

EX Series

Load Sensing
and Flow Sharing valves



DIRECTIONAL VALVES

The EX Series

The EX Series is a family of open/closed center post-compensated and pre-compensated sectional valves designed specifically for Mobile Applications. The EX series provides exceptional controllability, efficiency and flexibility for applications requiring up to 350 l/min (92.4 US gpm) flow rates. The EX Series is available in three different sizes: EX38, EX54 and EX72.



EX38



EX54



EX72

NOTE: the EX38 configuration is available with Right inlet (MR) and Left inlet (ML).
The EX54 and EX72 configurations are only available with Right inlet (MR).

Additional information

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

WARNING!

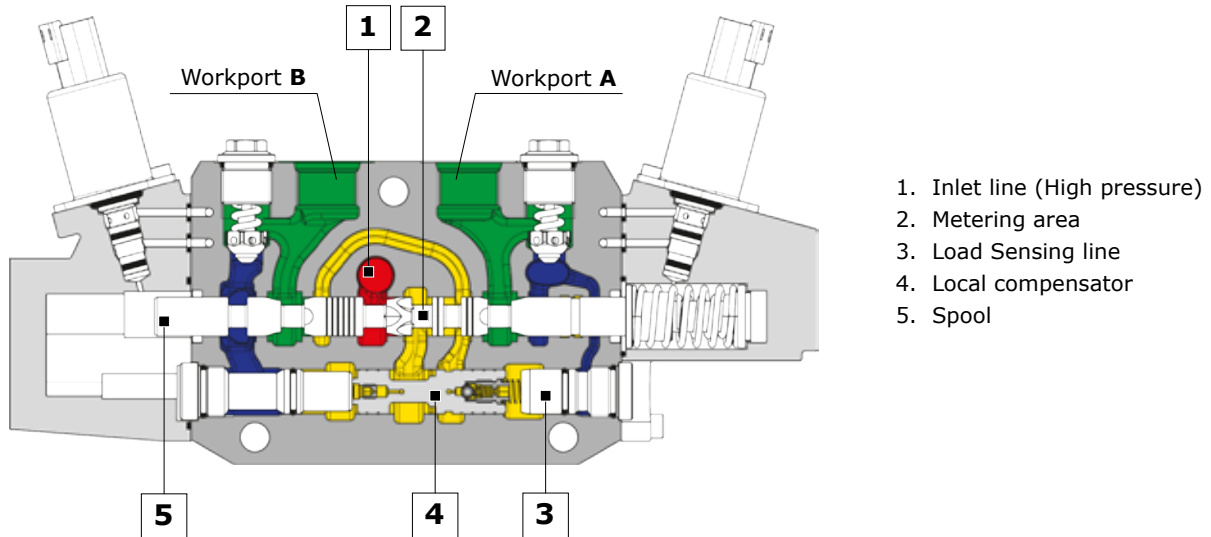
All specifications of this catalogue refer to the standard product at this date.
Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

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

2nd edition April 2025

The Flow Sharing technology

The EX Series control valves adds the benefit of Flow Sharing technology to the standard Load Sensing valve. The EX Series patented compensator maintains the margin pressure as a constant pressure drop across the spool metering area. The result is a flow to the workport dependent only on spool position. In case of flow saturation, the effective pressure drop across all spools is reduced equally. This results in proportional flow reduction at each section.



In case of flow saturation, the flow demand is higher than the maximum pump flow, therefore the margin pressure is reduced according to the formula (dimensionless indication):

$$Q \propto A \sqrt{\frac{\Delta P}{\rho}}$$

Q = flow to workports
 ΔP = pressure drop across metering area
 A = metering area
 ρ = oil density

Since all spools have the same pressure drop across the metering area, then all flows are reduced proportionally. This allows the operator to maintain control of all functions, though at reduced speed of active functions.

Advantages and options

- Energy saving on closed center system, is produced only required flow and pressure by the actuators.
- The flow sharing technology permits multiple movements even with flow saturation.
- Flow passage design allows high P and T flow rate in a standard valve dimension.
- Inlet section with unidirectional restrictor option suitable for dumping the pressure peaks from the LS line to the compensator and vice versa.
- Working section option with priority features in saturation conditions.
- Dedicated spools for special functions (customized flows, back pressures, pressure control).

For special options please contact Sales Dept.

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Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil ISO-VG46 viscosity at 50°C - 122°F temperature, 32 cSt.

		EX38		EX54	EX72
		Std.	HF		
Working section number		1 - 10	-	1 - 8	1 - 8
Spool stroke		7 mm 0.27 in	7 mm 0.27 in	9 mm 0.35 in	11 mm 0.43 in
Nominal flow rating	inlet port with compensator, stand-by (margin pressure) 14 bar - 200 psi EX38 16 bar - 232 psi EX54, EX72	150 l/min 39.6 US gpm	200 l/min 52.8 US gpm	300 l/min 79.2 US gpm	450 l/min 119 US gpm
	Working ports, stand-by (margin pressure) 14 bar - 200 psi EX38 16 bar - 232 psi EX54, EX72	100 l/min 26.4 US gpm	140 l/min 39.6 US gpm	250 l/min 68 US gpm	350 l/min 92.4 US gpm
Max. pressure	P inlet port	350 bar 5100 psi	350 bar 5100 psi	350 bar 5100 psi	350 bar 5100 psi
	A and B working ports	350 bar 5100 psi	350 bar 5100 psi	350 bar 5100 psi	350 bar 5100 psi
Back pressure (max.) on outlet T port	with mechanical, hydraulic and pneumatic devices	10 bar - 145 psi			
	with electrohydraulic devices	10 bar - 145 psi - 5 bar - 72.5 psi (with internal drain)			
Back pressure (max.) on outlet T1 port		5 bar - 72.5 psi			
Standard internal leakage A(B)->T	with port valves $\Delta p = 100$ bar - 1450 psi	max. 5 cm ³ /min max. 0.30 in ³ /min	max. 8 cm ³ /min max. 0.48 in ³ /min	max. 11 cm ³ /min max. 0.67 in ³ /min	max. 15 cm ³ /min max. 0.91 in ³ /min
Fluid		Mineral oil			
Fluid temperature range	standard configuration	from -20°C to 80°C - from -4°F to 176°F			
Viscosity	min.	10 mm ² /s - 10 cSt			
	max.	300 mm ² /s - 300 cSt			
Contamination level	max.	20/18/15 - ISO 4406 - NAS 1638 class 9			

Standard threads

REFERENCE STANDARD		BSP	UN-UNF	NPTF	Flange connection
THREAD ACCORDING TO		ISO 228/1	ISO 263		ISO 6162
		BS 2779	ANSI B1.1 unified	ANSI B1.20.3	SAEJ518
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926		
	SAE		J1926	J476a	SAE J518 code 61
	DIN	3852-2 shape X or Y			ISO 6162-1

Standard threads

EX38 PORTS THREADING	STANDARD				HIGH FLOW			
	BSP		UN-UNF		BSP		UN-UNF	
	Thread	Code	Thread	Code	Thread	Code	Thread	Code
P inlet	G 3/4	G05	1" 1/16-12 (SAE12)	U05	G 3/4	G05	1" 1/16-12 (SAE12)	U05
A and B ports	G 1/2	G04	7/8-14 (SAE 10)	U04	G 3/4	G05	1" 1/16-12 (SAE12)	U05
T outlet and HPCO ports	G 3/4	G05	1" 1/16-12 (SAE12)	U05	G 1"	G06	1" 5/16-12 (SAE16)	U06
T1 outlet port	G 1/4	G02	9/16-18 (SAE 6)	U02	G 1/4	G02	9/16-18 (SAE 6)	U02
Hydraulic controls	G 1/4	G02	9/16-18 (SAE 6)	U02	G 1/4	G02	9/16-18 (SAE 6)	U02
Pneumatic controls	G 1/8	-	1/8-27 (SAE4)	-	G 1/8	-	1/8-27 (SAE4)	-

FLANGE CONNECTION (bolt threading)								
EX54 PORTS THREADING	BSP		UN-UNF		ISO 6162-1 ISO 6162-2		SAE J518-1 code 61 SAE J518-2 code 62	
	Thread	Code	Thread	Code	Size	Code	Size	Code
P and P1 inlet	G 1" 1/4	G07	1" 5/8-12 (SAE20)	U07	1" (M12) - type 2	S35	1" (7/16-14 UNC) - type 2	S36
A and B ports	G 1" 1/4	G06	1" 5/16-12 (SAE16)	U06	3/4 (M10) - type 1	S03	3/4 (3/8-16 UNC) - type 1	S04
T outlet	G 1" 1/4	G07	1" 5/8-12 (SAE20)	U07	1" 1/4 (M10) - type 1	S07	1" 1/4 (7/16-14 UNC) - type 1	S08
T1 port	G 1/4	G02	9/16-18 (SAE 6)	U02	-	-	-	-
Hydraulic controls	G 1/4	G02	9/16-18 (SAE 6)	U02	-	-	-	-
Pneumatic controls	G 1/8	-	1/8-27 (SAE4)	-	-	-	-	-

FLANGE CONNECTION (bolt threading)								
EX72 PORTS THREADING	BSP		UN-UNF		ISO 6162-1 ISO 6162-2		SAE J518-1 code 61 SAE J518-2 code 62	
	Thread	Code	Thread	Code	Size	Code	Size	Code
P and P1 inlet	-	-	-	-	1" 1/4 (M14) - type 2	S37	1" 1/4 (1/2-13 UNC) - type 2	S38
A and B ports	-	-	-	-	1" (M12) - type 2	S35	1" (7/16-14 UNC) - type 2	S36
T outlet	-	-	-	-	1" (M10) - type 2	S07	1" (7/16-14 UNC) - type 2	S08
T1 port	G 1/4	G02	9/16-18 (SAE 6)	U02	-	-	-	-
Hydraulic controls	G 1/4	G02	9/16-18 (SAE 6)	U02	-	-	-	-
Pneumatic controls	G 1/8	-	1/8-27 (SAE4)	-	-	-	-	-

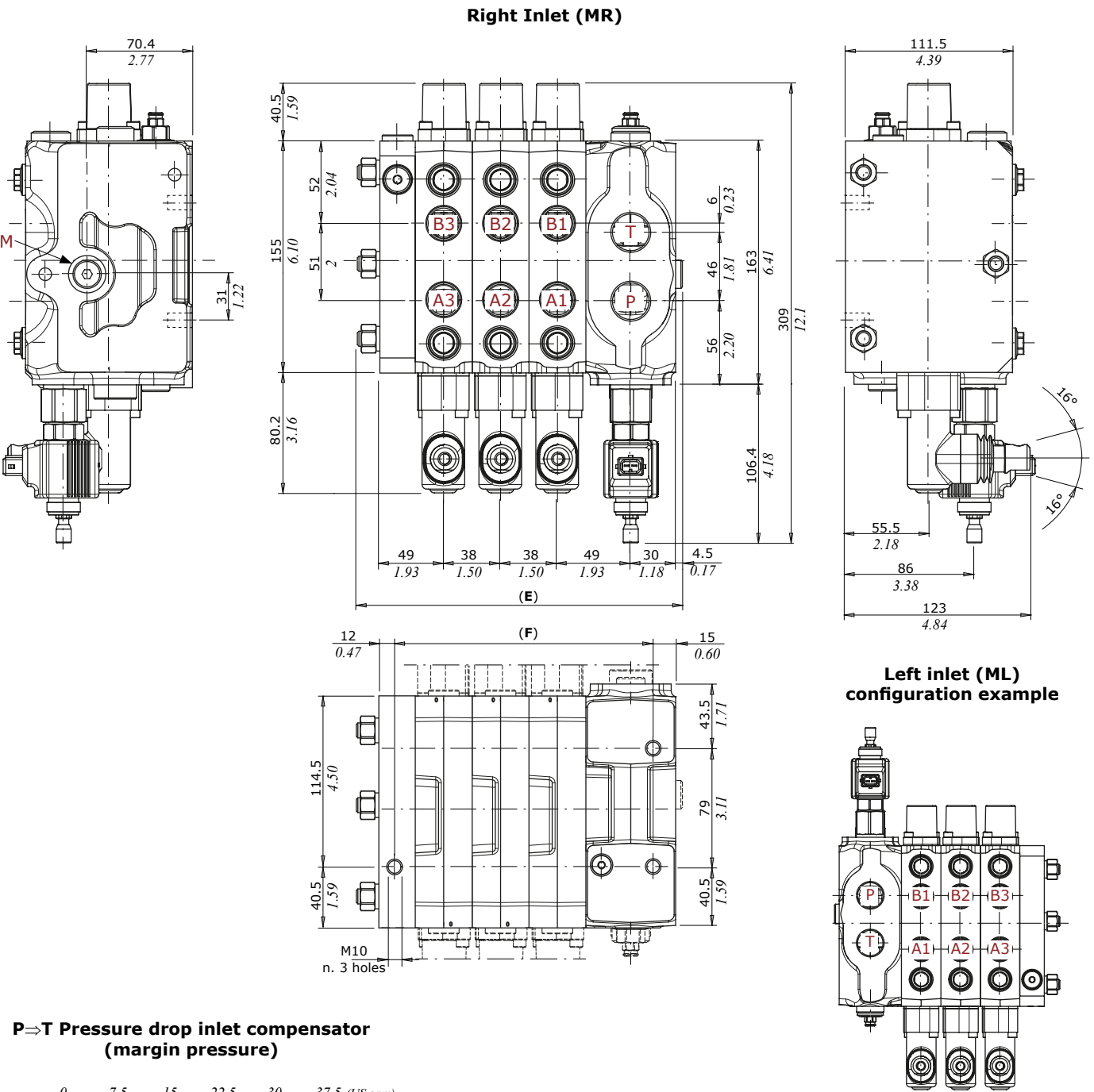
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• EX38

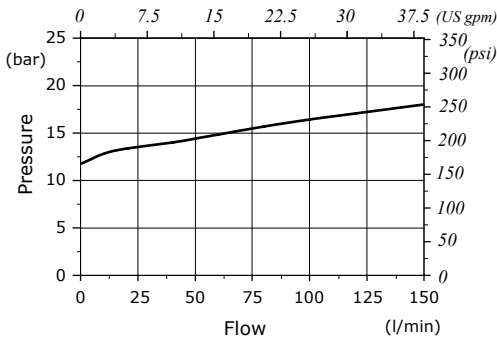
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Dimensional data

Mechanical control configuration example



P⇒T Pressure drop inlet compensator (margin pressure)



Type	E	F
	mm - in	mm - in
EX38/1	141 - 5.55	95 - 3.74
EX38/2	179 - 7.04	133 - 5.23
EX38/3	217 - 8.54	171 - 6.73
EX38/4	255 - 10.03	209 - 8.22
EX38/5	293 - 11.53	247 - 9.72

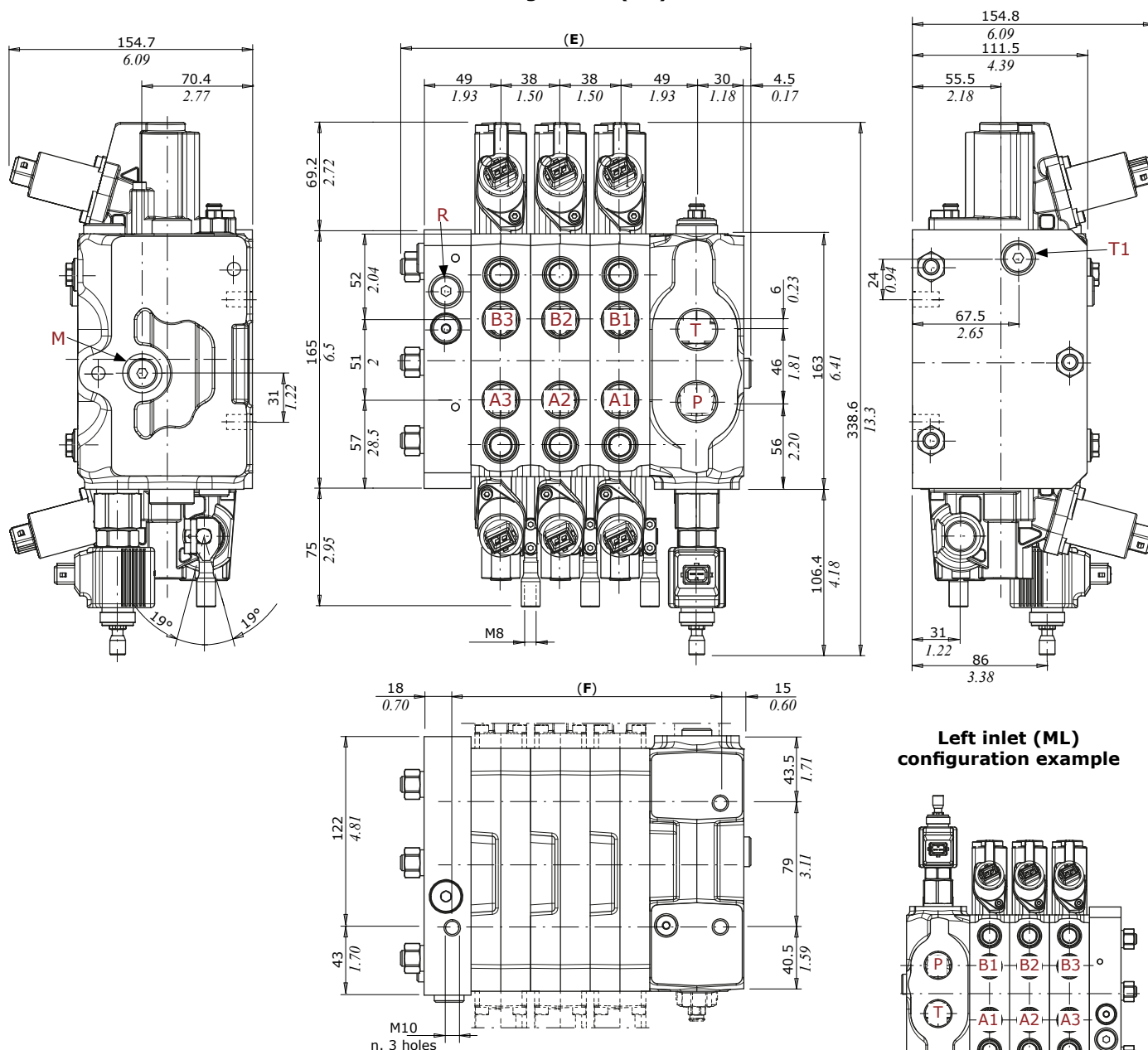
Type	E	F
	mm - in	mm - in
EX38/6	331 - 13.03	285 - 11.22
EX38/7	369 - 14.52	323 - 12.71
EX38/8	407 - 16.02	361 - 14.21
EX38/9	445 - 17.50	399 - 15.70
EX38/10	483 - 19.01	437 - 17.20

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

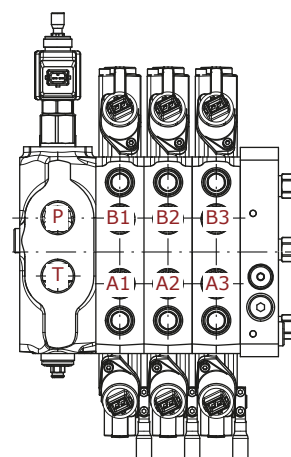
Dimensional data

Two-side electrohydraulic control configuration example

Right Inlet (MR)



Left inlet (ML) configuration example

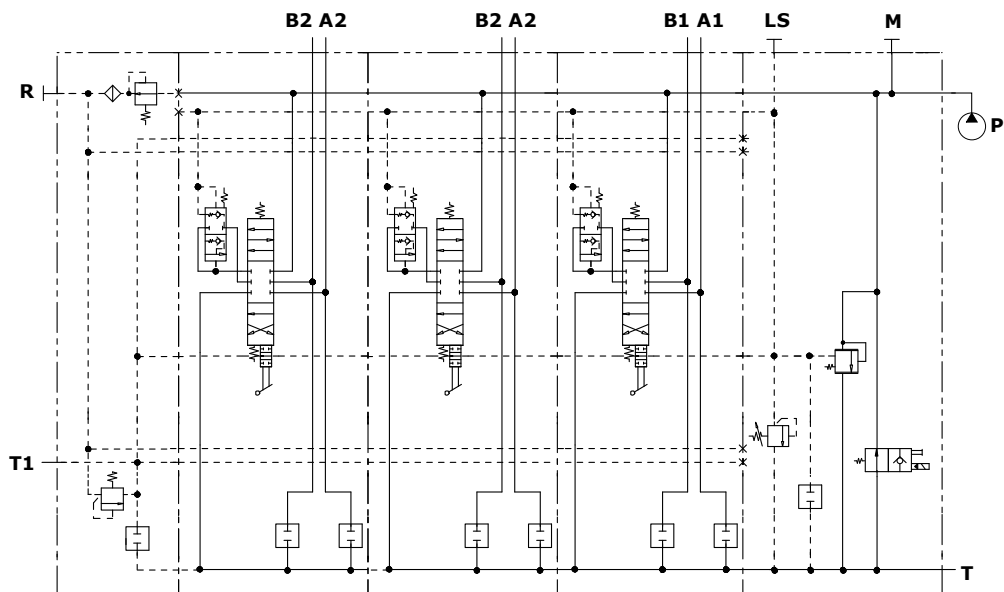


Type	E mm - in	F mm - in
EX38/1	147.5 - 5.80	95 - 3.74
EX38/2	185.5 - 7.30	133 - 5.23
EX38/3	223.5 - 8.80	171 - 6.73
EX38/4	261.5 - 10.30	209 - 8.22
EX38/5	299.5 - 11.80	247 - 9.72

Type	E mm - in	F mm - in
EX38/6	337.5 - 13.28	285 - 11.22
EX38/7	375.5 - 14.78	323 - 12.71
EX38/8	413.5 - 16.28	361 - 14.21
EX38/9	451.5 - 17.77	399 - 15.70
EX38/10	489.5 - 19.27	437 - 17.20

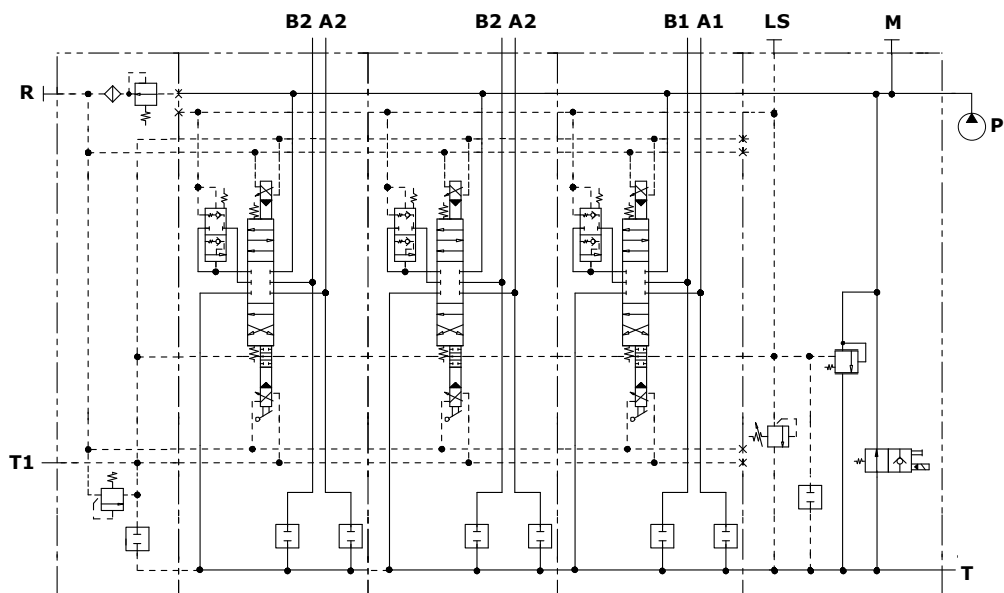
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration

Hydraulic circuits



**Right Inlet valve with mechanical controls
configuration example (Post-compensated):**

EX38/3/MR-V1A(200)-V7B(C12AY)-V10C-KV-G05/
W001C(80\80)-H001-F001A-RC1-G04.05TFPA\05TFPB/
W001C(80\80)-H001-F001A-RC1-G04.05TFPA\05TFPB/
W001C(80\80)-H001-F001A-RC1-G04.05TFPA\05TFPB/KZ10I



**Right Inlet valve with two-side electrohydraulic controls
configuration example (Post-compensated):**

EX38/3/MR-V1A(200)-V7B(C12AY)-V10C-KV-G05/
W001C(80\80)-HP04-FP04-B12AJ-RC1-G04.05TFPA\05TFPB/
W001C(80\80)-HP04-FP04-B12AJ-RC1-G04.05TFPA\05TFPB/
W001C(80\80)-HP04-FP04-B12AJ-RC1-G04.05TFPA\05TFPB/KZ20EH

Complete section ordering code

Two-side electrohydraulic control valve configuration example - Right and Left Inlet

EX38/3/MR-V1A(200)-V7B-C12AJ-V10C-KVG05/W001C(25\25)-HP04-FP04-B12AJ-RC1G04-05TFPA-

Working sections
Right Inlet: **MR**
Left Inlet: **ML**

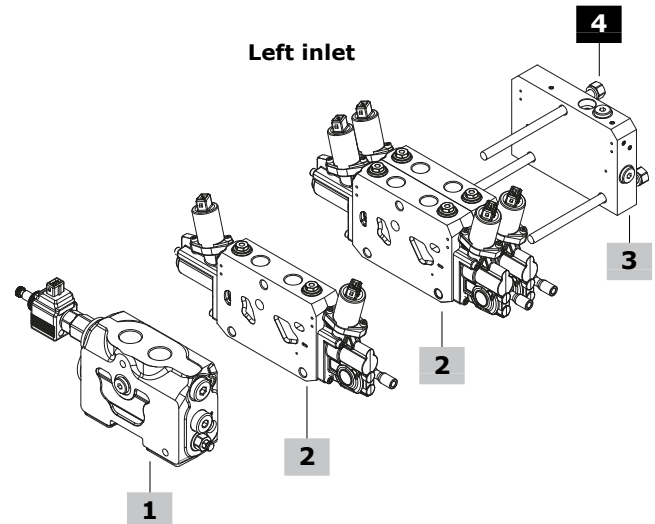
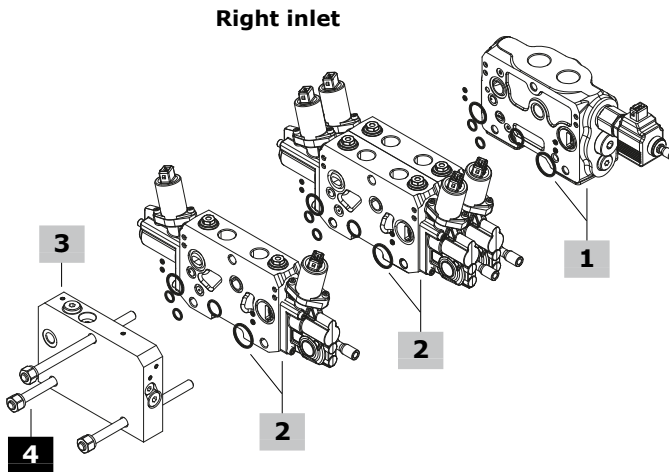
1

2

05TFPB/.../.../KZ20EH/P006/3 N10

2 **2** **3**

Painted with RAL 9005 black primer

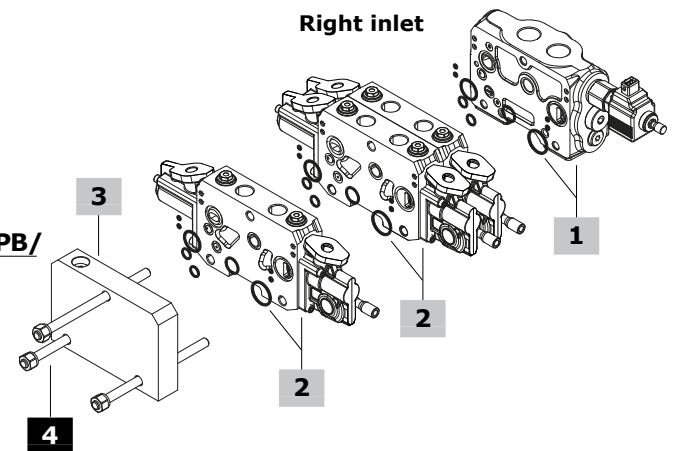


Tie rod tightening torque
wrench 13 - 40 Nm (29.5 lbf ft)

Hydraulic control valve configuration example - Right Inlet

1 **EX38/3/MR-V1A(200)-V7B-C12AJ-V10C-KVG05/**
2 **W001C(25/25)-HP01-FP01-RC1G04.05TFPA\05TFPB/**
2 **.../.../**
3 **KZ10I/P006/3 N10**

Painted with RAL 9005 black primer



1 Inlet sections*

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **MR-L/V1A(200)-V4B-V10C-KV-G05**

CODE: SHE380022

DESCRIPTION: with LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR-L/V1A(200)-V7B(C12AY)-V10C-KV-G05**

CODE: SHE380023

DESCRIPTION: as previous one with full flow electric unloading valve

TYPE: **MR-L/V1A(200)-V4B-V11C(C12AY)-KV-G05**

CODE: SHE380024

DESCRIPTION: with LS pressure relief valve, valve blanking plug on position B and LS push & twist emergency electric unloading valve

TYPE: **MR-L/V1A(200)-V3B(240)-V11C(C12AY)-KV-G05**

CODE: SHE380025

DESCRIPTION: as previous one with full flow direct relief valve

1 Inlet sections* (cont.)

The codes are referred to sections with O-ring seals

For Closed Center circuit (JV)

TYPE: **MR-L/V1A(200)-V4B-V10C-JV-G05**

CODE: SHE380026

DESCRIPTION: with LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR-L/V1A(200)-V7B(C12AY)-V10C-JV-G05**

CODE: SHE380027

DESCRIPTION: as previous one with full flow electric unloading valve

TYPE: **MR-L/V1A(200)-V4B-V11C(C12AY)-JV-G05**

CODE: SHE380028

DESCRIPTION: with LS pressure relief valve, valve blanking plug on position B and LS push & twist emergency electric unloading valve

TYPE: **MR-L/V1A(200)-V3B(240)-V11C(C12AY)-JV-G05**

CODE: SHE380029

DESCRIPTION: as previous one with full flow direct relief valve

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

Complete section ordering codes

2 Right inlet working sections*

The codes are referred to sections with O-ring seals

POST-COMPENSATED SECTIONS (RC)**With mechanical controls**

TYPE: **SD/W001C(25\25)-H001-F001A-RC2-G04**

CODE: SHL380060

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool, lever control and spring return to neutral

TYPE: **SD/W001C(25\25)-H001-F001A-RC1-G04-05TFPA-05TFPB**

CODE: SHL380061

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With hydraulic controls

TYPE: **SD/W001C(25\25)-HP01-FP01-RC2-G04**

CODE: SHL380069

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool, hydraulic control with lever

TYPE: **SD/W001C(25\25)-HP01-FP01-RC1-G04-05TFPA-05TFPB**

CODE: SHL380070

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With proportional electrohydraulic controls

TYPE: **SD/W001C(25\25)-HP04-FP04-B12AJ-RC2-G04**

CODE: SHL380066

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

TYPE: **SD/W001C(25\25)-HP04-FP04-B12AJ-RC1-G04-05TFPA-05TFPB**

CODE: SHL380067

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

TYPE: **SD/W001C(25\25)-HP06-FP06-B12AJ-RCU2-G04**

CODE: SHL380078

DESCRIPTION: without port valve arrangement with 25 l/min (6.6 US gpm) double acting spool and 12VDC one-side electrohydraulic control

TYPE: **SD/W001C(25\25)-HP06-FP06-B12AJ-RCU1-G04-05TFPA-05TFPB**

CODE: SHL380079

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

PRE-COMPENSATED SECTIONS (RL)**With mechanical controls**

TYPE: **SD/W001C(25\25)-H001-F001A-RL1-G04-05TFPA-05TFPB**

CODE: SHL380062

DESCRIPTION: with port valve arrangement (seat plugged), with 25 l/min (6.6 US gpm) double acting spool, lever control and spring return to neutral

With hydraulic controls

TYPE: **SD/W001C(25\25)-HP01-FP01-RL1-G04-05TFPA-05TFPB**

CODE: SHL380071

DESCRIPTION: with port valve arrangement (seat plugged), with 25 l/min (6.6 US gpm) double acting spool, hydraulic control with lever

With proportional electrohydraulic controls

TYPE: **SD/W001C(25\25)-HP04-FP04-B12AJ-RL1-G04-05TFPA-05TFPB**

CODE: SHL380068

DESCRIPTION: with port valve arrangement (seat plugged), with 25 l/min (6.6 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

2 Left inlet working sections*

The codes are referred to sections with O-ring seals

POST-COMPENSATED SECTION (RC)**With mechanical controls**

TYPE: **SS/W001C(25\25)-H001-F001A-RC2-G04**

CODE: SHL380063

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool, lever control and spring return to neutral

TYPE: **SS/W001C(25\25)-H001-F001A-RC1-G04-05TFPA-05TFPB**

CODE: SHL380064

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

2 Left inlet working sections* (cont.)

The codes are referred to sections with O-ring seals

POST-COMPENSATED SECTION (RC)**With hydraulic controls**

TYPE: **SS/W001C(25\25)-HP01-FP01-RC2-G04**

CODE: SHL380075

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool, hydraulic control with lever

TYPE: **SS/W001C(25\25)-HP01-FP01-RC1-G04-05TFPA-05TFPB**

CODE: SHL380076

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With proportional electrohydraulic controls

TYPE: **SS/W001C(25\25)-HP04-FP04-B12AJ-RC2-G04**

CODE: SHL380072

DESCRIPTION: without port valve arrangement, with 25 l/min (6.6 US gpm) double acting spool and 12VDC two-side electrohydraulic control

TYPE: **SS/W001C(25\25)-HP04-FP04-B12AJ-RC1-G04-05TFPA-05TFPB**

CODE: SHL380073

DESCRIPTION: as previous one with port valve arrangement (seat plugged)

PRE-COMPENSATED SECTION (RL)**With mechanical controls**

TYPE: **SS/W001C(25\25)-H001-F001A-RL1-G04-05TFPA-05TFPB**

CODE: SHL380065

DESCRIPTION: with port valve arrangement, 25 l/min (6.6 US gpm) double acting spool, lever control and spring return to neutral

With hydraulic controls

TYPE: **SS/W001C(25\25)-HP01-FP01-RL1-G04-05TFPA-05TFPB**

CODE: SHL380077

DESCRIPTION: with port valve arrangement (seat plugged), 25 l/min (6.6 US gpm) double acting spool, hydraulic control with lever

With proportional electrohydraulic controls

TYPE: **SS/W001C(25\25)-HP04-FP04-B12AJ-RL1-G04-05TFPA-05TFPB**

CODE: SHL380074

DESCRIPTION: with port valve arrangement (seat plugged), 25 l/min (6.6 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

3 End plates***For mechanical and hydraulic controls**

TYPE: **KZ10I** CODE: 320093101

DESCRIPTION: without pressure reducing valve, internal drain

TYPE: **KZ10E** CODE: 320093102

DESCRIPTION: without pressure reducing valve, external drain

For hydraulic and electrohydraulic controls

TYPE: **KZ20EC** CODE: 320093123

DESCRIPTION: with pressure reducing valve and pressure relief valve, external drain

TYPE: **KZ20EH** CODE: 320093124

DESCRIPTION: with pressure reducing valve and pressure relief valve, external-side drain

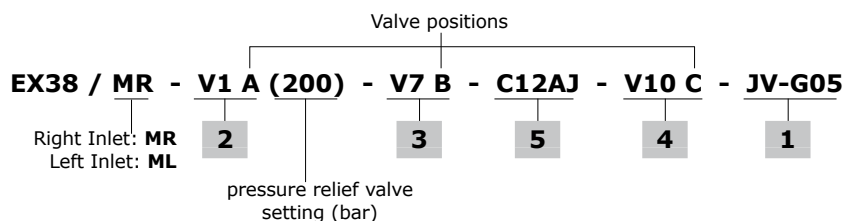
TYPE: **KZ30E** CODE: 320093113

DESCRIPTION: with pressure reducing valve, without pressure relief valve external-side drain

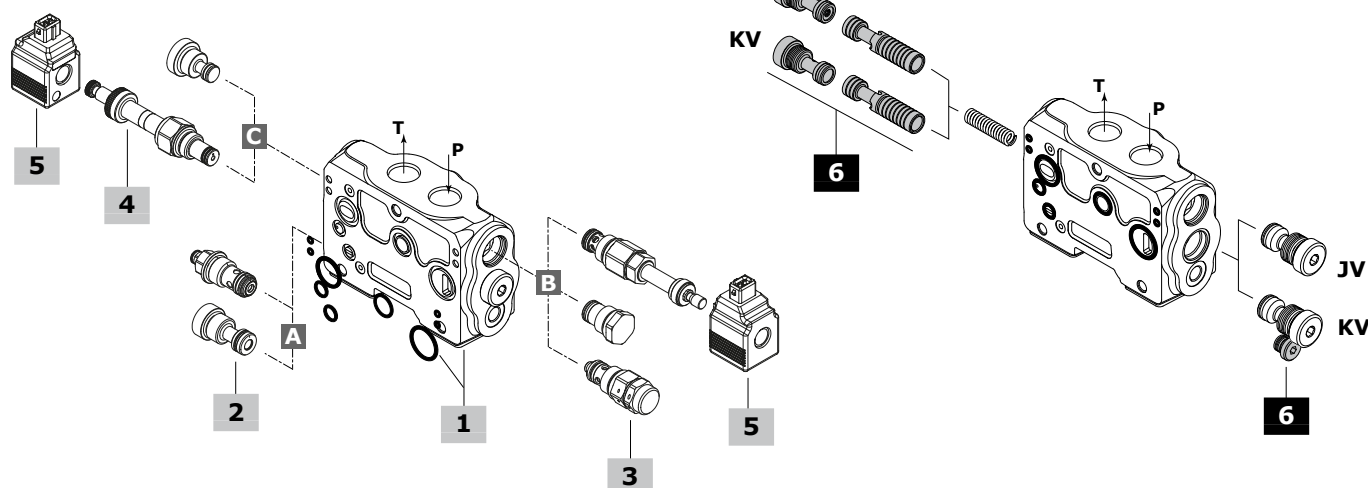
4 Assembly kit

CODE	DESCRIPTION
300193022	For 1 section valve
300193015	For 2 sections valve
300193016	For 3 sections valve
300193017	For 4 sections valve
300193010	For 5 sections valve
300193011	For 6 sections valve
300193012	For 7 sections valve
300193013	For 8 sections valve
300193014	For 9 sections valve
300193018	For 10 sections valve

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

**Transformation kit**

KV: for Open Center configuration
JV: for Closed Center configuration

**1 Inlet sections*** page 16

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **KV G05**

CODE: 029300001

DESCRIPTION: for fixed displacement pumps, internal LS. G3/4 ports

For Closed Center circuit (JV)

TYPE: **JV G05**

CODE: 029300011

DESCRIPTION: for variable displacement pumps, external LS. G3/4 ports

NOTE: for seal kit codes, see page 140

2 Valves on position A page 17

TYPE	CODE	DESCRIPTION
V1A		LS pressure relief valve
	915028503	setting range: 50-250 bar (725-3620 psi)
	915028504	setting range: 251-420 bar (3640-6100 psi)
V2A	430085034	Valve blanking plug

3 Valves on position B page 17

TYPE	CODE	DESCRIPTION
V3B		Full Flow direct relief valve
	915065501	setting range: 40-200 bar (580-2900 psi)
	915065502	setting range: 201-420 bar (2910-6100 psi)
V4B	430175001	Valve blanking plug
V7B	5EMSELTEX38	Full Flow electric unloading valve

4 Valves on position C page 18

TYPE	CODE	DESCRIPTION
V10C	430059003	Valve blanking plug
V11C	0EB08002000	LS Push & Twist emergency electric unloading valve (without coil)

5 Coils and accessories

For available **BER** coils and accessories list see page 136

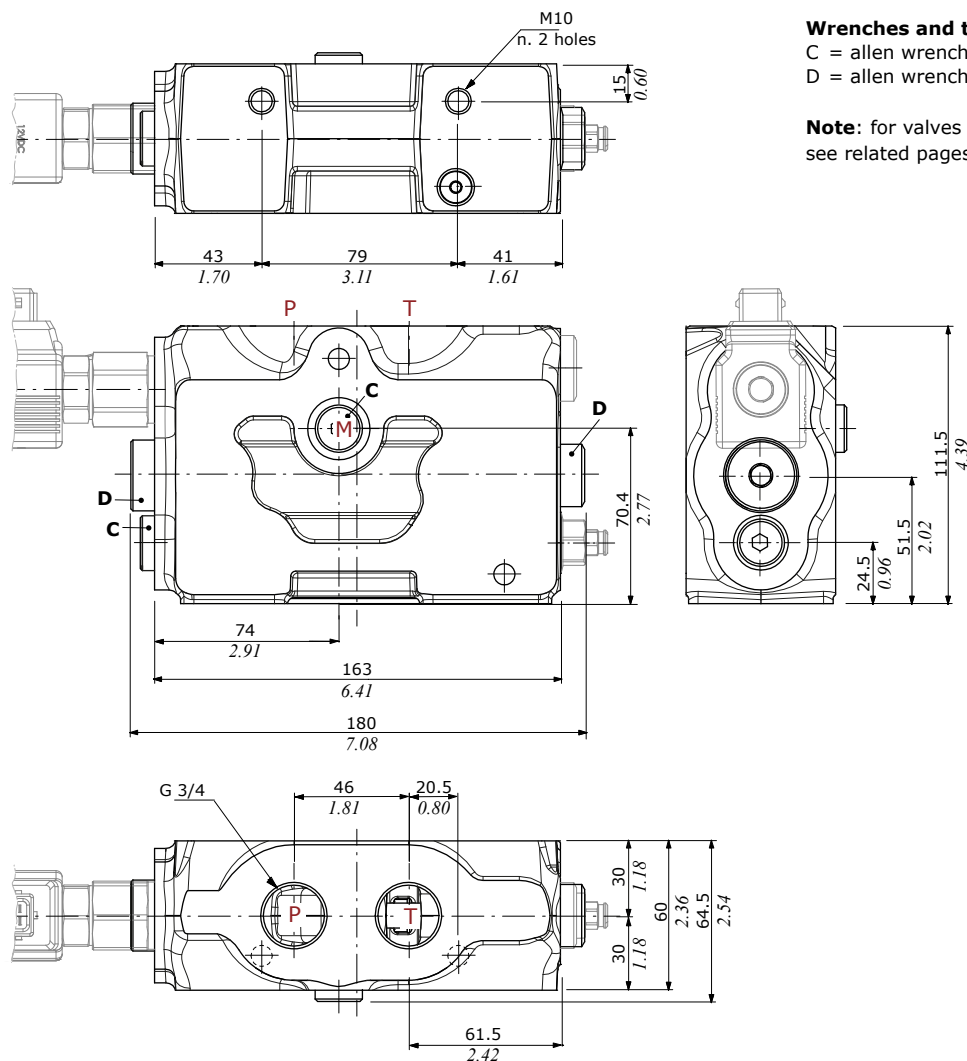
6 Trasformation kit page 18

TYPE	CODE	DESCRIPTION
KV kit	320093008*	Trasformation kit, from JV (closed center) to KV (open center)
JV kit	320093007	Trasformation kit, from KV (open center) to JV (closed center)

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

Dimensional data and hydraulic circuits

Drawing is referred to KV section; dimensions are the same for JV section

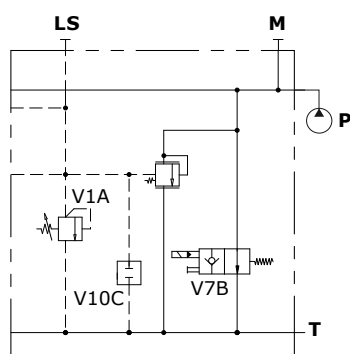


Wrenches and tightening torques

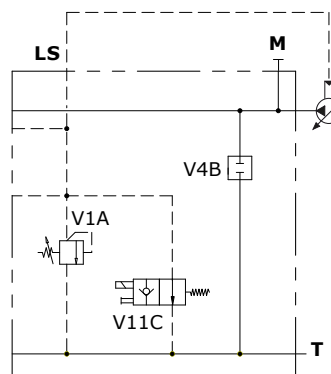
C = allen wrench 6 - 30 Nm (22 lbft)
D = allen wrench 8 - 30 Nm (22 lbft)

Note: for valves wrench and torque, see related pages

KV Open Center (example)



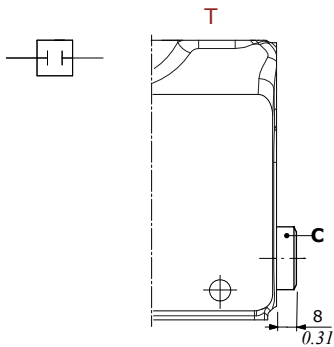
JV Closed Center (example)



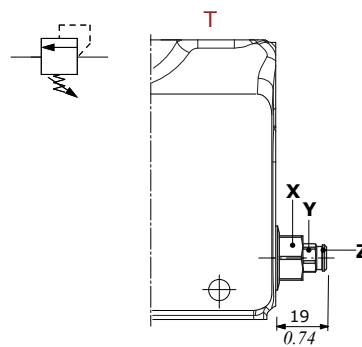
Inlet valves

Valves on position A

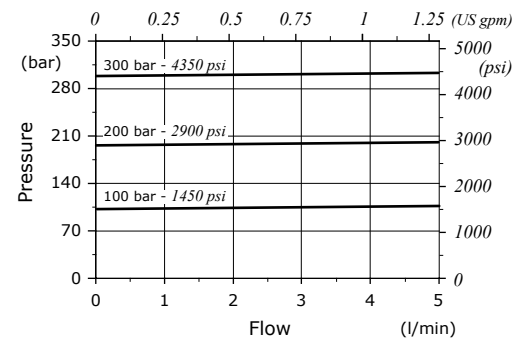
V2A type
Valve blanking plug



V1A type
LS pressure relief valve

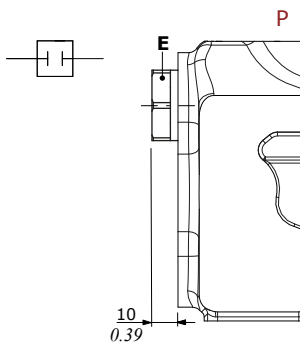


LS relief valve
characteristics

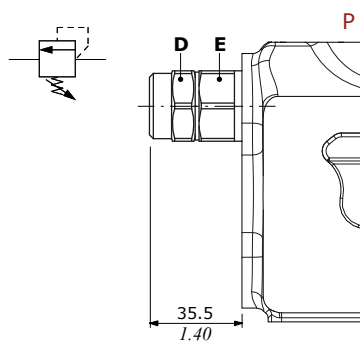


Valves on position B

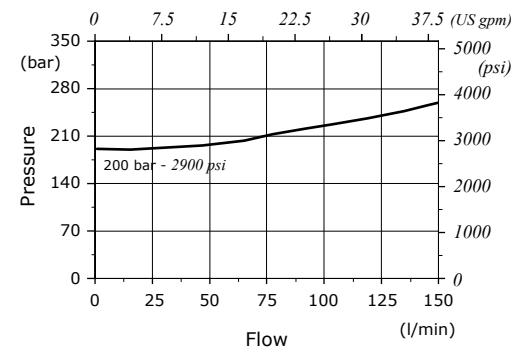
V4B type
Valve blanking plug



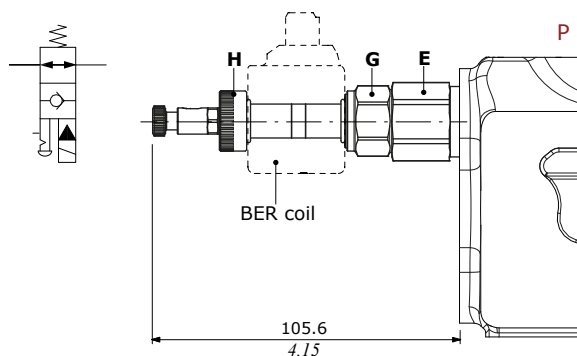
V3B type
Full Flow direct relief valve



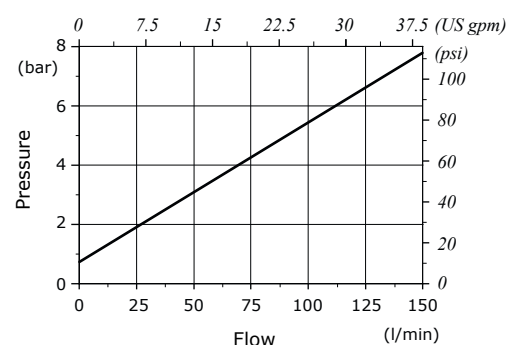
Full Flow relief valve
characteristics



V7B type
Full Flow electric unloading valve
(without coil)



Full Flow electric unloading valve
characteristics



Wrenches and tightening torque

- X = wrench 17 - 50 Nm (36 lbft)
- Y = wrench 10 - 7 Nm (5 lbft)
- Z = allen wrench 3 - manual tightening
- C = allen wrench 8 - 30 Nm (22 lbft)
- D = wrench 27 - 25 Nm (18 lbft)
- E = wrench 27 - 80 Nm (59 lbft)
- G = wrench 24 - 30 Nm (22 lbft)
- H = manual tightening

Valve features

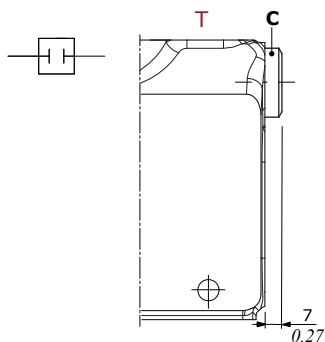
- Nominal flow.....: 150 l/min (0.53 US gpm)
- Max. pressure: 350 bar (5100 psi)
- Max. internal leakage...: 0,25 cm³/min @ 210 bar (0.015 in³/min @ 3050 psi)

For **BER** type coils see page 136

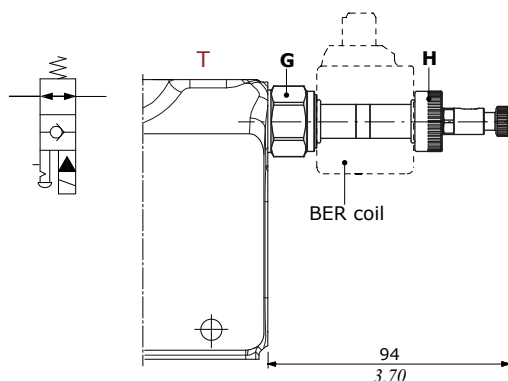
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



Wrenches and tightening torques

C = allen wrench 8 - 30 Nm (22 lbf ft)

G = wrench 24 - 30 Nm (22 lbf ft)

H = manual tightening

For **BER** type coils see page 136

NOTES:

Valve types V1A and V3B require factory setting (example: V1A - 150)

Valve combination V1A - V3B requires double setting (example: 200*240); the minimum difference between settings is 40 bar - 580 psi

Valve types V7B and V11C requires coil kit type (example: C12AJ).

