 25.8	35 / 25.8	
Q75 - Q95	Q75	Q95	Q75	Q95	Q75/Q95	Q75	Q95	
	BSP	G 1/2	G 3/4	G 1/2	G 3/4	G 1/2	G 3/4	
	With O-Ring seal	50 / 36.9	90 / 66.4	50 / 36.9	90 / 66.4	90 / 66.4	50 / 36.9	90 / 66.4
	With copper washer	60 / 44.3	90 / 66.4	60 / 44.3	90 / 66.4	90 / 66.4	60 / 44.3	90 / 66.4
	With steel and rubber washer	60 / 44.3	70 / 51.6	60 / 44.3	70 / 51.6	70 / 51.6	60 / 44.3	70 / 51.6
UN-UNF	7/8-14 (SAE 10)	1" 1/16-12 (SAE 12)	7/8-14 (SAE 10)	1" 1/16-12 (SAE 12)	1" 1/16-12 (SAE 12)	7/8-14 (SAE 10)	1" 1/16-12 (SAE 12)	
With O-Ring seal	90 / 66.4	95 / 70.1	90 / 66.4	95 / 70.1	95 / 70.1	90 / 66.4	95 / 70.1	

NOTE – These torques are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish.

Sectional valves



FITTING TIGHTENING TORQUE - Nm / lbft						
THREAD TYPE	P and P1 ports		A and B ports		T port	T1 and Lc ports
	Q30	Q50	Q30	Q50	Q30/Q50	Q30/ Q50
Q30 - Q50	BSP	G 3/8	G 1/2	G 3/8	G 1/2	G 1/2
	With O-Ring seal	35 / 25.8	50 / 36.9	35 / 25.8	50 / 36.9	50 / 36.9
	With copper washer	40 / 29.5	60 / 44.3	40 / 29.5	60 / 44.3	60 / 44.3
	With steel and rubber washer	30 / 22.1	60 / 44.3	30 / 22.1	60 / 44.3	60 / 44.3
	UN-UNF	3/4-16 (SAE 8)	3/4-16 (SAE 8)	9/16-18 (SAE 6)	3/4-16 (SAE 8)	7/8-14 (SAE 10)
With O-Ring seal	35 / 25.8	35 / 25.8	30 / 22.1	35 / 25.8	90 / 66.4	35 / 25.8
GSV50	BSP	G 1/2		G 1/2		G 1/2
	With O-Ring seal	50 / 36.9		50 / 36.9		50 / 36.9
	With copper washer	60 / 44.3		60 / 44.3		60 / 44.3
	With steel and rubber washer	60 / 44.3		60 / 44.3		60 / 44.3
	UN-UNF	3/4-16 (SAE 8)		3/4-16 (SAE 8)		7/8-14 (SAE 10)
With O-Ring seal	35 / 25.8		35 / 25.8		90 / 66.4	35 / 25.8
Q80	BSP	G 1/2 - G 3/4		G 1/2 - G 3/4		G 3/4
	With O-Ring seal	50 / 36.9 - 90 / 66.4		50 / 36.9 - 90 / 66.4		90 / 66.4
	With copper washer	60 / 44.3 - 90 / 66.4		60 / 44.3 - 90 / 66.4		90 / 66.4
	With steel and rubber washer	60 / 44.3 - 70 / 51.6		60 / 44.3 - 70 / 51.6		70 / 51.6
	UN-UNF	7/8-14 (SAE 10)		3/4-16 (SAE 8)		1" 1/16-12 (SAE 12)
With O-Ring seal	90 / 66.4		35 / 25.8		95 / 70.1	90 / 66.4
Q130	BSP	G 3/4 - G 1"		G 3/4 - G 1"		G 1"
	With O-Ring seal	90 / 66.4 - 100 / 73.8		90 / 66.4 - 100 / 73.8		100 / 73.8
	With copper washer	90 / 66.4 - 90 / 66.4		90 / 66.4 - 90 / 66.4		90 / 66.4
	With steel and rubber washer	70 / 51.6 - 100 / 73.8		70 / 51.6 - 100 / 73.8		100 / 73.8
	UN-UNF	1" 5/16-12 (SAE 16)		1" 5/16-12 (SAE 16)		1" 5/16-12 (SAE 16)
With O-Ring seal	150 / 100.6		150 / 100.6		150 / 100.6	150 / 100.6

NOTE - These torques are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish.

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