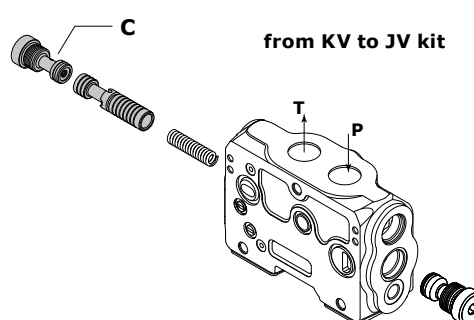
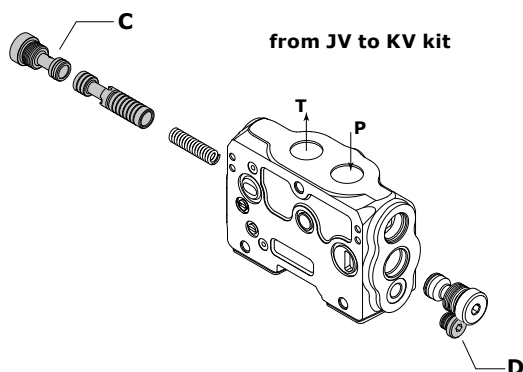
Trasformation kit

In order to trasform the inlet section from Closed Center (JV) to Open Center (KV) and viceversa.

The following kit are available:

code 320093008, from JV to KV kit

code 320093007, from KV to JV kit



Wrenches and tightening torques

C = allen wrench 8 - 30 Nm (22 lbf ft)

D = allen wrench 6 - 30 Nm (22 lbf ft)

Guide to configuration (valve general informations)

EX38 working section are available in two configuration: POST-COMPENSATED and PRE-COMPENSATED.

Has been conceived as a post-compensated Flow Sharing valve, but completely interchangeable pre-compensated sections are also available. Pre-compensated section can be freely mixed with post-compensated ones.

When using a pre-compensated section between post-compensated, priority is established for this section; if the system reaches flow saturation condition, all post-compensated sections will reduce proportionally their delivered flows, while the pre-compensated will keep a constant delivered flow.

This function is particularly appreciated on applications where the loss of the speed for a specific function must be avoided when other functions are simultaneously activated.

POST-COMPENSATED section with additional port for remoted LS relief valve (RCS)

It is possible to bring local signal to a remoted relief valve by means of a dedicated 1/4 BSP or 9/16" UNF port.

Remoted relief valve must be provided separately in the hydraulic circuit.

The local pressure limitation works properly if the section is actuated alone or if the section is the most charged.

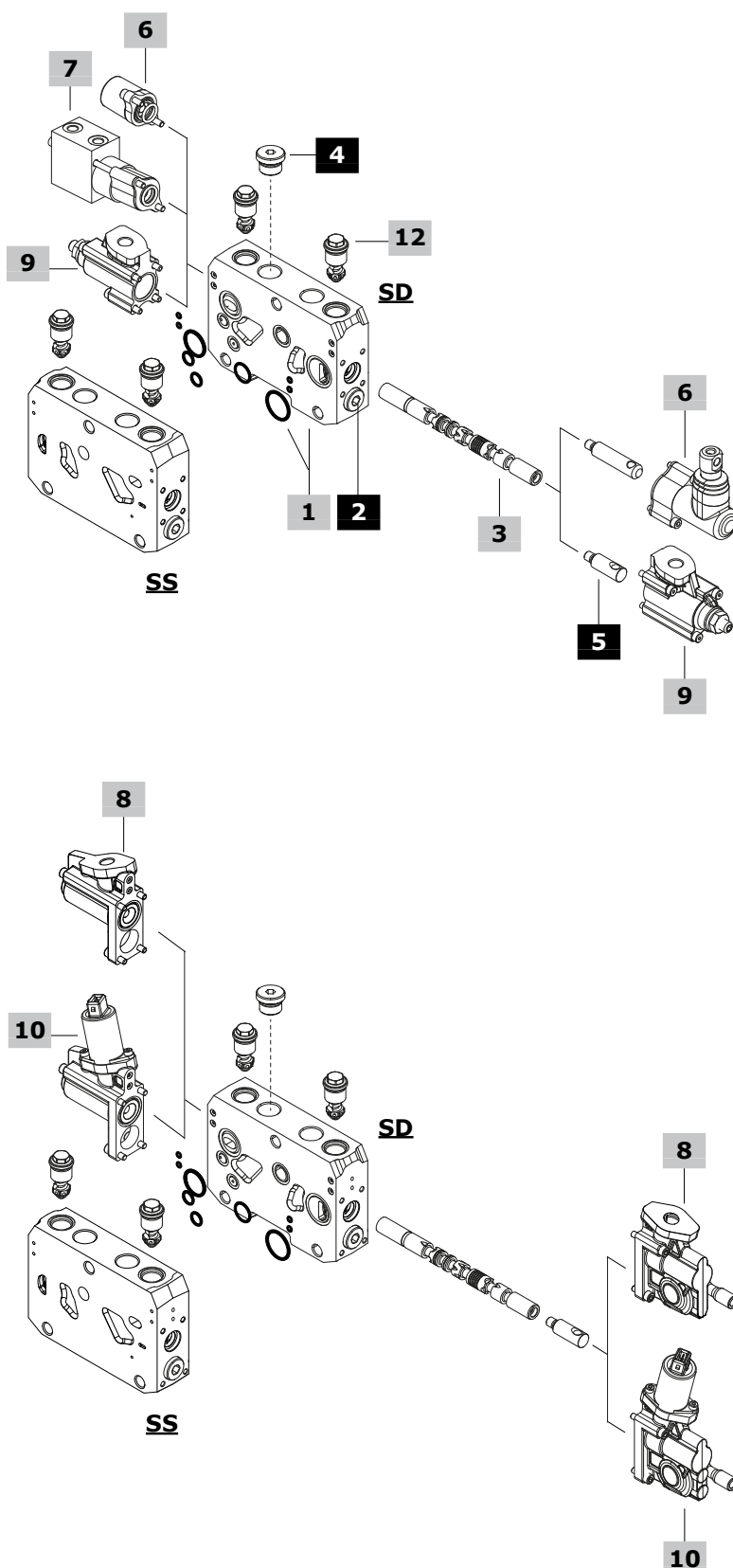
PRE-COMPENSATED section with additional port for remoted LS relief valve (RLS)

It is possible to bring local signal to a remoted relief valve by means of a dedicated 1/4 BSP or 9/16" UNF port.

Remoted relief valve must be provided separately in the hydraulic circuit. The pressure limitation generated by relieving the local LS applies to both section ports, A and B.

Parts ordering codes

Post-compensated section (Right Inlet SD - Left Inlet SS)

Working section with mechanical control

flow on A/B ports (l/min)

EX38-SD/W001C(25\25) - H001 - F001A

 Right Inlet: SD 3 6 6
 Left Inlet: SS
valve setting (bar)
A port B port

RC1-G04 . 03TF-PA(100) \ 03TF-PB(100)

1 12

Working section with pneumatic control

EX38-SD/W001C(25\25) - H001 - F022A

6 7

RC1-G04 . 03TF-PA(100)\03TF-PB(100)

Working section with prop. hydraulic control

EX38-SD/W001C(25\25) - HP05L - RC1-G04

9

03TF-PA(100)\03TF-PB(100)

Working section with hydraulic control

EX38-SD/W001C(25\25) - HP01 - FP01

8 8

RL1-G04 . 03TF-PA(100)\03TF-PB(100)

Working section with electrohydraulic control

EX38-SD/W001C(25\25) - HP04 - FP04 - B12AJ

10 10

RL1-G04 . 03TF-PA(100)\03TF-PB(100)

POST-COMPENSATED SECTION

1 Working sections* page 24

The codes are referred to sections with O-ring seals

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

For mechanical, pneumatic and proportional hydraulic controls

Standard section:

RC1 G04	039300001	With port valves arrangement
RC2 G04	039300003	Without port valves arrangement

Float section (only for SD configuration):

RCF1 G04	039300067	With port valves arrangement, requires H001 or H004 controls. Only for W012C spool
RCF2 G04	039300069	Without port valves arrangement, requires H001 or H004 controls. Only for W012C spool

Section with additional port for remoted LS relief valve (for SD/SS configurations):

RCS1 G04	039300021	With port valves arrangement
RCS2 G04	039300023	Without port valves arrangement

For hydraulic and electrohydraulic controls

Standard section:

RC1 G04	039300101	With port valves arrangement
RC2 G04	039300103	Without port valves arrangement

Float section (only for SD configuration):

RCF1 G04	039300167	With port valves arrangement, requires HP04 , HP04L or HP07 controls. Only for W012C spool
RCF2 G04	039300169	Without port valves arrangement, requires HP04 , HP04L or HP07 controls. Only for W012C spool

Standard section, for FP06 control:

RCU1 G04	039300175	With port valves arrangement
RCU2 G04	039300176	Without port valves arrangement

Section with additional port for remoted LS relief valve (only for SS configuration):

RCS1 G04	039300121	With port valves arrangement
RCS2 G04	039300123	Without port valves arrangement

NOTE: for seal kit codes, see page 140

2 Trasformation kit page 24

TYPE	CODE	DESCRIPTION
RC/RCF/RCU⁽¹⁾	430085006	Standard kit
RCS	430085041*	Additional G1/8 port for remoted LS relief valve

(¹): RCF for float circuit arrangement

RCU for FP06 control

3 Spools page 25

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

3 pos., double acting, A and B closed in neutral position:

W001C 0505	421293030	5 l/min (1.3 US gpm)
W001C 1010	421293035	10 l/min (2.6 US gpm)
W001C 1515	421293019	15 l/min (4.0 US gpm)
W001C 2525	421293040	25 l/min (6.6 US gpm)
W001C 3535	421293015	35 l/min (9.2 US gpm)
W001C 4040	421293041	40 l/min (10.6 US gpm)
W001C 5050	421293010	50 l/min (13.2 US gpm)
W001C 6565	421293020	65 l/min (17.2 US gpm)
W001C 8080	421293013	80 l/min (21 US gpm)
W001C 9090	421293016	90 l/min (23.8 US gpm)
W001C 100100	421293032	100 l/min (26.4 US gpm)

3 pos., double acting, A and B to tank in neutral position:

W002C 0505	421293065	5 l/min (1.3 US gpm)
W002C 1010	421293049	10 l/min (2.6 US gpm)
W002C 1515	421293051	15 l/min (4.0 US gpm)
W002C 2525	421293043	25 l/min (6.6 US gpm)
W002C 3535	421293131	35 l/min (9.2 US gpm)
W002C 5050	421293130	50 l/min (13.2 US gpm)
W002C 6565	421293039	65 l/min (17.2 US gpm)
W002C 8080	421293155	80 l/min (21 US gpm)
W002C 100100	421293132	100 l/min (26.4 US gpm)

3 pos., single acting on A, B plugged: G1/2 plug is required (only for SS configuration):

W005C 25	421293175	25 l/min (6.6 US gpm)
W005C 65	421293149	65 l/min (17.2 US gpm)
W005C 90	421293150	90 l/min (23.8 US gpm)

3 pos., single acting on B, A plugged: G1/2 plug is required (only for SD configuration):

W006C 25	421293175	25 l/min (6.6 US gpm)
W006C 65	421293149	65 l/min (17.2 US gpm)
W006C 90	421293150	90 l/min (23.8 US gpm)

4 pos., double acting with float in the 4th position (only for SD configuration):

W012C 1010	421293093	10 l/min (2.6 US gpm)
W012C 3535	421293147	35 l/min (9.2 US gpm)
W012C 6565	421293146	65 l/min (17.2 US gpm)
W012C 8080	421293092	80 l/min (21 US gpm)

NOTES: not symmetric spools are available on request; contact Sales Department.

W012 spool needs a special machining on the valve body and a special kit. It is available only as float circuit on Right Inlet valve. For regenerative spools, partially to tank spools and other types contact our Sales Department

4 Plug for single acting spool*

TYPE	CODE	DESCRIPTION
-	430000019	G1/2 plug

5 Spool end kit page 138

TYPE	CODE	DESCRIPTION
A side:		
-	422501205	Only with H001/H002 controls
-	422501153	Only with H004 control
-	422501217	Only with hydraulic and electrohydraulic controls
-	430093105	For W012C spools, only with H001/H002 controls
-	430093106	For W012C spools, only with H004 control
-	430085020	For W012C spools, only with HP07 control
-	430085052	For W012C spools, only with HP04/HP04L controls

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

Parts ordering codes

POST-COMPENSATED SECTION

6 Mechanical controls page 28

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
H001	320366001	With lever box
H002	320366001	With lever box, rotated 180°
H004	320366003	Without lever box
"B" side controls:		
F001A	320793001	3 pos., std. spring type A. Spring return in neutral position
F001B	320793002	3 pos., soft spring type B. Spring return in neutral position
F002A	320893001	3 pos., detent in A and B
F005A	320893002	4 pos., detent in 4 th position for float section
F145	320085011	With friction and neutral position notch
F001ASD	320093025	3 pos., with digital SPSD spool position sensor
F001ASL	320093024	3 pos., with analog SPSL spool position sensor

7 Pneumatic controls* page 30

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
See A side mechanical controls, #6		
"B" side controls:		
F022A	321293002	Proportional type, G1/8 ports
F023A	321293002	Proportional type rotated 180°, G1/8 ports

8 Hydraulic controls* page 32

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP01	322593015	With lever
"B" side controls:		
FP01	322593016	Hydraulic control

9 Proportional hydraulic controls* page 38

Type and code referred to the complete control (A+B sides)

TYPE	CODE	DESCRIPTION
HP05A	320593100	With G1/4 upper ports
HP05C	320593106	With G1/4 side ports
HP05L	320593112	With G1/4 upper ports and stroke limiter
HP05W	320593118	With G1/4 side ports

10 Two-side electrohydraulic controls page 33

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP00	322593001	With lever, electrohydraulic arrangement
HP04	322593018	With lever, 12VDC, AMP JPT connector
	322593019	With lever, 24VDC, AMP JPT connector
	322593020	With lever, 12VDC, DEUTSCH DT connector
	322593021	With lever, 24VDC, DEUTSCH DT connector
HP04L	322593022	With lever, stroke limiter, 12VDC, AMP JPT connector
	322593023	With lever, stroke limiter, 24VDC, AMP JPT connector
	322593024	With lever, stroke limiter, 12VDC, DEUTSCH DT connector
	322593025	With lever, stroke limiter, 24VDC, DEUTSCH DT connector

10 Two-side electrohydraulic controls page 33

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP07	322593026	Without lever, 12VDC, AMP JPT connector
	322593027	Without lever, 24VDC, AMP JPT connector
	322593028	Without lever, 12VDC, DEUTSCH DT connector
	322593029	Without lever, 24VDC, DEUTSCH DT connector
HP07L	322593046	Without lever, stroke limiter, 12VDC, AMP JPT connector
	322593047	Without lever, stroke limiter, 24VDC, AMP JPT connector
	322593048	Without lever, stroke limiter, 12VDC, DEUTSCH DT connector
	322593049	Without lever, stroke limiter, 24VDC, DEUTSCH DT connector
"B" side controls:		
FP00	322593101	Electrohydraulic arrangement
	322593320	As previous one, for floating sections
RCF1-RCF2		
FP04	322593107	12VDC, AMP JPT connector
	322593108	24VDC, AMP JPT connector
	322593109	12VDC, DEUTSCH DT connector
	322593110	24VDC, DEUTSCH DT connector
	322593325	12VDC, AMP JPT connector, for floating sections
	322593326	24VDC, AMP JPT connector, for floating sections
	322593327	12VDC, DEUTSCH DT connector, for floating sections
	322593328	24VDC, DEUTSCH DT connector, for floating sections
FP04L	322593111	With stroke limiter, 12VDC, AMP JPT connector
	322593112	With stroke limiter, 24VDC, AMP JPT connector
	322593113	With stroke limiter, 12VDC, DEUTSCH DT connector
	322593114	With stroke limiter, 24VDC, DEUTSCH DT connector
FP04SD	322593135	Digital SPSD spool position sensor, 12VDC, AMP JPT connector
	322593136	Digital SPSD spool position sensor, 24VDC, AMP JPT connector
	322593137	Digital SPSD spool position sensor, 12VDC, DEUTSCH DT connector
	322593138	Digital SPSD spool position sensor, 24VDC, DEUTSCH DT connector
FP04SL	322593130	Analog SPSL spool position sensor, 12VDC, AMP JPT connector
	322593131	Analog SPSL spool position sensor, 24VDC, AMP JPT connector
	322593132	Analog SPSL spool position sensor, 12VDC, DEUTSCH DT connector
	322593133	Analog SPSL spool position sensor, 24VDC, DEUTSCH DT connector

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

POST-COMPENSATED SECTION

12 Port valves page 55			12 Port valves (cont.) page 55		
Setting is referred to 10 l/min (2.6 Us gpm)			TYPE	CODE	DESCRIPTION
TYPE	CODE	DESCRIPTION	02TF PA/PB	915089001	Anticavitation valve
03TF PA/PB	915870190	Combined valve	05TF PA/PB	430490001	Valve blanking plug
Settings:					
└ setting (bar)					
40 bar (580 psi)	50 bar (725 psi)	60 bar (850 psi)			
70 bar (1020 psi)	80 bar (1150 psi)	90 bar (1300 psi)			
100 bar (1450 psi)	110 bar (1600 psi)	120 bar (1750 psi)			
130 bar (1900 psi)	140 bar (2050 psi)	150 bar (2150 psi)			
160 bar (2300 psi)	170 bar (2450 psi)	180 bar (2600 psi)			
190 bar (2750 psi)	200 bar (2900 psi)	210 bar (3050 psi)			
220 bar (3200 psi)	230 bar (3350 psi)	240 bar (3500 psi)			
250 bar (3600 psi)	260 bar (3750 psi)	270 bar (3900 psi)			
280 bar (4050 psi)	290 bar (4200 psi)	300 bar (4350 psi)			
310 bar (4500 psi)	320 bar (4650 psi)	330 bar (4800 psi)			
340 bar (4950 psi)	350 bar (5050 psi)				

NOTE:

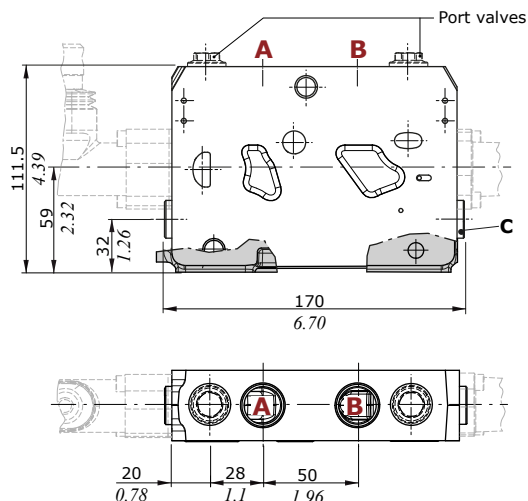
Always indicate setting value when using fixed setting combined valve: 03TF PA (120) - 03TF PB (120).

Dimensional data and hydraulic circuits

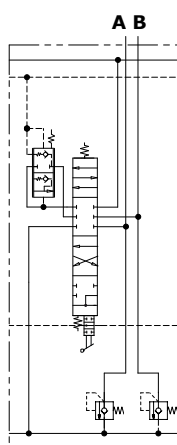
Post-compensated section

RC1 - RCF1 - RCU1 types

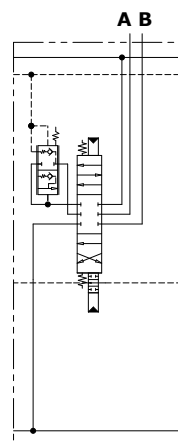
Standard section with
port valves arrangement
(RCF1 for floating circuit/RCU1 for FP06 control)

**RCF1**

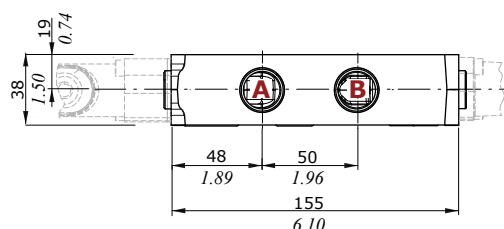
Mechanical control
with port valves for
floating circuit

**RC2**

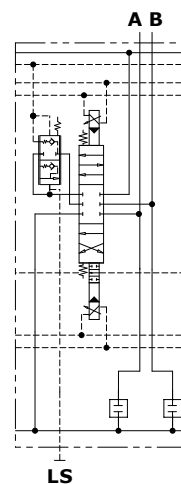
Hydraulic control
without port valves

**RC2 - RCF2 - RCU2 types**

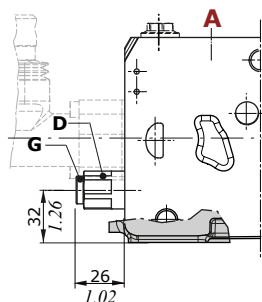
Standard section without
port valves arrangement
(RCF2 for floating circuit/RCU2 for FP06 control)

**RCS1**

Electrohydraulic control
with port valves and
additional G1/8 port for
remoted LS relief valve

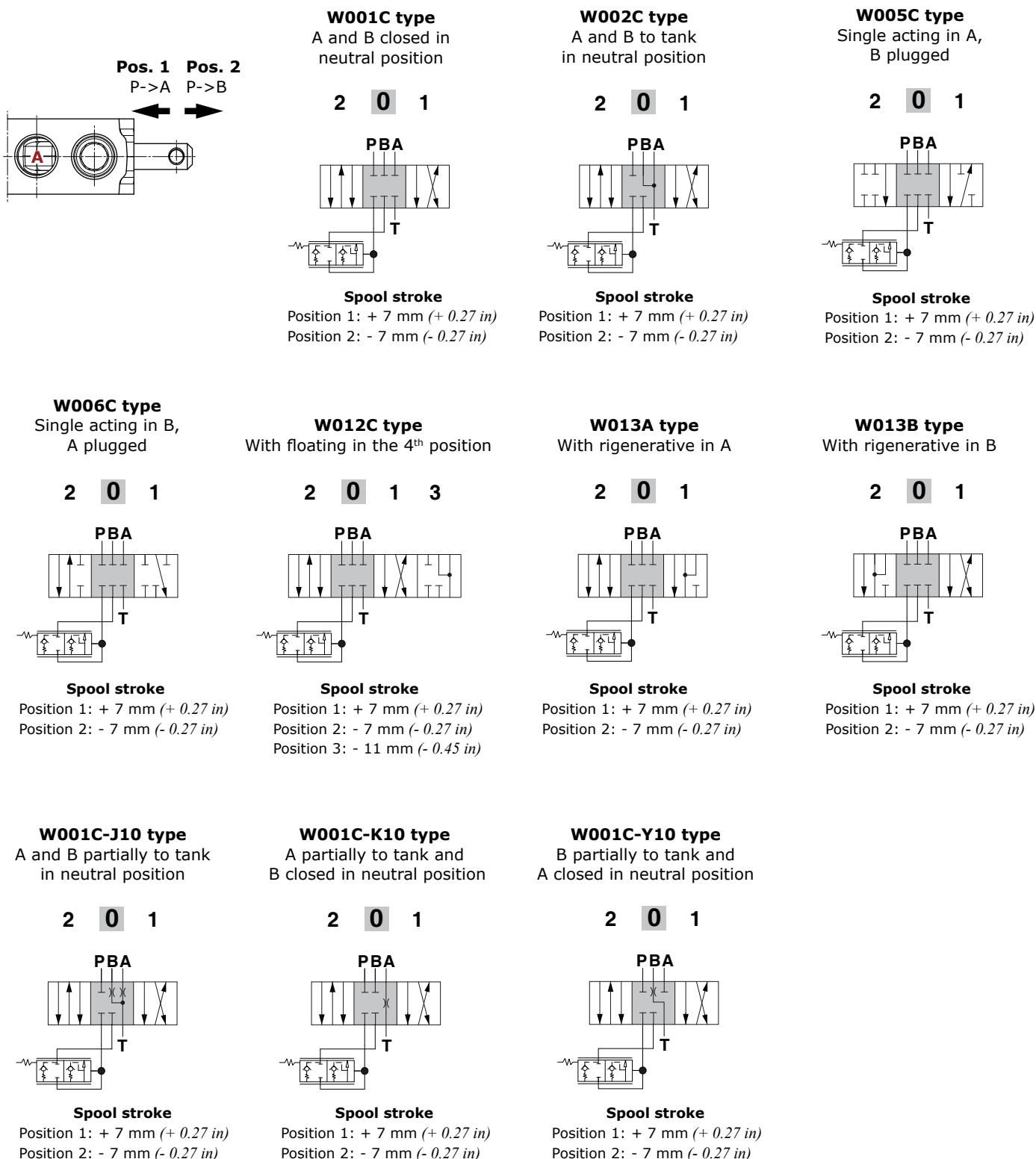
**RCS1 - RCS2 types**

With additional G1/8 port for
remoted LS relief valve, with port
valves arrangement (RCS1) and without
port valves arrangement (RCS2)

**Wrenches and tightening torques**

C = allen wrench 8 - 30 Nm (22 lbft)
D = wrench 19 - 60 Nm (44.2 lbft)
G = allen wrench 5 - 13 Nm (9.58 lbft)

Post-compensated section



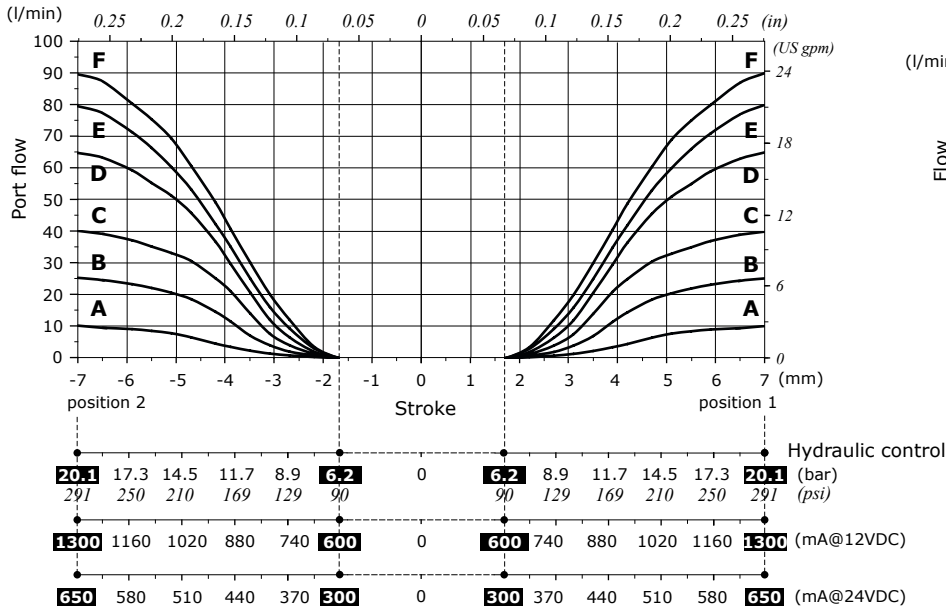
Spools

Post-compensated section

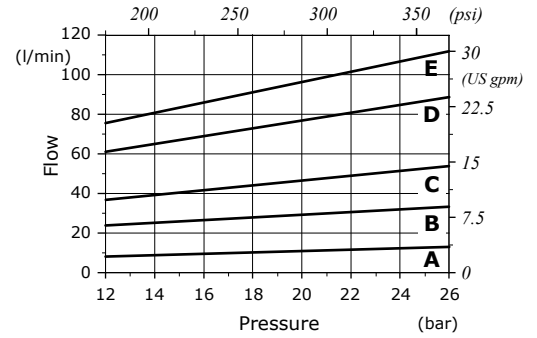
3 position spools metering curve

Q_{in}: 120 l/min (31.7 US gpm) - open center circuit (KV)

Pump compensator @ 14 bar (200 psi)



Spool flow vs. stand-by pressure (margin pressure) on closed center circuit (JV)



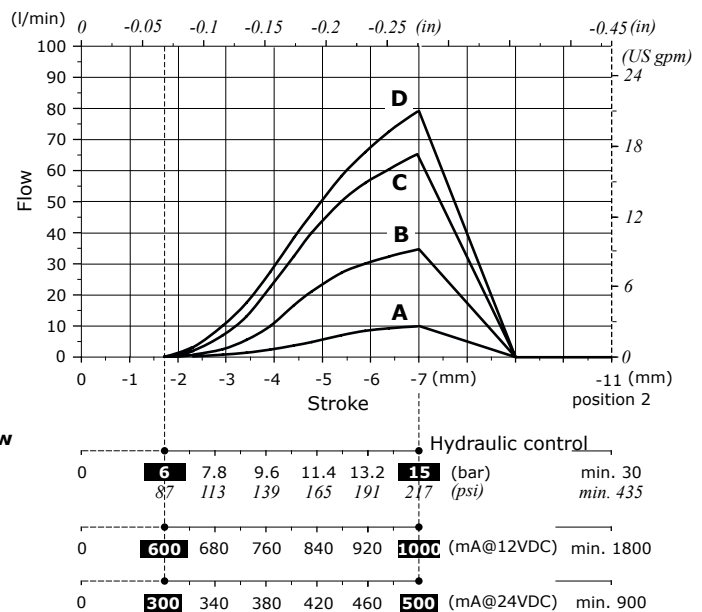
Curves with spool nominal flow @ 14 bar (200 psi) stand-by (margin pressure)

- A = 10 l/min (2.6 US gpm)
- B = 25 l/min (6.6 US gpm)
- C = 40 l/min (10.6 US gpm)
- D = 65 l/min (17 US gpm)
- E = 80 l/min (21 US gpm)
- F = 90 l/min (24 US gpm)

Floating spools metering curve

Q_{in}: 120 l/min (31.7 US gpm) - open center circuit (KV)

Pump compensator @ 14 bar (200 psi)



Curves with spool nominal flow @ 14 bar (200 psi) stand-by (margin pressure)

- A = 10 l/min (2.6 US gpm)
- B = 35 l/min (9.2 US gpm)
- C = 65 l/min (17 US gpm)
- D = 80 l/min (21 US gpm)

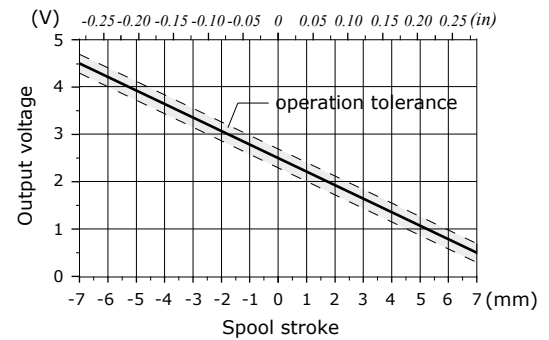
Spools position sensor

SPSL sensor

The SPSL position sensor converts the spool movements into a voltage linear signal.

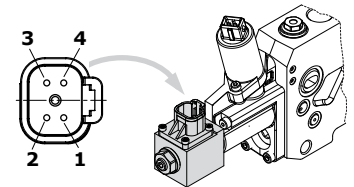
Working conditions		
Voltage supply		5 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	range	from 0.5 to 4.5 V
	linearity	± 5%
	spool in neutral	2.5 ± 0.2 V
	max. current	1 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSL sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	+ 5V
2	not connected
3	GND
4	signal OUT



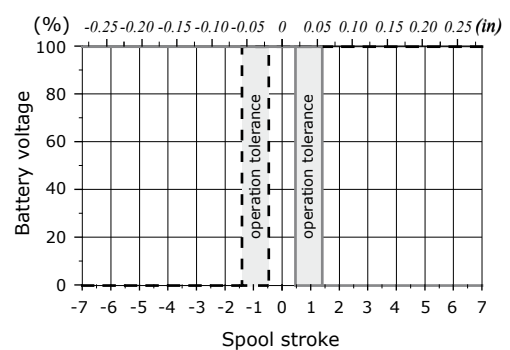
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

The SPSP position sensor converts the spool movements into an electric digital signal.

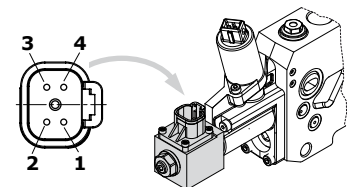
Working conditions		
Voltage supply		from 9 to 32 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	type	PNP
	max. current	6 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSD sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	Out A
2	GND
3	VB +
4	Out B



Deutsch DT06-4S mating connector, code 5CON140072

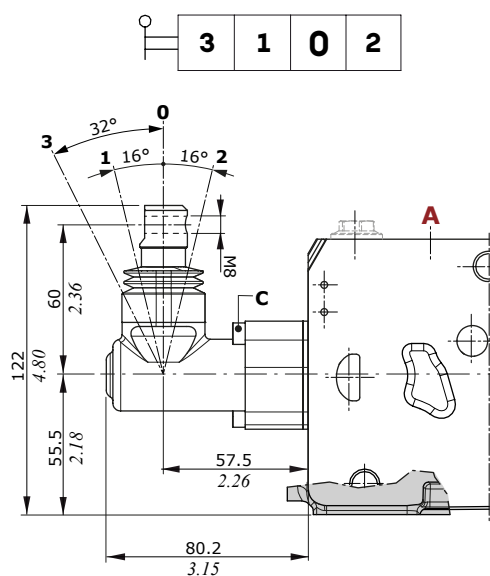
Post-compensated sections

Mechanical controls

"A" side controls

H001 type

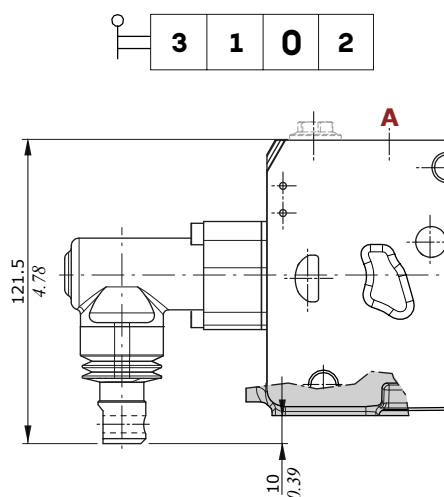
With lever box



H002 type

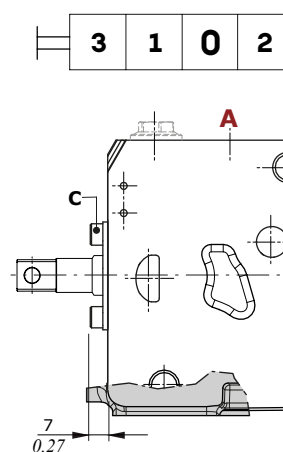
With lever box, rotated 180°

Dimensions are the same of H001 type



H004 type

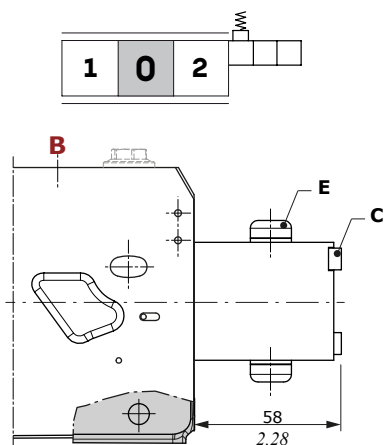
Without lever box



"B" side controls

F145 type

With friction and neutral position notch



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

E = allen wrench 7 - 20 Nm (14.7 lbft)

Post-compensated sections

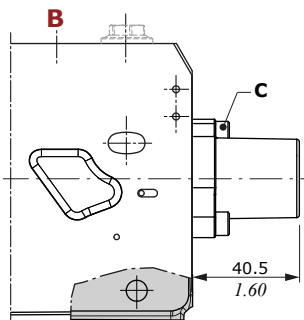
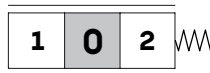
Mechanical controls

"B" side controls

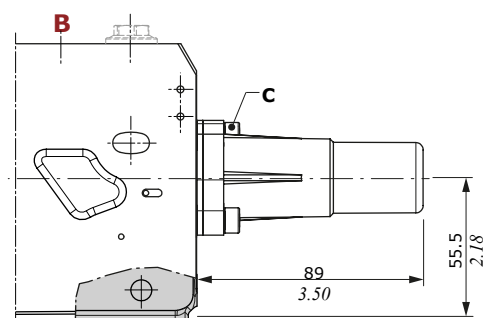
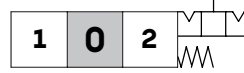
Controls are available with standard spring A type (F001A) or soft spring B type (F001B)

F001A - F001B types

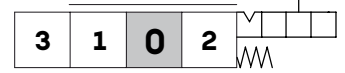
With spring A or B, return in neutral position

**F002A type**

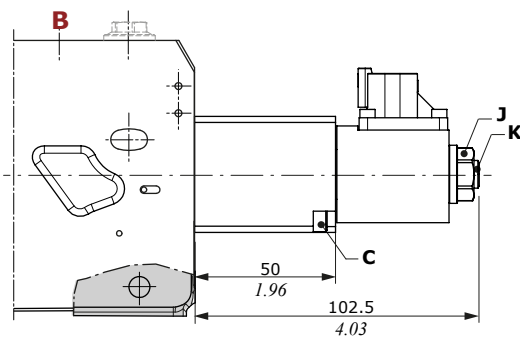
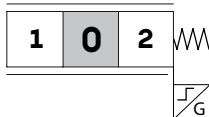
With spring A, detent in A and B

**F005A type**

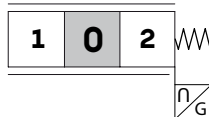
With spring A, detent in 4th pos. For floating section

**F001ASD type**

With spring A, digital SPSP spool position sensor

**F001ASL type**

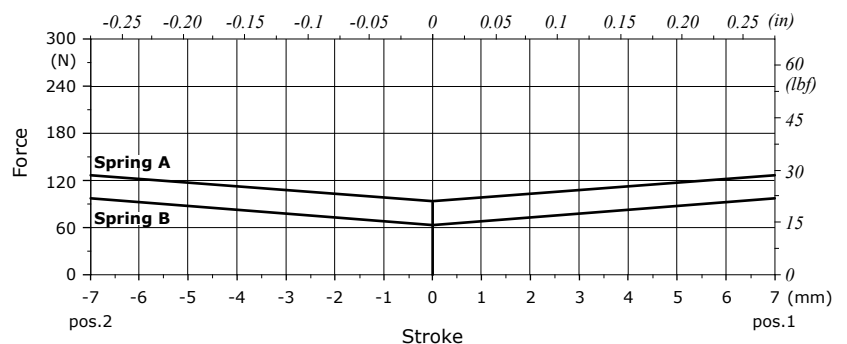
With spring A, analog SPSP spool position sensor

**Wrenches and tightening torques**

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf ft)

J = wrench 17 - 9.8 Nm (7.2 lbf ft)

K = allen wrench 4 - 9.8 Nm (7.2 lbf ft)

Force vs Stroke diagram**Legenda**

Spring A = from 98 N to 125 N (22 lbf to 28 lbf)

Spring B = from 68.6 N to 98.6 N (15.4 lbf to 22.1 lbf)

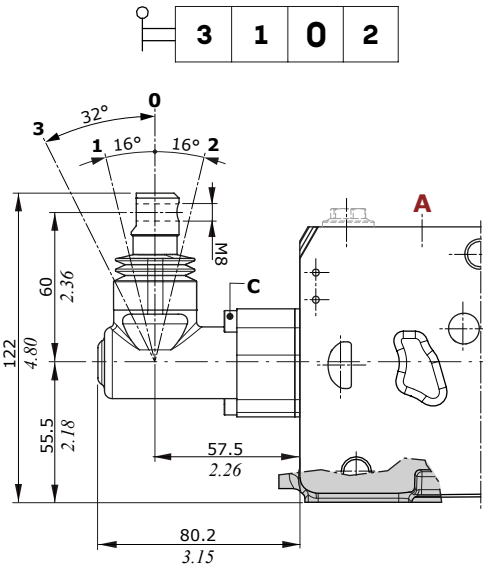
Post-compensated sections

Pneumatic controls

"A" side controls

H001 type

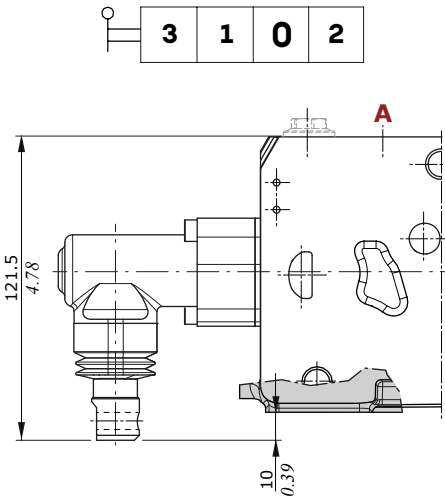
With lever box



H002 type

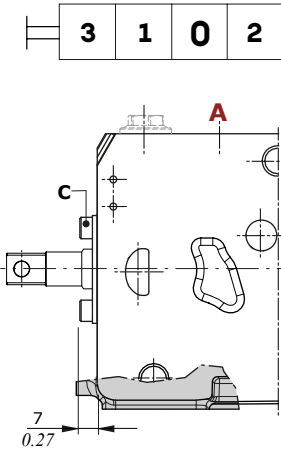
With lever box, rotated 180°

Dimensions are the same of H001 type



H004 type

Without lever box



Wrenches and tightening torques

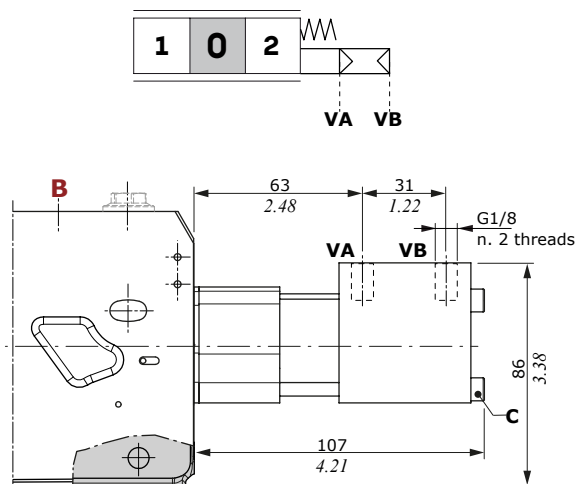
C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

Post-compensated sections

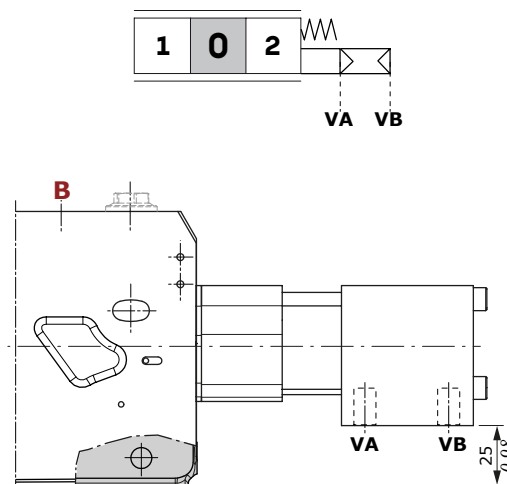
Pneumatic controls

"B" side controls

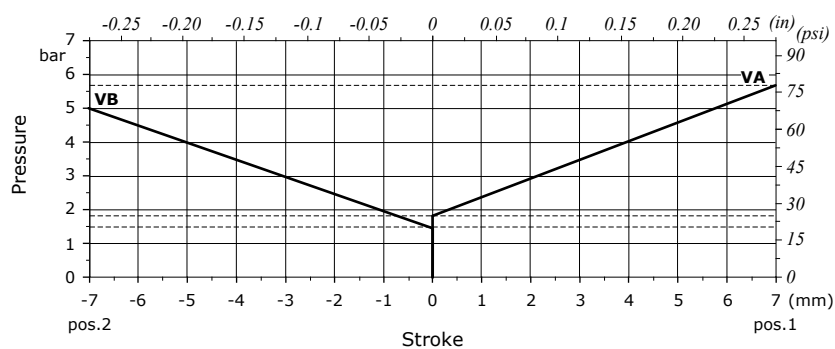
F022A type
Proportional pneumatic control



F023A type
As F022A type, rotated 180°



Stroke vs. Pressure diagram



Legenda

VA = from 1.8 bar to 5.7 bar (26.1 psi to 82.6 psi)

VB = from 1.5 bar to 5 bar (21.7 psi to 72.5 psi)

Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

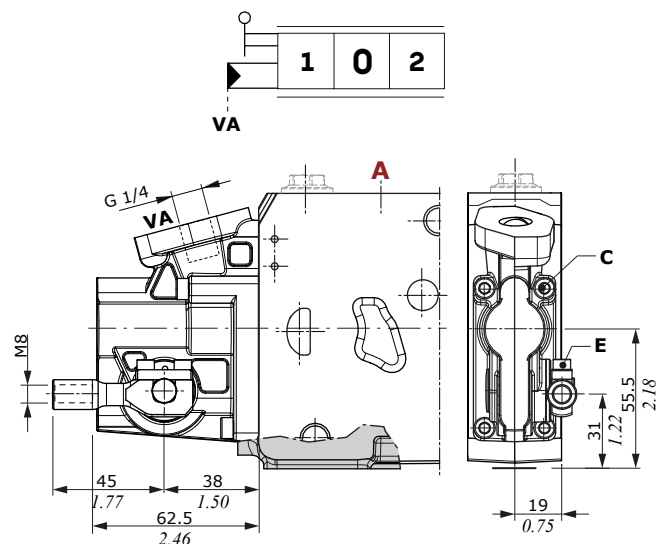
Post-compensated sections

Hydraulic controls

"A" side controls

HP01 type

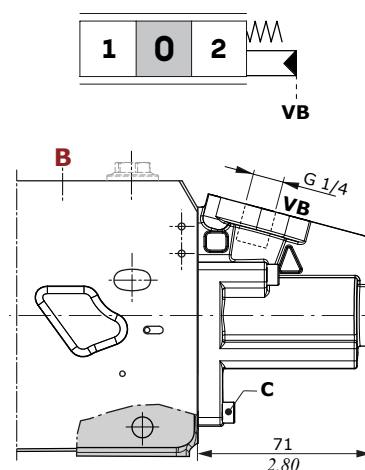
Proportional hydraulic control with lever



"B" side controls

FP01 type

Proportional hydraulic control

**Wrenches and tightening torques**

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

E = allen wrench 3 - 2 Nm (1.5 lbf·ft)

Proportional electrohydraulic controls

Following specifications are measured with:

- mineral oil of 32 mm²/s - 32 cSt viscosity at 50°C - 122°F temperature,
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

A and B sides spool controls

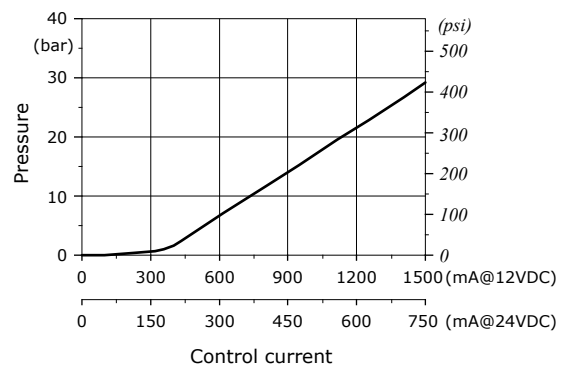
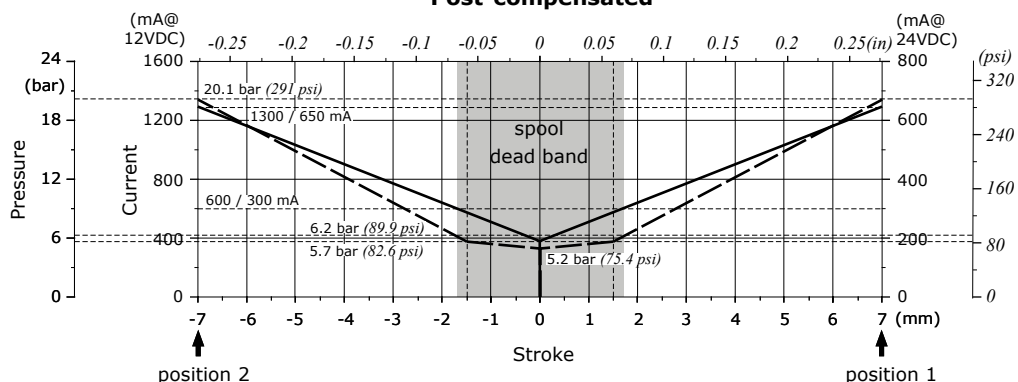
Electric specifications

Coil impedance	12 VDC	4.7 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption	0	
Min. flow control signal	12 VDC	400 mA
	24 VDC	200 mA
Flow control signal	12 VDC	1200 mA
	24 VDC	600 mA
Dither frequency	70 - 90 Hz	
Insertion	100%	
Coil insulation	Class H (180°C - 356°F)	
Connector type	AMP JPT Deutsch DT	
Weather protection (connector)	IP65 (JPT type) IP69K (DT type)	

Hydraulic specifications

Max. pressure	40 bar (580 psi)
Max. back pressure on solenoid valve drain	5 bar (72.5 psi)

Solenoid pressure reducing valve performance

Stroke vs. Current/Pressure diagram
Post-compensated

Post-compensated sections

Two-side electrohydraulic controls

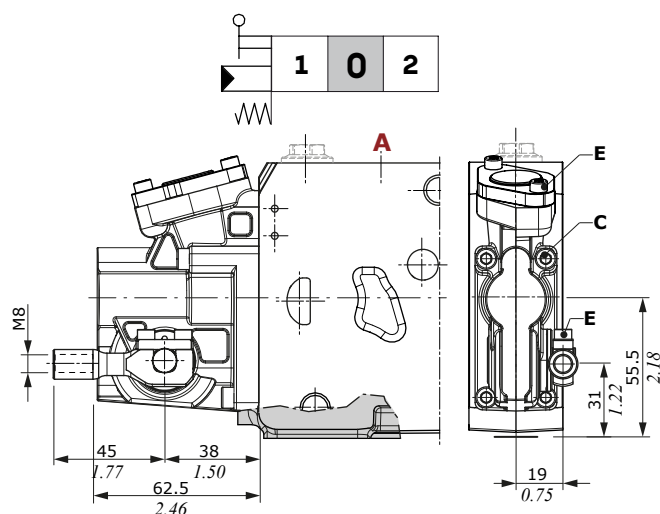
"A" side controls

Control Types

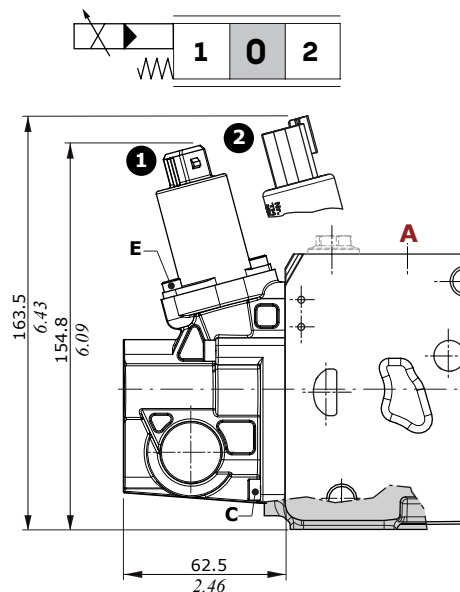
① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003

② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

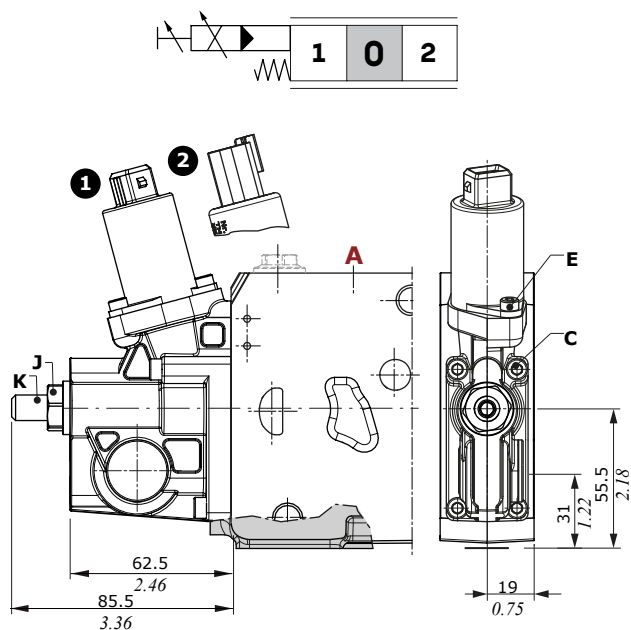
HP00 type
With lever,
electrohydraulic arrangement



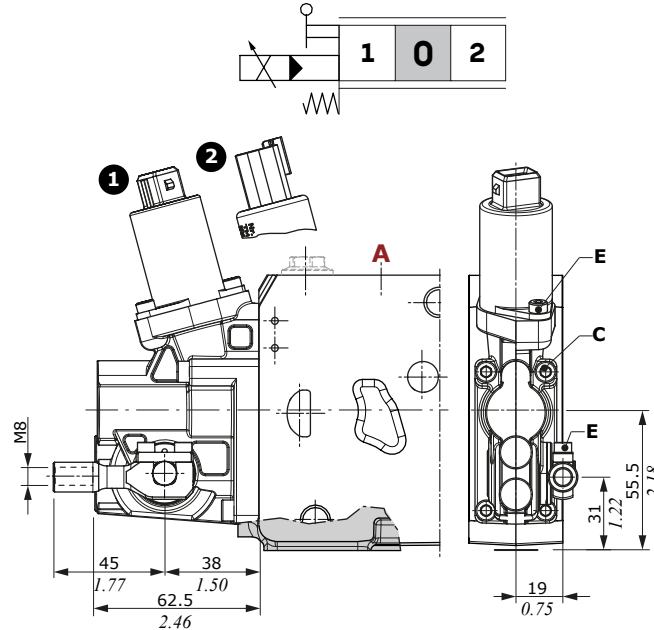
HP07 type
Without lever



HP07L type
Without lever with stroke limiter



HP04 type
With lever



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)

E = allen wrench 3 - 2 Nm (1.5 lbf_t)

J = wrench 17 - 24 Nm (17.7 lbf_t)

K = allen wrench 5

Post-compensated sections

Two-side electrohydraulic controls

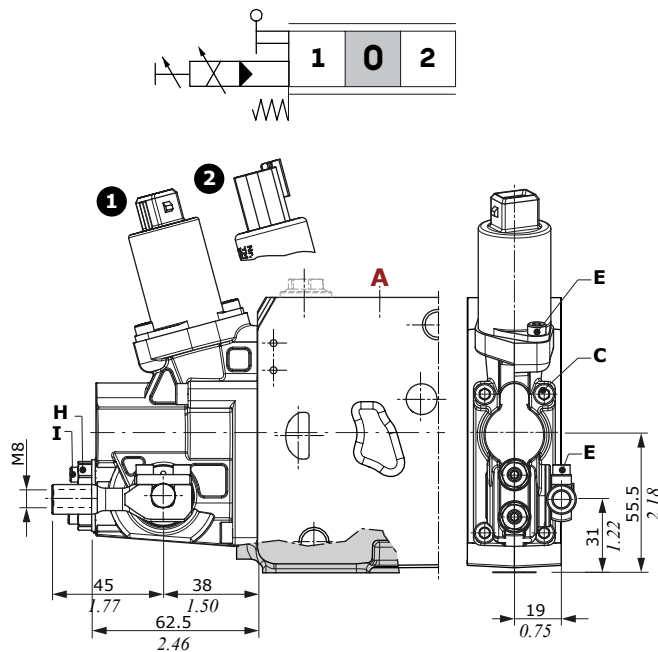
"A" side controls

Control Types

- 1 : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
 2 : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

HP04L type

With lever and stroke limiter



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)E = allen wrench 3 - 2 Nm (1.5 lbf_t)H = wrench 10 - 9.8 Nm (7.2 lbf_t)

I = allen wrench 3

J = wrench 17 - 9.8 Nm (7.2 lbf_t)

K = allen wrench 4

"B" side controls

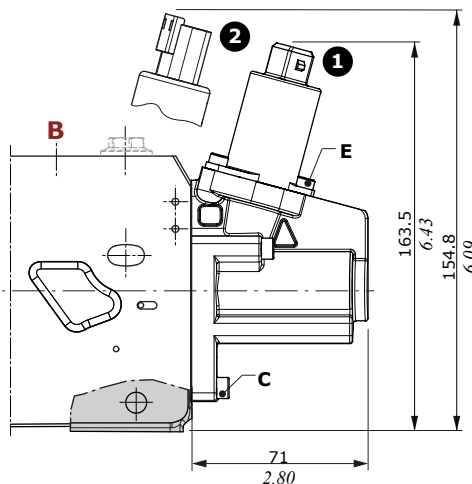
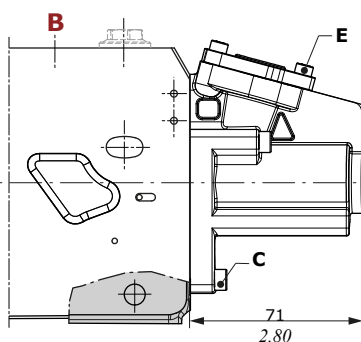
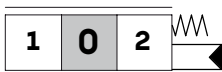
FP04 type

Electrohydraulic control



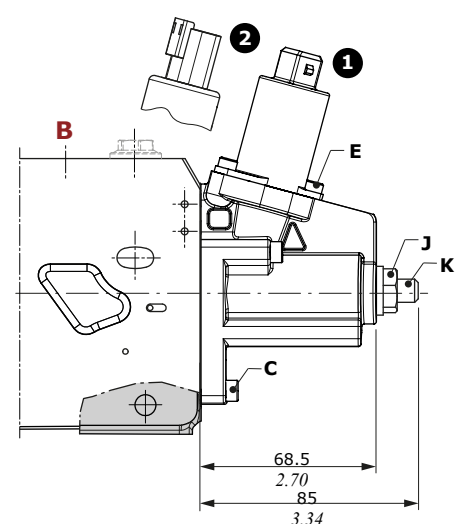
FP00 type

Electrohydraulic arrangement



FP04L type

With stroke limiter



Post-compensated sections

Two-side electrohydraulic controls

"B" side controls

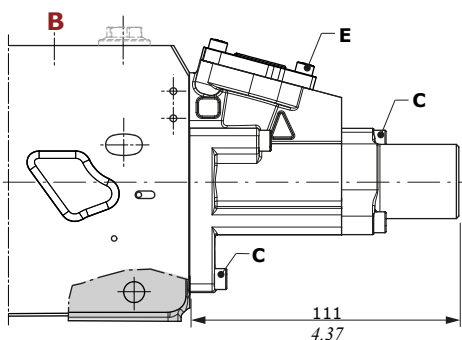
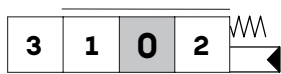
Control Types

① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003

② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

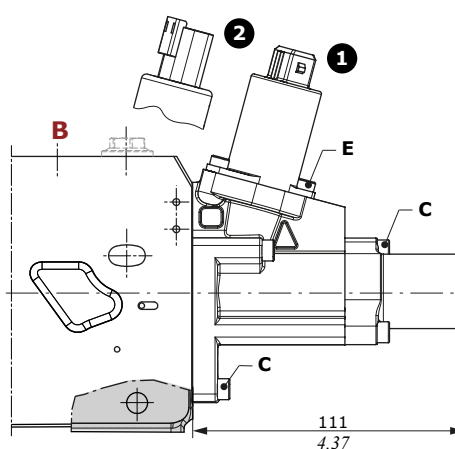
FP00 type

Electrohydraulic arrangement
for floating section



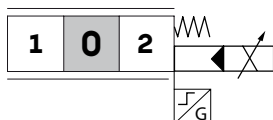
FP04 type

Electrohydraulic control
for floating section



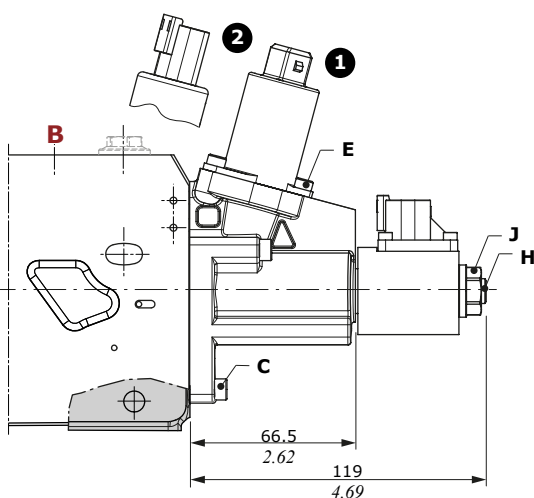
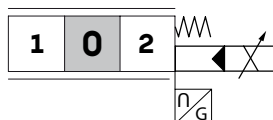
FP04SD type

With digital SPSP
spool position sensor



FP04SL type

With analog SPSP
spool position sensor



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

E = allen wrench 3 - 2 Nm (1.5 lbft)

J = wrench 17 - 9.8 Nm (7.2 lbft)

H = allen wrench 4 - 9.8 Nm (7.2 lbft)

Note: for sensor types, see page 27

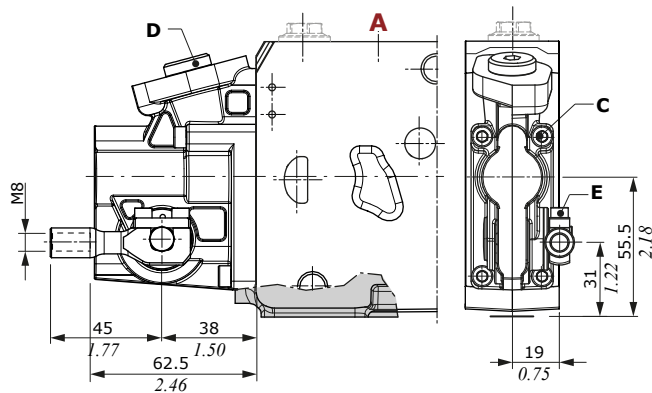
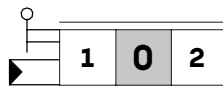
Post-compensated sections

One-side electrohydraulic controls

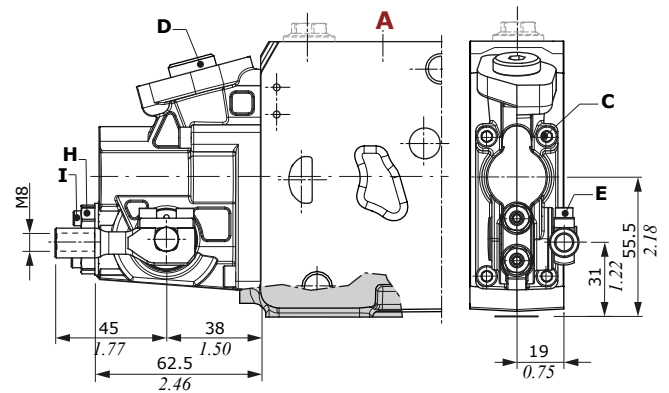
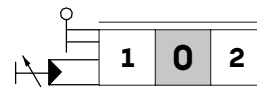
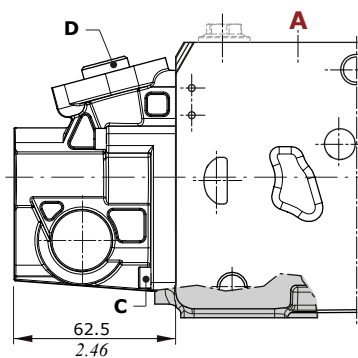
"A" side controls

Control Types*

- ① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
 ② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

HP06 type
With lever

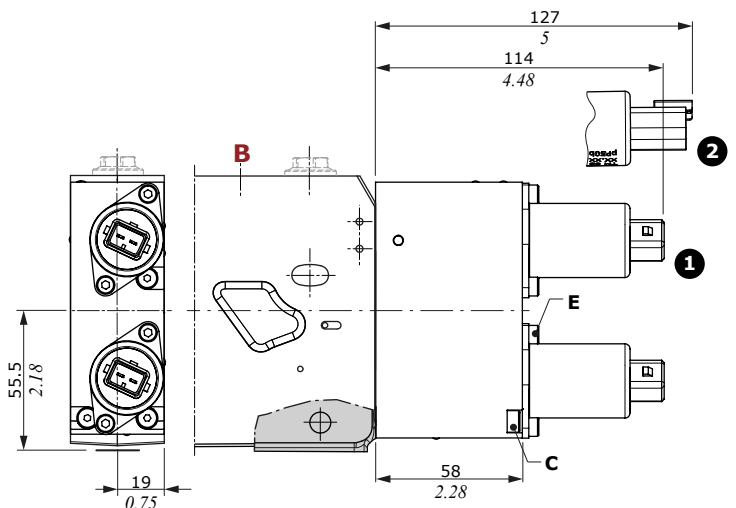
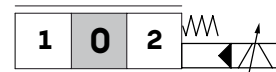
HP06L type

With lever
and stroke limiterHP10 type
Without lever

"B" side control*

FP06 type

One-side electrohydraulic control



Wrenches and tightening torques

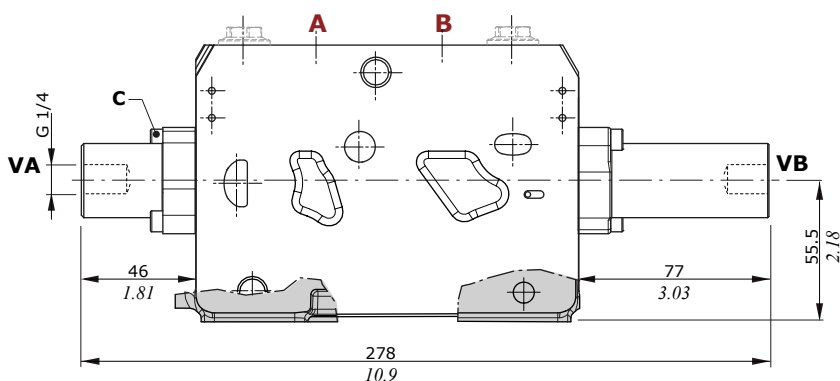
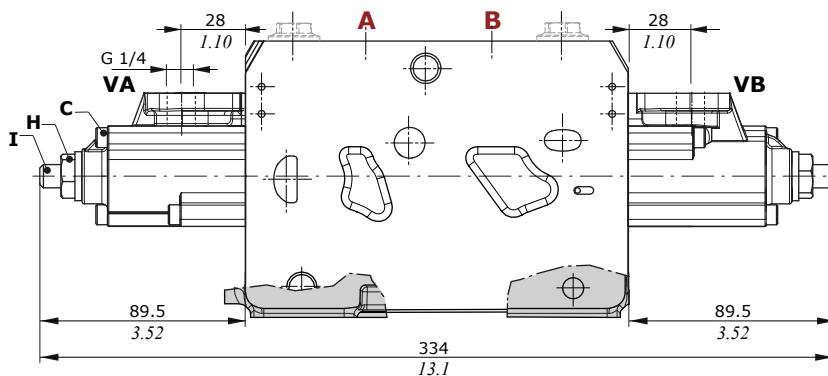
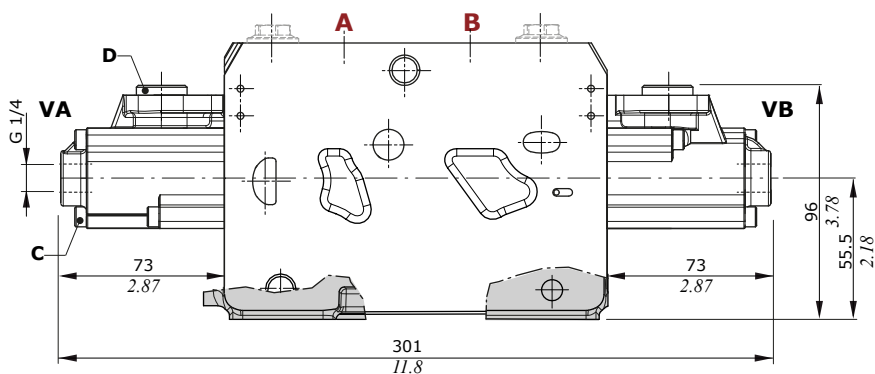
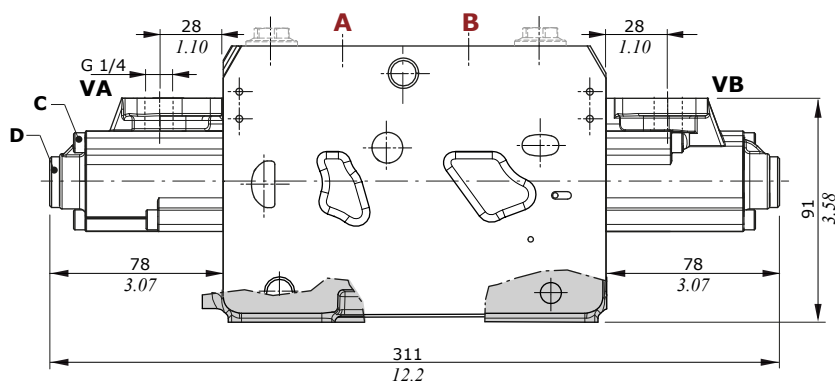
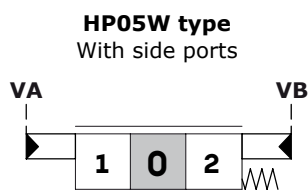
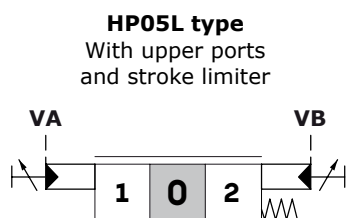
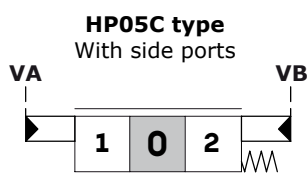
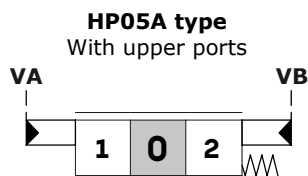
- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
 D = allen wrench 6 - 30 Nm (22 lbft)
 E = allen wrench 3 - 2 Nm (1.5 lbft)
 H = wrench 10 - 9.8 Nm (7.2 lbft)
 I = allen wrench 3

Post-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

Controls are available with upper or side ports.



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

H = wrench 17 - 9.8 Nm (7.2 lbft)

I = allen wrench 4

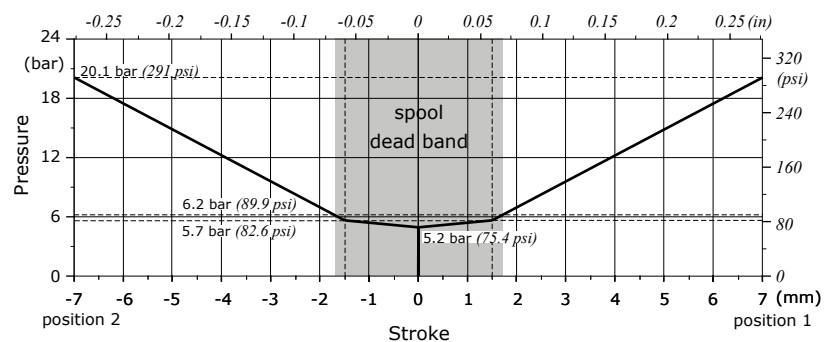
Post-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page

Stroke vs. Pressure diagram



Compatibility table

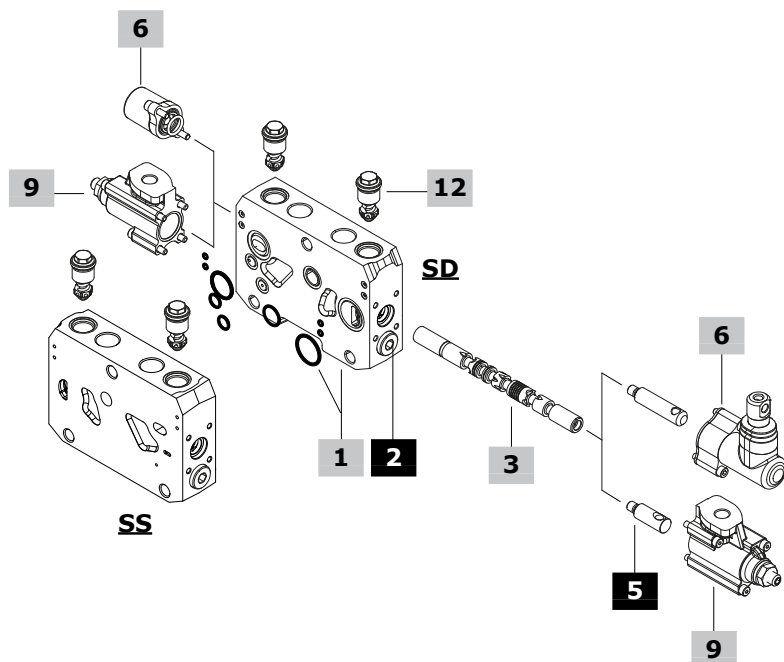
Combination controls and spool end kit		"A" side controls											
		H001 H002	H004	HP00	HP01	HP04	HP04L	HP06	HP06L	HP07	HP07L	HP10	HP05
"B" side controls	F001A	422501205	422501153										
	F001B	422501205	422501153										
	F002A	422501205	422501153										
	F005A	430093105	430093106										
	F145	422501205	422501153										
	F001ASD	422501205	422501153										
	F001ASL	422501205	422501153										
	F022A	422501205	422501153										
	F023A	422501205	422501153										
	FP00			422501217 430085052*									
	FP01				422501217								
	FP04					422501217 430085052*	422501217 430085052*			422501217 430085020*	422501217		
	FP04L									422501217	422501217		
	FP06							422501217	422501217			422501217	
	FP04SL					422501217	422501217			422501217			
	FP04SD					422501217	422501217			422501217			
	HP05												422501217

(*)= For floating spools

For spool end types, see page 138

Parts ordering codes

Pre-compensated section (Right Inlet SD - Left Inlet SS)

Working section with mechanical control

flow on A/B ports (l/min)

EX38-SD/W001C(25\25) - H001 - F001A

Right Inlet: SD	3	6	6
Left Inlet: SS			

valve setting (bar)
A port B port

RC1-G04 . 03TF-PA(100) \ 03TF-PB(100)

1

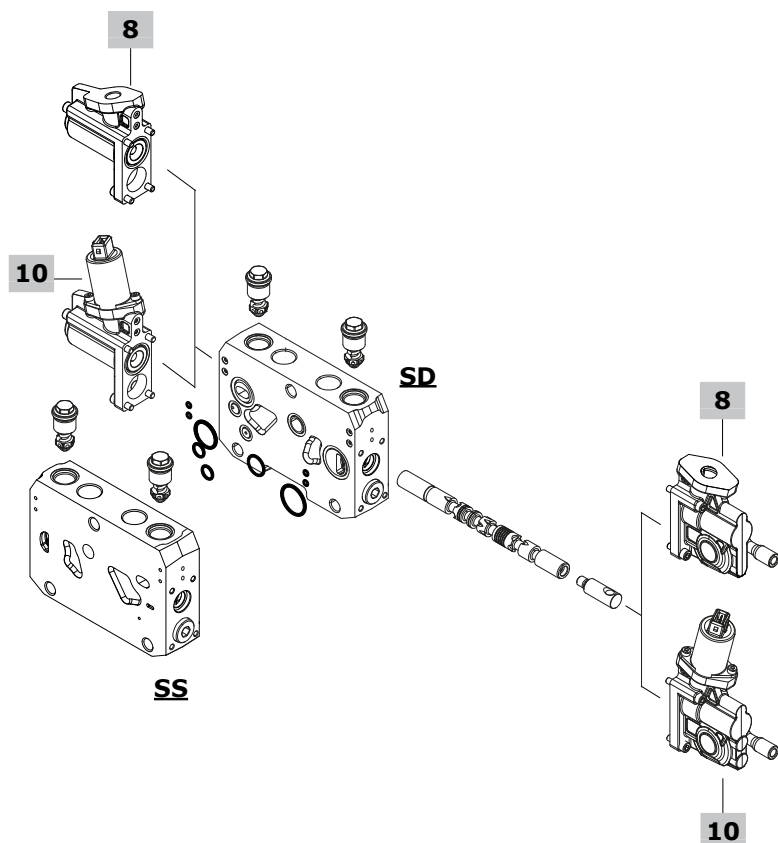
12

Working section with prop. hydraulic control

EX38-SD/W001C(25\25) - HP05L - RC1-G04

9

03TF-PA(100)\03TF-PB(100)

Working section with hydraulic control

EX38-SD/W001C(25\25) - HP01 - FP01

8

8

RL1-G04 . 03TF-PA(100)\03TF-PB(100)

Working section with electrohydraulic control

EX38-SD/W001C(25\25) - HP04 - FP04 - B12AJ

10

10

RL1-G04 . 03TF-PA(100)\03TF-PB(100)

PRE-COMPENSATED SECTION

1 Working sections* page 43

The codes are referred to sections with O-ring seals

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

For mechanical and proportional hydraulic controls

Standard section:

RL1 G04	039300051	With port valves arrangement
RL2 G04	039300053	Without port valves arrangement

Section with additional port for remoted LS relief valve

(for SD/SS configurations):

RLS1 G04	039300063	With port valves arrangement
RLS2 G04	039300065	Without port valves arrangement

For hydraulic and electrohydraulic controls

Standard section:

RL1 G04	039300151	With port valves arrangement
RL2 G04	039300153	Without port valves arrangement

Section with additional port for remoted LS relief valve

(only for SS configuration):

RLS1 G04	039300163	With port valves arrangement
RLS2 G04	039300165	Without port valves arrangement

NOTE: for seal kit codes, see page 140

2 Trasformation kit page 43

TYPE	CODE	DESCRIPTION
RL	430085029	Standard kit
RLS	430085042*	Additional G1/8 port for remoted LS relief valve

3 Spools page 44

TYPE	CODE	DESCRIPTION
<u>3 pos., double acting, A and B closed in neutral position:</u>		
W001C 1515	421293048	15 l/min (4.0 US gpm)
W001C 2525	421293063	25 l/min (6.6 US gpm)
W001C 4040	421293064	40 l/min (10.6 US gpm)
W001C 6565	421293075	65 l/min (17.2 US gpm)
<u>3 pos., double acting, A and B to tank in neutral position:</u>		
W002C 1515	421293091	15 l/min (4.0 US gpm)
W002C 2525	421293082	25 l/min (6.6 US gpm)
W002C 4040	421293081	40 l/min (10.6 US gpm)
W002C 6565	421293080	65 l/min (17.2 US gpm)

NOTE: not symmetric spools are available on request; contact Sales Department.

5 Spool end kit page 138

TYPE	CODE	DESCRIPTION
-	430085044	Only with H001/H002 control
-	430085045	Only with H004 control
-	430085026	For hydraulic and electrohydraulic controls

6 Mechanical controls page 46

Please choose A+B side controls

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

"A" side controls:

H001	320366001	With lever box
H002	320366001	With lever box, rotated 180°
H004	320366003	Without lever box

"B" side controls:

F001A	320785001	3 pos., std. spring type A. Spring return in neutral position
F001B	320785002	3 pos., soft spring type B. Spring return in neutral position
F001ASD	320093027	3 pos., with digital SPSP spool position sensor
F001ASL	320093026	3 pos., with analog SPSP spool position sensor

8 Hydraulic controls* page 48

Please choose A+B side controls

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

"A" side controls:

HP01	322593015	With lever
-------------	-----------	------------

"B" side controls:

FP01	320593231	Hydraulic control
-------------	-----------	-------------------

9 Proportional hydraulic controls* page 53

Type and code referred to the complete control (A+B sides)

TYPE	CODE	DESCRIPTION
HP05A	320593200	With G1/4 upper ports
HP05C	320593206	With G1/4 side ports
HP05L	320593212	With G1/4 upper ports and stroke limiter
HP05W	320593218	With G1/4 side ports

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

Parts ordering codes

PRE-COMPENSATED SECTION

10 Two-side electrohydraulic controls page 49

Please choose A+B side controls

TYPE CODE DESCRIPTION

"A" side controls:

HP00	322593001	With lever, electrohydraulic arrangement
HP04	322593018	With lever, 12VDC, AMP JPT connector
	322593019	With lever, 24VDC, AMP JPT connector
	322593020	With lever, 12VDC, DEUTSCH DT connector
	322593021	With lever, 24VDC, DEUTSCH DT connector
HP04L	322593022	With lever, stroke limiter, 12VDC, AMP JPT connector
	322593023	With lever, stroke limiter, 24VDC, AMP JPT connector
	322593024	With lever, stroke limiter, 12VDC, DEUTSCH DT connector
	322593025	With lever, stroke limiter, 24VDC, DEUTSCH DT connector
HP07	322593026	Without lever, 12VDC, AMP JPT connector
	322593027	Without lever, 24VDC, AMP JPT connector
	322593028	Without lever, 12VDC, DEUTSCH DT conn.
	322593029	Without lever, 24VDC, DEUTSCH DT conn.
HP07L	322593046	Without lever, stroke limiter, 12VDC, AMP JPT connector
	322593047	Without lever, stroke limiter, 24VDC, AMP JPT connector
	322593048	Without lever, stroke limiter, 12VDC, DEUTSCH DT connector
	322593049	Without lever, stroke limiter, 24VDC, DEUTSCH DT connector

"B" side controls:

FP00	322593201	Electrohydraulic arrangement
FP04	322593207	12VDC, AMP JPT connector
	322593208	24VDC, AMP JPT connector
	322593209	12VDC, DEUTSCH DT connector
	322593210	24VDC, DEUTSCH DT connector
FP04L	322593211	With stroke limiter, 12VDC, AMP JPT conn.
	322593212	With stroke limiter, 24VDC, AMP JPT conn.
	322593213	With stroke limiter, 12VDC, DEUTSCH DT conn.
	322593214	With stroke limiter, 24VDC, DEUTSCH DT conn.
FP04SD	322593233	Digital SPSP spool position sensor, 12VDC, AMP JPT connector
	322593234	Digital SPSP spool position sensor, 24VDC, AMP JPT connector
	322593235	Digital SPSP spool position sensor, 12VDC, DEUTSCH DT connector
	322593236	Digital SPSP spool position sensor, 24VDC, DEUTSCH DT connector
FP04SL	322593228	Analog SPSP spool position sensor, 12VDC, AMP JPT connector
	322593229	Analog SPSP spool position sensor, 24VDC, AMP JPT connector
	322593230	Analog SPSP spool position sensor, 12VDC, DEUTSCH DT connector
	322593231	Analog SPSP spool position sensor, 24VDC, DEUTSCH DT connector

12 Port valves**page 55**

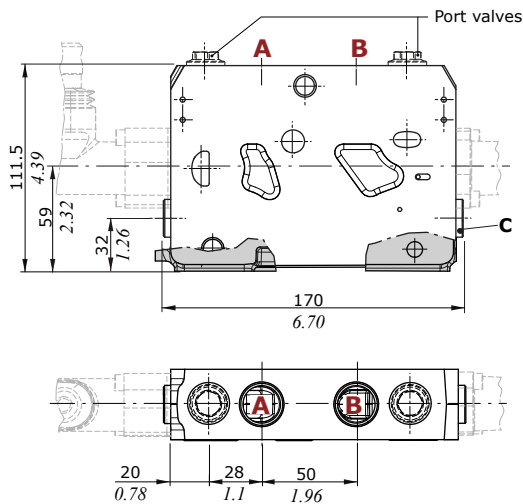
For port valves, see #12 page 23

Dimensional data and hydraulic circuits

Pre-compensated section

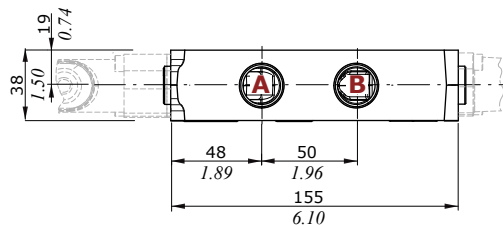
RL1 type

Standard section with port valves arrangement



RL2 type

Standard section without port valves arrangement

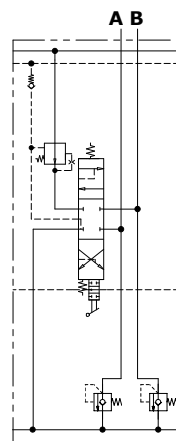


Wrenches and tightening torques

C = allen wrench 8 - 60 Nm (44.2 lbft)
D = wrench 19 - 60 Nm (44.2 lbft)
G = allen wrench 5 - 13 Nm (9.58 lbft)

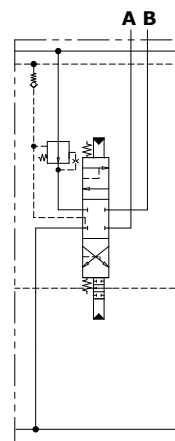
RL1

Mechanical control with port valves



RL2

Hydraulic control without port valves

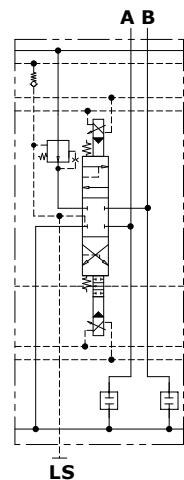
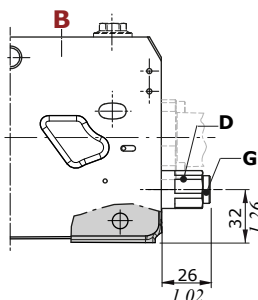


RLS1

Electrohydraulic control with port valve and with additional G1/8 port for remoted LS relief valves

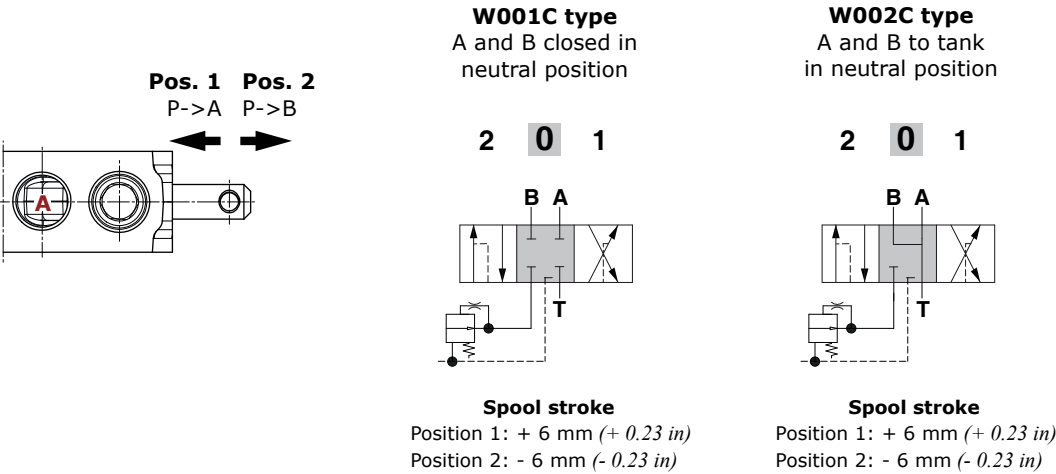
RLS1 - RLS2 types

With additional G1/8 port for remoted LS relief valve, with port valves arrangement (RLS1) and without port valves arrangement (RLS2)



Spools

Pre-compensated section



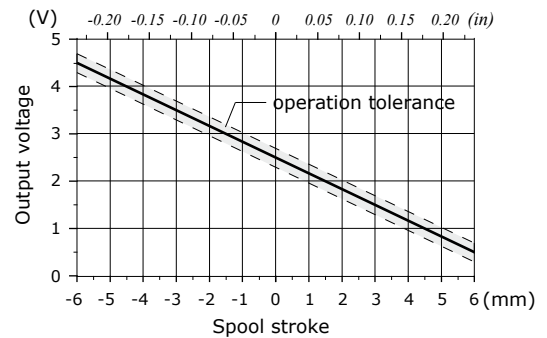
Spools position sensor

SPSL sensor

The SPSL position sensor converts the spool movements into a voltage linear signal.

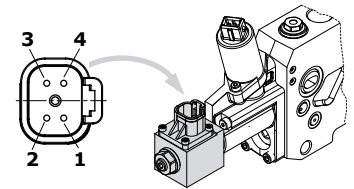
Working conditions		
Voltage supply		5 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	range	from 0.5 to 4.5 V
	linearity	± 5%
	spool in neutral	2.5 ± 0.2 V
	max. current	1 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSL sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	+ 5V
2	not connected
3	GND
4	signal OUT



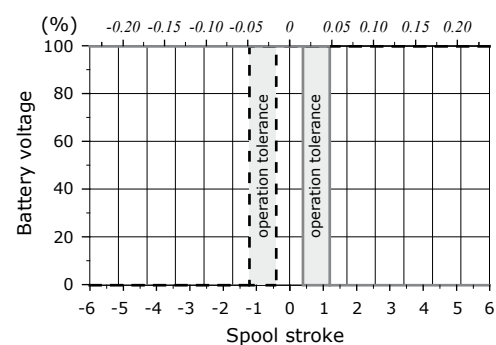
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

The SPSP position sensor converts the spool movements into an electric digital signal.

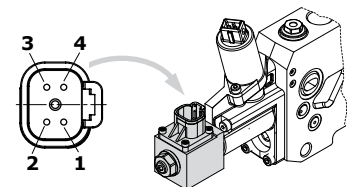
Working conditions		
Voltage supply		from 9 to 32 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	type	PNP
	max. current	6 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSD sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	Out A
2	GND
3	VB +
4	Out B



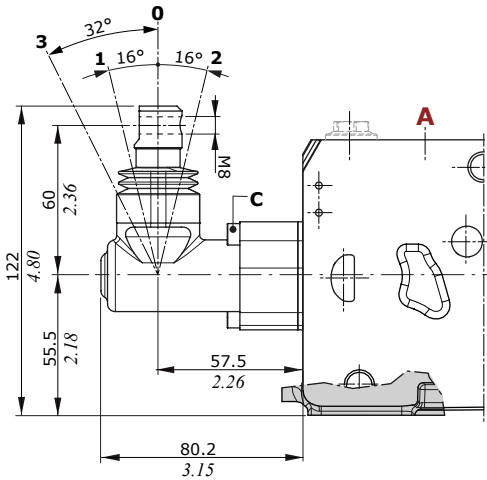
Deutsch DT06-4S mating connector, code 5CON140072

Pre-compensated sections

Mechanical controls

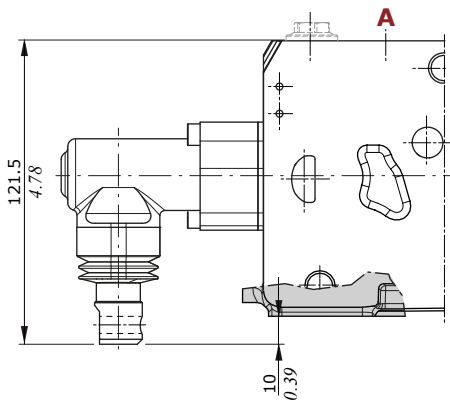
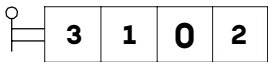
"A" side controls

H001 type
With lever box

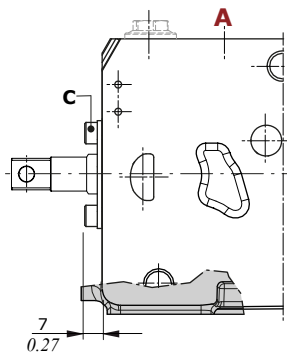
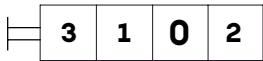


H002 type

With lever box, rotated 180°
Dimensions are the same of H001 type



H004 type
Without lever box



Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

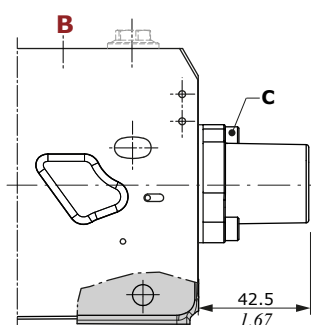
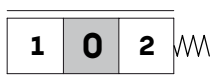
Mechanical controls

"B" side controls

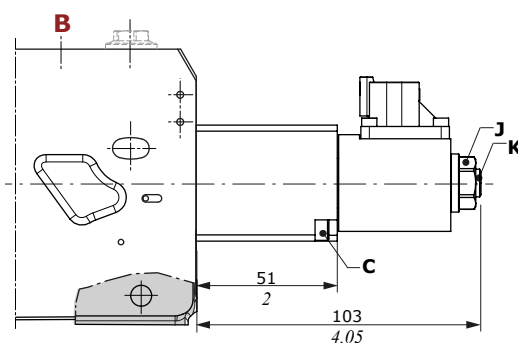
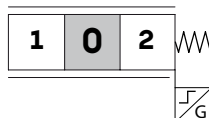
Controls are available with standard spring A type (F001A) or soft spring B type (F001B)

F001A - F001B types

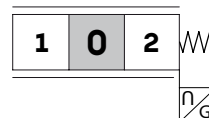
With spring A or B,
return in neutral position

**F001ASD type**

With spring A, digital SPSP
spool position sensor

**F001ASL type**

With spring A, analog SPSP
spool position sensor

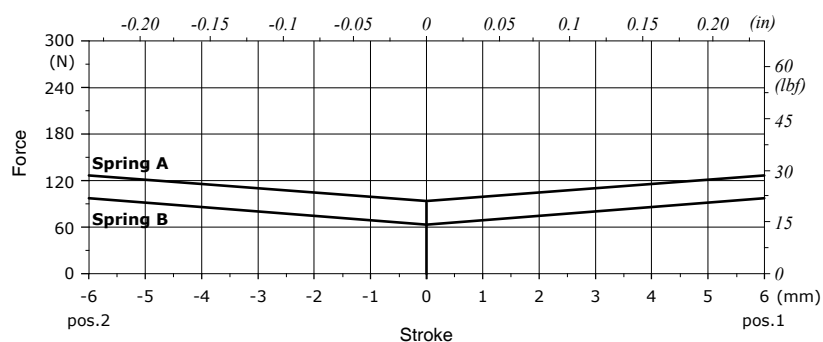
**Wrenches and tightening torques**

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

J = wrench 17 - 9.8 Nm (7.2 lbf·ft)

K = allen wrench 4 - 9.8 Nm (7.2 lbf·ft)

Note: for sensor types, see page 45

Force vs Stroke diagram**Legenda**

Spring A = from 98 N to 125 N (22 lbf to 28 lbf)

Spring B = from 68.6 N to 98.6 N (15.4 lbf to 22 lbf)

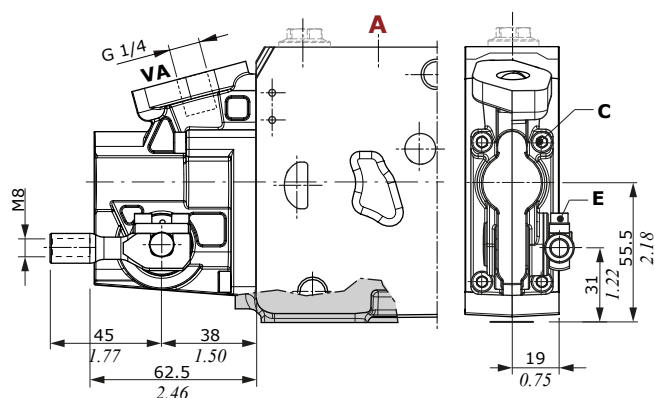
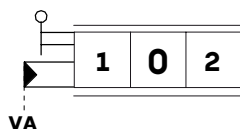
Pre-compensated sections

Hydraulic controls

"A" side controls

HP01 type

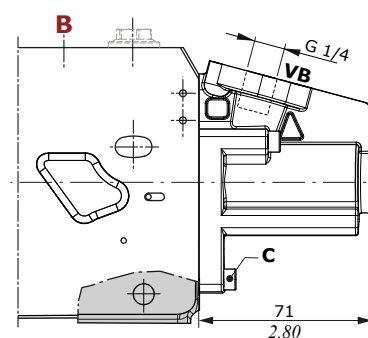
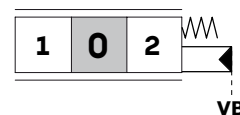
Proportional hydraulic control with lever



"B" side controls

FP01 type

Proportional hydraulic control



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

E = allen wrench 3 - 2 Nm (1.5 lbft)

Proportional electrohydraulic controls

Following specifications are measured with:

- mineral oil of 32 mm²/s - 32 cSt viscosity at 50°C - 122°F temperature,
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

A and B sides spool controls

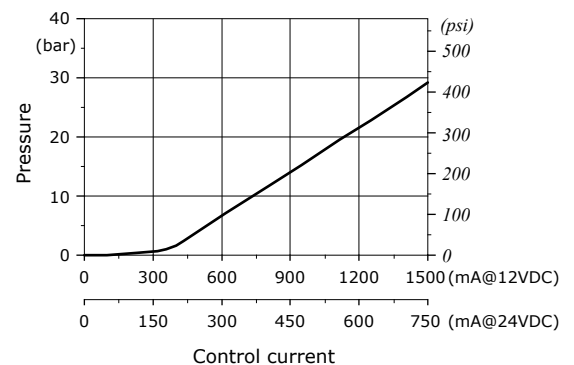
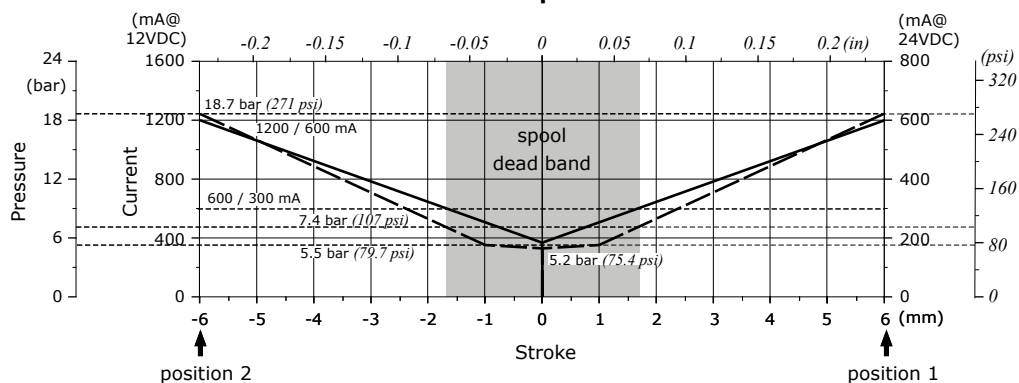
Electric specifications

Coil impedance	12 VDC	4.7 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption	0	
Min. flow control signal	12 VDC	400 mA
	24 VDC	200 mA
Flow control signal	12 VDC	1200 mA
	24 VDC	600 mA
Dither frequency	70 - 90 Hz	
Insertion	100%	
Coil insulation	Class H (180°C - 356°F)	
Connector type	AMP JPT	
	Deutsch DT	
Weather protection (connector)	IP65 (JPT type)	
	IP69K (DT type)	

Hydraulic specifications

Max. pressure	40 bar (580 psi)
Max. back pressure on solenoid valve drain	5 bar (72.5 psi)

Solenoid pressure reducing valve performance

Stroke vs. Current/Pressure diagram
Pre-compensated

Pre-compensated sections

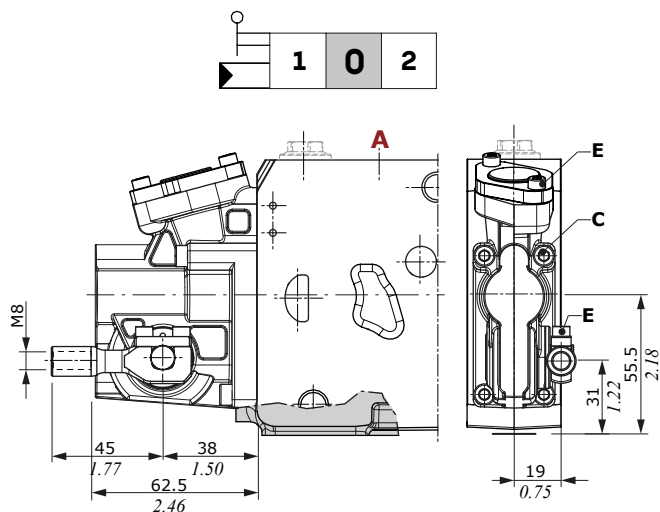
Two-side electrohydraulic controls

"A" side controls

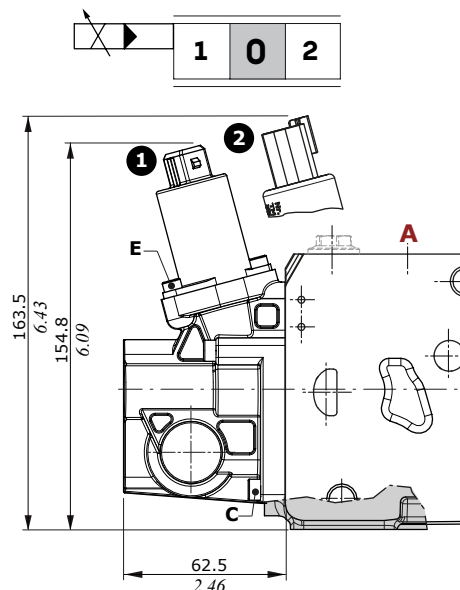
Control Types

- ① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
 ② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

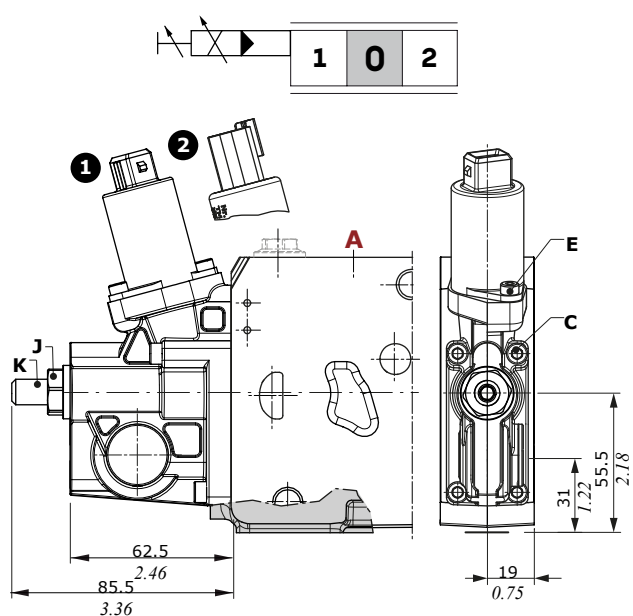
HP00 type
 With lever,
 electrohydraulic arrangement



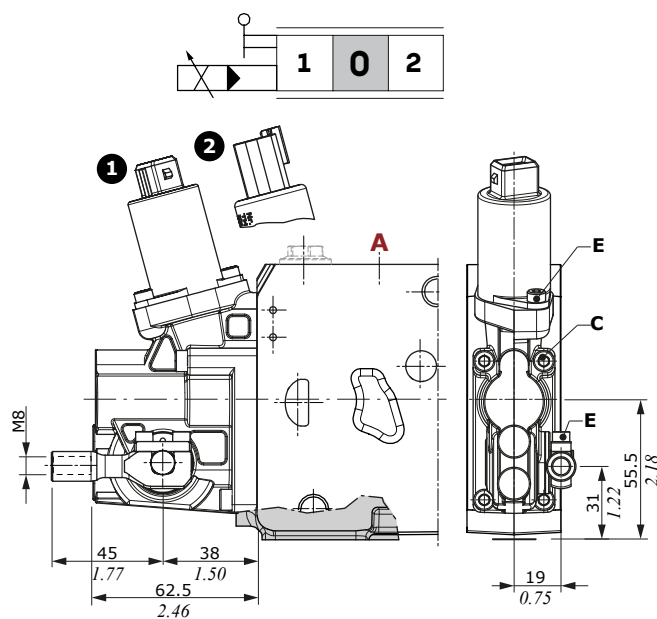
HP07 type
 Without lever



HP07L type
 Without lever with stroke limiter



HP04 type
 With lever



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)

E = allen wrench 3 - 2 Nm (1.5 lbf_t)

J = wrench 17 - 24 Nm (17.7 lbf_t)

K = allen wrench 5

Two-side electrohydraulic controls

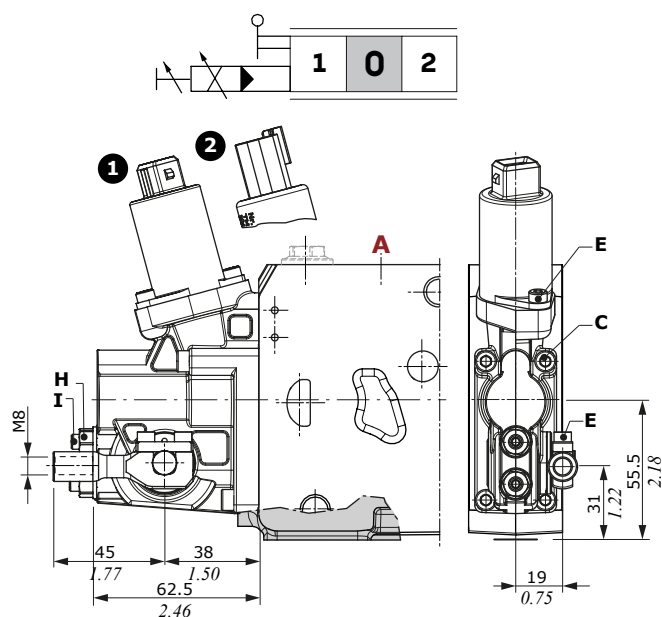
"A" side controls

Control Types

- ① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
 ② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

HP04L type

With lever and stroke limiter



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

E = allen wrench 3 - 2 Nm (1.5 lbf·ft)

H = wrench 10 - 9.8 Nm (7.2 lbf·ft)

I = allen wrench 3

Pre-compensated sections

Two-side electrohydraulic controls

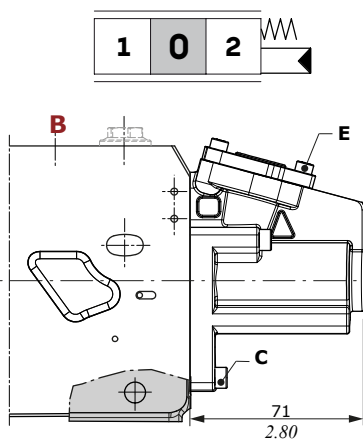
"B" side controls

Control Types

- ① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
 ② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

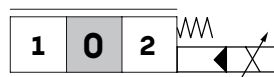
FP00 type

Electrohydraulic arrangement



FP04 type

Electrohydraulic control



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

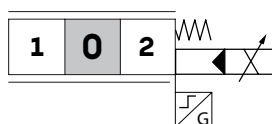
E = allen wrench 3 - 2 Nm (1.5 lbf·ft)

J = wrench 17 - 9.8 Nm (7.2 lbf·ft)

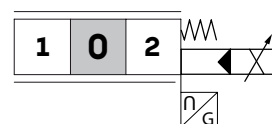
K = allen wrench 4

H = allen wrench 4 - 9.8 Nm (7.2 lbf·ft)

FP04SD type
 With digital SPSP
 spool position sensor



FP04SL type
 With analog SPSP
 spool position sensor



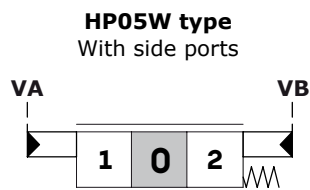
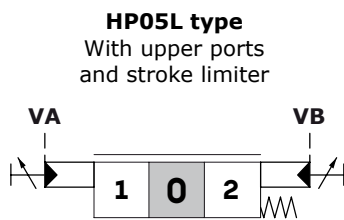
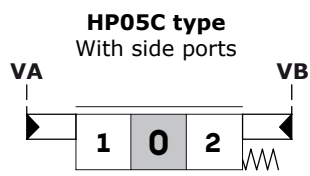
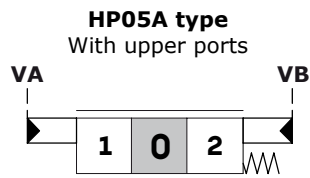
Note: for sensor types, see page 45

Pre-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

Controls are available with upper or side ports.



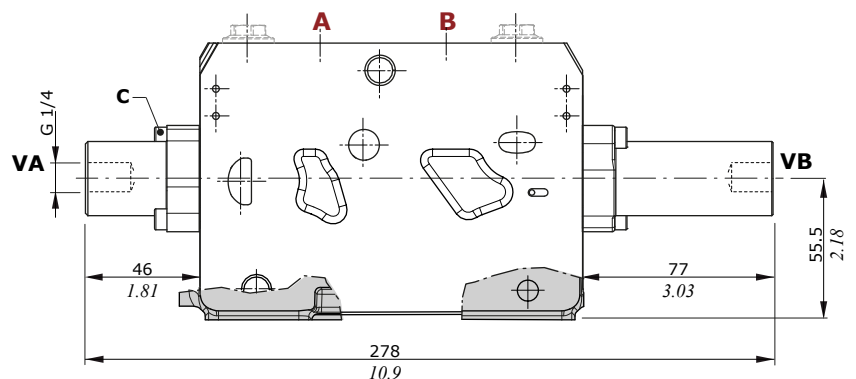
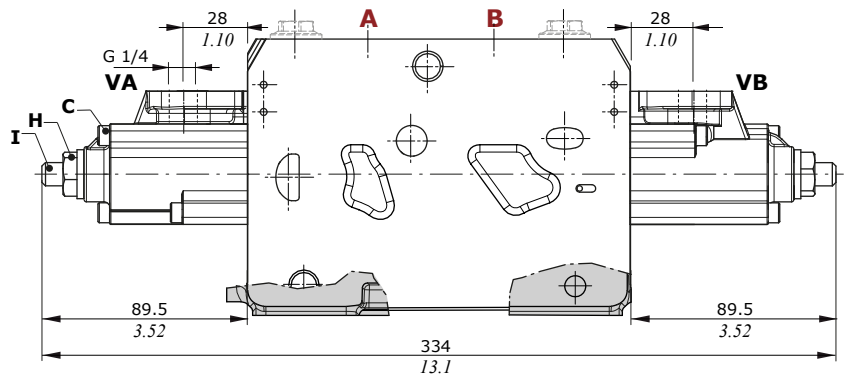
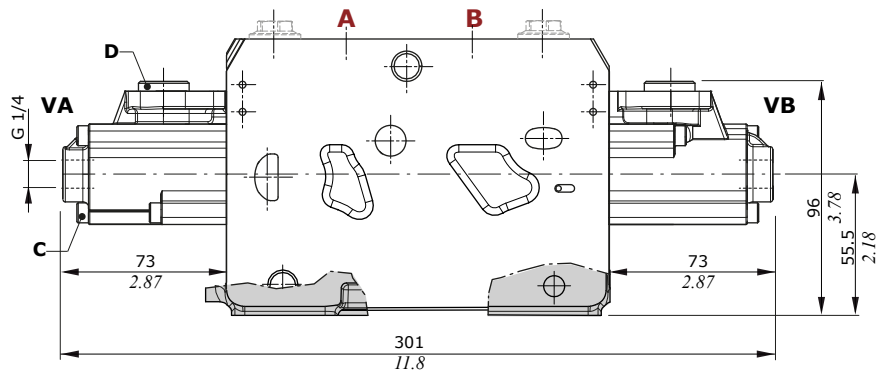
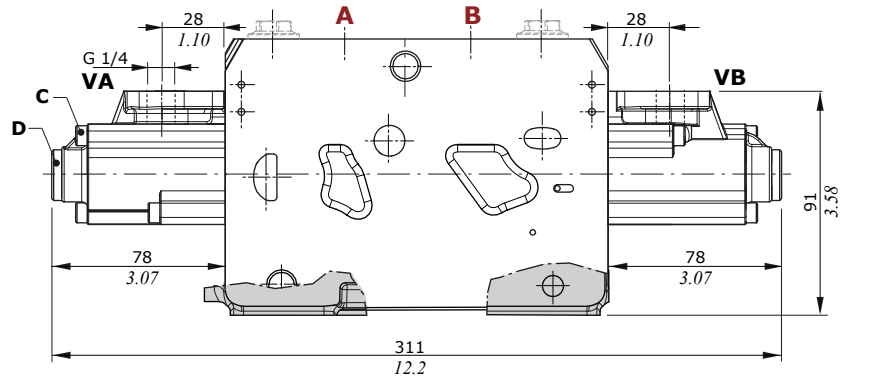
Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

D = allen wrench 6 - 30 Nm (22 lbf·ft)

H = wrench 17 - 9.8 Nm (7.2 lbf·ft)

I = allen wrench 4

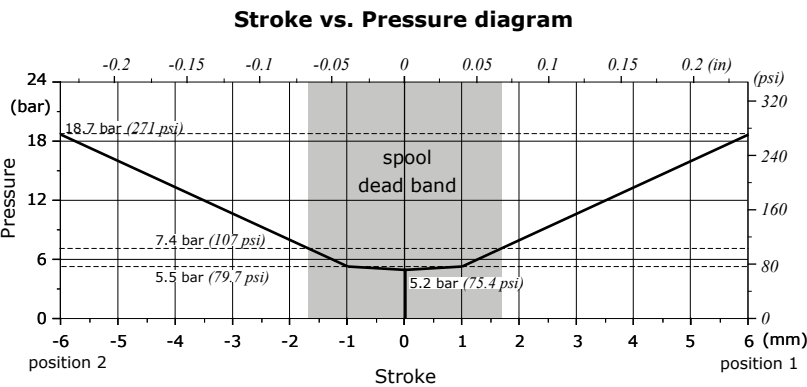


Pre-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page



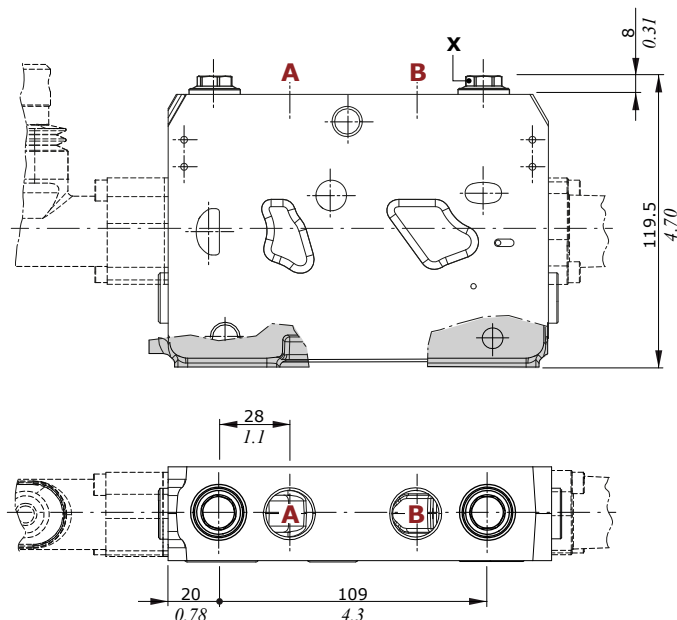
Compatibility tables

Combination controls and spool end kit		"A" side controls							
		H001 H002	H004	HP00	HP01	HP04	HP04L	HP07	HP07L HP05
"B" side controls	F001A	430085044	430085045						
	F001B	430085044	430085045						
	FP00			430085026					
	FP01				430085026				
	FP04					430085026	430085026	430085026	430085026
	FP04L					430085026		430085026	430085026
	FP04SL					430085026	430085026	430085026	
	FP04SD					430085026	430085026	430085026	
	HP05								430085026

For spool end types, see page 138

Always indicate setting value when using fixed setting combined valve:

Example: 03TF PA (120) = setting



03TF type
Pilot combined valve



02TF type
Anticavitation valve



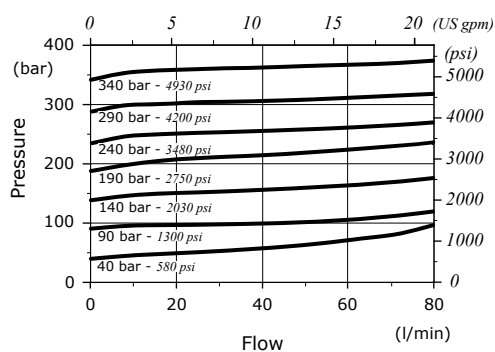
05TF type
Valve blanking plug



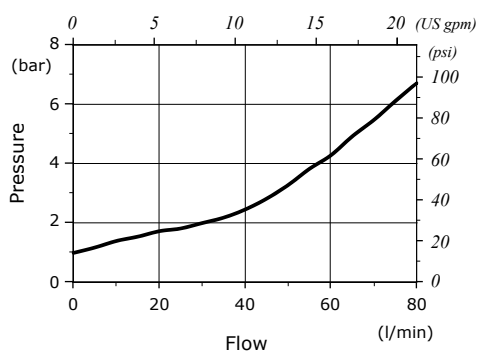
Wrenches and tightening torques

X = wrench 13 - 40 Nm (29.5 lbf ft)

**03TF type
combined valves (antishock function)**
(10 l/min - 2.6 US gpm)



**03TF type
combined valves (anticavitation function)**



Parts ordering codes

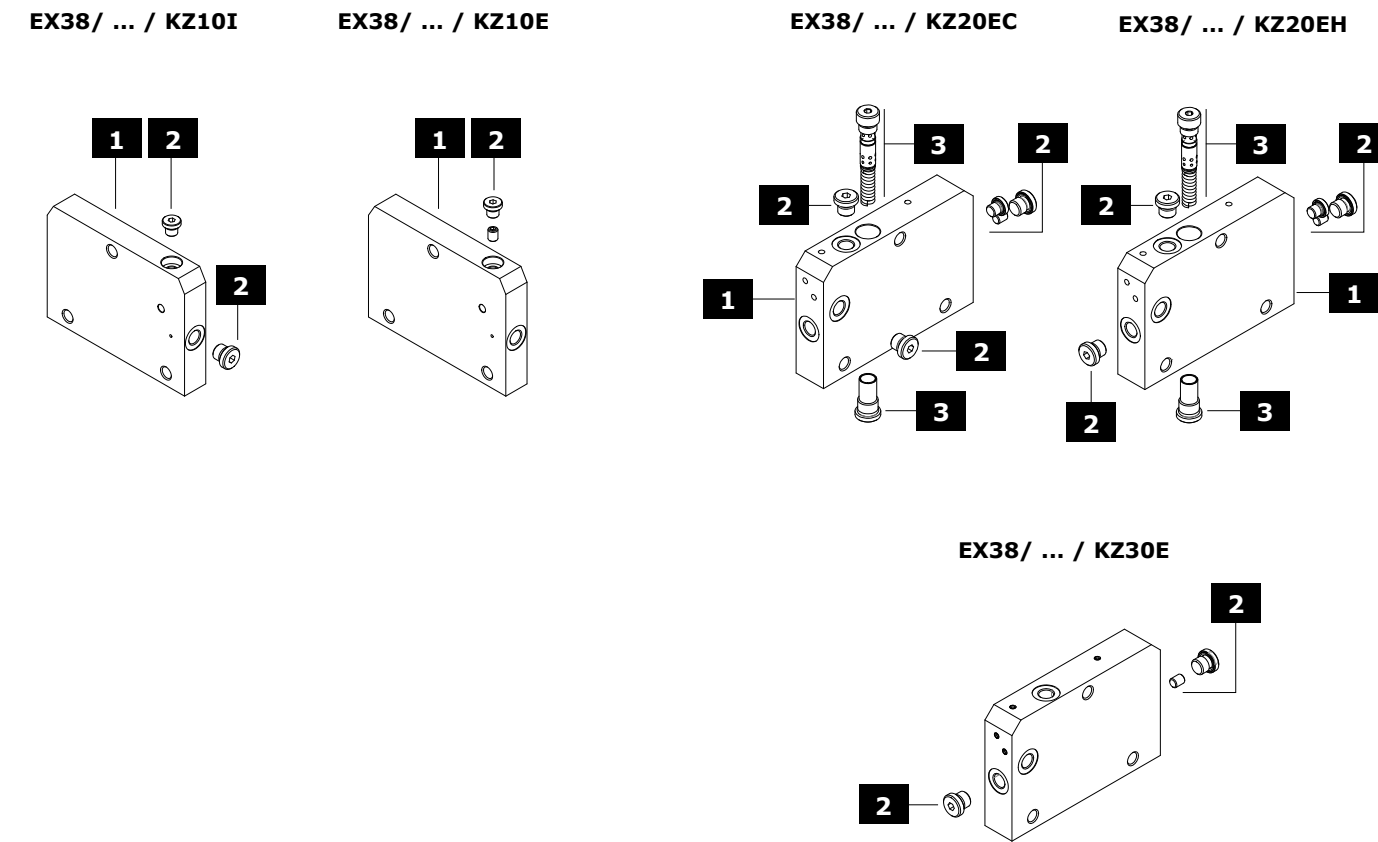
There are two main types of End plate:

- **Mechanical and hydraulic controls configuration:** to be used when no electrohydraulic controls are present in the valve: this plate is simply collecting the LS signal drain that can be connected to tank internally or externally without significant differences.
- **Electrohydraulic controls configuration:** to be used when at least one section in the valve has electrohydraulic operation: this plate is collecting LS signal and electrohydraulic controls drain and is providing electrohydraulic operation feeding by means of a pressure reducing valve.

IMPORTANT: with electrohydraulic actuation, only external drain outlet is provided. We recommend to connect drain directly to tank without any other additional pressure drop, in order to avoid control system damages and poor control properties.

For mechanical and prop. hydraulic controls

For hydraulic and electrohydraulic controls



1

End plate*

page 57

For mechanical and hydraulic controls

TYPE: -
DESCRIPTION: End plate without pressure reducing valve kit,
internal drain (type **KZ10I**) or external drain (type **KZ10E**)

For electrohydraulic controls

TYPE: -
DESCRIPTION: End plate with pressure reducing valve kit,
external drain (type **KZ20EC**) or external-side drain
(type **KZ20EH** or **KZ30E**)

CODE: 420705060

CODE: 420705064

2

Plugs*

TYPE

CODE

DESCRIPTION

Grub PPCE

411110807

Grub screw

-

430000016

G1/8 plug

-

430000017

G1/4 plug

3

Pressure reducing valve kit

TYPE

CODE

DESCRIPTION

-

320285002

Pressure reducing valve kit
(40 bar - 580 psi)

-

430085053

Spring holder kit (40 bar - 580 psi)

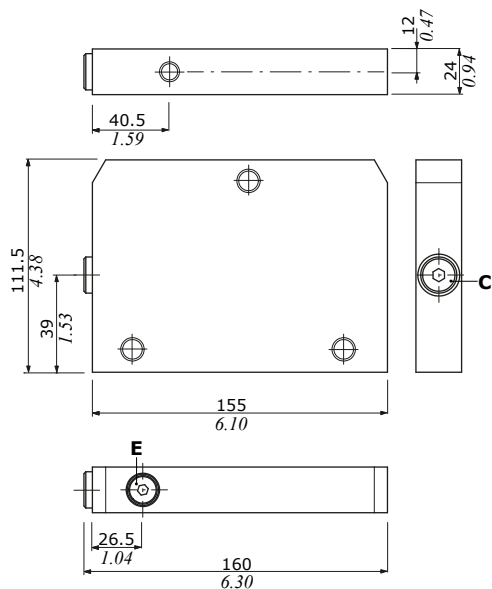
NOTE (*): Codes are referred to **BSP** thread

End plate

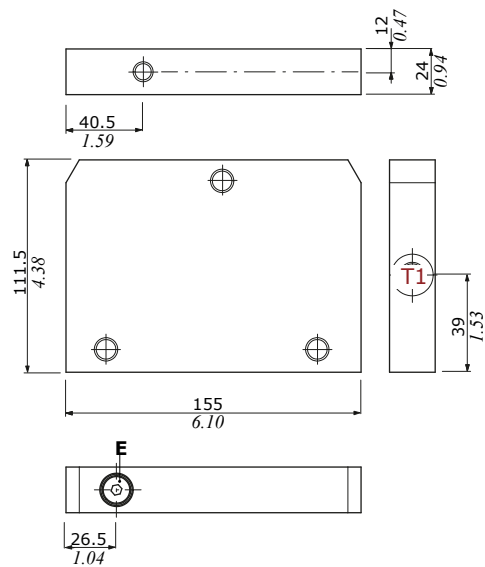
Dimensional data and hydraulic circuits

For mechanical and proportional hydraulic controls

KZ10I



KZ10E

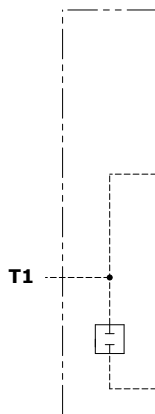
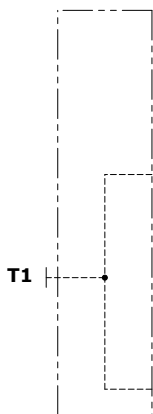


KZ10I

End plate without
reducing pressure valve.
Internal drain

KZ10E

End plate without
reducing pressure valve.
External drain



Port configurations

Types	T1 port (front)	T1 port (side)	R port	
KZ10I	plugged	no	no	
KZ10E	open	no	no	

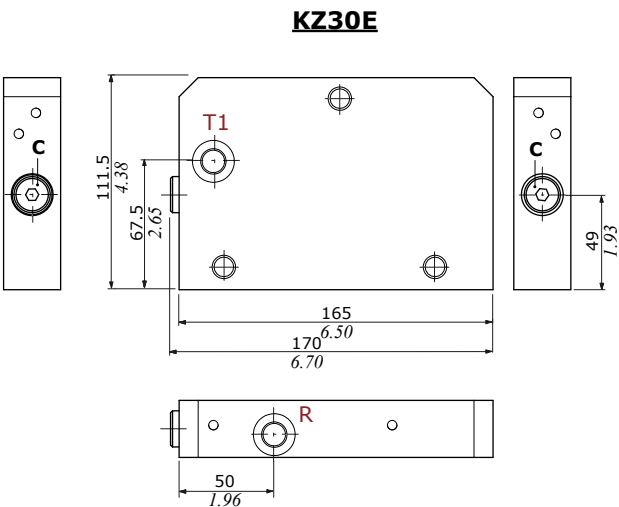
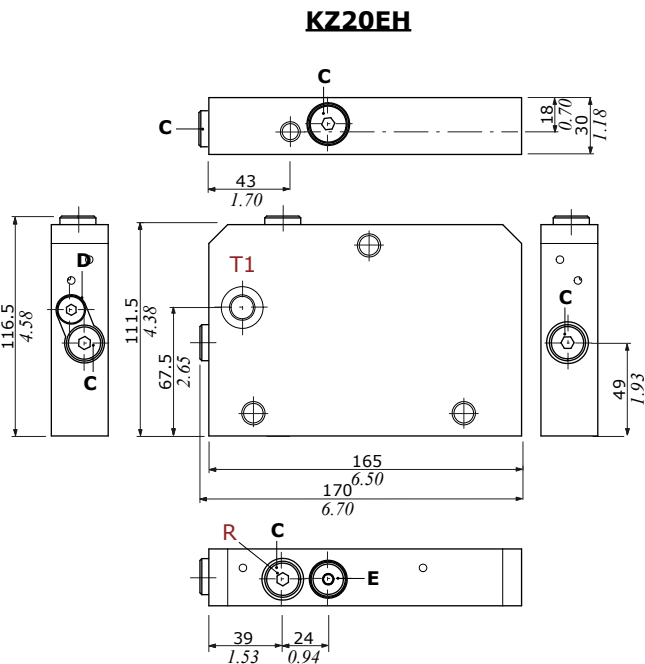
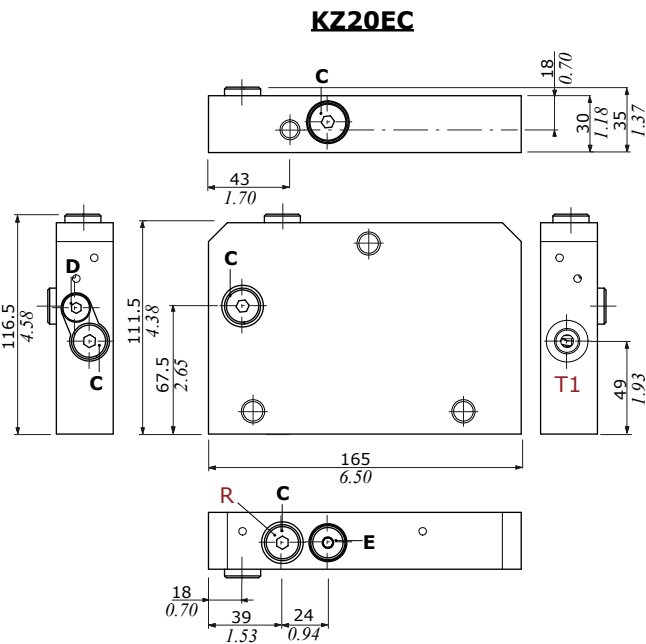
Wrenches and tightening torques

C = allen wrench 6 - 30 Nm (22 lbf_t)

E = allen wrench 5 - 30 Nm (22 lbf_t)

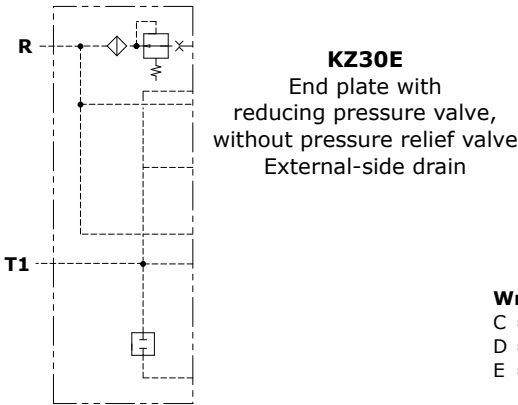
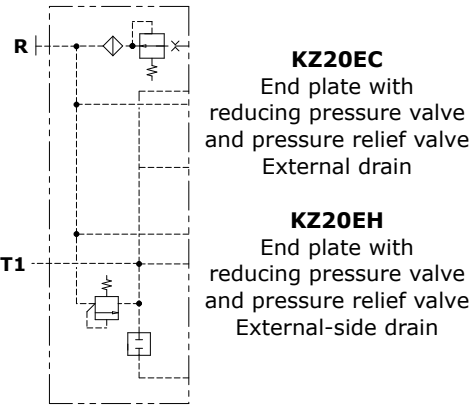
Dimensional data and hydraulic circuits

For hydraulic and electrohydraulic controls



Port configurations

Types	T1 port (front)	T1 port (side)	R port
KZ20EC	open	plugged	plugged
KZ20EH	plugged	open	plugged
KZ30E	plugged	open	open



Wrenches and tightening torques
C = allen wrench 6 - 30 Nm (22 lbf_t)
D = allen wrench 5 - 13 Nm (9 lbf_t)
E = allen wrench 5 - 30 Nm (22 lbf_t)

Content

• EX38-HF

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Working section	
<u>POST-COMPENSATED SECTION</u>	
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Proportional electrohydraulic controls (A and B side).	page 75
Proportional hydraulic controls (A and B side)	page 77
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Dimensional data

High Flow valve configuration example with one-side electrohydraulic control

It needs to flow up to 140 l/min (37 US gpm), the EX38 valve can be configured with up to 4 HF (High Flow) working sections. In addition to an entirely for Standard flow or High Flow configuration, a mixed configuration – Standard/HF – is available by combining only the sections needed (the number of HF sections is always limited to 4).

In this case, for hydraulic requirements, the HF sections must be positioned just downstream to the inlet.

Example of entirely High Flow (HF) valve configuration

EX38-~~HF~~/3/MR-V1A(50)-V4B-V10C-KV-G05/W001C(140\140)-HP10-FP06-B12AJ-~~HF~~-RCU1-G05.03TF-PA(100)\

N° working sections

HF Open Center inlet section

HF working section

03TF-PB(100)/W001C(140\140)-HP10-FP06-B12AJ-~~HF~~-RCU1-G05.03TF-PA(100)\03TF-PB(100)/

HF working section

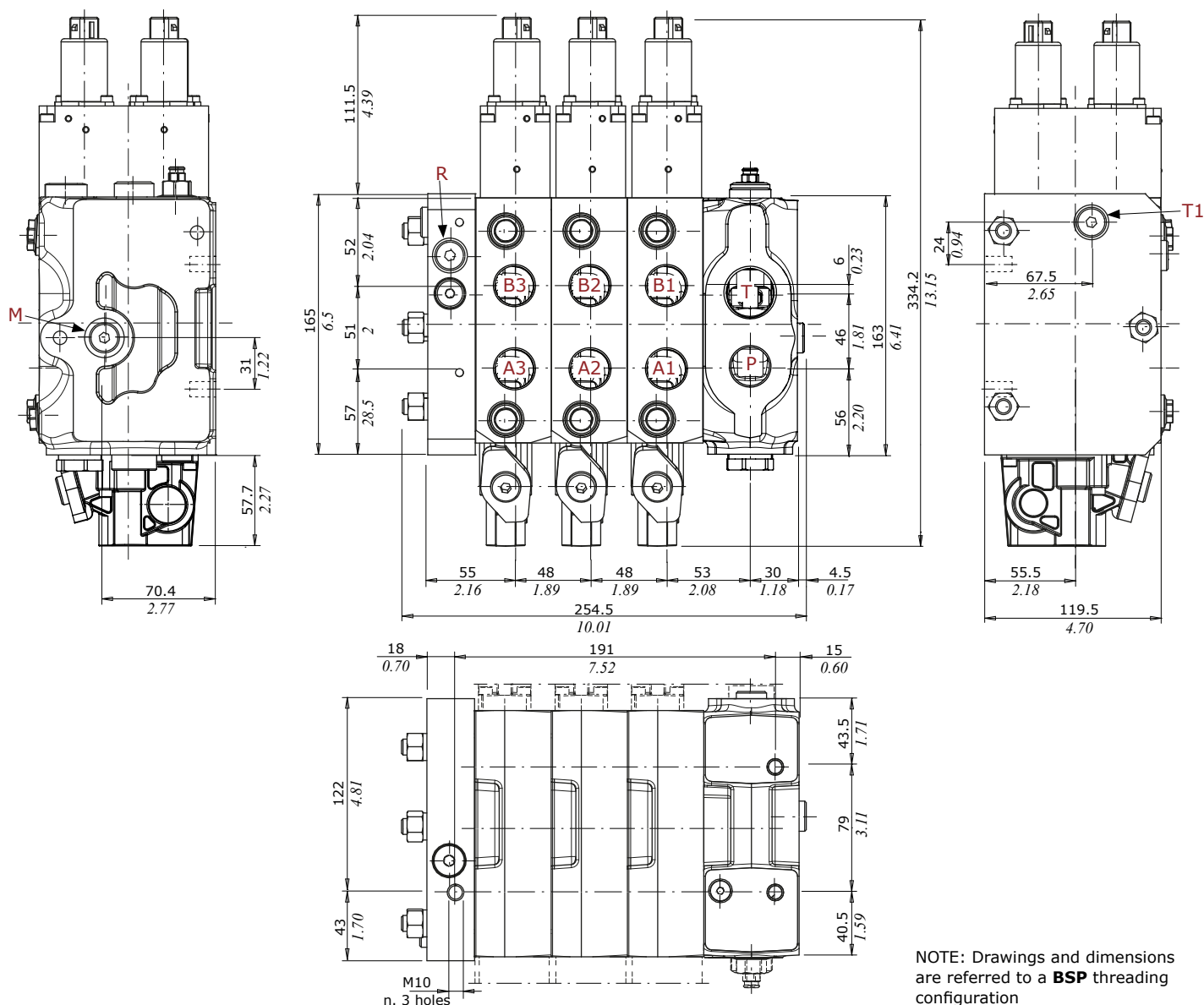
HF working section

W001C(140\140) -HP10-FP06-B12AJ-~~HF~~-RCU1-G05.03TF-PA(100)\03TF-PB(100)/KZ20EC/P006/3 N10

HF working section

End plate

Painted with RAL 9005 black primer



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

EX38-**HF**/3/MR-V1A(50)-V7B-C12AJ-V10C-KV-G05/W001C(140\140)-HP10-FP06-B12AJ-**HF**-RCU1-G05.03TF-

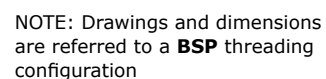
HF working section

PA(100)\ 03TF-PB(100)/W001C(140\140)-HP10-FP06-B12AJ-~~TF~~RCU1-G05.03TF-PA(100)\03TF-PB(100)\

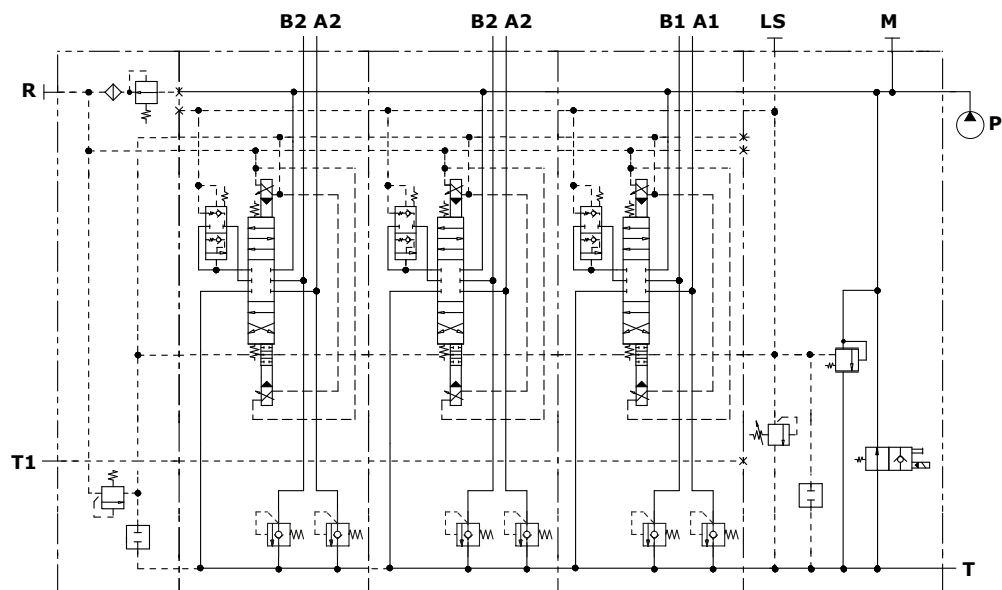
HF working section

W001C(25\25)-HP10-FP06-B12AJ-RC1-G04.03TF-PA(100)\-03TF-PB(100)/KZ20EC/P006/3 N10

Painted with RAL 9005
black primer

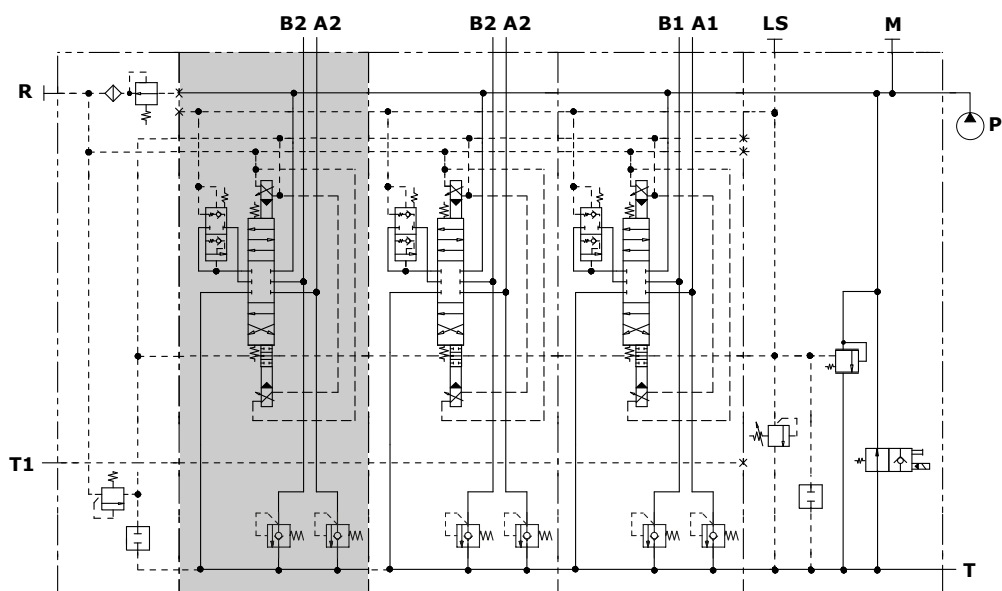


Hydraulic circuits



Right Inlet valve with one-side electrohydraulic controls configuration example:

EX38-HF/3/MR-V1A(50)-V4B-V10C-KV-G05/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-G05.03TFPA(100/100)\03TFPB(100/100)/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-G04.03TFPA(100/100)\03TFPB(100/100)/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-G04.03TFPA(100/100)\03TFPB(100/100)/KZ20EC



Right Inlet valve with one-side electrohydraulic controls example of mixed HF/Std section configurations:

EX38/3/MR-V1A(50-V7B(C12AJ)-V10C-KV-G05/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-G05.03TFPA(100/100)\03TFPB(100/100)/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-G05.03TFPA(100/100)\03TFPB(100/100)/
W001C(25\25)-HP10-FP06-B12AJ-RC1-G04.03TFPA(100/100)\03TFPB(100/100)/KZ20EC

EX std. section

Complete section ordering codes

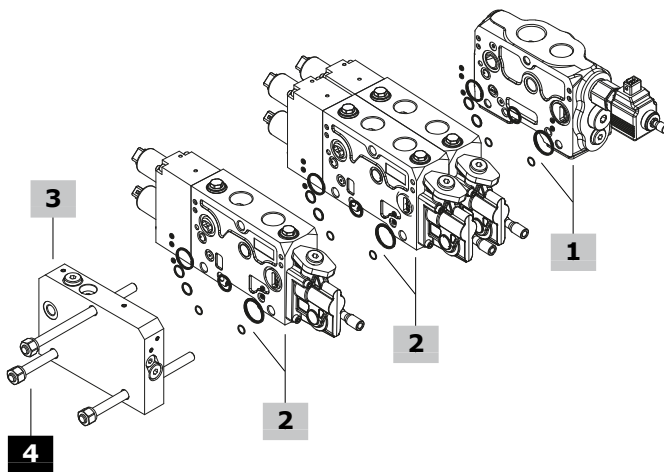
One-side electrohydraulic control valve configuration example - Right Inlet

EX38-**HF**/3/MR-V1A(200)-V7B-C12AJ-V10C-KVG05/W001C(120\120)-HP06-FP06-B12AJ-**HF**-RC1G05

Working sections Right Inlet 1 2

05TFPA-05TFPB/.../.../KZ20EH/P006/3 N10

2 2 3 Painted with RAL 9005 black primer



1 Inlet sections*

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **HF/ML-R/V1A(200)-V4B-V10C-KV-G05**

CODE: SHE380014

DESCRIPTION: with LS pressure relief valve and valve blanking plugs on position B and C

TYPE: **HF/MR-L/V1A(200)-V7B(C12AY)-V10C-KV-G05**

CODE: SHE380015

DESCRIPTION: as previous one with full flow electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V4B-V11C(C12AY)-KV-G05**

CODE: SHE380016

DESCRIPTION: with LS pressure relief valve, valve blanking plug on position B and LS push & twist emergency electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V3B(240)-V11C(C12AY)-KV-G05**

CODE: SHE380017

DESCRIPTION: as previous one with full flow direct relief valve

For Closed Center circuit (JV)

TYPE: **HF/MR-L/V1A(200)-V4B-V10C-JV-G05**

CODE: SHE380018

DESCRIPTION: with LS pressure relief valve and valve blanking plugs on position B and C

TYPE: **HF/MR-L/V1A(200)-V7B(C12AY)-V10C-JV-G05**

CODE: SHE380019

DESCRIPTION: as previous one and full flow electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V4B-V11C(C12AY)-KV-G05**

CODE: SHE380020

DESCRIPTION: with LS pressure relief valve, valve blanking plug on position B and LS push & twist emergency electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V3B(240)-V11C(C12AY)-KV-G05**

CODE: SHE380021

DESCRIPTION: as previous one with full flow direct relief valve

2 Right inlet working sections*

The codes are referred to sections with O-ring seals

POST-COMPENSATED SECTION (RC)**With mechanical controls**

TYPE: **SD/W001C(120\120)-H001-F001A-HF-RC1-G05-05TFPA-05TFPB**

CODE: SHL380028

DESCRIPTION: with port valve arrangement (seat plugged), 120 l/min (31.7 US gpm) double acting spool, lever control and spring return to neutral

With proportional hydraulic controls

TYPE: **SD/W001C(120\120)-HP05A-HF-RC1-G05-05TFPA-05TFPB**

CODE: SHL380080

DESCRIPTION: with port valve arrangement (seat plugged), 120 l/min (31.7 US gpm) double acting spool, proportional hydraulic control

With proportional electrohydraulic controls

TYPE: **SD/W001C(120\120)-HP06-FP06-B12AJ-HF-RCU1-G05-05TFPA-05TFPB**

CODE: SHL380081

DESCRIPTION: with port valve arrangement (seat plugged), 120 l/min (31.7 US gpm) double acting spool and 12VDC one-side electrohydraulic control

3 End plates*

For mechanical, pneumatic and hydraulic controls

TYPE: **KZ10I** CODE: 320093101

DESCRIPTION: end plate without pressure reducing valve, internal drain

TYPE: **KZ10E** CODE: 320093102

DESCRIPTION: end plate without pressure reducing valve, external drain

For hydraulic and electrohydraulic controls

TYPE: **KZ20EC** CODE: 320093123

DESCRIPTION: end plate with pressure reducing valve, external drain

TYPE: **KZ20EH** CODE: 320093124

DESCRIPTION: end plate with pressure reducing valve, external-side drain

TYPE: **KZ30E** CODE: 320093113

DESCRIPTION: end plate with pressure reducing valve, external-side drain

4 Assembly kit

CODE DESCRIPTION

300193042 For 1 HF section valve

300193039 For 2 HF sections valve

300193040 For 3 HF sections valve

300193043 For 4 HF sections valve

Tie rods kit for Std+HF sections:

300193033 For 2 sections valve (1 HF)

300193026 For 3 sections valve (1 HF)

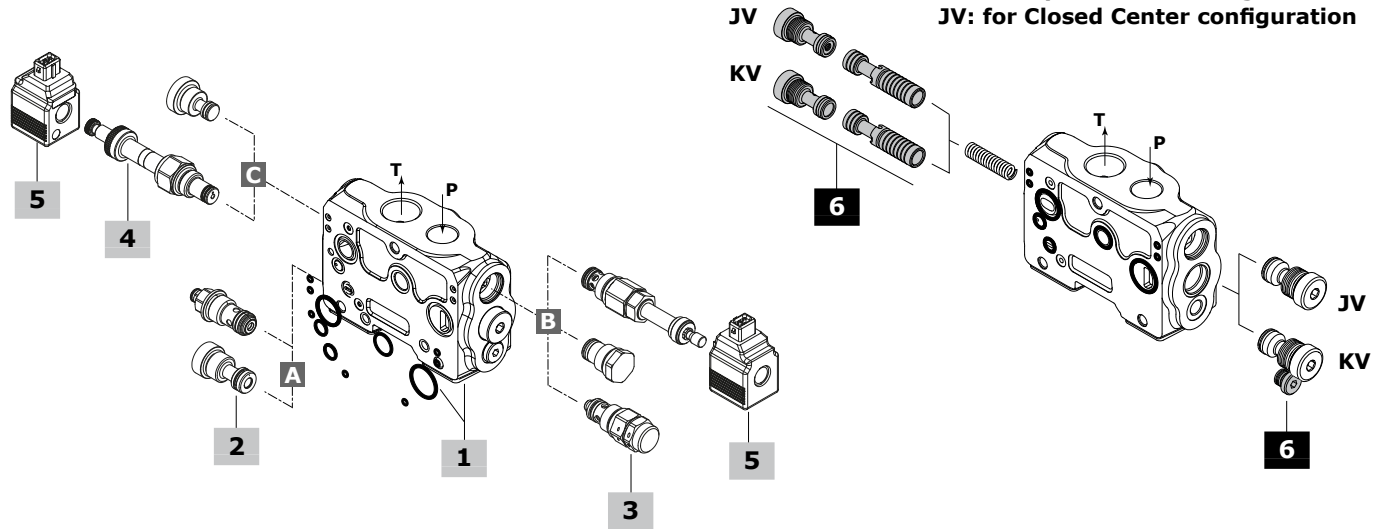
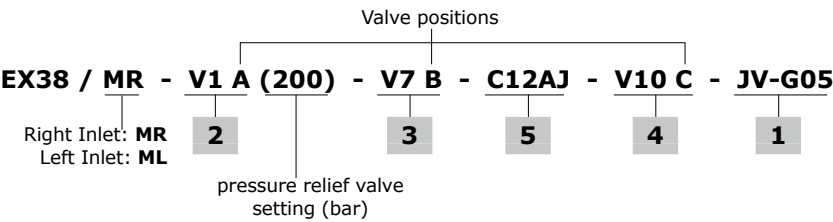
300193028 For 4 sections valve (1 HF)

300193034 For 5 sections valve (1 HF)

NOTE: for other configuration, contact our Sales Department

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

Parts ordering codes



1 Inlet sections* page 65

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **HF/KV G05-G06** CODE: 029300032

DESCRIPTION: for fixed displacement pumps, internal LS.
G3/4 P port - G1" T port

For Closed Center circuit (JV)

TYPE: **HF/JV G05-G06** CODE: 029300031

DESCRIPTION: for variable displacement pumps, external LS.
G3/4 P port - G1" T port

NOTE: for seal kit codes, see page 140

2 Valves on position A page 66

TYPE	CODE	DESCRIPTION
V1A		LS pressure relief valve
	915028503	setting range: 50-250 bar (725-3620 psi)
	915028504	setting range: 251-420 bar (3640-6100 psi)
V2A	430085034	Valve blanking plug

3 Valves on position B page 66

TYPE	CODE	DESCRIPTION
V3B		Full Flow direct relief valve
	915065501	setting range: 40-200 bar (580-2900 psi)
	915065502	setting range: 201-420 bar (2910-6100 psi)
V4B	430175001	Valve blanking plug
V7B	5EMSELTEX38	Full Flow electric unloading valve

4 Valves on position C page 67

TYPE	CODE	DESCRIPTION
V10C	430059003	Valve blanking plug
V11C	0EB08002000	LS Push & Twist emergency electric unloading valve (without coil)

5 Coils and accessories

For available **BER** coils and accessories list see page 136

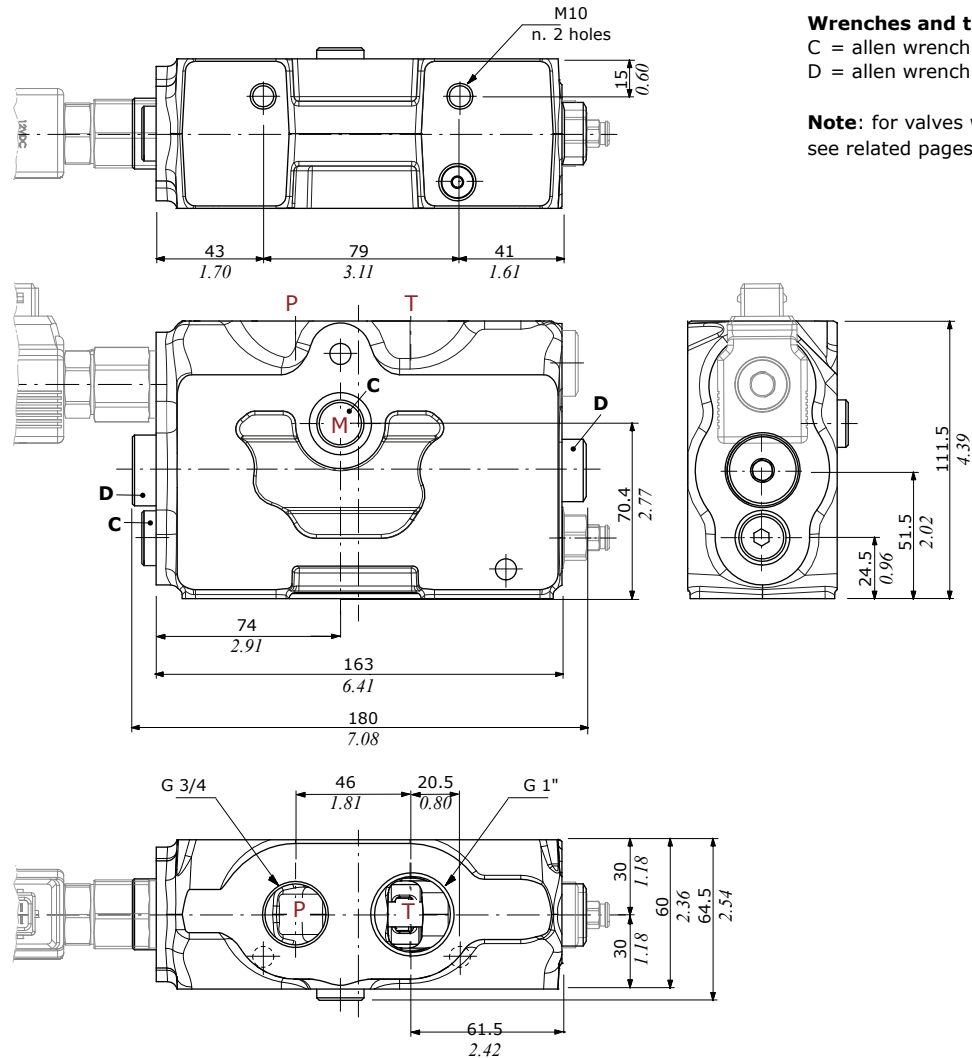
6 Trasformation kit page 67

TYPE	CODE	DESCRIPTION
KV kit	320093008*	Trasformation kit, from JV (closed center) to KV (open center)
JV kit	320093007	Trasformation kit, from KV (open center) to JV (closed center)

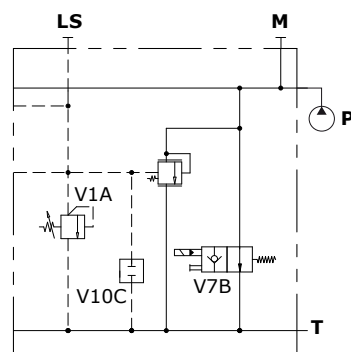
NOTE (*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

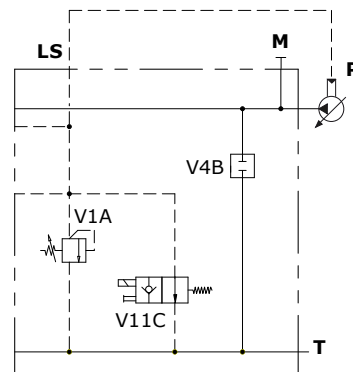
Drawing is referred to KV section; dimensions are the same for JV section



KV Open Center (example)

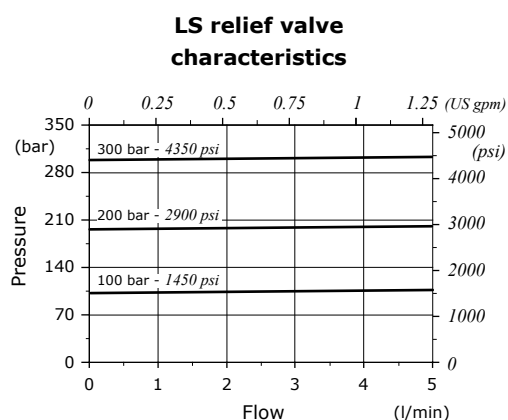
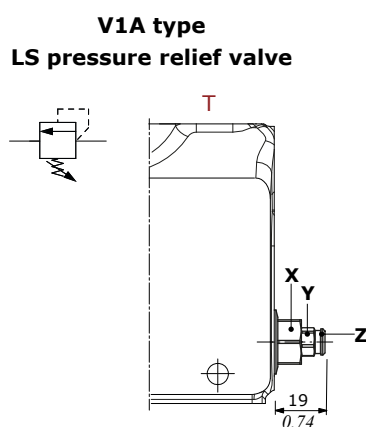
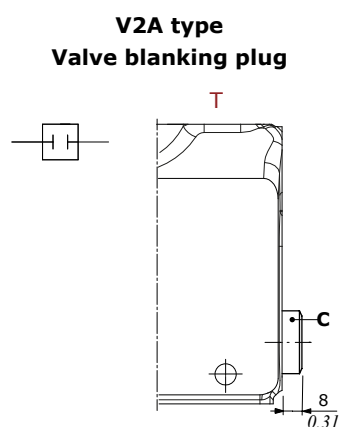


JV Closed Center (example)

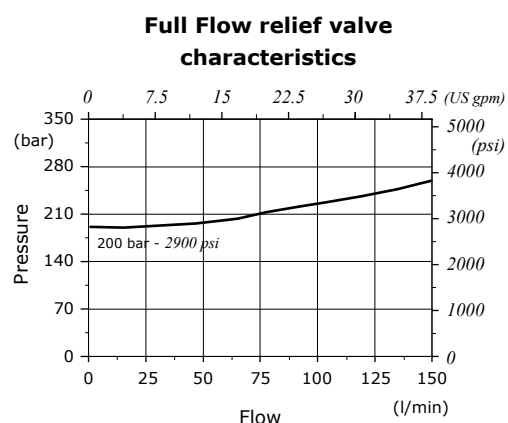
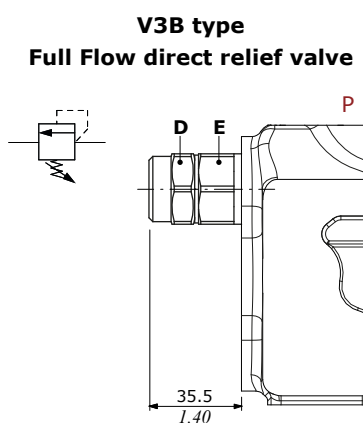
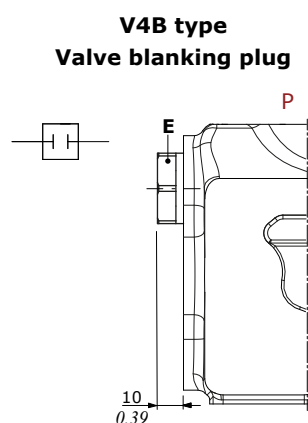


Inlet valves

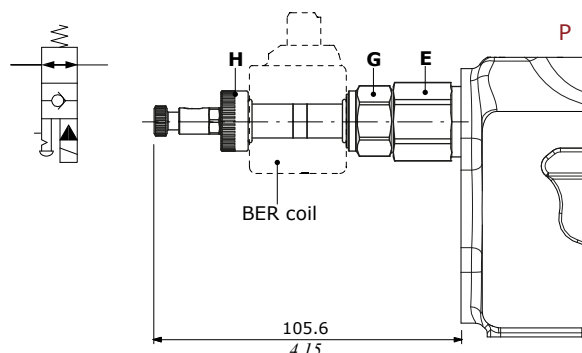
Valves on position A



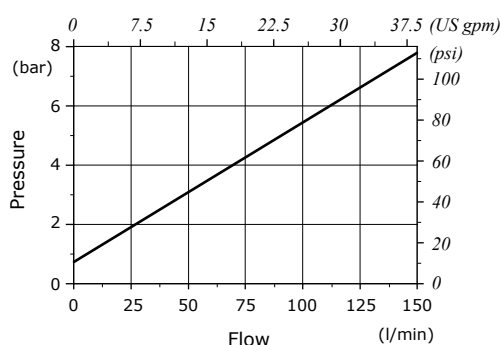
Valves on position B



V7B type
Full Flow electric unloading valve
(without coil)



Full Flow electric unloading valve characteristics



Wrenches and tightening torque

- X = wrench 17 - 50 Nm (36 lbft)
- Y = wrench 10 - 7 Nm (5 lbft)
- Z = allen wrench 3 - manual tightening
- C = allen wrench 8 - 30 Nm (22 lbft)
- D = wrench 27 - 25 Nm (18 lbft)
- E = wrench 27 - 80 Nm (59 lbft)
- G = wrench 24 - 30 Nm (22 lbft)
- H = manual tightening

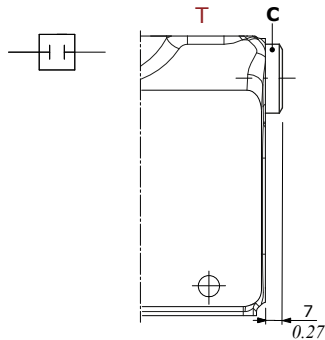
Valve features

- Nominal flow.....: 150 l/min (0.53 US gpm)
- Max. pressure: 350 bar (5100 psi)
- Max. internal leakage....: 0,25 cm³/min @ 210 bar (0.015 in³/min @ 3050 psi)

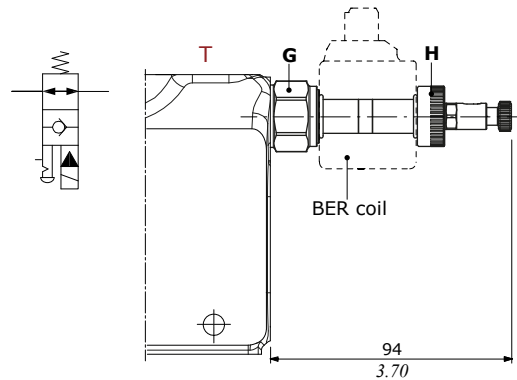
For **BER** type coils see page 136

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)

**Wrenches and tightening torques**

C = allen wrench 8 - 30 Nm (22 lbf ft)

G = wrench 24 - 30 Nm (22 lbf ft)

H = manual tightening

For **BER** type coils see page 136

NOTES:

Valve types V1A and V3B require factory setting (example: V1A - 150)

Valve combination V1A - V3B requires double setting (example: 200*240); the minimum difference between settings is 40 bar - 580 psi

Valve types V7B and V11C requires coil kit type (example: C12AJ).

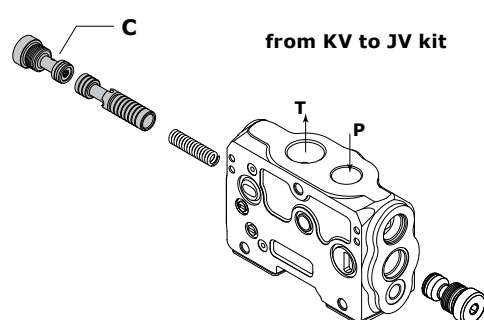
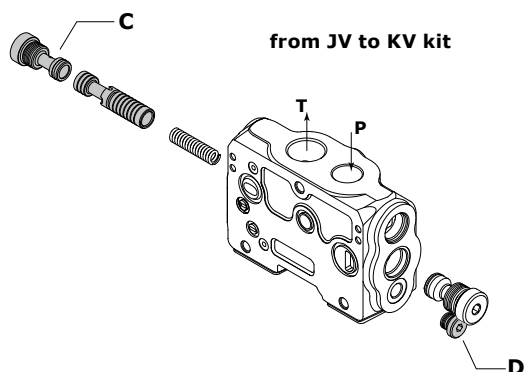
Trasformation kit

In order to trasform the inlet section from Closed Center (JV) to Open Center (KV) and viceversa.

The following kit are available:

code 320093008, from JV to KV kit

code 320093007, from KV to JV kit

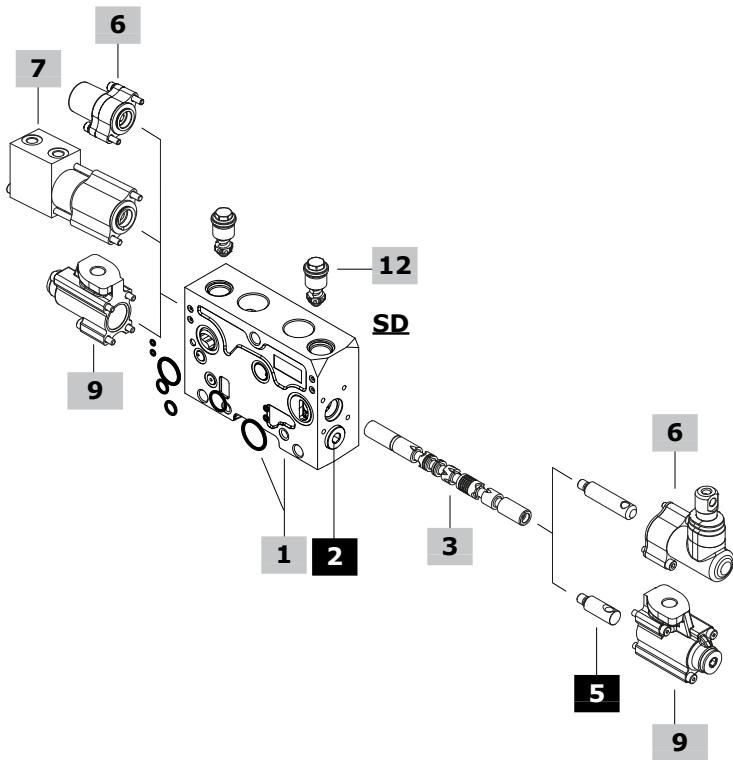
**Wrenches and tightening torques**

C = allen wrench 8 - 30 Nm (22 lbf ft)

D = allen wrench 6 - 30 Nm (22 lbf ft)

Parts ordering codes

High Flow post-compensated section (only Right Inlet SD)



Working section with mechanical control

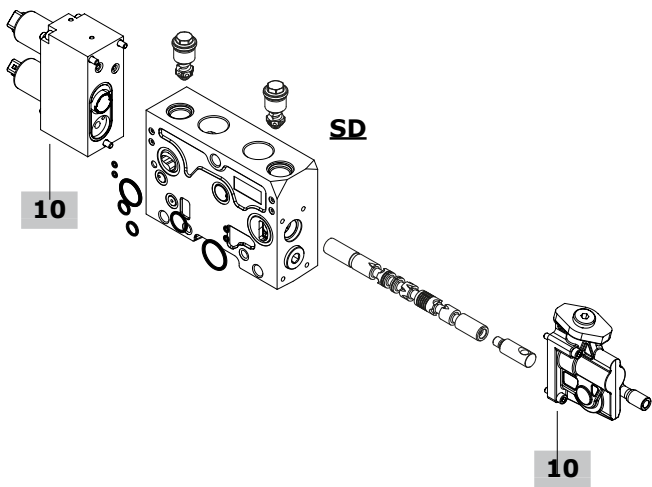
flow on A/B ports (l/min)
EX38-HF-SD/W001C(120\120) - H001 - F001A
Right Inlet 3 6 6
valve setting (bar)
A port B port
HF-RC1-G05 . 03TFPA(100) \ 03TFPB(100)
1 12

Working section with pneumatic control

EX38-HF-SD/W001C(120\120) - H001 - F022A
6 7
HF-RC1-G05 . 03TFPA(100)\03TFPB(100)

Working section with proportional hydraulic control

EX38-HF-SD/W001C(120\120) - HP05A
9
HF-RC1-G05 . 03TFPA(100)\03TFPB(100)



Working section with electrohydraulic control

EX38-HF-SD/W001C(120\120)- HP06 - FP06
10 10
B12AJ - HF-RCU1-G05 . 03TFPA(100)\03TFPB(100)
10

HIGH FLOW POST-COMPENSATED SECTION

1 Working sections* page 70

The codes are referred to sections with O-ring seals

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

For mechanical, pneumatic and proportional hydraulic controls

Standard section (only for SD configuration):

HF-RC1 G05	039300073	With port valves arrangement
-------------------	-----------	------------------------------

For electrohydraulic controls

Standard section (only for SD configuration):

HF-RCU1 G05	039300179	With port valves arrangement
--------------------	-----------	------------------------------

NOTE: for seal kit codes, see page 140

2 Trasformation kit page 70

TYPE	CODE	DESCRIPTION
HF-RC	430085059	Standard kit for mechanical and hydraulic controls
HF-RCU	430085062	Standard kit for electrohydraulic controls

3 Spools page 71

TYPE	CODE	DESCRIPTION
3 pos., double acting, A and B closed in neutral position:		
W001C 120120	421293115	120 l/min (31.7 Us gpm)
W001C 130130	421293111	130 l/min (34.3 Us gpm)
W001C 140140	421293138	140 l/min (36.9 Us gpm)
3 pos., double acting, A and B to tank in neutral position:		
W002C 120120	421293162	120 l/min (31.7 Us gpm)
W002C 130130	421293180	130 l/min (34.3 Us gpm)
W002C 140140	421293144	140 l/min (36.9 Us gpm)

5 Spool end kit page 138

TYPE	CODE	DESCRIPTION
-	422501205	Only with H001/H002 controls
-	422501217	Only with hydraulic and electrohydraulic controls

6 Mechanical controls page 72

Please choose A+B side controls

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

"A" side controls:

H001	320393002	With lever box
H002	320393002	With lever box, rotated 180°

"B" side controls:

F001A	320793004	3 pos., standard spring type A. Spring return in neutral position
--------------	-----------	---

F002A	320893003	3 pos., detent in A and B
--------------	-----------	---------------------------

F145	320093020	With friction and neutral position notch
-------------	-----------	--

7 Pneumatic controls* page 74

Please choose A+B side controls

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

"A" side controls:

See A side mechanical controls, #6

"B" side controls:

F022A	321293004	Proportional type, G1/8 ports
--------------	-----------	-------------------------------

F023A	321293004	Proportional type, rotated 180°, G1/8 ports
--------------	-----------	---

9 Proportional hydraulic controls* page 77

Type and code referred to the complete control (A+B sides)

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

HP05A	320593142	With G1/4 upper ports
--------------	-----------	-----------------------

HP05C	320593143	With G1/4 side ports
--------------	-----------	----------------------

HP05L	320593152	With G1/4 upper ports and stroke limiter
--------------	-----------	--

11 One-side electrohydraulic controls page 75

Please choose A+B side controls

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

"A" side controls:

HP06	322593302	With lever
HP06L	322593317	With lever and stroke limiter
HP10	322593303	Without lever

"B" side controls:

FP06	320093012	12VDC, AMP JPT connector
	320093014	24VDC, AMP JPT connector
	320093021	12VDC, DEUTSCH DT connector
	320093023	24VDC, DEUTSCH DT connector

12 Port valves page 78

Setting is referred to 10 l/min (2.6 Us gpm)

TYPE	CODE	DESCRIPTION
02TF PA/PB	915089001	Anticavitation valve
05TF PA/PB	430490001	Valve blanking plug

03TF PA/PB	915870190	Combined valve
-------------------	-----------	----------------

└ setting (bar)

Settings:

40 bar (580 psi)	50 bar (725 psi)	60 bar (850 psi)
70 bar (1020 psi)	80 bar (1150 psi)	90 bar (1300 psi)
100 bar (1450 psi)	110 bar (1600 psi)	120 bar (1750 psi)
130 bar (1900 psi)	140 bar (2050 psi)	150 bar (2150 psi)
160 bar (2300 psi)	170 bar (2450 psi)	180 bar (2600 psi)
190 bar (2750 psi)	200 bar (2900 psi)	210 bar (3050 psi)
220 bar (3200 psi)	230 bar (3350 psi)	240 bar (3500 psi)
250 bar (3600 psi)	260 bar (3750 psi)	270 bar (3900 psi)
280 bar (4050 psi)	290 bar (4200 psi)	300 bar (4350 psi)
310 bar (4500 psi)	320 bar (4650 psi)	330 bar (4800 psi)
340 bar (4950 psi)	350 bar (5050 psi)	

NOTE:

Always indicate setting value when using fixed setting combined valve: 03TF PA (120) - 03TF PB (120).

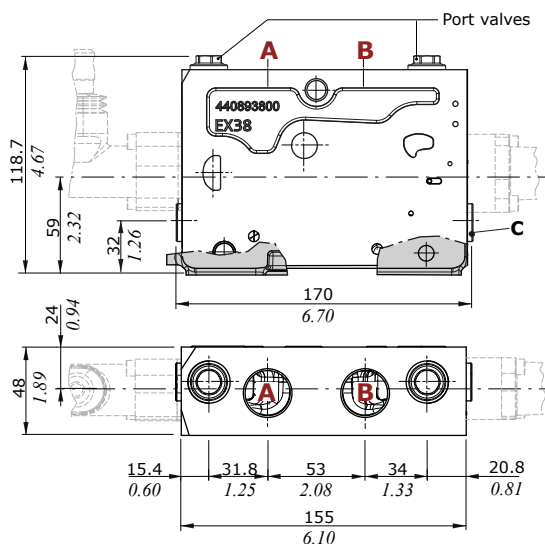
NOTE (*): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

High Flow post-compensated section

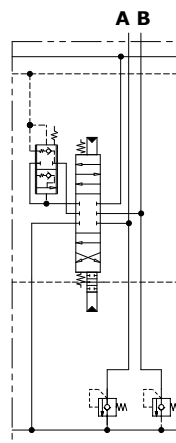
HF-RC1 - HF-RCU1 types

Standard section with port valves arrangement



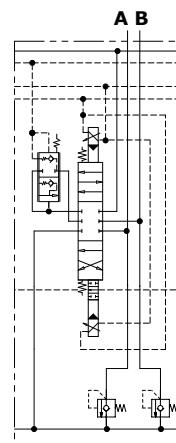
HF-RC1

Hydraulic control with port valves



HF-RCU1

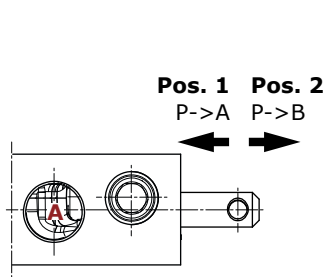
Electrohydraulic control with port valves



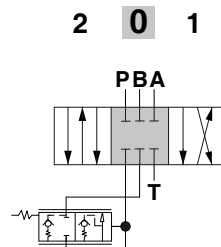
Wrenches and tightening torques

C = allen wrench 8 - 30 Nm (22 lbf ft)

High Flow post-compensated section

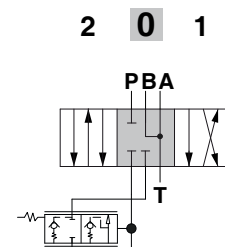


W001C type
A and B closed in
neutral position



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

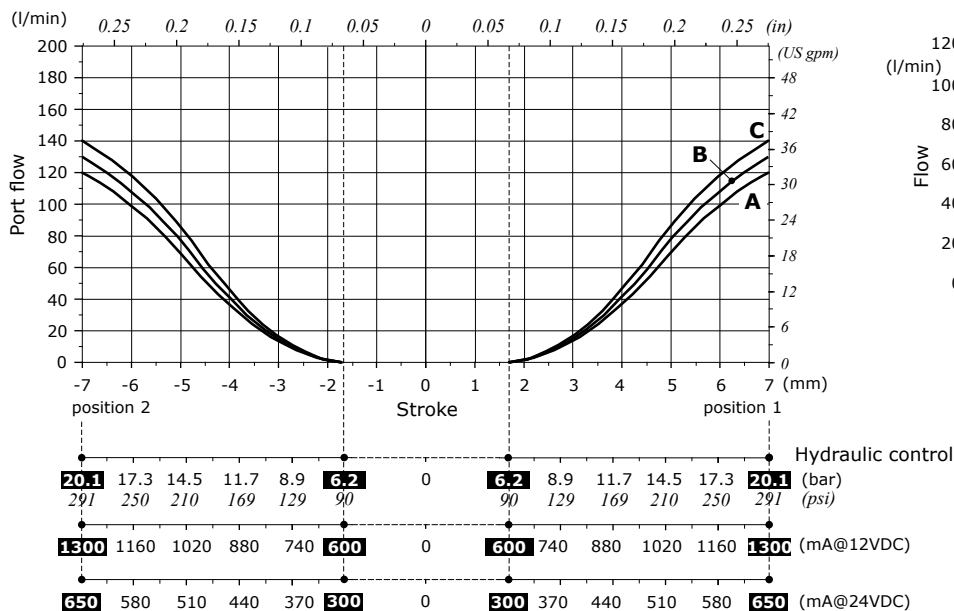
W002C type
A and B to tank
in neutral position



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

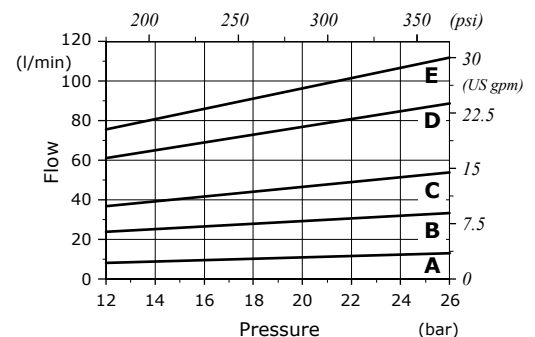
3 position spools metering curve

Q_{in}: 140 l/min (37 US gpm) - closed center circuit (JV)
Pump compensator @ 16 bar (232 psi)



**Curves with spool nominal flow
@ 16 bar (232 psi) stand-by
(margin pressure)**
A = 120 l/min (31.7 US gpm)
B = 130 l/min (34.3 US gpm)
C = 140 l/min (37 US gpm)

Spool flow vs. stand-by pressure (margin pressure) on closed center circuit (JV)



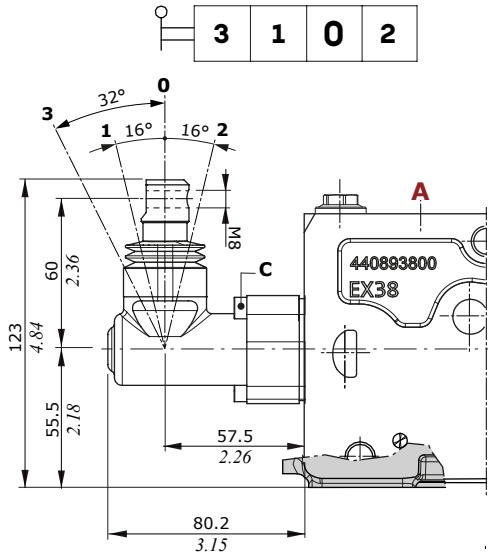
**Curves with spool nominal flow
@ 14 bar (200 psi) stand-by
(margin pressure)**
A = 10 l/min (2.6 US gpm)
B = 25 l/min (6.6 US gpm)
C = 40 l/min (10.6 US gpm)
D = 65 l/min (17 US gpm)
E = 80 l/min (21 US gpm)

High Flow post-compensated sections

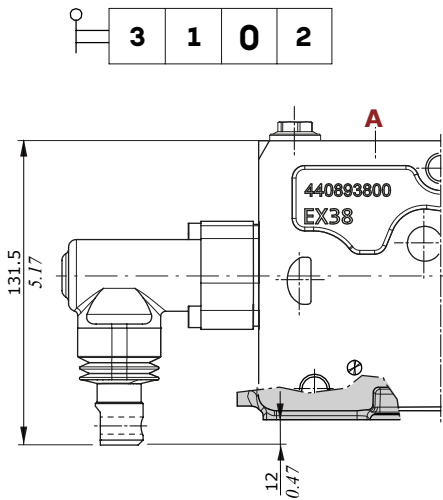
Mechanical controls

"A" side controls

H001 type
With lever box

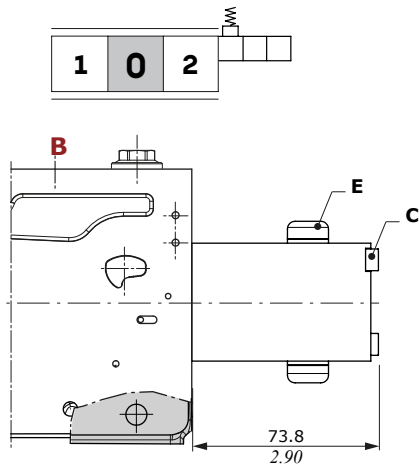


H002 type
With lever box, rotated 180°
Dimensions are the same of H001 type



"B" side controls

F145 type
With friction and neutral position
notch



Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
E = allen wrench 7 - 20 Nm (14.7 lbft)

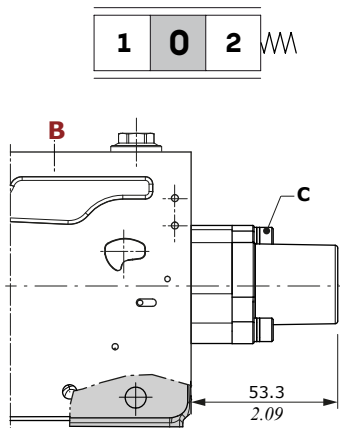
High Flow post-compensated sections

Mechanical controls

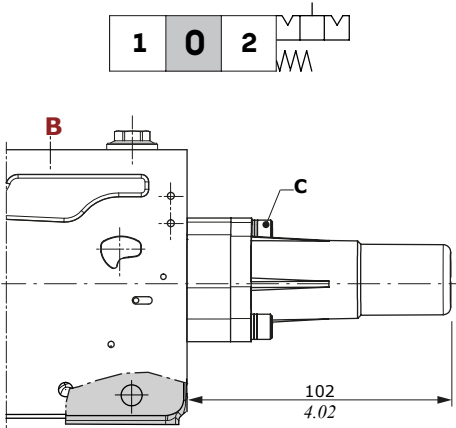
"B" side controls

Controls are available with standard spring A type (F001A)

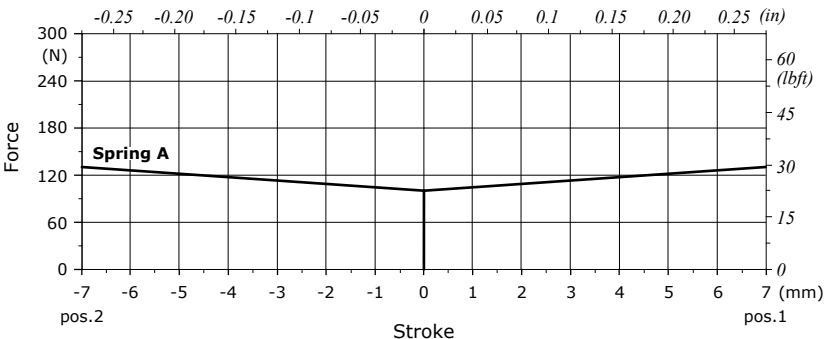
F001A type
With spring return in neutral position



F002A type
With detent in A and B



Force vs Stroke diagram



Legenda
Spring A = from 100.5 N to 132.5 N (22.6 lbf to 29.7 lbf)

Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf)

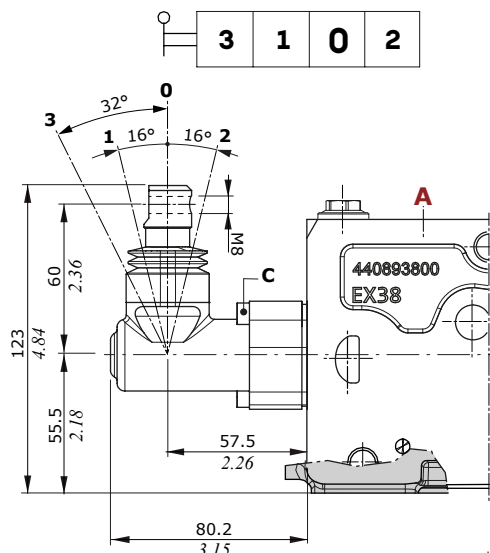
High Flow post-compensated sections

Pneumatic controls

"A" side controls

H001 type

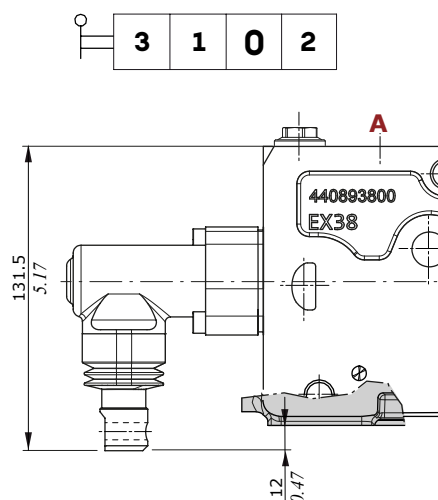
With lever box



H002 type

With lever box, rotated 180°

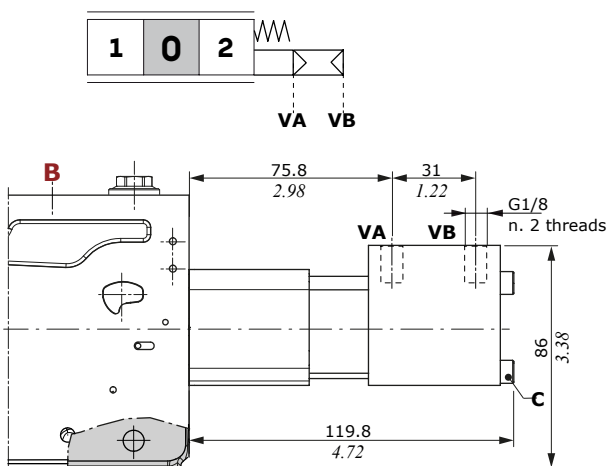
Dimensions are the same of H001 type



"B" side controls

F022A type

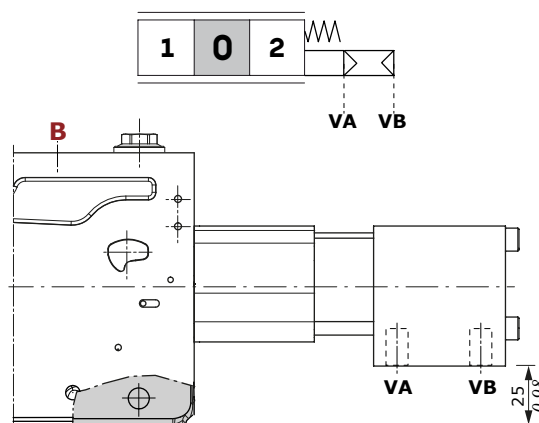
Proportional pneumatic control



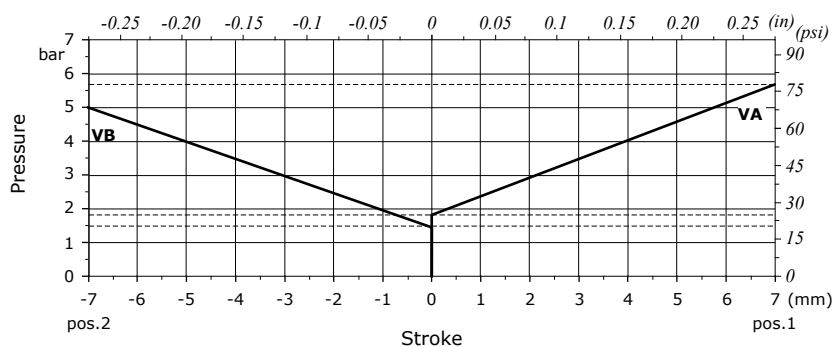
F023A type

Proportional pneumatic control, rotated 180°

Dimensions are the same of F022A type



Stroke vs. Pressure diagram



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

Legenda

VA = from 1.8 bar to 5.7 bar (26.1 psi to 82.6 psi)

VB = from 1.5 bar to 5 bar (21.7 psi to 72.5 psi)

Proportional electrohydraulic controls

Following specifications are measured with:

- mineral oil of 32 mm²/s - 32 cSt viscosity at 50°C - 122°F temperature,
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

A and B sides spool controls

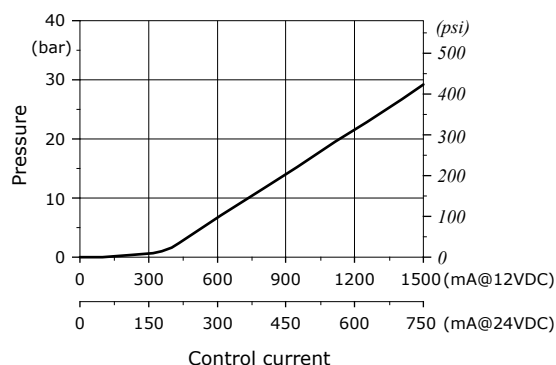
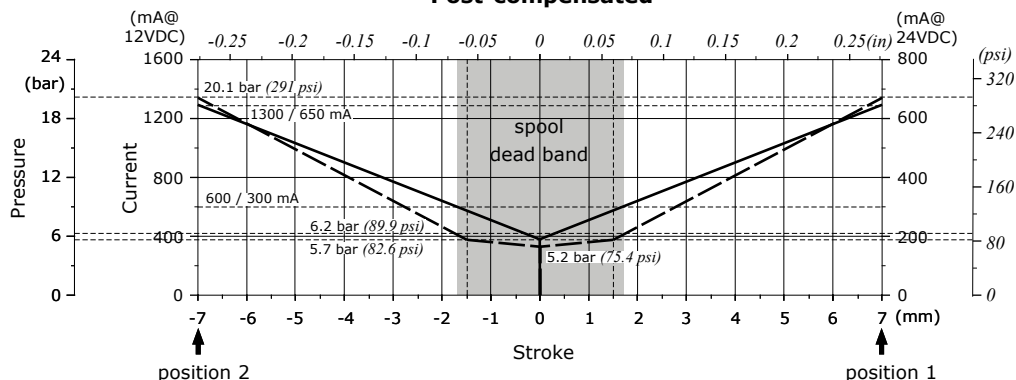
Electric specifications

Coil impedance	12 VDC	4.7 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption	0	
Min. flow control signal	12 VDC	400 mA
	24 VDC	200 mA
Flow control signal	12 VDC	1200 mA
	24 VDC	600 mA
Dither frequency	70 - 90 Hz	
Insertion	100%	
Coil insulation	Class H (180°C - 356°F)	
Connector type	AMP JPT	
	Deutsch DT	
Weather protection (connector)	IP65 (JPT type)	
	IP69K (DT type)	

Hydraulic specifications

Max. pressure	40 bar (580 psi)
Max. back pressure on solenoid valve drain	5 bar (72.5 psi)

Solenoid pressure reducing valve performance

Stroke vs. Current/Pressure diagram
Post-compensated

High Flow post-compensated sections

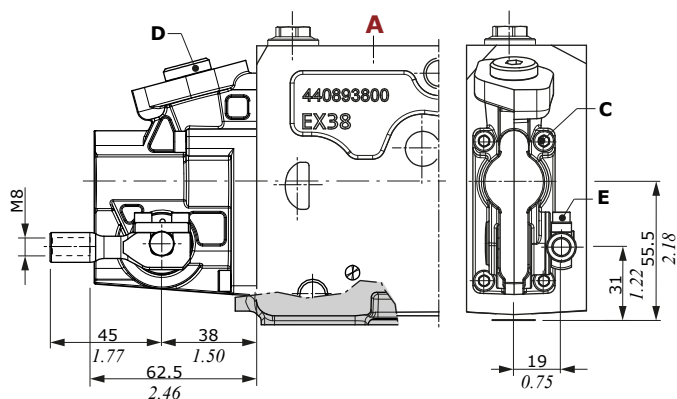
One-side electrohydraulic controls

"A" side controls

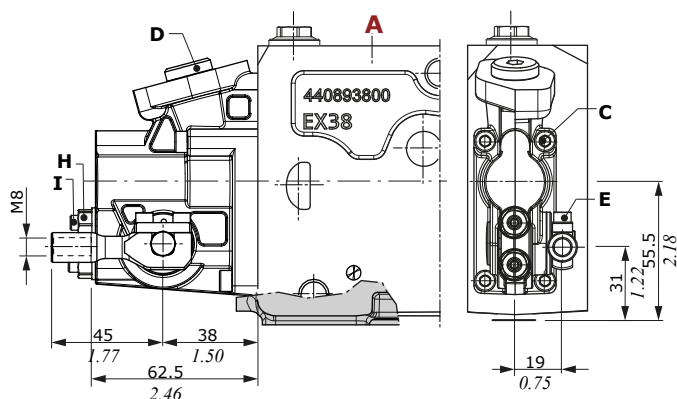
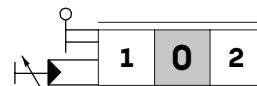
Control Types*

- ① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
- ② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

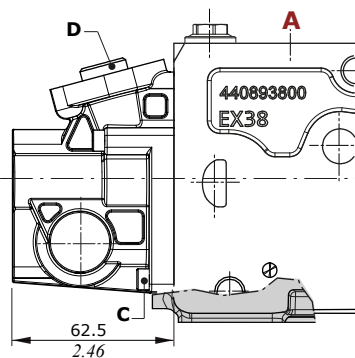
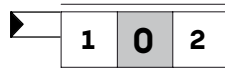
HP06 type With lever



HP06L type With lever and stroke limiter

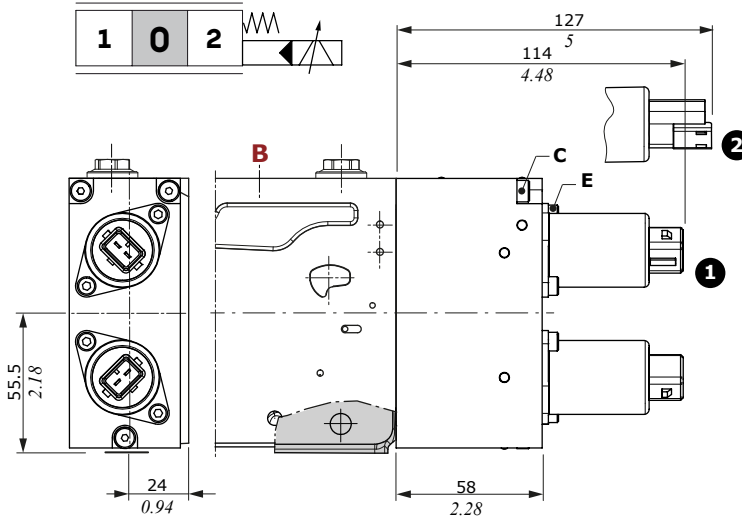


HP10 type Without lever



"B" side control*

FP06 type One-side electrohydraulic control



Wrenches and tightening torques

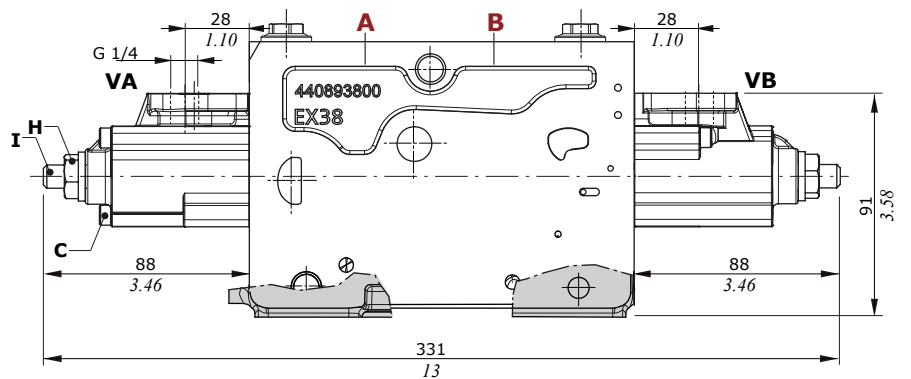
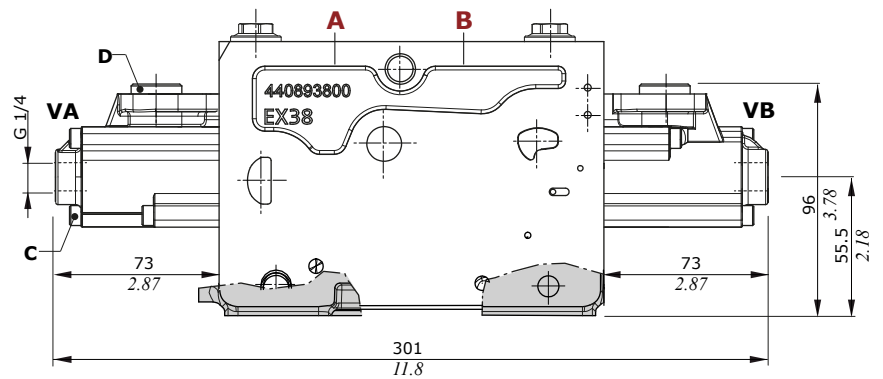
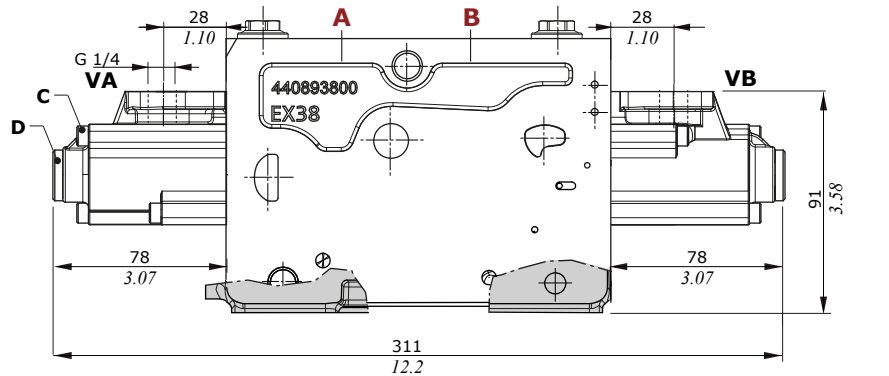
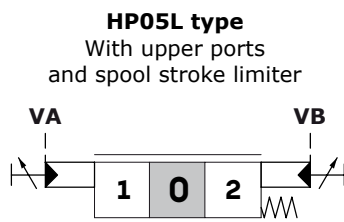
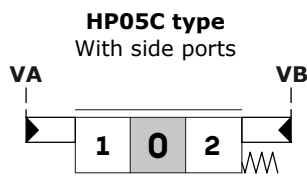
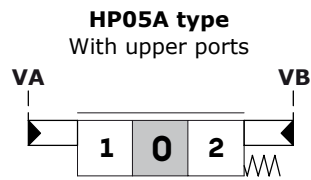
- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
- D = allen wrench 6 - 30 Nm (22 lbft)
- E = allen wrench 3 - 2 Nm (1.5 lbft)
- H = wrench 10 - 9.8 Nm (7.2 lbft)
- I = allen wrench 3

High Flow post-compensated sections

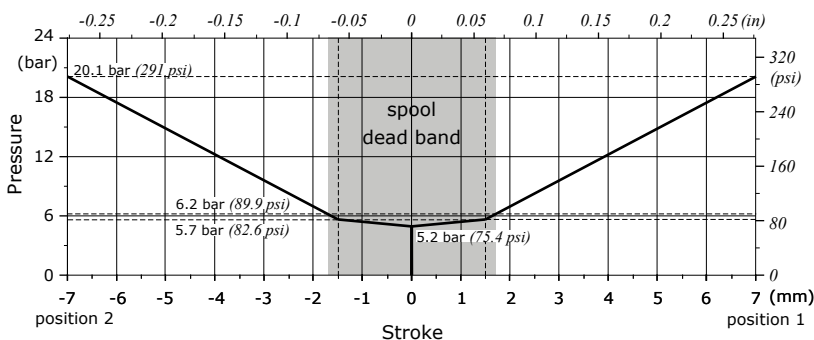
Hydraulic controls

Proportional controls (A+B sides)

Controls are available with upper or side ports.



Stroke vs. Pressure diagram



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

H = wrench 10 - 9.8 Nm (7.2 lbft)

I = allen wrench 3

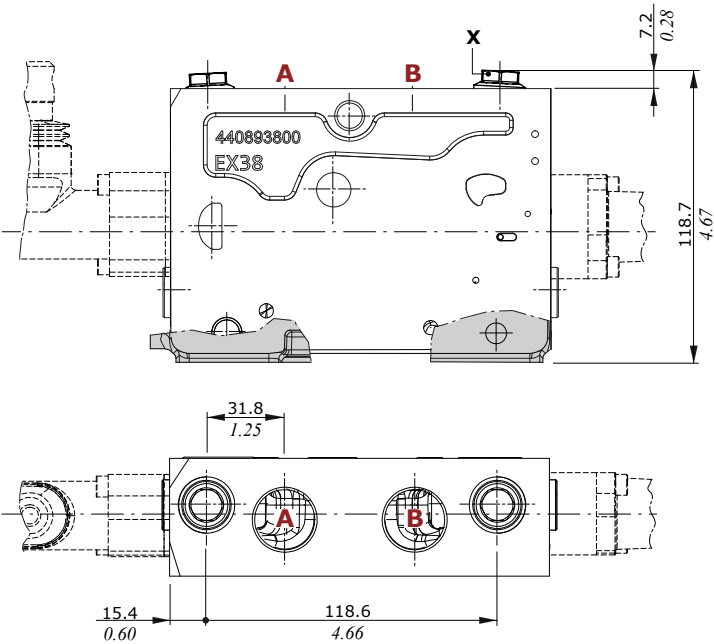
Compatibility table

Combination controls and spool end kit		"A" side controls				
		H001 H002	HP06	HP06L	HP10	HP05
"B" side controls	F001A	422501205				
	F002A	422501205				
	F145	422501205				
	F022A	422501205				
	F023A	422501205				
	FP06		422501217	422501217	422501217	
	HP05					422501217

For spool end types, see page 138

Port valves

Always indicate setting value when using fixed setting combined valve:
Example: 03TF PA (120) = setting



03TF type
Pilot combined valve



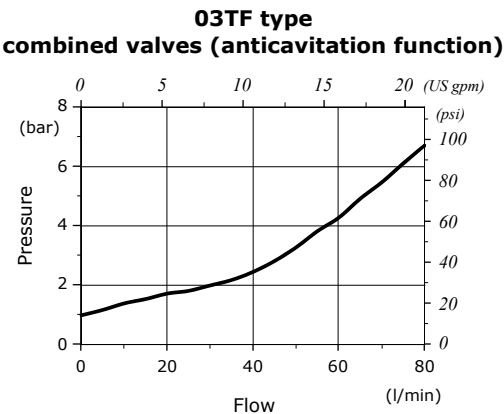
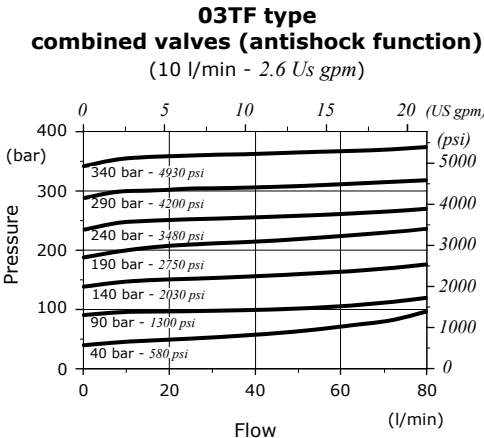
02TF type
Anticavitation valve



05TF type
Valve blanking plug



Wrenches and tightening torques
X = wrench 13 - 40 Nm (29.5 lbf ft)



HPCO connection - High Pressure Carry Over function

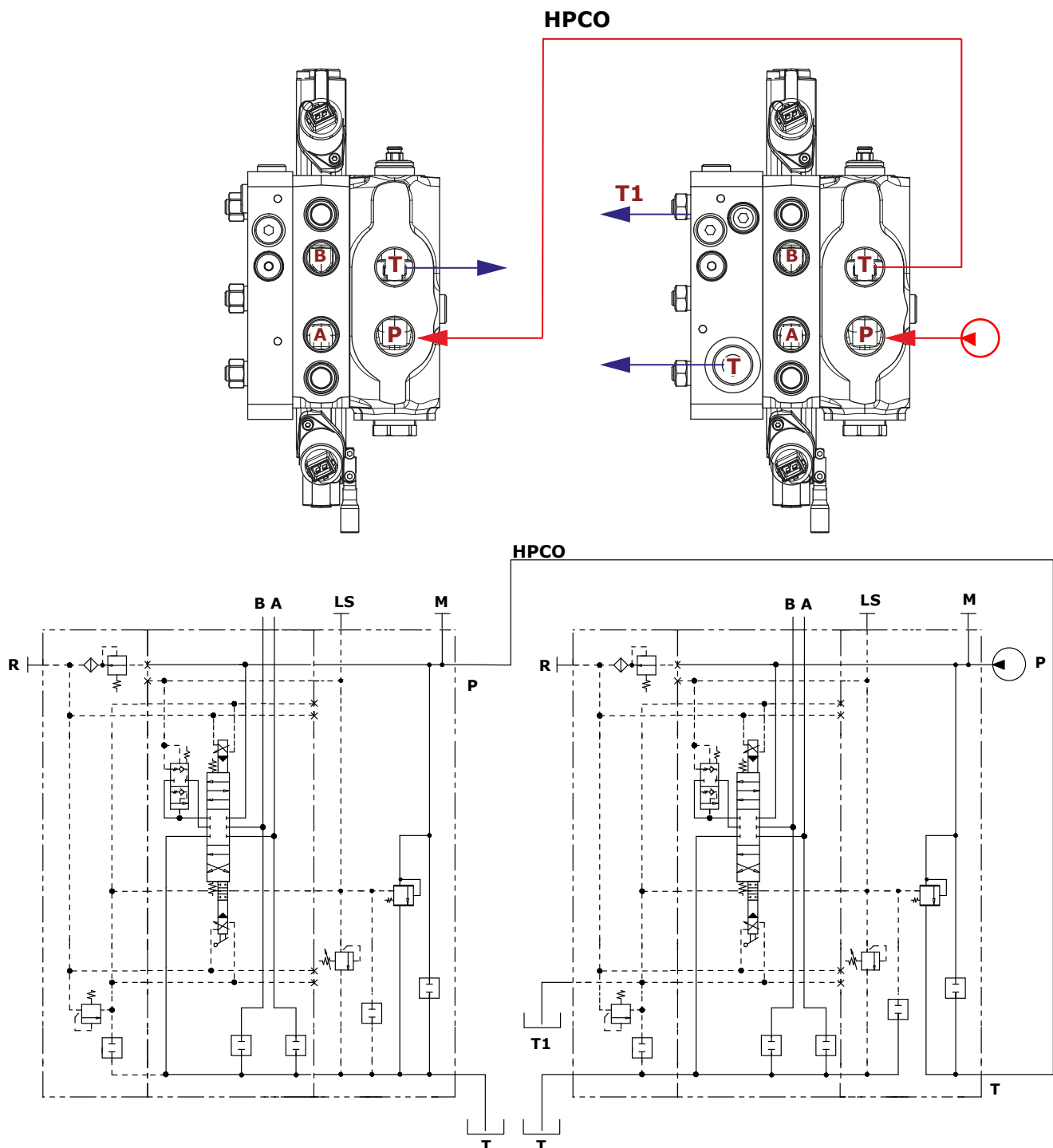
The Carry Over function is yet another unique option offered by the EX family.

In fixed pump circuits (KV), two control valves connected in succession can be used to ensure flow through both valves' inlet compensators.

This special design is obtained by using a special inlet and outlet cover on the first valve.

This circuit is ideally suitable for trailer-equipped machines, since the connection between the two control valves is achieved by simply using one pipe for P and one pipe for T (no additional LS signal connections are necessary).

For this configuration contact our Sales Department.

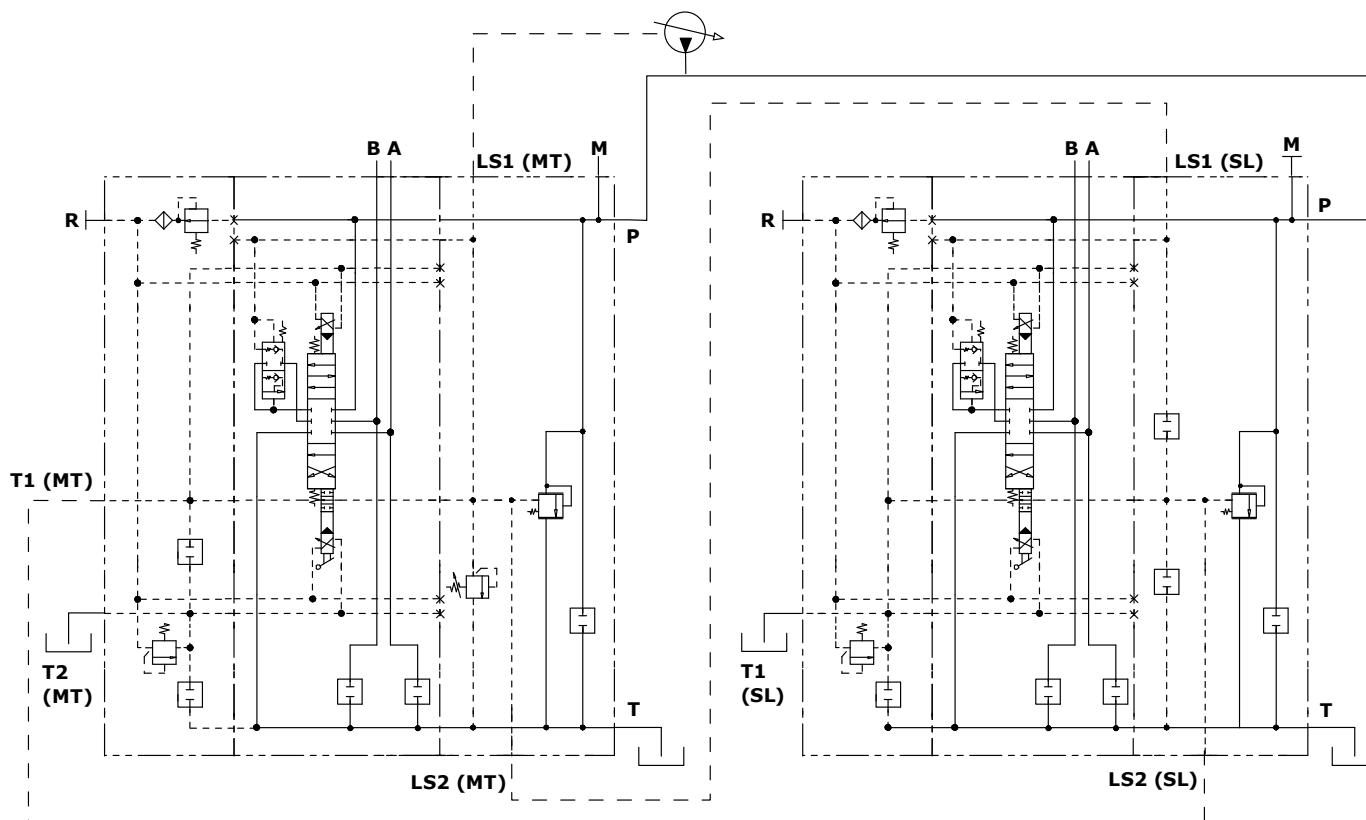
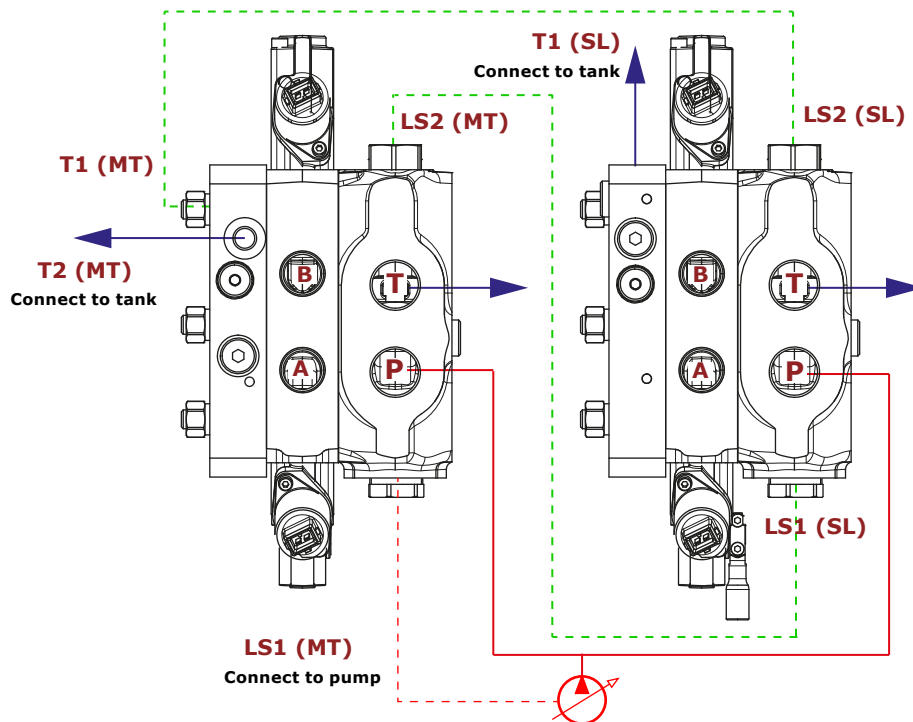


Two valves connection

Parallel connection of several valves

Thanks to an interesting construction design, it is possible to obtain parallel connection of several control valves without that the flow sharing function efficiency and simultaneity of movement being affected. The circuit available either for fixed pump circuits (KV) or variable pump circuits (JV), requires P, T and LS signal connection according to the following diagram.

For this configuration contact our Sales Department.



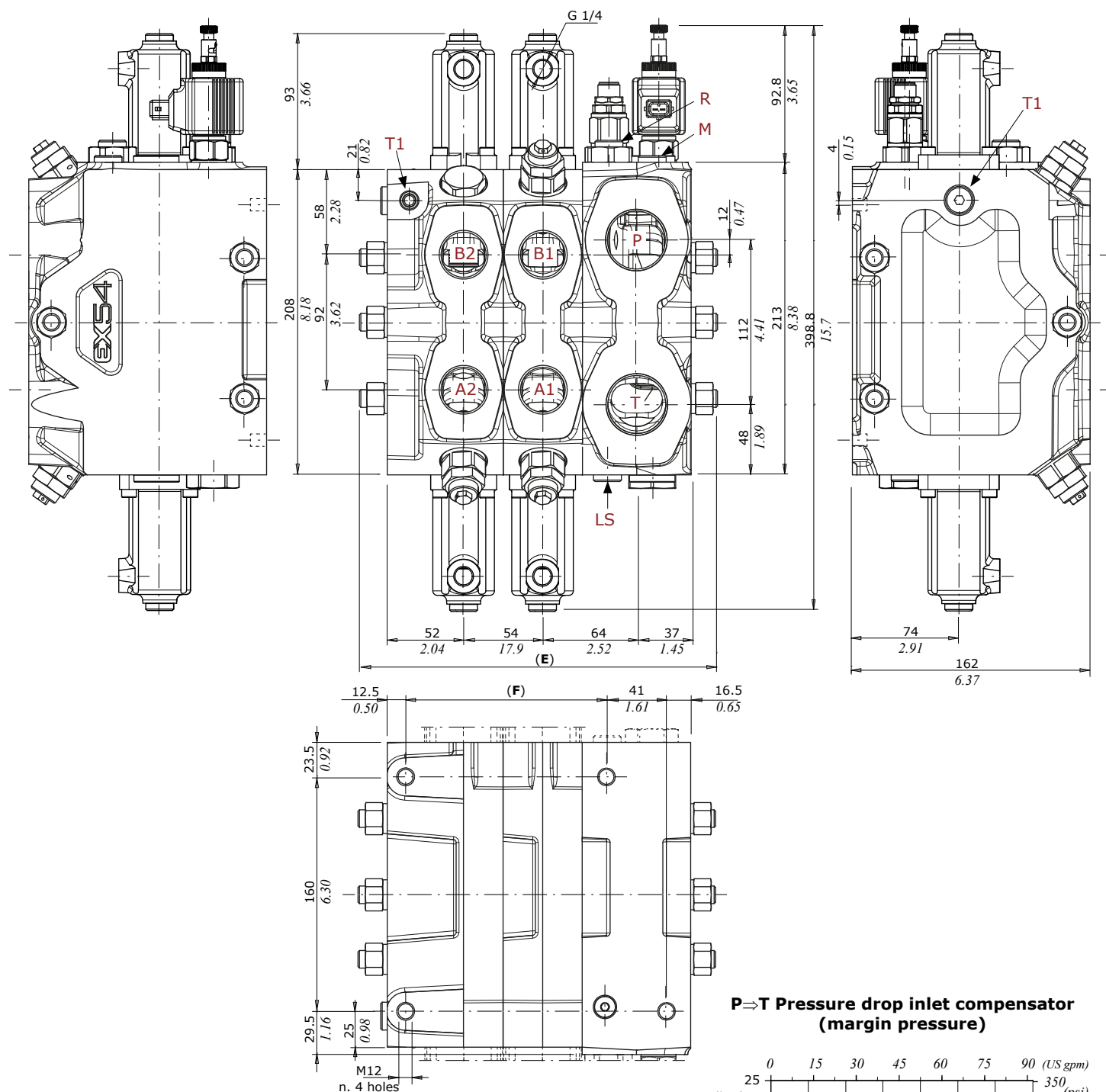
Content

• EX54

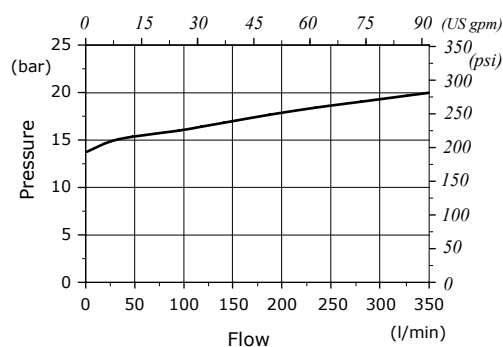
Dimensional data	page 82
Hydraulic circuits.	page 84
Complete section ordering codes.	page 85
Inlet section	
Parts ordering codes	page 87
Dimensional data and hydraulic circuits	page 88
Inlet valves	page 89
Trasformation kit.	page 90
Guide to configuration	page 91
Working section and Integrated end section	
<u>POST-COMPENSATED SECTION</u>	
Parts ordering codes	page 92
Dimensional data and hydraulic circuits	page 95
Spools	page 99
Spool position sensor.	page 100
Mechanical controls (A and B side)	page 101
Hydraulic controls (A and B side)	page 103
Proportional electrohydraulic controls (A and B side).	page 104
Proportional hydraulic controls (A and B side)	page 107
Compatibility table	page 108
Port valves	page 109
Accessories	
Coils and connectors	page 136
Spool end kit	page 138
Seal kits.	page 140
Installation and Maintenance	
Main rules	page 142

Dimensional data

Hydraulic control configuration example

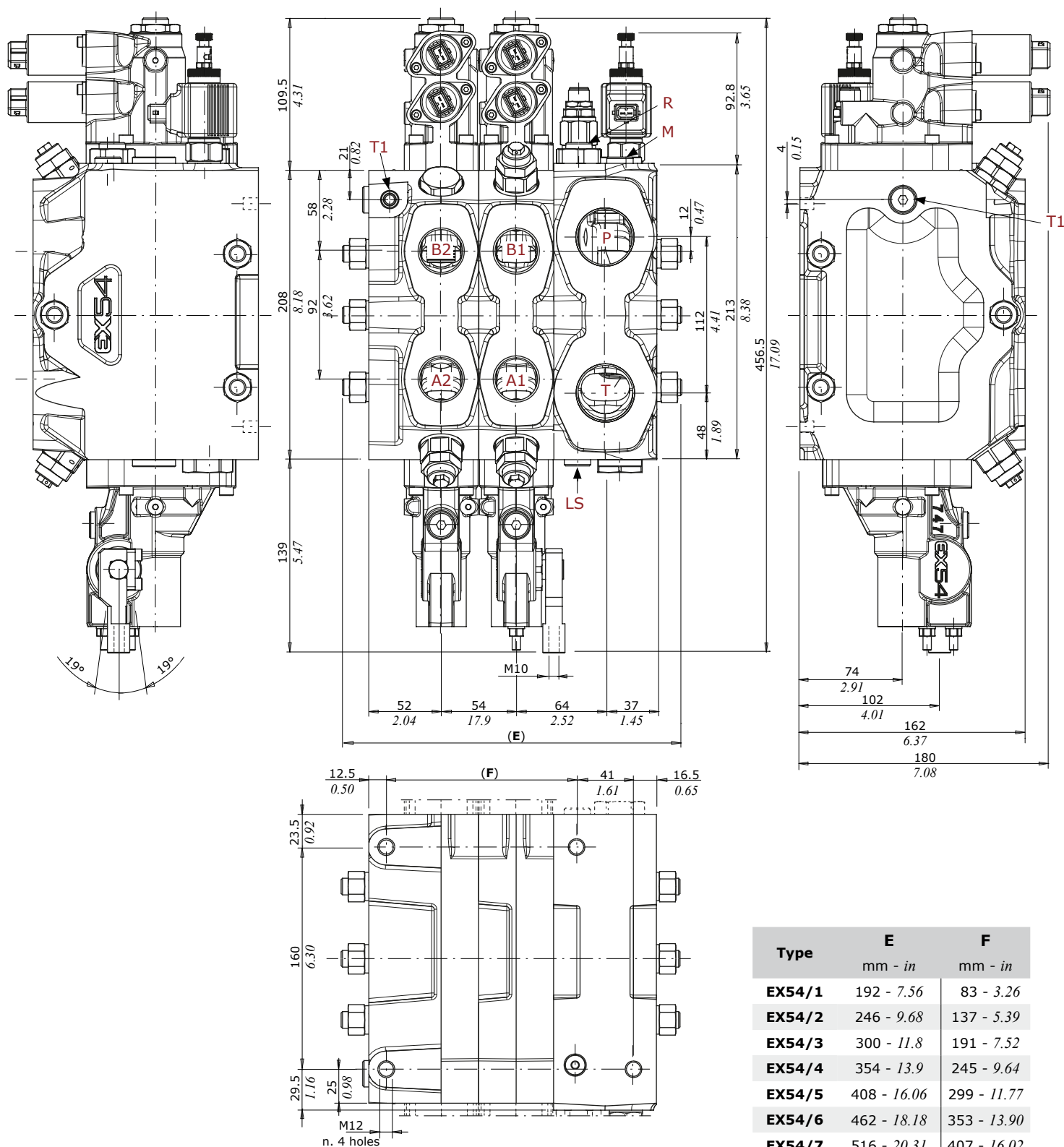


P⇒T Pressure drop inlet compensator (margin pressure)



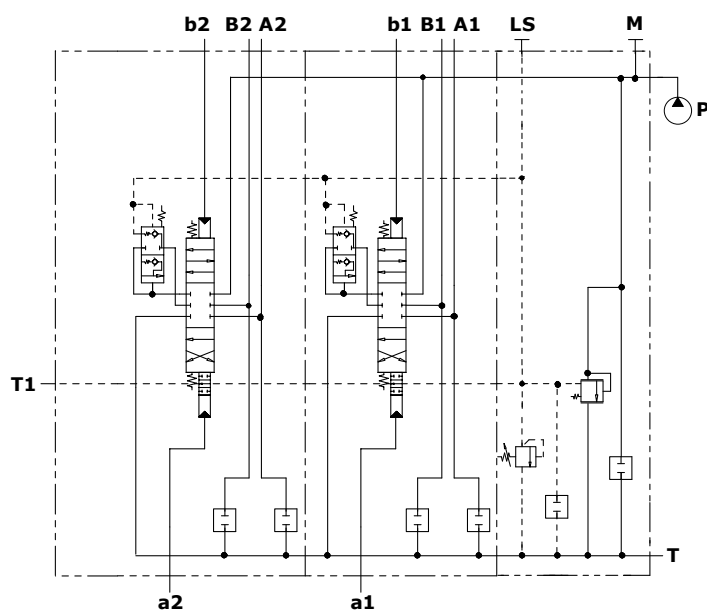
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration

Two-side electrohydraulic control configuration example



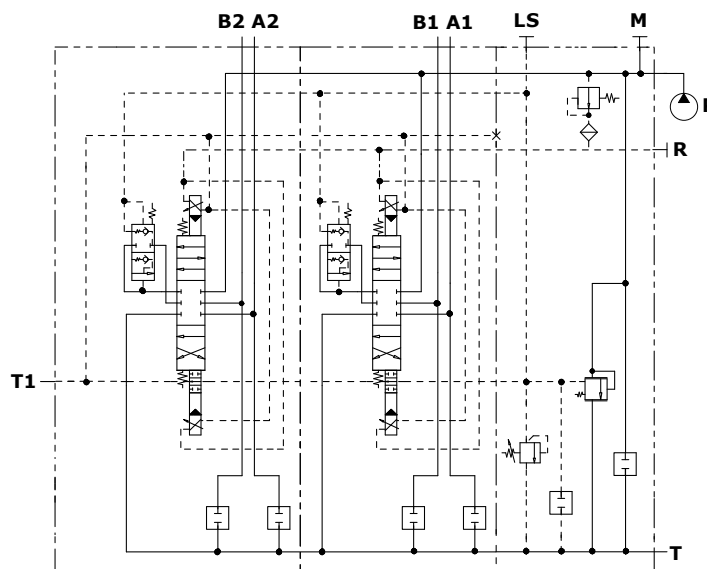
NOTE: Drawings and dimensions are referred to a **BSP** threading configuration

Hydraulic circuits



Right Inlet valve with hydraulic controls configuration (Fixed displacement pump):

EX54/2/MR-V1A(200)-V4B-V10C-KV-G07/
W001C(250\250)-HP05A-RC1-G06.05PA\05PB/
W001C(250\250)-HP05A-RCK1A-G06.05PA\05PB



Right Inlet valve with two-side electrohydraulic controls configuration (Fixed displacement pump):

EX54/2/MR-V1A(200)-V4B-V10C-KVR-G07/
W001C(250\250)-HP07-FP04-B12AJ-RC1-G06.05PA\05PB/
W001C(250\250)-HP07-FP04-B12AJ-RCK1A-G06.05PA\05PB

Complete section ordering codes

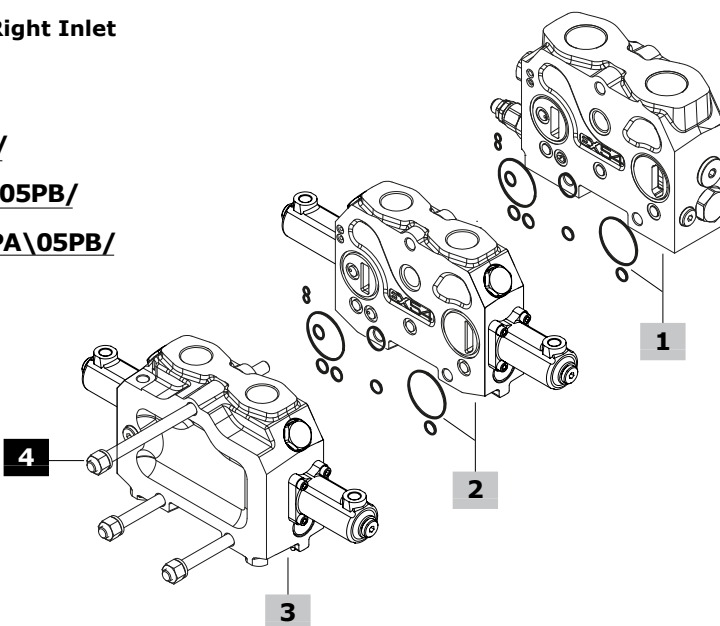
Hydraulic control valve configuration example - Right Inlet

- Working sections Right Inlet
- 1 **EX54/2/MR-V1A(200)-V4B-V10C-KVG07/**
 - 2 **W001C(250/250)-HP05A-RC1G06.05PA\05PB/**
 - 3 **W001C(250/250)-HP05A-RCK1AG06.05PA\05PB/**

P006/2 N10

Painted with RAL 9005
black primer

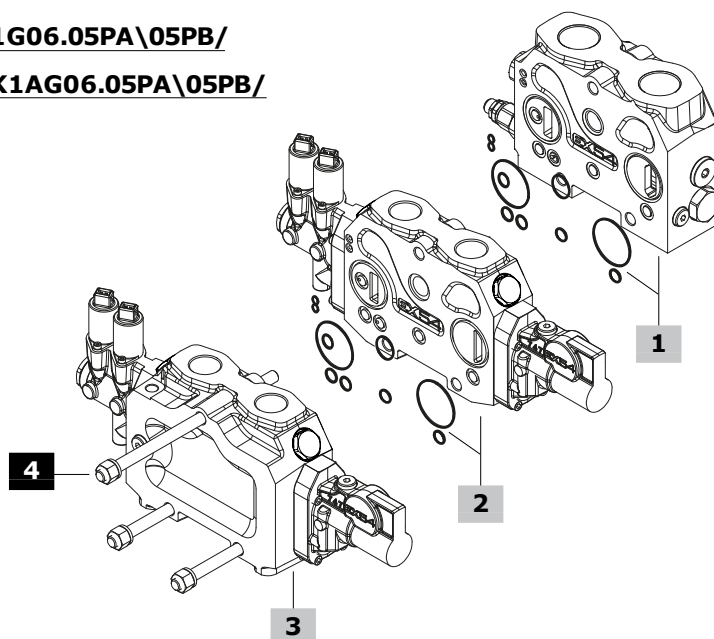
Tie rod tightening torque
wrench 19 - 40 Nm (29.5 lbf ft)



Two-side electrohydraulic control valve configuration example - Right Inlet

- 1 **EX54/2/MR-V1A(200)-V4B-V10C-KVG07/**
- 2 **W001C(250/250)-HP07-FP04-B12AJ-RC1G06.05PA\05PB/**
- 3 **W001C(250/250)-HP07-FP04-B12AJ-RCK1AG06.05PA\05PB/**

P006/2 N10



Complete section ordering codes

1 Inlet sections*

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **MR/V1A(200)-V3B(240)-V10C-KV-G07**

CODE: SHE540012

DESCRIPTION: With LS pressure relief valve, full flow direct relief valve and valve blanking plug on position C

TYPE: **MR/V1A(200)-V4B-V10C-KV-G07**

CODE: SHE540013

DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-KVR-G07**

CODE: SHE540014

DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-KVE-G07**

CODE: SHE540015

DESCRIPTION: As previous one for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **MR/V1A(200)-V4B-V10C-JV-G07**

CODE: SHE540009

DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-JVR-G07**

CODE: SHE540010

DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-JVE-G07**

CODE: SHE540011

DESCRIPTION: As previous one for external pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V11C(C12AJ)-JVR-G07**

CODE: SHE540016

DESCRIPTION: With LS pressure relief valve, valve blanking plug on position B and LS push & twist emergency electric unloading valve

2 Working sections*

The codes are referred to sections with O-ring seals

With mechanical controls

TYPE: **SD/W001C(250\250)-H001-F001A-RC1-G06-05PA-05PB**

CODE: SHL540015

DESCRIPTION: With port valves arrangement (seat plugged), with 250 l/min (66 US gpm) double acting spool, lever control and spring return to neutral

TYPE: **SD/W001C(250\250)-H001-F001A-RC1-G06-04PA(150)-04PB(150)**

CODE: SHL540016

DESCRIPTION: As previous one with pilot combined valves

With proportional hydraulic controls

TYPE: **SD/W001C(250\250)-HP05A-RC1-G06-05PA-05PB**

CODE: SHL540017

DESCRIPTION: With port valves arrangement (seat plugged), with 250 l/min (66 US gpm), double acting spool, complete hydraulic control

TYPE: **SD/W001C(250\250)-HP05A-RC1-G06-04PA(150)-04PB(150)**

CODE: SHL540018

DESCRIPTION: As previous one with pilot combined valves

2 Working sections* (cont.)

The codes are referred to sections with O-ring seals

With proportional electrohydraulic controls

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RC1-G06-05PA-05PB**

CODE: SHL540019

DESCRIPTION: With port valves arrangement (seat plugged), 250 l/min (66 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RC1-G06-04PA(150)-04PB(150)**

CODE: SHL540022

DESCRIPTION: As previous one with pilot combined valves

TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-G06-05PA-05PB**

CODE: SHL540020

DESCRIPTION: With port valves arrangement (seat plugged), 250 l/min (66 US gpm) double acting spool and 12VDC two-side electrohydraulic control, without lever

TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-G06-04PA(150)-04PB(150)**

CODE: SHL540021

DESCRIPTION: As previous one with pilot combined valves

3 Integrated end sections***With mechanical controls**

TYPE: **SD/W001C(250\250)-H001-F001A-RCK1A-G06-05PA-05PB**

CODE: SHU540005

DESCRIPTION: With port valves arrangement (seat plugged), with 250 l/min (66 US gpm) double acting spool, lever control and spring return to neutral

With proportional hydraulic controls

TYPE: **SD/W001C(250\250)-HP05A-RCK1A-G06-05PA-05PB**

CODE: SHU540006

DESCRIPTION: With port valves arrangement (seat plugged), with 250 l/min (66 US gpm), double acting spool, complete hydraulic control

With proportional electrohydraulic controls

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RCK1A-G06-05PA-05PB**

CODE: SHL540007

DESCRIPTION: With port valves arrangement (seat plugged), 250 l/min (66 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

4 Assembly kit

CODE	DESCRIPTION
300198002	For 1 section valve
300198003	For 2 sections valve
300198004	For 3 sections valve
300198005	For 4 sections valve
300198006	For 5 sections valve
300198007	For 6 sections valve
300198008	For 7 sections valve
300198009	For 8 sections valve

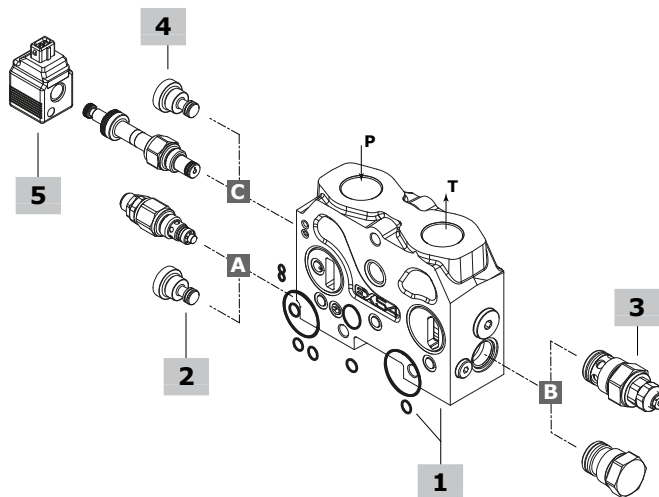
NOTE (*): Codes are referred to **BSP** thread

Valve positions

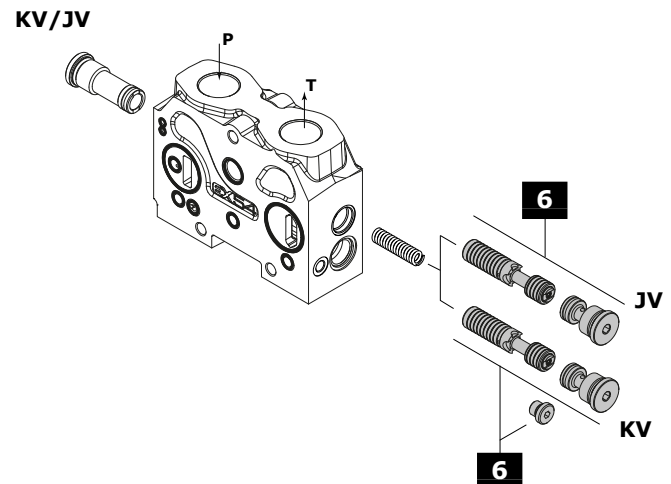
EX54 / MR - V1 A (200) - V4 B - V11 C - C12AJ - KV-G07

Right Inlet **2** **3** **4** **5** **1**

pressure relief valve setting (bar)

**Transformation kit**

KV: for Open Center configuration
JV: for Closed Center configuration

**1 Inlet sections* page 88**

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **KV G07** - G 1" 1/4 ports CODE: 029800001

KV S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800003

DESCRIPTION: For fixed displacement pumps, internal LS and without pressure reducing valve

TYPE: **KVR G07** - G 1" 1/4 ports CODE: 029800021

KVR S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800023

DESCRIPTION: For fixed displacement pumps, internal LS with pressure reducing valve

TYPE: **KVE G07** - G 1" 1/4 ports CODE: 029800041

KVE S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800043

DESCRIPTION: For fixed displacement pumps, internal LS, for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **JV G07** - G 1" 1/4 ports CODE: 029800011

JV S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800013

DESCRIPTION: For variable displacement pumps, external LS and without pressure reducing valve

TYPE: **JVR G07** - G 1" 1/4 ports CODE: 029800031

JVR S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800033

DESCRIPTION: For variable displacement pumps, external LS with pressure reducing valve

TYPE: **JVE G07** - G 1" 1/4 ports CODE: 029800051

JVE S35 - ISO 6162 type 2 flange connection - P port
 ISO 6162 type 1 flange connection - T port
 CODE: 029800053

DESCRIPTION: For variable displacement pumps, external LS, for external pressure reducing valve

NOTE: for seal kit codes, see page 140

2 Valves on position A page 89

TYPE	CODE	DESCRIPTION
V1A		LS pressure relief valve
	915029501	setting range: 50-250 bar (725-3600 psi)
	915029502	setting range: 251-350 bar (3610-5050 psi)
V2A	430059003	Valve blanking plug

3 Valves on position B page 89

TYPE	CODE	DESCRIPTION
V3B		Full Flow direct relief valve
	915078801	setting range: 50-350 bar (725-5050 psi)
V4B	430488001	Valve blanking plug

4 Valves on position C page 90

TYPE	CODE	DESCRIPTION
V10C	430059003	Valve blanking plug
V11C	0EF08002004	LS Push & Twist emergency electric unloading valve

5 Coils and accessories

For available **BER** coils and accessories list see page 136

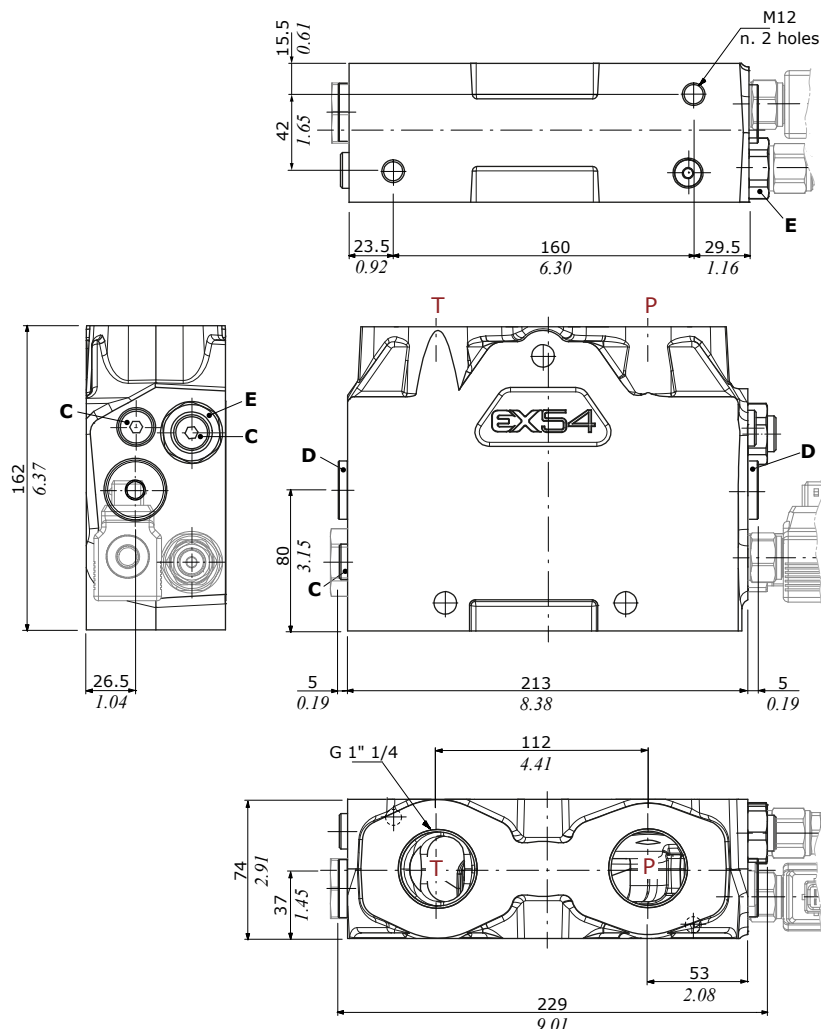
6 Trasformation kit page 90

TYPE	CODE	DESCRIPTION
KV kit	320098007 ⁽¹⁾	Transformation kit, from JV (closed center) to KV (open center)
JV kit	320098006	Transformation kit, from KV (open center) to JV (closed center)

NOTE (*): Codes are referred to **BSP-MA** thread
 (1): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

Drawing is referred to KV section; dimensions are the same for JV section



Wrenches and tightening torques

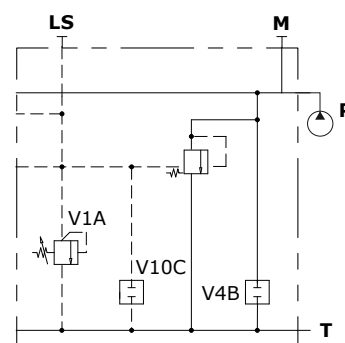
C = allen wrench 6 - 30 Nm (22 lbft)

D = allen wrench 8 - 65 Nm (48 lbft)

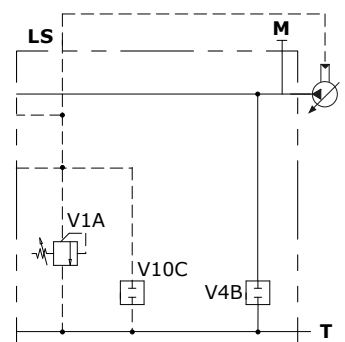
E = wrench 30 - 65 Nm (48 lbft)

NOTE: for valves wrench and torque, see related pages

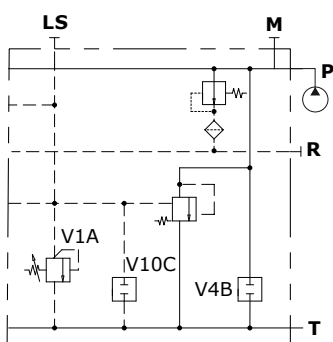
KV Open Center (example)



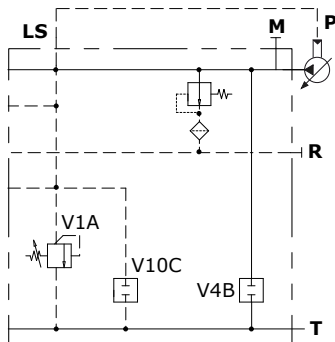
JV Closed Center (example)



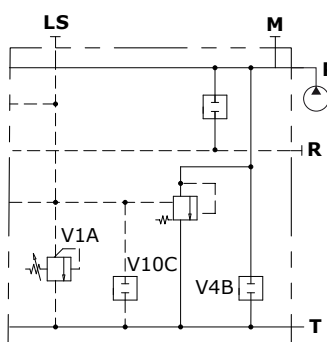
KVR Open Center
with pressure reducing valve
(example)



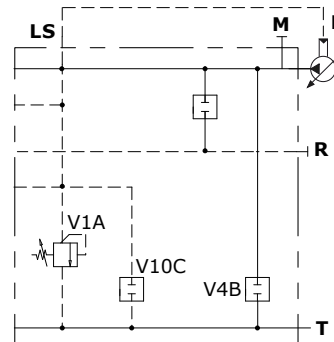
JVR Closed Center
with pressure reducing valve
(example)



KVE Open Center
for external pressure
reducing valve (example)



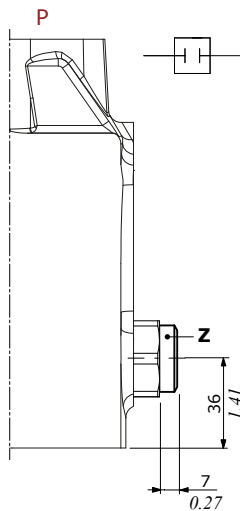
JVE Closed Center
for external pressure
reducing valve (example)



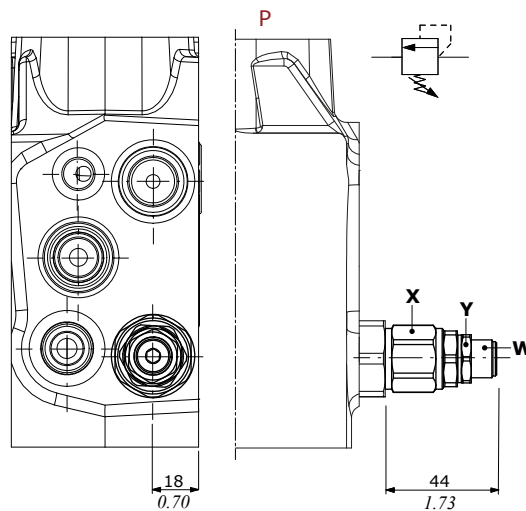
Inlet valves

Valves on position A

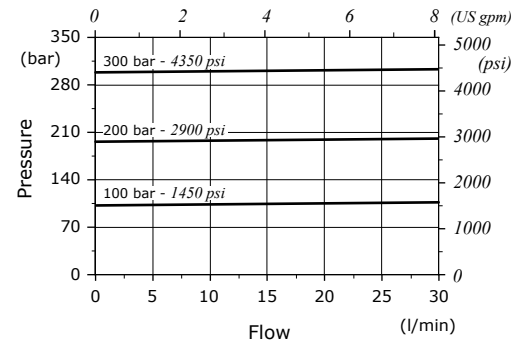
V2A type
Valve blanking plug



V1A type
LS pressure relief valve



LS relief valve
characteristics



Wrenches and tightening torque

X = wrench 24 - 45 Nm (33 lbft)

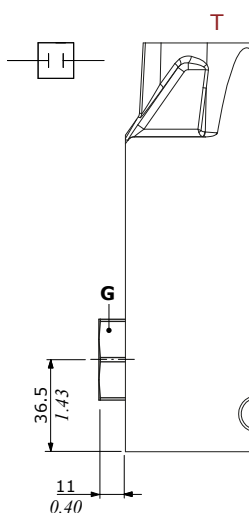
Y = wrench 19 - 30 Nm (22 lbft)

W = allen wrench 5

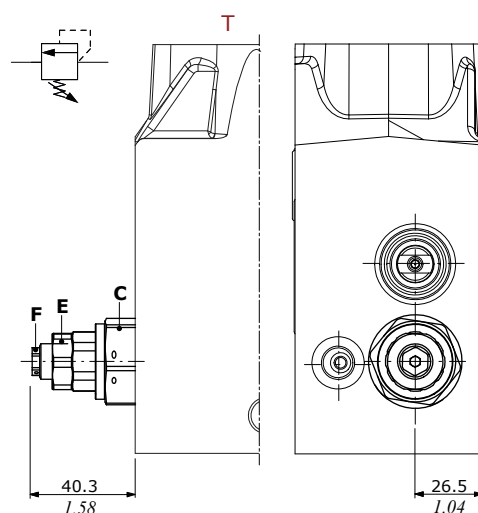
Z = allen wrench 8 - 30 Nm (22 lbft)

Valves on position B

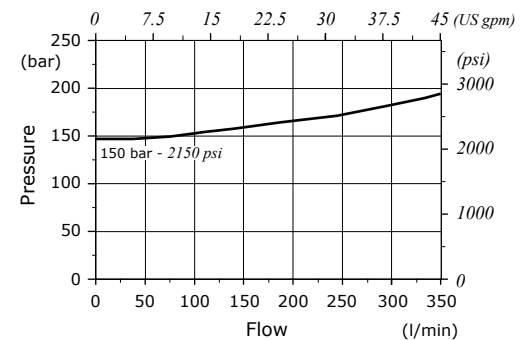
V4B type
Valve blanking plug



V3B type
Full Flow direct relief valve



Full Flow relief valve
characteristics



Wrenches and tightening torque

C = wrench 32 - 65 Nm (48 lbft)

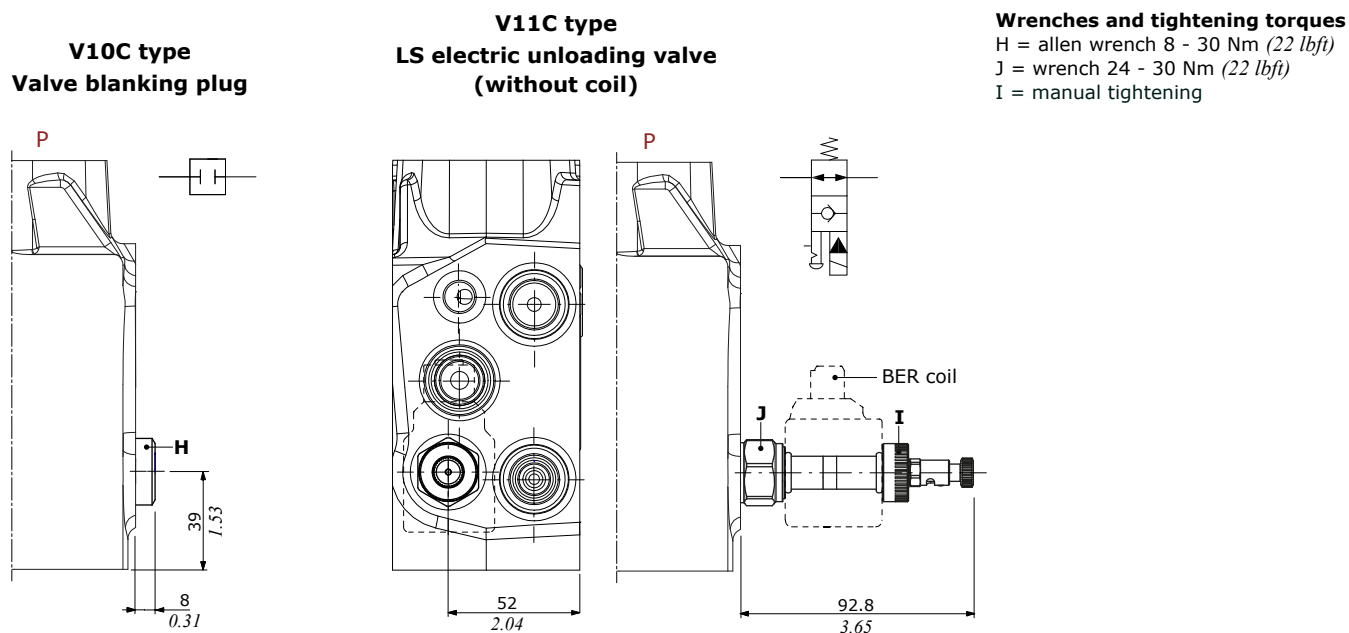
E = wrench 22 - 20 Nm (14.7 lbft)

F = wrench 10 - 20 Nm (14.7 lbft)

G = wrench 32 - 65 Nm (48 lbft)

Inlet valves

Valves on position C



For **BER** type coils see page 136

NOTES:

Valve types V1A and V3B require factory setting (example: V1A - 150)

Valve combination V1A - V3B requires double setting (example: 200*240); the minimum difference between settings is 40 bar - 580 psi

Valve type V11C requires coil kit type (example: C12AJ).

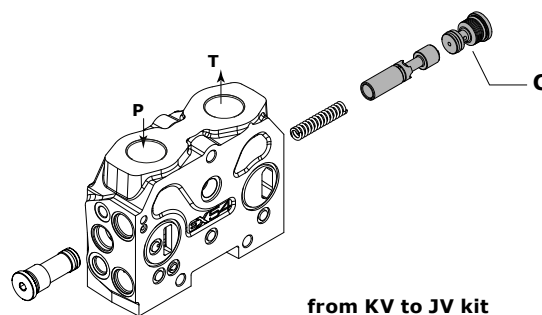
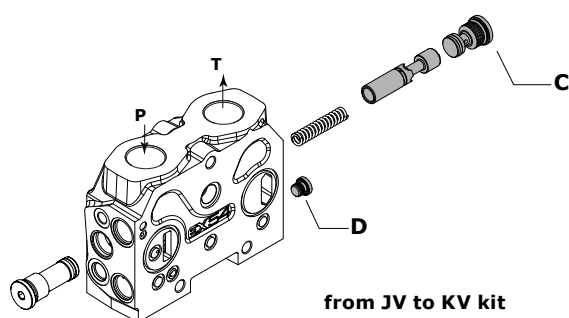
Trasformation kit

In order to trasform the inlet section from Closed Center (JV) to Open Center (KV) and viceversa.

The following kit are available:

code 320098007, from JV to KV kit

code 320098006, from KV to JV kit



Wrenches and tightening torques

C = allen wrench 8 - 65 Nm (48 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

Guide to configuration (valve general informations)

EX54 working section and Integrated end section are only available in POST-COMPENSATED configuration.

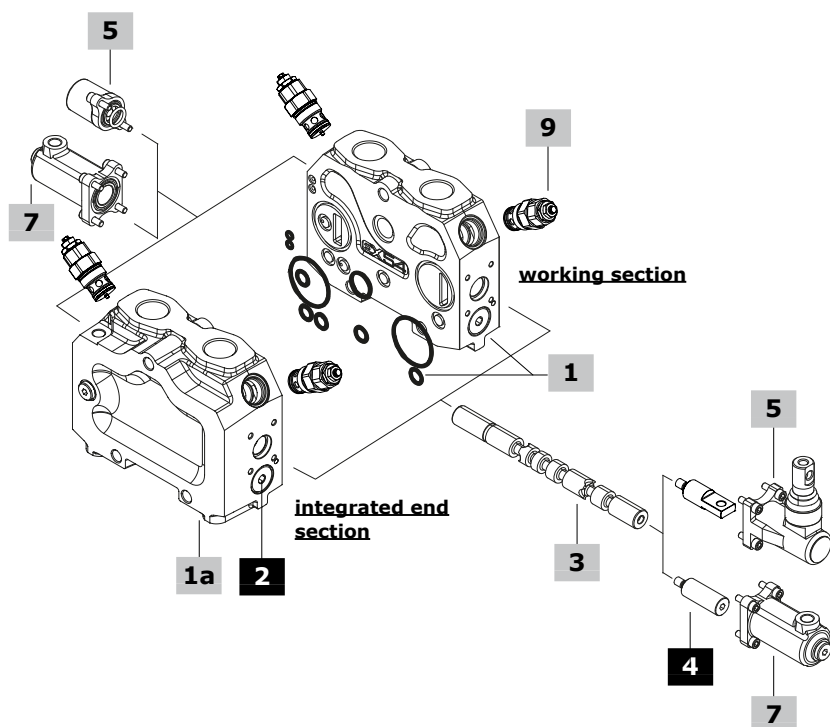
POST-COMPENSATED section with additional port for remoted LS relief valve (RCS)

It is possible to bring local signal to a remoted relief valve by means of a dedicated 1/4 BSP or 9/16" UNF port.

Remoted relief valve must be provided separately in the hydraulic circuit.

The local pressure limitation works properly if the section is actuated alone or if the section is the most charged.

Part ordering codes



Working section with mechanical control

flow on A/B ports (l/min)

EX54-SD/W001C(250\250) - H001 - F001A

Right Inlet 3 5 5

valve setting (bar)

A port B port

RC1-G06 . 04-PA(150)\04-PB(150)

1 9

Working section with prop. hydraulic control

EX54-SD/W001C(250\250) - HP05A -

7

RC1-G06 . 04-PA(150)\04-PB(150)

Integrated end section with mechanical control

EX54-SD/W001C(250\250) - H001 - F001A

RCK1A-G06 . 04-PA(150)\04-PB(150)

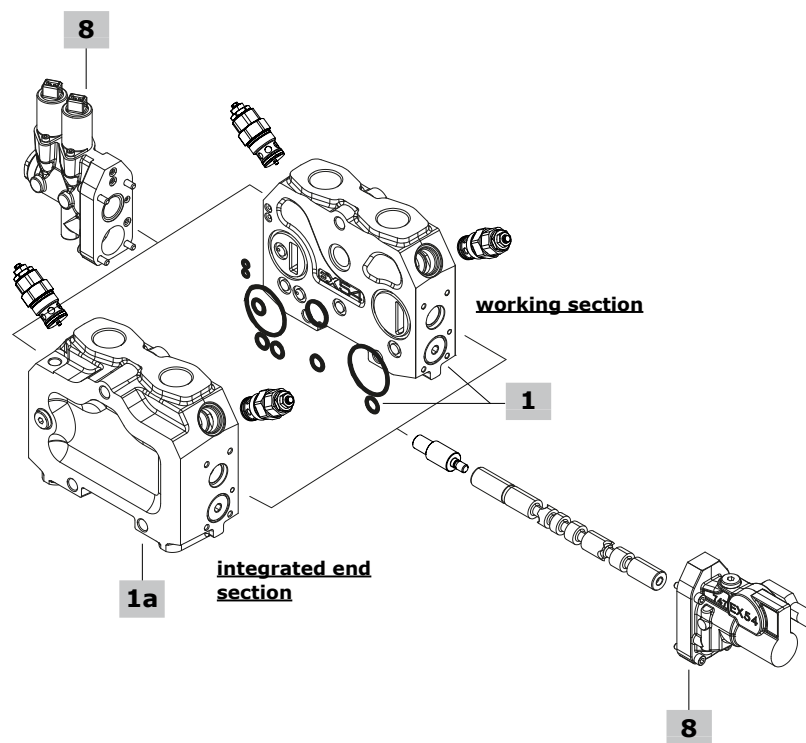
1a

Integrated end section with prop. hydraulic control

EX54-SD/W001C(250\250) - HP05A -

RCK1A-G06 . 04-PA(150)\04-PB(150)

1a



Working section with electrohydraulic control

EX54-SD/W001C(250\250) - HP04 - FP04

8 8

B12AJ - RC1-G06 . 04-PA(150)\04-PB(150)

8 1

Integrated end section, with electrohydraulic control

EX54-SD/W001C(250\250) - HP04 - FP04

B12AJ - RCK1A-G06 . 04-PA(150)\04-PB(150)

1a

Part ordering codes

1 Working sections* page 95

The codes are referred to sections with O-ring seals

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

For mechanical and proportional hydraulic controls

Standard section, with port valves arrangement:

RC1 G06	039800001	G 1" 1/4 ports
----------------	-----------	----------------

RC1 S03	039800003	ISO 6162 type 1 flange connection ports
----------------	-----------	---

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCS1 G06	039800021	G 1" 1/4 ports
-----------------	-----------	----------------

RCS1 S03	039800023	ISO 6162 type 1 flange connection ports
-----------------	-----------	---

For hydraulic and electrohydraulic controls

Standard section, with port valves arrangement:

RC1 G06	039800101	G 1" 1/4 ports
----------------	-----------	----------------

RC1 S03	039800103	ISO 6162 type 1 flange connection ports
----------------	-----------	---

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCS1 G06	039800121	G 1" 1/4 ports
-----------------	-----------	----------------

RCS1 S03	039800123	ISO 6162 type 1 flange connection ports
-----------------	-----------	---

NOTE: for seal kit codes, see page 140

1a Integrated end sections* page 96

The codes are referred to sections with O-ring seals

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

For mechanical and proportional hydraulic controls

Standard section, with port valves arrangement:

RCK1A G06	039800201	G1/4 upper T1 drain, G 1" 1/4 ports
------------------	-----------	-------------------------------------

RCK1A S03	039800203	G1/4 upper T1 drain, ISO 6162 type 1 flange connection ports
------------------	-----------	--

RCK1C G06	039800205	G1/4 side T1 drain, G 1" 1/4 ports
------------------	-----------	------------------------------------

RCK1C S03	039800207	G1/4 side T1 drain, ISO 6162 type 1 flange connection ports
------------------	-----------	---

Section with additional port for remoted LS relief valve, with aux valves arrangement:

RCSK1A G06	039800301	G1/4 upper T1 drain, G 1" 1/4 ports
-------------------	-----------	-------------------------------------

RCSK1A S03	039800303	G1/4 upper T1 drain, ISO 6162 type 1 flange connection ports
-------------------	-----------	--

RCSK1C G06	039800305	G1/4 side T1 drain, G 1" 1/4 ports
-------------------	-----------	------------------------------------

RCSK1C S03	039800307	G1/4 side T1 drain, ISO 6162 type 1 flange connection ports
-------------------	-----------	---

For hydraulic and electrohydraulic controls

Standard section, with port valves arrangement:

RCK1A G06	039800231	G1/4 upper T1 drain, G 1" 1/4 ports
------------------	-----------	-------------------------------------

RCK1A S03	039800233	G1/4 upper T1 drain, ISO 6162 type 1 flange connection ports
------------------	-----------	--

RCK1C G06	039800235	G1/4 side T1 drain, G 1" 1/4 ports
------------------	-----------	------------------------------------

RCK1C S03	039800237	G1/4 side T1 drain, ISO 6162 type 1 flange connection ports
------------------	-----------	---

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCSK1A G06	039800331	G1/4 upper T1 drain, G 1" 1/4 ports
-------------------	-----------	-------------------------------------

RCSK1A S03	039800333	G1/4 upper T1 drain, ISO 6162 type 1 flange connection ports
-------------------	-----------	--

RCSK1C G06	039800335	G1/4 side T1 drain, G 1" 1/4 ports
-------------------	-----------	------------------------------------

RCSK1C S03	039800337	G1/4 side T1 drain, ISO 6162 type 1 flange connection ports
-------------------	-----------	---

Standard section with P1 port and port valves arrangement:

RCP1A G06	039800261	G1/4 upper T1 drain, side P1 inlet, G1/4 ports
------------------	-----------	--

RCP1A S03	039800265	G1/4 upper T1 drain, A and B ISO 6162 type 1, and side P1 inlet ISO 6162 type 2 flange connection ports
------------------	-----------	---

RCP1C G06	039800263	G1/4 side T1 drain, side P1 inlet, G1/4 ports
------------------	-----------	---

RCP1C S03	039800267	G1/4 side T1 drain, A and B ISO 6162 type 1, and side P1 inlet ISO 6162 type 2 flange connection ports
------------------	-----------	--

NOTE (*): Codes are referred to **BSP-MA** thread

1a Integrated end sections* (cont.) page 96

The codes are referred to sections with O-ring seals

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

Section with P1 port and additional port for remoted LS relief valve, with port valves arrangement:

RCSP1A G06	039800291	G1/4 upper T1 drain, side P1 inlet, G1/4 ports
-------------------	-----------	--

RCSP1A S03	039800295	G1/4 upper T1 drain, A and B ISO 6162 type 1, and side P1 inlet ISO 6162 type 2 flange connection ports
-------------------	-----------	---

RCSP1C G06	039800293	G1/4 side T1 drain, side P1 inlet, G1/4 ports
-------------------	-----------	---

RCSP1C S03	039800297	G1/4 side T1 drain, A and B ISO 6162 type 1, and side P1 inlet ISO 6162 type 2 flange connection ports
-------------------	-----------	--

NOTE: for seal kit codes, see page 140

2 Trasformation kit page 95

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

RC	430098002	Standard kit
-----------	-----------	--------------

RCS	430098026	Additional G1/4 port for remoted LS relief valve
------------	-----------	--

3 Spools page 99

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

3 pos., double-acting, A and B closed in neutral position:

W001C 5050	421298007	50 l/min (13.2 Us gpm)
-------------------	-----------	------------------------

W001C 100100	421298003	100 l/min (26.4 Us gpm)
---------------------	-----------	-------------------------

W001C 150150	421298004	150 l/min (39.6 Us gpm)
---------------------	-----------	-------------------------

W001C 200200	421298005	200 l/min (52.8 Us gpm)
---------------------	-----------	-------------------------

W001C 250250	421298006	250 l/min (66 Us gpm)
---------------------	-----------	-----------------------

3 pos., double-acting, A and B to tank in neutral position:

W002C 5050	421298014	50 l/min (13.2 Us gpm)
-------------------	-----------	------------------------

W002C 100100	421298010	100 l/min (26.4 Us gpm)
---------------------	-----------	-------------------------

W002C 150150	421298011	150 l/min (39.6 Us gpm)
---------------------	-----------	-------------------------

W002C 200200	421298012	200 l/min (52.8 Us gpm)
---------------------	-----------	-------------------------

W002C 250250	421298013	250 l/min (66 Us gpm)
---------------------	-----------	-----------------------

NOTE: not symmetric spools are available on request; contact Sales Department.

4 Spool end kit page 138

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

A side:

-	422501289	Only for mechanical controls
---	-----------	------------------------------

-	422501240	Only for hydraulic controls
---	-----------	-----------------------------

B side:

-	422501251	Only for electrohydraulic controls
---	-----------	------------------------------------

-	422501309	Only for spool position sensor controls
---	-----------	---

5 Mechanical controls page 101

Please choose A+B side controls

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

"A" side controls:

H001	320306006	Whit lever box
-------------	-----------	----------------

H002	320306006	With lever box, rotated 180°
-------------	-----------	------------------------------

H004	320306002	Without lever box
-------------	-----------	-------------------

"B" side controls:

F001A	320798001	3 pos., std. spring type A.
--------------	-----------	-----------------------------

F001B	320798002	Spring return in neutral position
--------------	-----------	-----------------------------------

F001ASD	320098013	3 pos., soft spring type B.
----------------	-----------	-----------------------------

F001ASD	320098013	Spring return in neutral position
----------------	-----------	-----------------------------------

F001ASD	320098013	3 pos., std. spring type A.
----------------	-----------	-----------------------------

F001BSD	320098014	With digital SPSP spool position sensor
----------------	-----------	---

F001BSD	320098014	3 pos., soft spring type B.
----------------	-----------	-----------------------------

F001BSD	320098014	With digital SPSP spool position sensor
----------------	-----------	---

F001ASL	320098011	3 pos., std. spring type A.
----------------	-----------	-----------------------------

F001ASL	320098011	With analog SPSP spool position sensor
----------------	-----------	--

F001BSL	320098012	3 pos., soft spring type B.
----------------	-----------	-----------------------------

F001BSL	320098012	With analog SPSP spool position sensor
----------------	-----------	--

Part ordering codes

6 Hydraulic controls* page 103

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP01	320598130	With lever
"B" side controls:		
FP01	320598131	Hydraulic control

7 Proportional hydraulic controls* page 107

Type and code referred to the complete control (A+B sides)

TYPE	CODE	DESCRIPTION
HP05A	320598100	With G1/4 upper ports
HP05C	320598106	With G1/4 side ports
HP05L	320598112	With G1/4 upper ports and stroke limiter

8 Two-side electrohydraulic controls page 104

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP04	322598002	With lever
HP04L	322598003	With lever and stroke limiter
HP07	322598004	Without lever
HP07L	322598005	Without lever with stroke limiter
"B" side controls:		
FP04	322598107	12VDC, AMP JPT connector
	322598108	24VDC, AMP JPT connector
	322598109	12VDC, DEUTSCH DT connector
	322598110	24VDC, DEUTSCH DT connector
FP04L	322598111	With stroke limiter, 12VDC, AMP JPT connector
	322598112	With stroke limiter, 24VDC, AMP JPT connector
	322598113	With stroke limiter, 12VDC, DEUTSCH DT connector
	322598114	With stroke limiter, 24VDC, DEUTSCH DT connector
FP04SD	322598130	Digital SPSP spool position sensor, 12VDC, AMP JPT connector
	322598134	Digital SPSP spool position sensor, 24VDC, AMP JPT connector
	322598135	Digital SPSP spool position sensor, 12VDC, DEUTSCH DT connector
	322598136	Digital SPSP spool position sensor, 24VDC, DEUTSCH DT connector
FP04SL	322598129	Analog SPSP spool position sensor, 12VDC, AMP JPT connector
	322598130	Analog SPSP spool position sensor, 24VDC, AMP JPT connector
	322598131	Analog SPSP spool position sensor, 12VDC, DEUTSCH DT connector
	322598132	Analog SPSP spool position sensor, 24VDC, DEUTSCH DT connector

9 Port valves page 109

Setting is referred to 10 l/min (2.6 US gpm)

TYPE	CODE	DESCRIPTION
02 PA/PB	915080601	Anticavitation valve
05 PA/PB	430006002	Valve blanking plug

Antishock valve (example of setting):TYPE: **01PA/PB(100)**

└─setting (bar) @ full flow - 300 l/min (79.2 US gpm)

TYPE: **01PA/PB(80-A)**

└─setting (bar) @ min. flow - 5 l/min (1.3 US gpm)

TYPE	CODE	DESCRIPTION
01 PA/PB	915064501	setting @ full flow from 70 to 150 bar
		(from 1015 to 2170 psi), setting @ min. flow from
		70-A to 120-A bar (from 1015-A to 1740-A psi)
	915064502	setting @ full flow from 151 to 230 bar
		(from 2190 to 3330 psi), setting @ min. flow from
		121-A to 200-A bar (from 1760-A to 2900-A psi)
	915064503	setting @ full flow from 231 to 280 bar
		(from 3350 to 4050 psi), setting @ min. flow from
		201-A to 250-A bar (from 2920-A to 3630-A psi)
	915064504	setting @ full flow from 281 to 350 bar
		(from 4070 to 5070 psi), setting @ min. flow from
		251-A to 350-A bar (from 3640-A to 5070-A psi)

TYPE: **04PA/PB(100-A)**

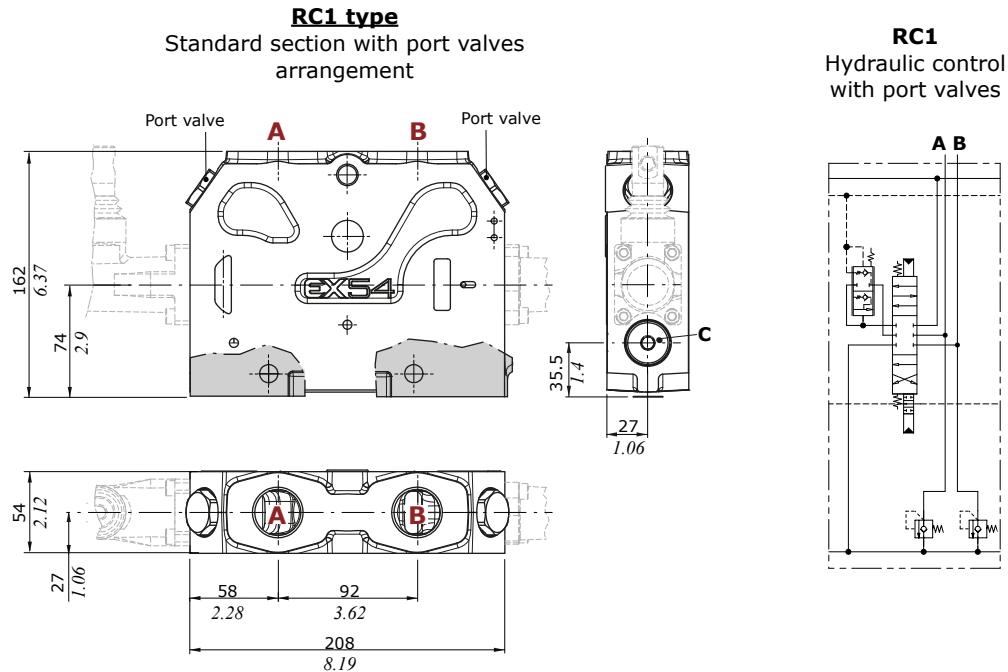
└─setting (bar) @ min. flow - 5 l/min (1.3 US gpm)

TYPE	CODE	DESCRIPTION
04 PA/PB	915074501	setting @ full flow from 50 to 420 bar
		(from 725 to 6090 psi), setting @ min. flow from
		50-A to 420-A bar (from 725-A to 6090-A psi)

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

Dimensional data and hydraulic circuits

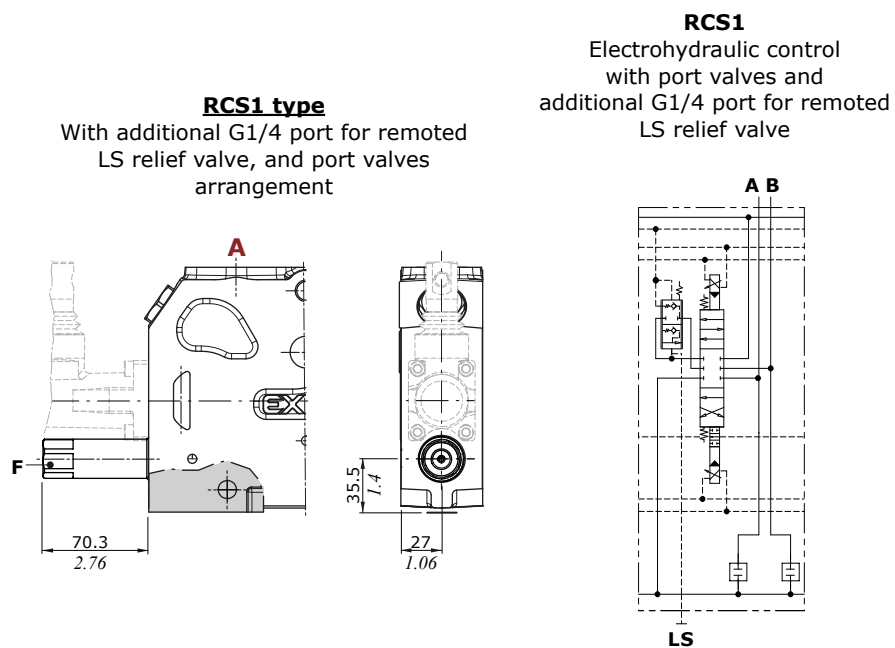
Post-compensated section



Wrenches and tightening torques

C = allen wrench 8 - 65 Nm (48 lbf_t)

F = wrench 24 - 55 Nm (40.5 lbf_t)

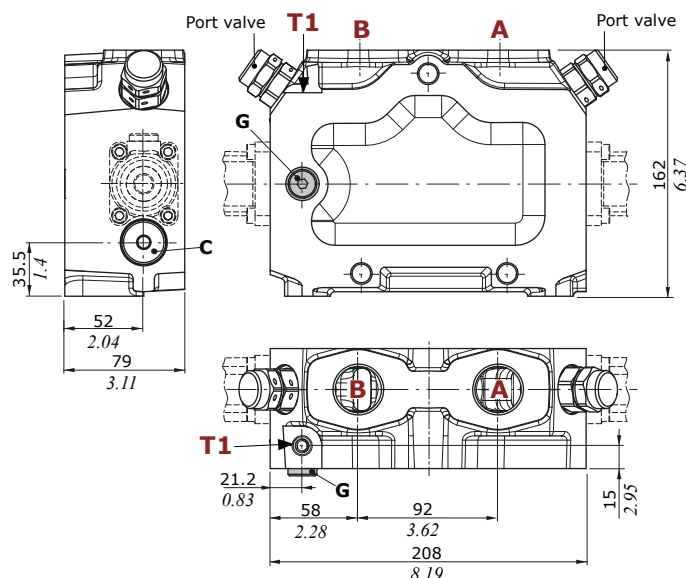


Dimensional data

Integrated end sections

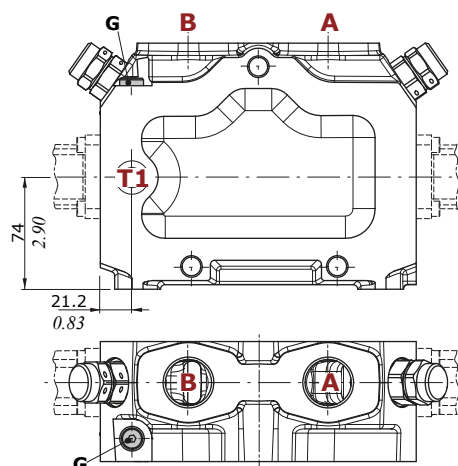
RCK1A type

Standard section with upper T1 drain and port valves arrangement



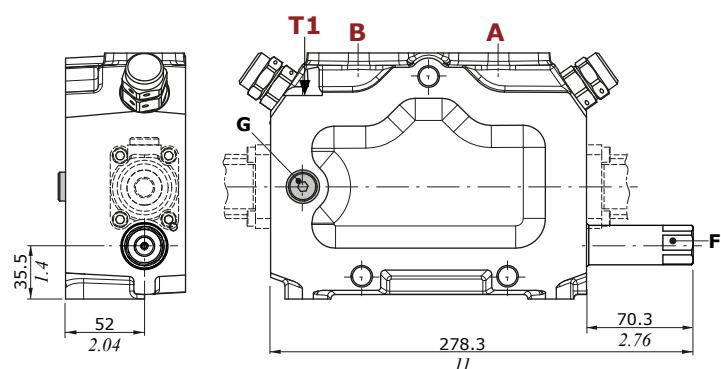
RCK1C type

Standard section with side T1 drain and port valves arrangement



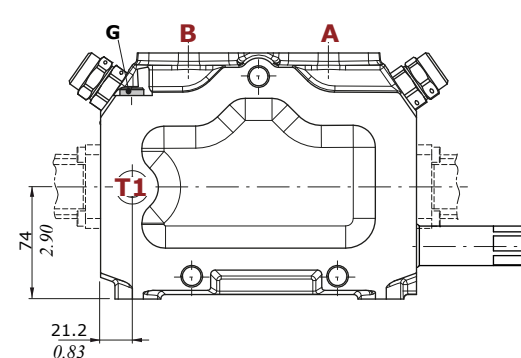
RCSK1A type

With upper T1 drain, additional G1/4 port for remoted LS relief valve and port valves arrangement



RCSK1C type

With side T1 drain, additional G1/4 port for remoted LS relief valve and port valves arrangement



Wrenches and tightening torques

C = allen wrench 8 - 65 Nm (48 lbft)

F = wrench 24 - 55 Nm (40.5 lbft)

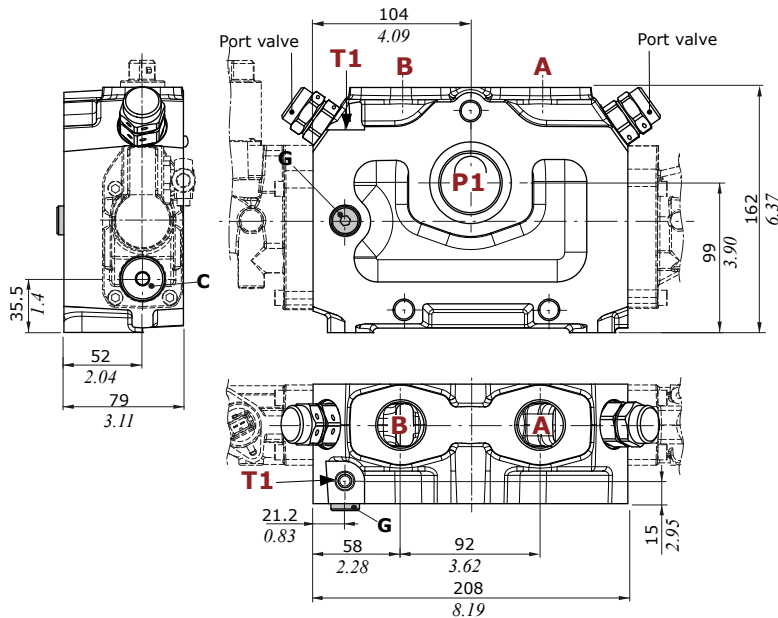
G = allen wrench 6 - 30 Nm (22 lbft)

Dimensional data

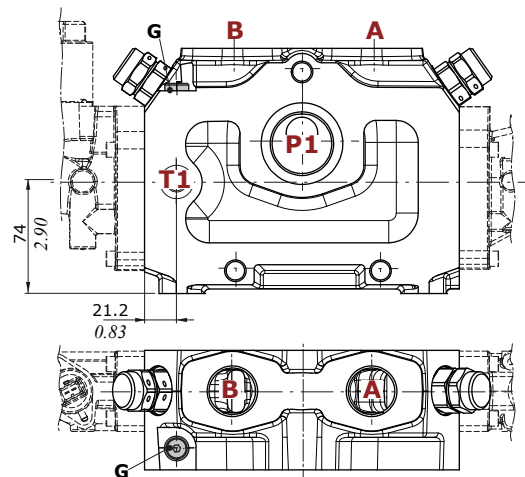
Integrated end sections

RCP1A type

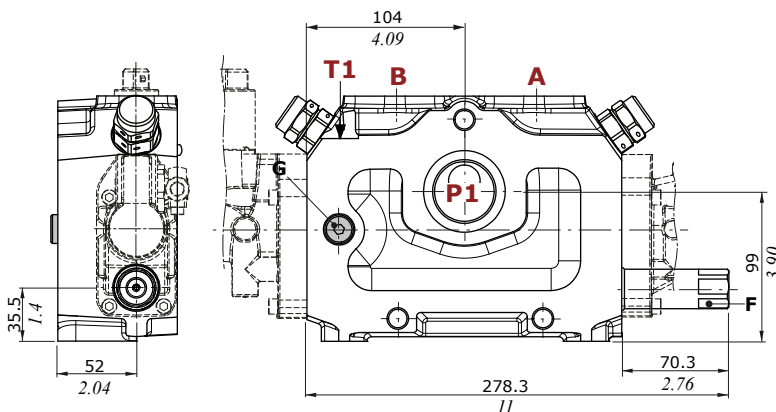
Standard section with upper T1 drain,
side P1 inlet and port valves arrangement

**RCP1C type**

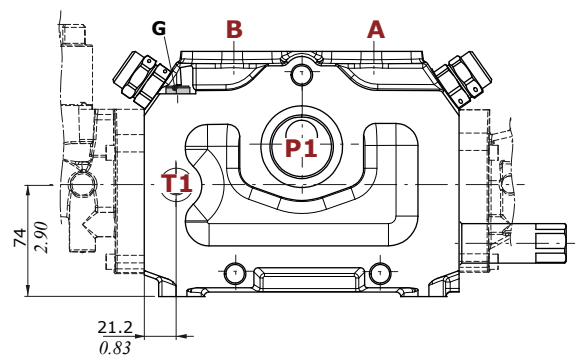
Standard section with side T1 drain,
side P1 inlet and port valves arrangement

**RCSP1A type**

With upper T1 drain, side P1 inlet, additional G1/4 port for
remoted LS relief valve and port valves arrangement

**RCSP1C type**

With side T1 drain, side P1 inlet, additional G1/4 port for
remoted LS relief valve and port valves arrangement

**Wrenches and tightening torques**

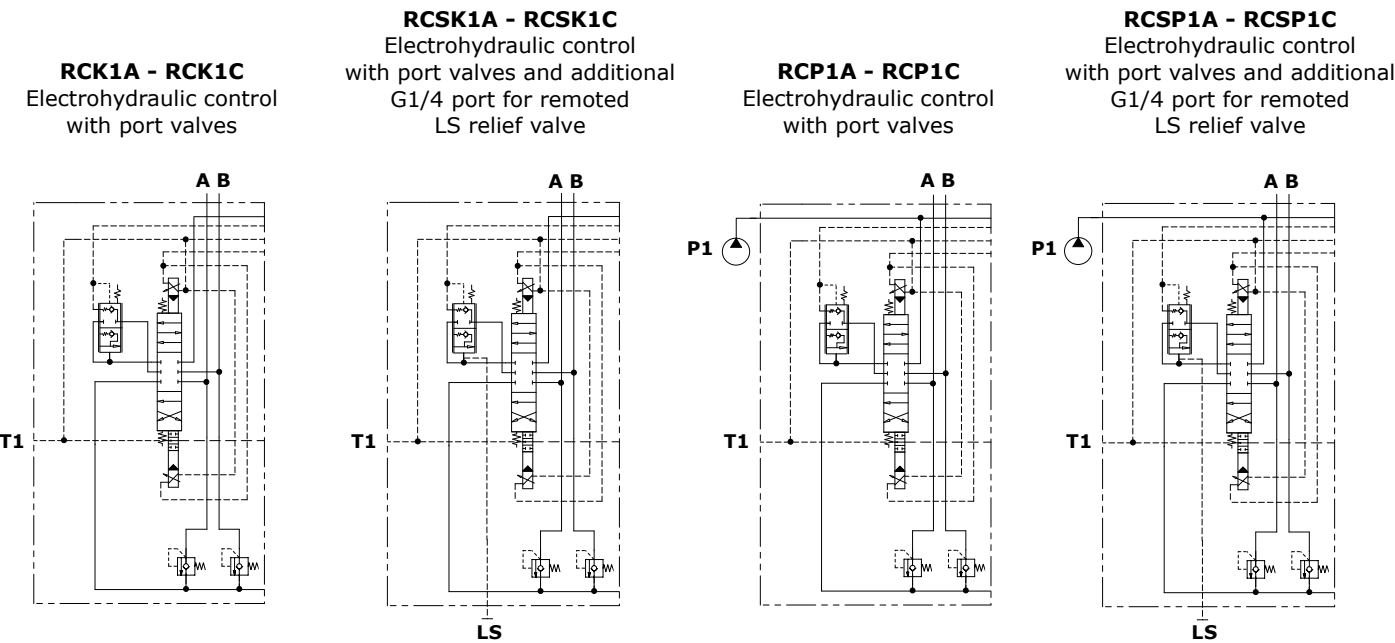
C = allen wrench 8 - 65 Nm (48 lbft)

F = wrench 24 - 55 Nm (40.5 lbft)

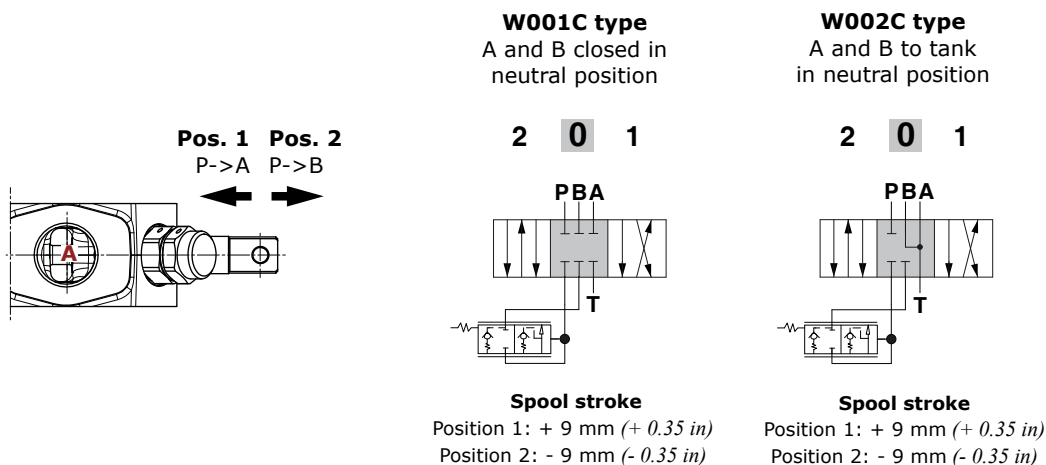
G = allen wrench 6 - 30 Nm (22 lbft)

Hydraulic circuits

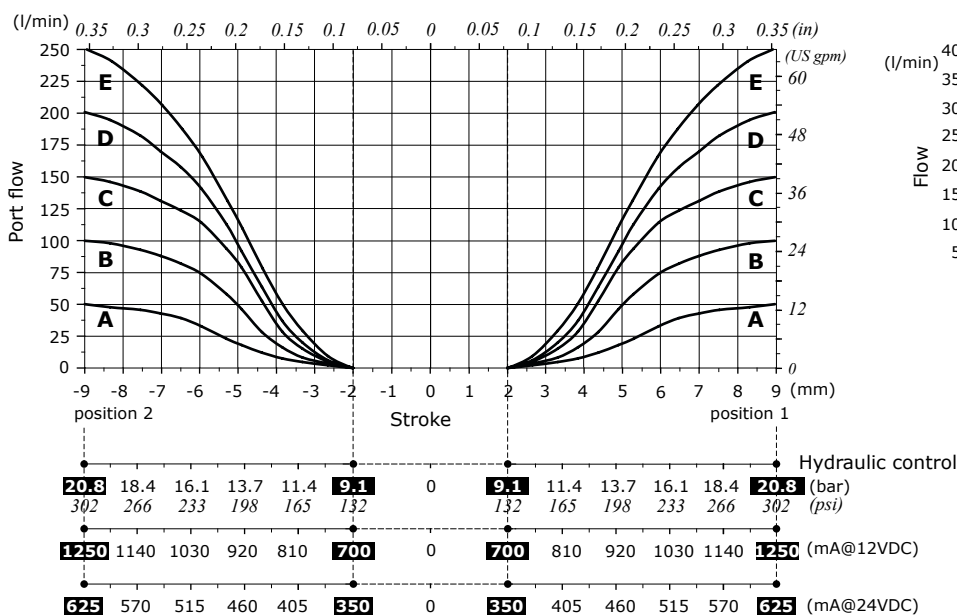
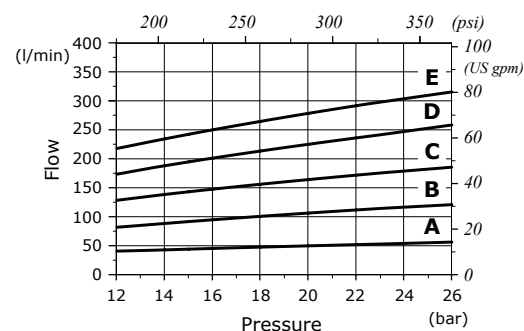
Integrated end sections



Port configurations						
Types	T1 port (side)	T1 port (upper)	Types	T1 port (side)	T1 port (upper)	P1 port (side)
RCK1A	plugged	open	RCP1A	plugged	open	open
RCK1C	open	plugged	RCP1C	open	plugged	open
RCSK1A	plugged	open	RCSP1A	plugged	open	open
RCSK1C	open	plugged	RCSP1C	open	plugged	open

**3 position spools metering curve**

Qin: 300 l/min (79.2 US gpm) - open center circuit (KV)
Pump compensator @ 16 bar (232 psi)


**Spool flow vs. stand-by pressure
(margin pressure)
on closed center circuit (JV)**

**Curves with spool nominal flow
@ 16 bar (232 psi) stand-by
(margin pressure)**

- A = 50 l/min (13.2 US gpm)
- B = 100 l/min (26.4 US gpm)
- C = 150 l/min (39.6 US gpm)
- D = 200 l/min (52.8 US gpm)
- E = 250 l/min (66 US gpm)

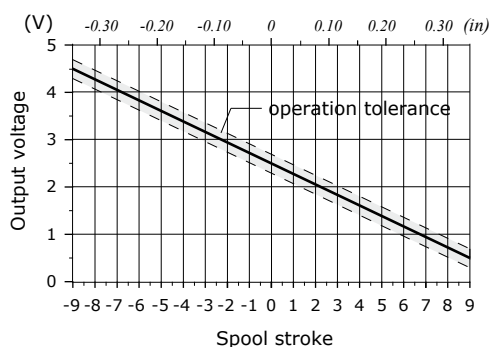
Spool position sensors

SPSL sensor

The SPSL position sensor converts the spool movements into a voltage linear signal.

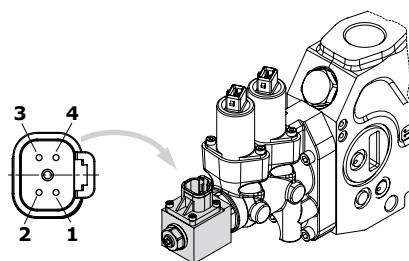
Working conditions		
Voltage supply		5 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	range	from 0.5 to 4.5 V
	linearity	± 5%
	spool in neutral	2.5 ± 0.2 V
	max. current	1 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSL sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	+ 5V
2	not connected
3	GND
4	signal OUT



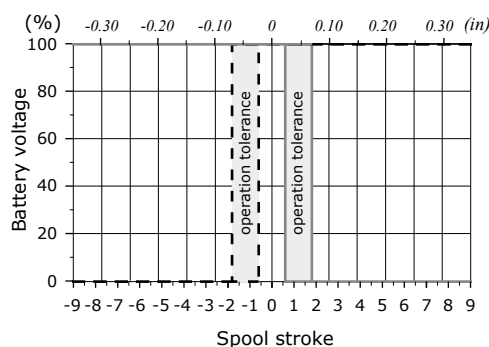
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

The SPSP position sensor converts the spool movements into an electric digital signal.

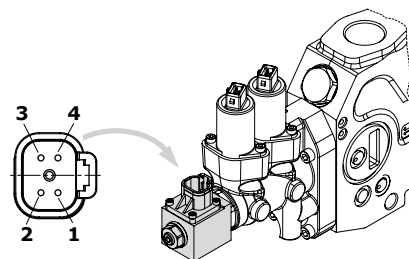
Working conditions		
Voltage supply		from 9 to 32 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10 ⁶
Connector type		DT04-4P Deutsch
Weather protection		IP67 / IP69K
Working temperature		from -40°C to 105°C (from -40°F to 221°F)
Working pressure		350 bar (5100 psi)
Max. electrical stroke		±10 mm (±0.39 in)
Max. mechanical stroke		±10 mm (±0.39 in)
Output signal	type	PNP
	max. current	6 mA
EMC compatibility		ISO 13766 / ISO 14982
Mechanical vibrations, shock, bumps		IEC 68-2-6,-27,-29

SPSD sensor output signal



Deutsch DT04-4P connector

Pin	Function
1	Out A
2	GND
3	VB +
4	Out B



Deutsch DT06-4S mating connector, code 5CON140072

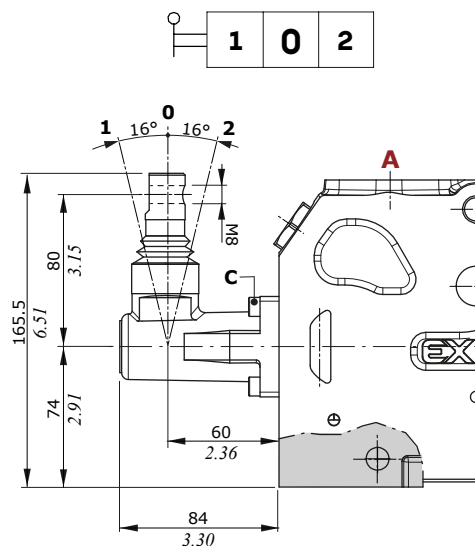
A and B side controls

Mechanical controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

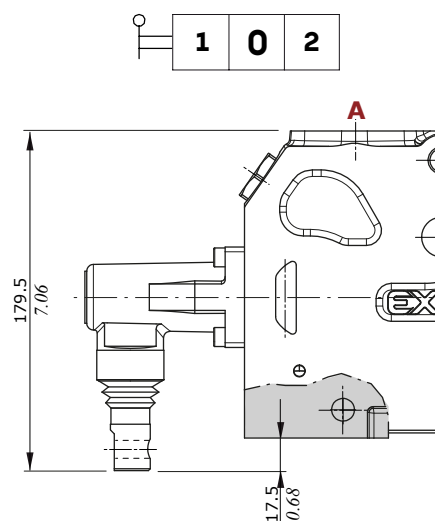
"A" side controls

H001 type
With lever box



H002 type

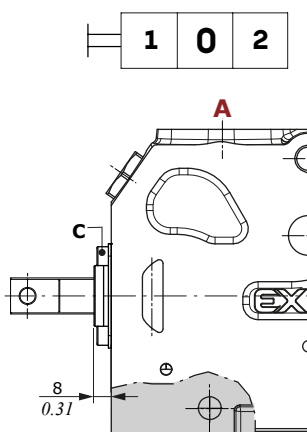
With lever box, rotated 180°
Dimensions are the same of H001 type



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf·ft)

H004 type
Without lever box



A and B side controls

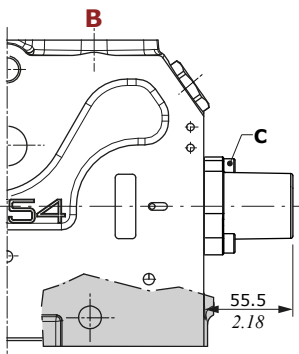
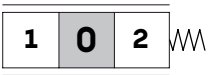
Mechanical controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

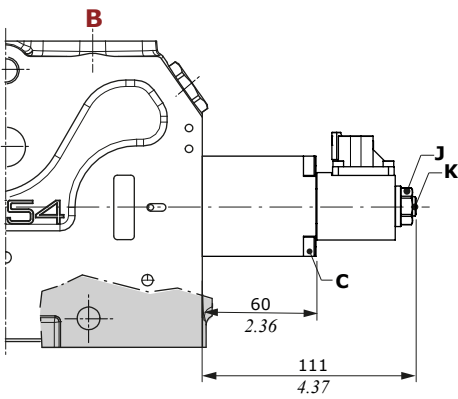
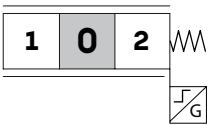
"B" side controls

Controls is available with standard spring A type (F001A) or soft spring B type (F001B)

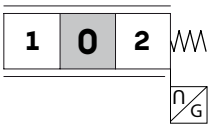
F001A - F001B types
With spring A or B,
return in neutral position



F001ASD/F001BSD types
With spring A or B,
digital SPSP spool position sensors

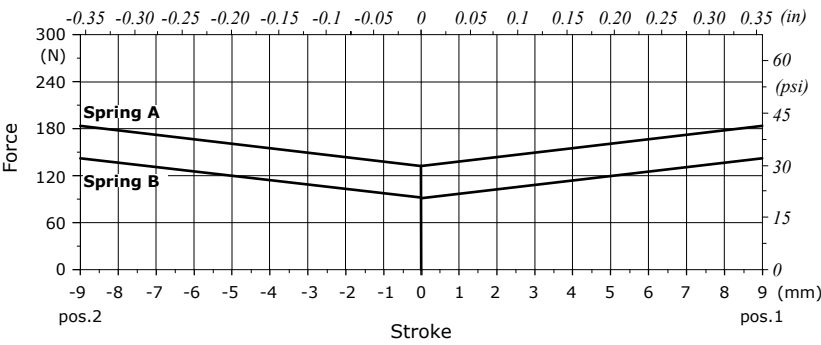


F001ASL/F001BSL types
With spring A or B,
analog SPSP spool position sensors



Note: for sensor types, see page 100

Force vs Stroke diagram



Legenda
Spring A = from 132.5 N to 182.3 N (29.7 lbf to 41 lbf)
Spring B = from 107 N to 146 N (24 lbf to 32.8 lbf)

Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf)
J = wrench 17 - 9.8 Nm (7.2 lbf)
K = allen wrench 4 - 9.8 Nm (7.2 lbf)

A and B side controls

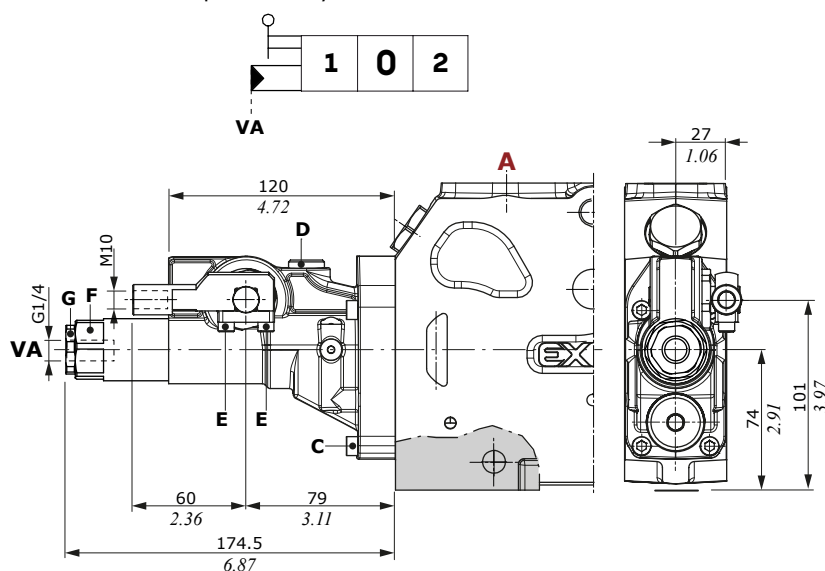
Hydraulic controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

HP01 type

Proportional hydraulic control with lever



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

E = allen wrench 3 - 2 Nm (1.5 lbft)

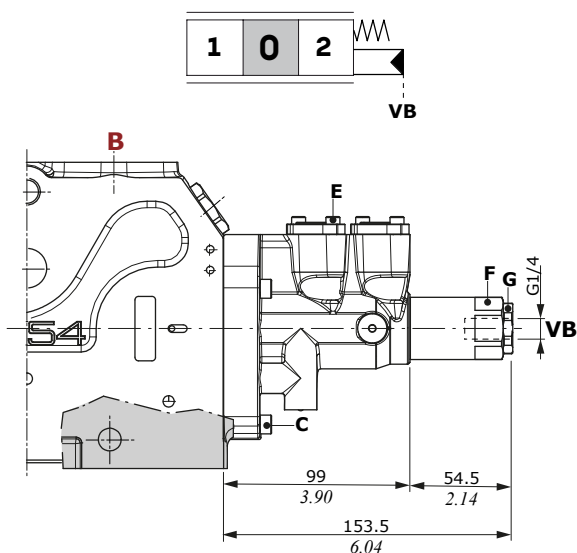
F = wrench 30 - 25 Nm (18.4 lbft)

G = wrench 25 - 25 Nm (18.4 lbft)

"B" side controls

FP01 type

Proportional hydraulic control



Proportional electrohydraulic control

Following specifications are measured with:

- mineral oil of $32 \text{ mm}^2/\text{s}$ - 32 cSt viscosity at 50°C - 122°F temperature,
- standard spools, connecting $P \Rightarrow A \Rightarrow B \Rightarrow T$ ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with $\pm 10\%$ tolerance.

Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

A and B sides spool controls

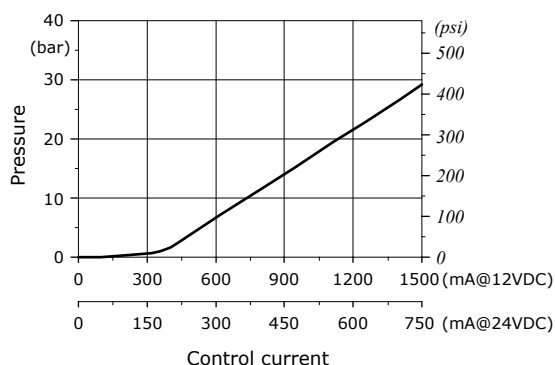
Electric specifications

Coil impedance	12 VDC	4.7 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption		0
Min. flow control signal	12 VDC	400 mA
	24 VDC	200 mA
Flow control signal	12 VDC	1200 mA
	24 VDC	600 mA
Dither frequency		70 - 90 Hz
Insertion		100%
Coil insulation		Class H (180°C - 356°F)
Connector type		AMP JPT Deutsch DT
Weather protection (connector)		IP65 (JPT type) IP69K (DT type)

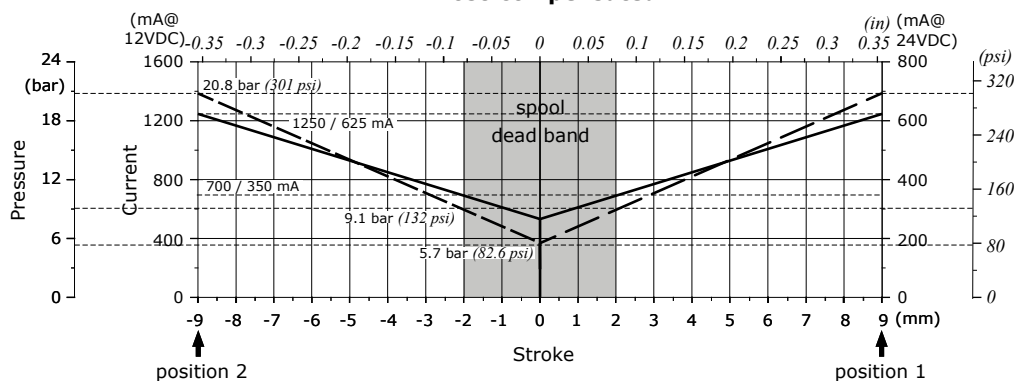
Hydraulic specifications

Max. pressure	40 bar (580 psi)
Max. back pressure on solenoid valve drain	5 bar (72.5 psi)

Solenoid pressure reducing valve performance



Stroke vs. Current/Pressure diagram Post-compensated



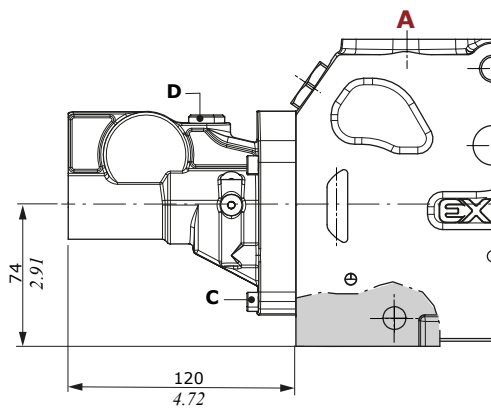
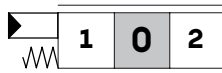
A and B side controls

Two-side electrohydraulic controls

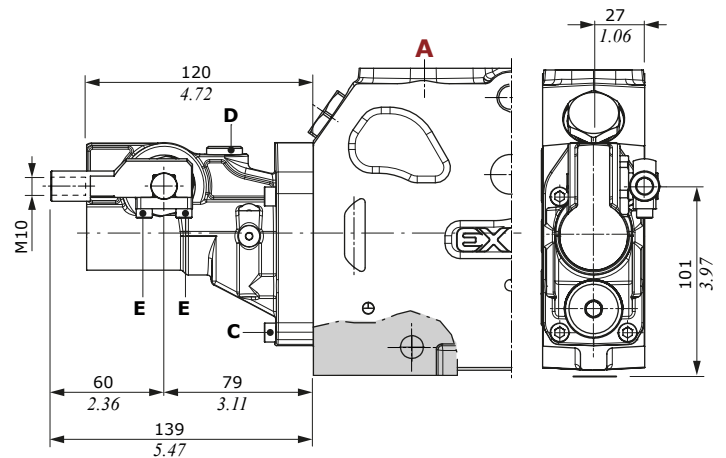
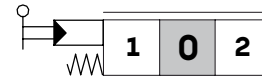
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

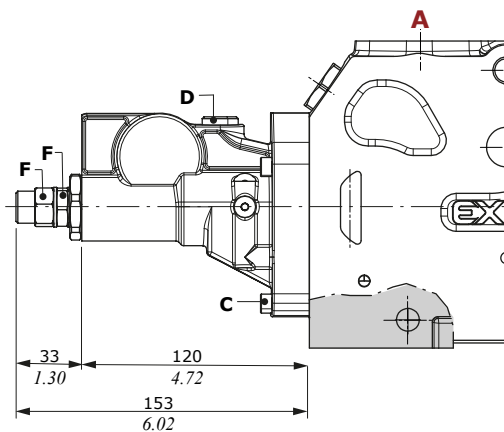
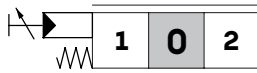
HP07 type
Without lever



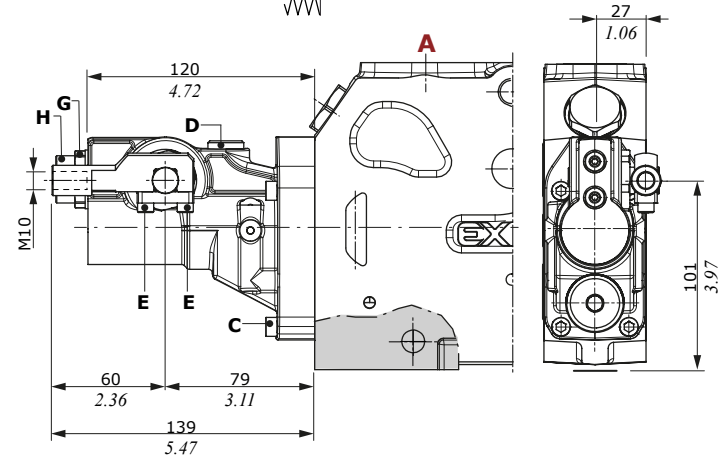
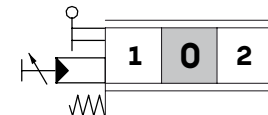
HP04 type
With lever



HP07L type
Without lever with stroke limiter



HP04L type
With lever and stroke limiter

**Wrenches and tightening torques**

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbf_t)

D = allen wrench 6 - 30 Nm (22 lbf_t)

E = allen wrench 3 - 2 Nm (1.5 lbf_t)

F = wrench 19 - 15 Nm (11 lbf_t)

G = wrench 10 - 10 Nm (7.37 lbf_t)

H = allen wrench 3

A and B side controls

Two-side electrohydraulic controls

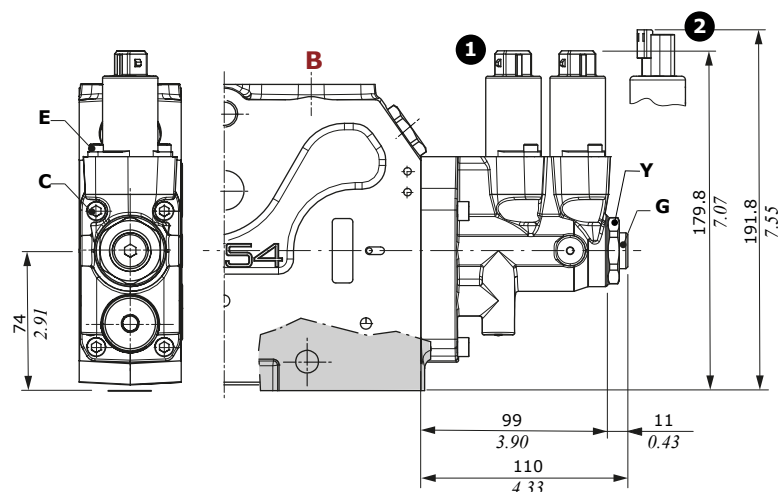
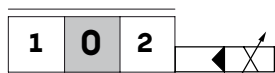
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"B" side controls

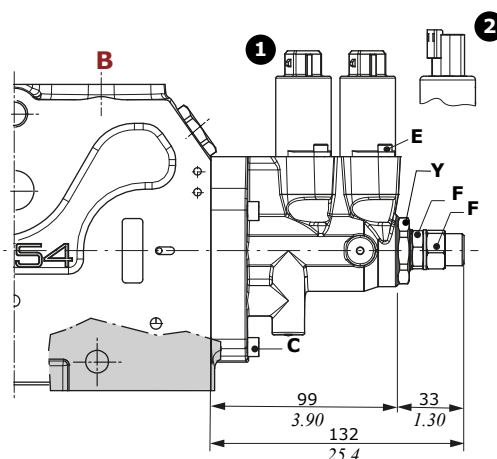
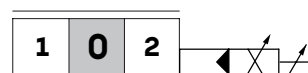
Control Types

- 1 : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
- 2 : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

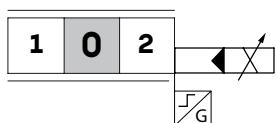
FP04 type
Electrohydraulic control



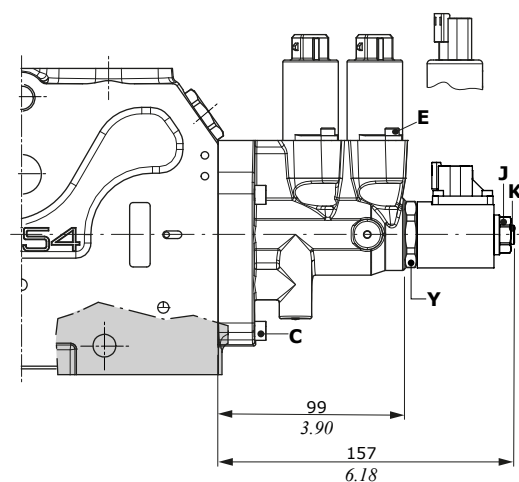
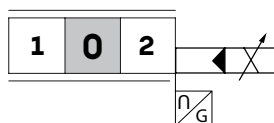
FP04L type
With stroke limiter



FP04SD type
With digital SPDS
spool position sensor



FP04SL type
With analog SPSL
spool position sensor



Wrenches and tightening torques

- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
- E = allen wrench 3 - 2 Nm (1.5 lbft)
- F = wrench 19 - 15 Nm (11 lbft)
- G = allen wrench 6 - 30 Nm (22 lbft)
- J = wrench 17 - 9.8 Nm (7.2 lbft)
- K = allen wrench 4 - 9.8 Nm (7.2 lbft)
- Y = wrench 32 - 30 Nm (22 lbft)

Note: for sensor types, see page 100

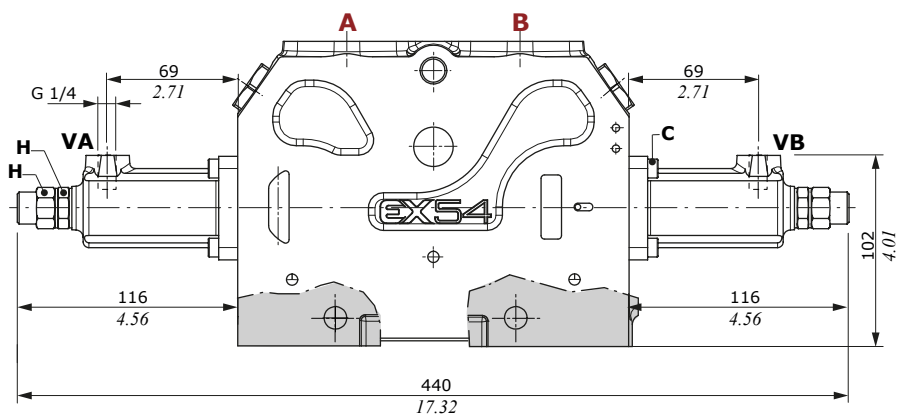
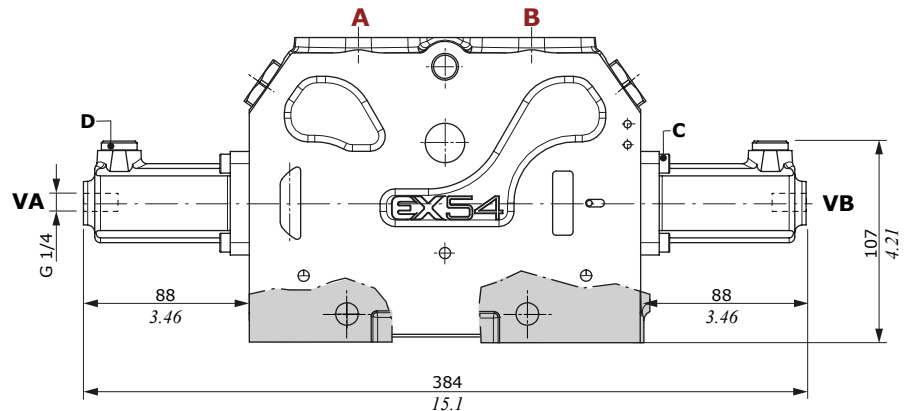
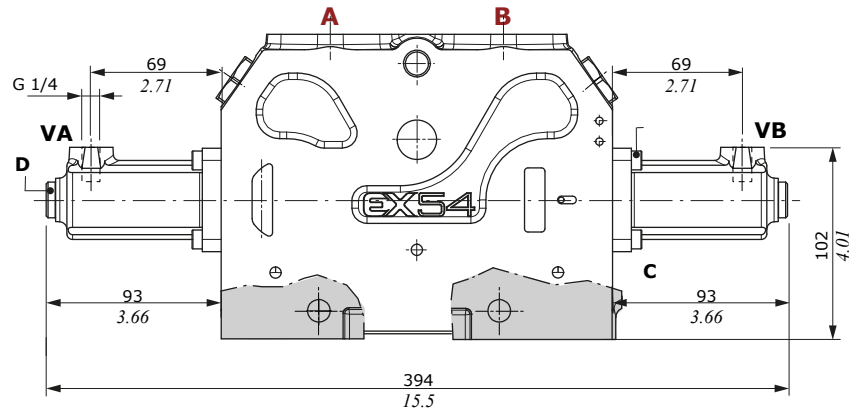
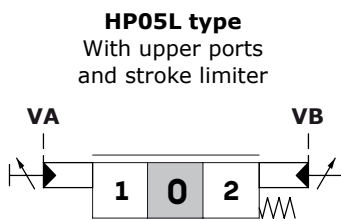
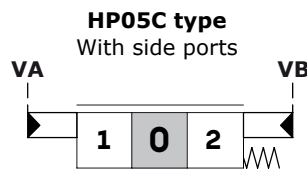
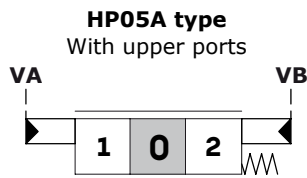
A and B side controls

Hydraulic controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

Proportional controls (A+B sides)

Controls are available with upper or side ports.



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

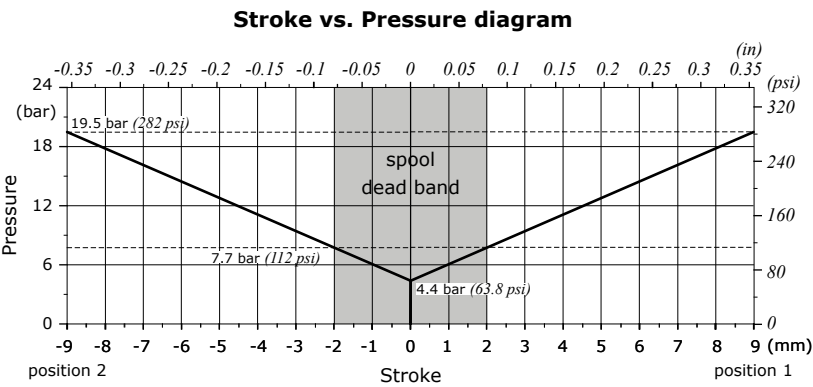
H = wrench 19 - 15 Nm (11 lbft)

A and B side controls

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page



Compatibility table

Combination controls and spool end kit		"A" side controls							
		H001 H002	H004	HP01	HP04	HP04L	HP07	HP07L	HP05
"B" side controls	F001A	422501289	422501289						
	F001B	422501289	422501289						
	F001ASL/SD	422501289	422501289						
	F001BSL/SD	422501289	422501289						
	FP01			422501240					
	FP04				422501251	422501251	422501251	422501251	
	FP04L				422501251		422501251	422501251	
	FP04SL				422501309	422501309	422501309		
	FP04SD				422501309	422501309	422501309		
	HP05								422501240

For spool end types, see page 138

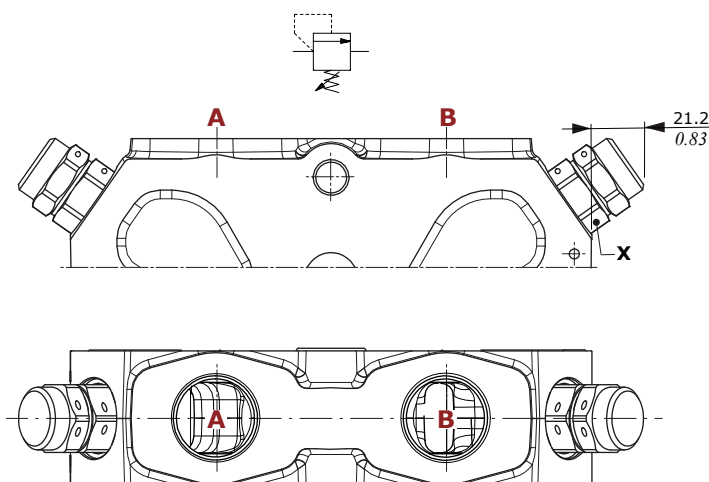
Port valves

Always indicate setting value when using antishock valve or pilot combined valve:

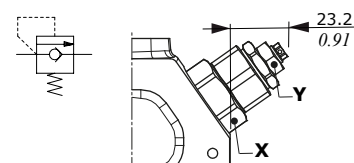
Example: 01 PA (120) = setting at full flow / 01 PA (120-A) = setting at min. flow

Example: 04 PA (120) = setting at full flow / 04 PA (120-A) = setting at min. flow

01 PA/PB type
Antishock valve



04 PA/PB type
Pilot combined valve



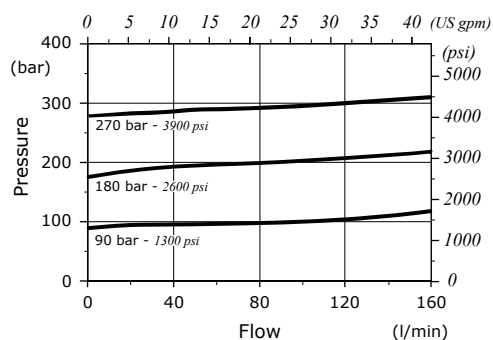
setting ranges (bar - psi)

Type	pressure @ 300 l/min (79.2 US gpm)	pressure @ 5 l/min (1.3 US gpm)
A	50/420 - 725/6090	50-A/420-A - 725-A/6090-A

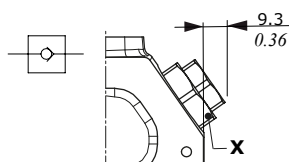
setting ranges (bar - psi)

Type	pressure @ 300 l/min (79.2 US gpm)	pressure @ 5 l/min (1.3 US gpm)
A	70/150 - 1015/2170	70-A/120-A - 1015-A/1740-A
B	151/230 - 2190/3330	121-A/200-A - 1760-A/2900-A
C	231/280 - 3350/4050	201-A/250-A - 2920-A/3630-A
D	281/350 - 4070/5070	251-A/350-A - 3640-A/5070-A

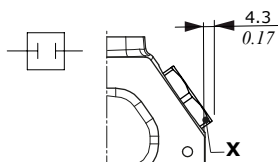
04 type
combined valves (antishock function)
(10 l/min - 2.6 US gpm)



02 PA/PB type
Anticavitation valve



05 PA/PB type
Valve blanking plug

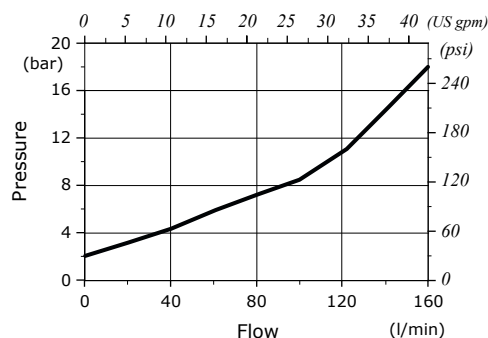


Wrenches and tightening torques

X = wrench 27 - 70 Nm (51.6 lbft)

Y = wrench 13 - 20 Nm (14.7 lbft)

04 type
combined valves (anticavitation function)





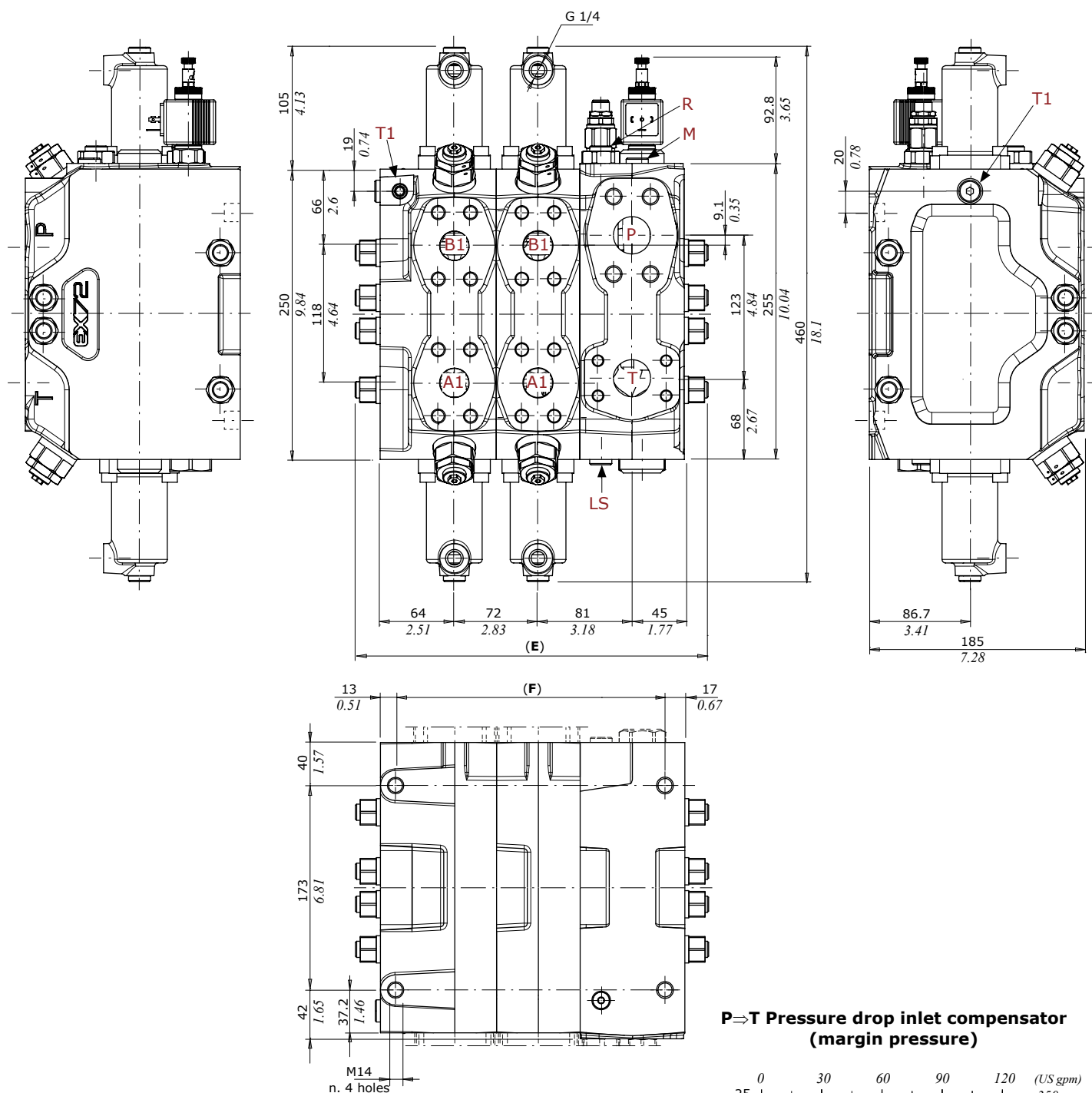
Content

• EX72

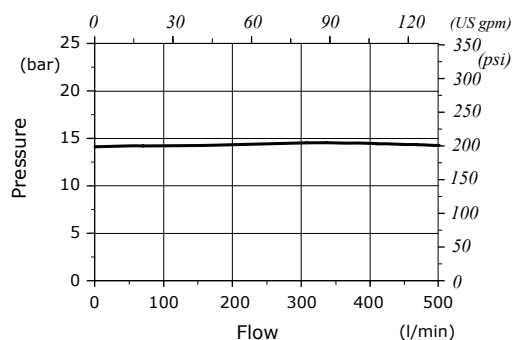
Dimensional data	page 112
Hydraulic circuits.	page 114
Complete section ordering codes.	page 115
Inlet section	
Parts ordering codes	page 117
Dimensional data and hydraulic circuits	page 118
Inlet valves	page 119
Trasformation kit.	page 120
Guide to configuration	page 121
Working section and Integrated end section	
<u>POST-COMPENSATED SECTION</u>	
Parts ordering codes	page 122
Dimensional data and hydraulic circuits	page 124
Spools	page 128
Proportional electrohydraulic controls (A and B side).	page 129
Proportional hydraulic controls (A and B side)	page 132
Compatibility table	page 133
Port valves	page 134
Accessories	
Coils and connectors	page 136
Spool end kit	page 138
Seal kits.	page 140
Installation and Maintenance	
Main rules	page 142

Dimensional data

Hydraulic control configuration example



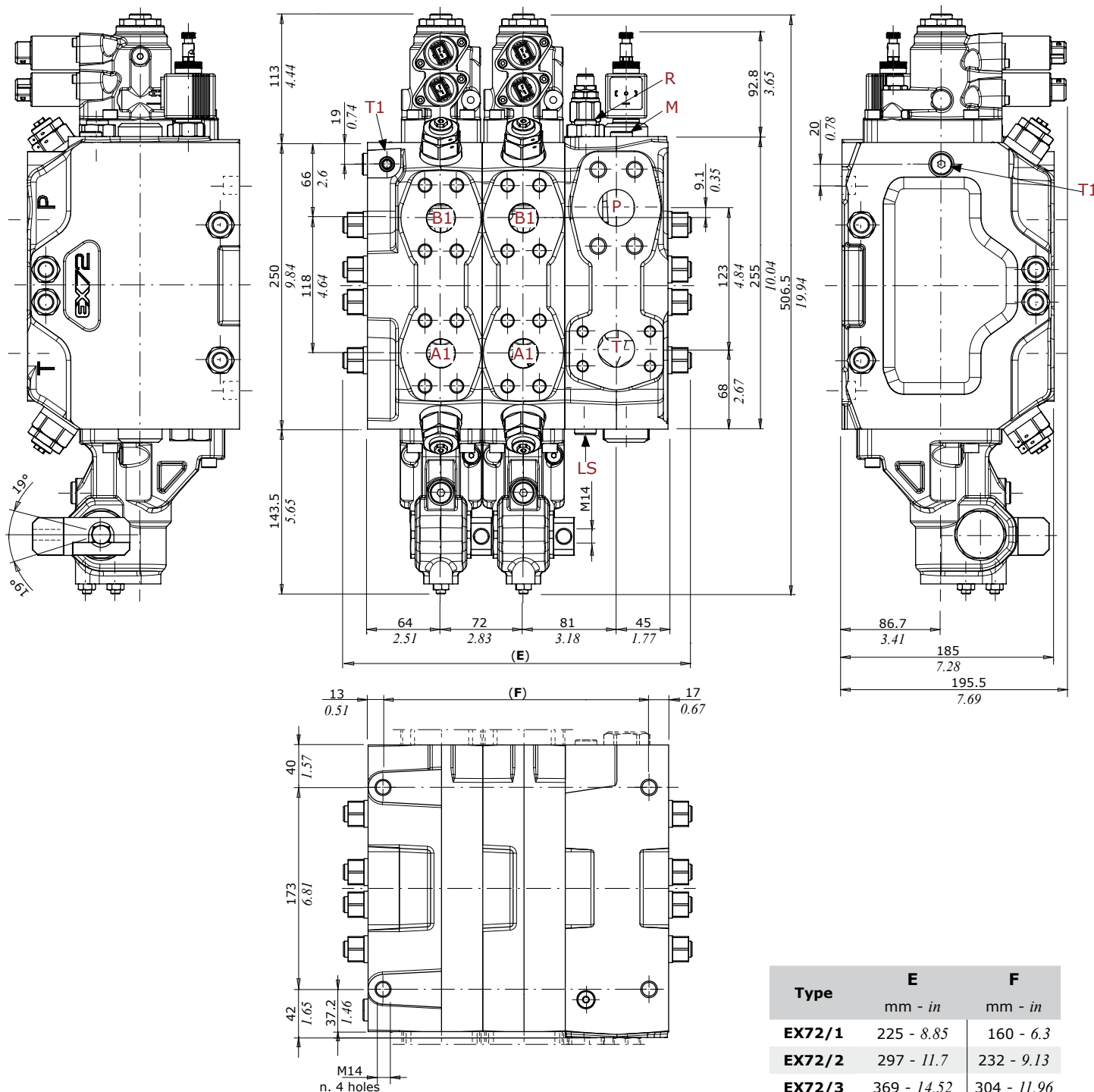
P→T Pressure drop inlet compensator (margin pressure)



Type	E mm - in	F mm - in	Type	E mm - in	F mm - in
EX72/1	225 - 8.85	160 - 6.3	EX72/5	513 - 20.2	448 - 17.63
EX72/2	297 - 11.7	232 - 9.13	EX72/6	585 - 23	520 - 20.47
EX72/3	369 - 14.52	304 - 11.96	EX72/7	657 - 25.86	592 - 23.3
EX72/4	441 - 17.36	376 - 14.8	EX72/8	729 - 28.7	664 - 26.14

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

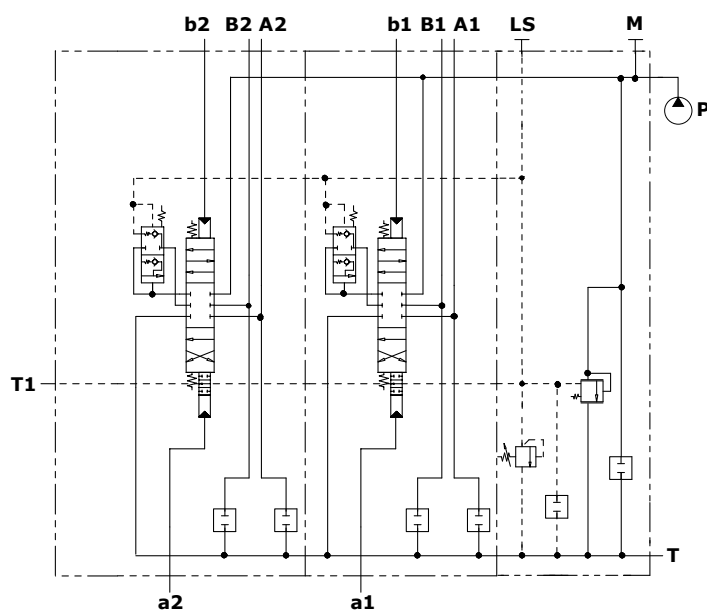
Two-side electrohydraulic control configuration example



Type	E mm - in	F mm - in
EX72/1	225 - 8.85	160 - 6.3
EX72/2	297 - 11.7	232 - 9.13
EX72/3	369 - 14.52	304 - 11.96
EX72/4	441 - 17.36	376 - 14.8
EX72/5	513 - 20.2	448 - 17.63
EX72/6	585 - 23	520 - 20.47
EX72/7	657 - 25.86	592 - 23.3
EX72/8	729 - 28.7	664 - 26.14

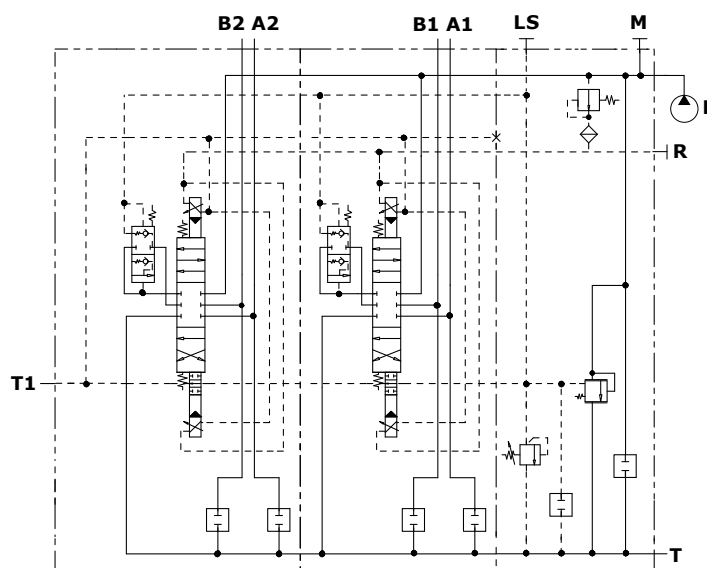
NOTE: Drawings and dimensions are referred to a **MA** threading configuration

Hydraulic circuits



Right Inlet valve with hydraulic controls configuration (Fixed displacement pump):

EX72/2/MR-V1A(200)-V4B-V10C-KV-S37/
W001C(250\250)-HP05A-RC1-S35.05PA\05PB/
W001C(250\250)-HP05A-RCK1A-S35.05PA\05PB



Right Inlet valve with two-side electrohydraulic controls configuration (Fixed displacement pump):

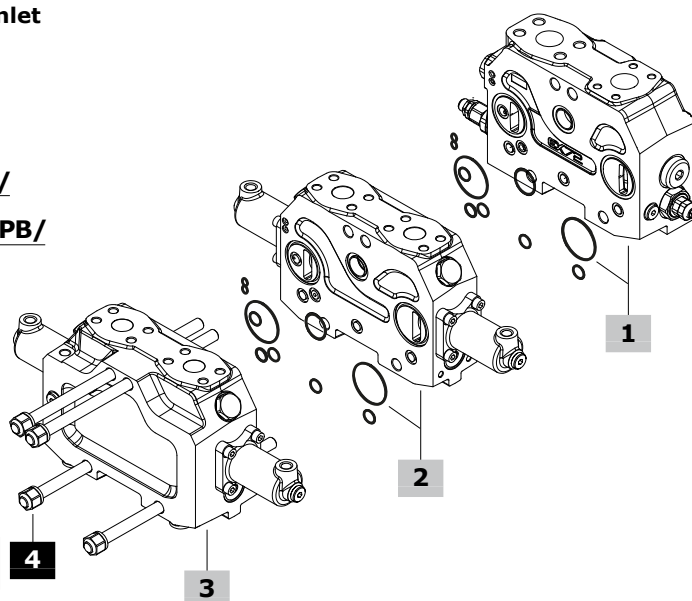
EX72/2/MR-V1A(200)-V4B-V10C-KVR-S37/
W001C(250\250)-HP07-FP04-B12AJ-RC1-S35.05PA\05PB/
W001C(250\250)-HP07-FP04-B12AJ-RCK1A-S35.05PA\05PB

Complete section ordering codes

Hydraulic control valve configuration example - Right inlet

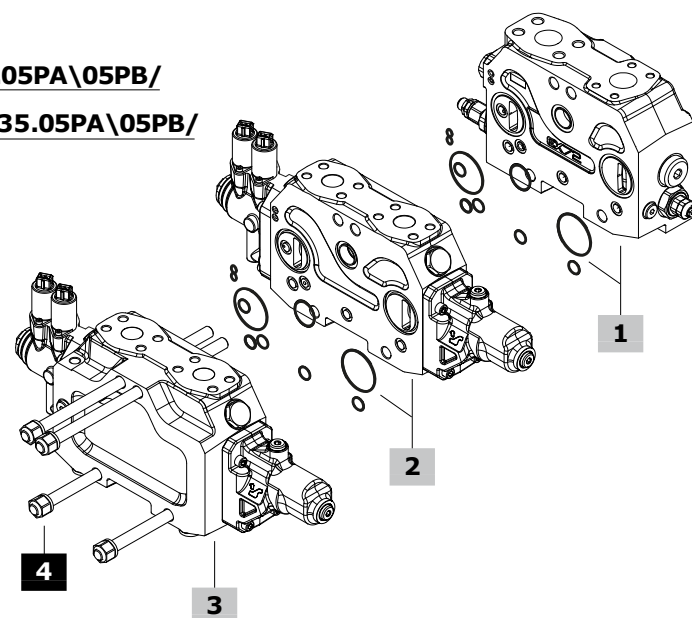
- Working sections Right Inlet
- 1 **EX72/2/MR-V1A(200)-V4B-V10C-KVS37/**
 - 2 **W001C(250/250)-HP05A-RC1S35.05PA\05PB/**
 - 3 **W001C(250/250)-HP05A-RCK1AS35.05PA\05PB/**
- P006/2 N10**
- Painted with RAL 9005 black primer

Tie rod tightening
wrench 22 - 110 Nm (81.1 lbf)



Two-side electrohydraulic control valve configuration example - Right inlet

- 1 **EX72/2/MR-V1A(200)-V4B-V10C-KVS37/**
 - 2 **W001C(250/250)-HP07-FP04-B12AJ-RC1S35.05PA\05PB/**
 - 3 **W001C(250/250)-HP07-FP04-B12AJ-RCK1AS35.05PA\05PB/**
- P006/2 N10**



Complete section ordering codes

1 Inlet sections*

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **MR/V1A(200)-V3B(240)-V10C-KV-S37**

CODE: SHE720010

DESCRIPTION: With LS pressure relief valve, full flow direct relief valve and valve blanking plug on position C

TYPE: **MR/V1A(200)-V4B-V10C-KV-S37**

CODE: SHE720009

DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-KVR-S37**

CODE: SHE720011

DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-KVE-S37**

CODE: SHE720012

DESCRIPTION: As previous one for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **MR/V1A(200)-V4B-V10C-JV-S37**

CODE: SHE720005

DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-JVR-S37**

CODE: SHE720006

DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-JVE-S37**

CODE: SHE720007

DESCRIPTION: As previous one for external pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V11C(C12AJ)-JVR-S37**

CODE: SHE720008

DESCRIPTION: With LS pressure relief valve, valve blanking plug on port B and LS push & twist emergency electric unloading valve

2 Working sections*

The codes are referred to sections with O-ring seals

With proportional hydraulic controls

TYPE: **SD/W001C(250\250)-HP05A-RC1-S35-05PA-05PB**

CODE: SHL720009

DESCRIPTION: With port valves arrangement (seat plugged), with 350 l/min (92 US gpm), double acting spool, complete hydraulic control

TYPE: **SD/W001C(250\250)-HP05A-RC1-S35-04PA(150)-04PB(150)**

CODE: SHL720010

DESCRIPTION: As previous one with pilot combined valves

With proportional electrohydraulic controls

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RC1-S35-05PA-05PB**

CODE: SHL720011

DESCRIPTION: With port valves arrangement (seat plugged), 350 l/min (92 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RC1-S35-04PA(150)-04PB(150)**

CODE: SHL720014

DESCRIPTION: As previous one with pilot combined valves

TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-S35-05PA-05PB**

CODE: SHL720012

DESCRIPTION: With port valves arrangement (seat plugged), 350 l/min (92 US gpm) double acting spool and 12VDC two-side electrohydraulic control, without lever

TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-S35-04PA(150)-04PB(150)**

CODE: SHL720013

DESCRIPTION: As previous one with pilot combined valves

3 Integrated end sections***With proportional hydraulic controls**

TYPE: **SD/W001C(250\250)-HP05A-RCK1A-S35-05PA-05PB**

CODE: SHU720001

DESCRIPTION: With port valves arrangement (seat plugged), with 350 l/min (92 US gpm), double acting spool, complete hydraulic control

With proportional electrohydraulic controls

TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RCK1A-S35-05PA-05PB**

CODE: SHL720002

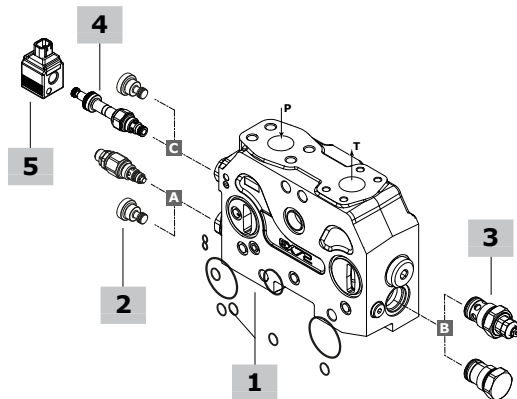
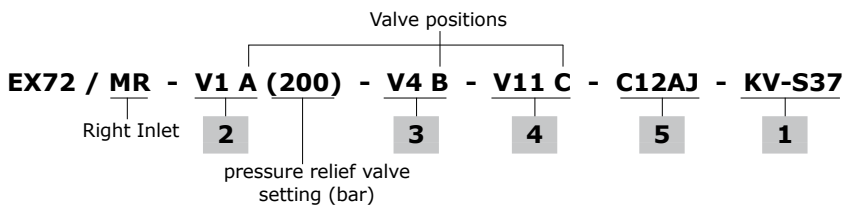
DESCRIPTION: With port valves arrangement (seat plugged), 350 l/min (92 US gpm) double acting spool and 12VDC two-side electrohydraulic control, with lever

4 Assembly kit

CODE	DESCRIPTION
300198002	For 1 section valve
300198003	For 2 sections valve
300198004	For 3 sections valve
300198005	For 4 sections valve
300198006	For 5 sections valve
300198007	For 6 sections valve
300198008	For 7 sections valve
300198009	For 8 sections valve

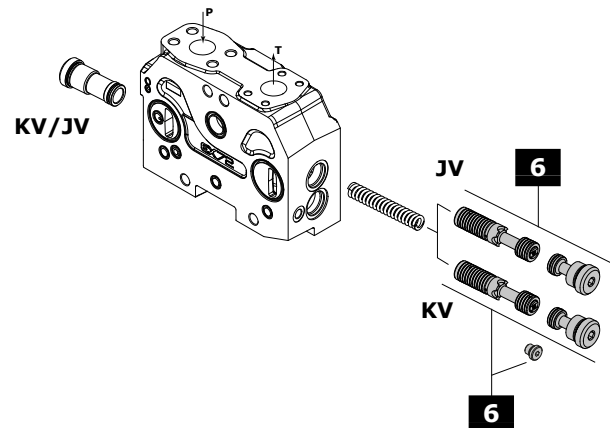
NOTE (*): Codes are referred to **MA** thread

Part ordering codes



Transformation kit

KV: for Open Center configuration
JV: for Closed Center configuration



1 Inlet sections* page 118

The codes are referred to sections with O-ring seals

For Open Center circuit (KV)

TYPE: **KV S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500001

DESCRIPTION: For fixed displacement pumps, internal LS, without pressure reducing valve

TYPE: **KVR S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500011

DESCRIPTION: For fixed displacement pumps, internal LS, with pressure reducing valve

TYPE: **KVE S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500041

DESCRIPTION: For fixed displacement pumps, internal LS, for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **JV S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500003

DESCRIPTION: For variable displacement pumps, internal LS, without pressure reducing valve

TYPE: **JVR S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500013

DESCRIPTION: For variable displacement pumps, internal LS, with pressure reducing valve

TYPE: **JVE S37** - P and T ports ISO 6162 type 2 flange connection
CODE: 029500043

NOTE: for seal kit codes, see page 140

2 Valves on position A page 119

TYPE	CODE	DESCRIPTION
V1A	915029501	LS pressure relief valve setting range: 50-250 bar (725-3600 psi)
	915029502	setting range: 251-350 bar (3610-5050 psi)
V2A	430059003	Valve blanking plug

3 Valves on position B page 119

TYPE	CODE	DESCRIPTION
V3B	915079501	Full Flow direct relief valve setting range: 50-400 bar (725-5800 psi)
V4B	430195001	Valve blanking plug

4 Valves on position C page 120

TYPE	CODE	DESCRIPTION
V10C	430059003	Valve blanking plug
V11C	0EF08002004	LS Push & Twist emergency electric dump valve

5 Coils and accessories

For available **BER** coils and accessories list see page 136

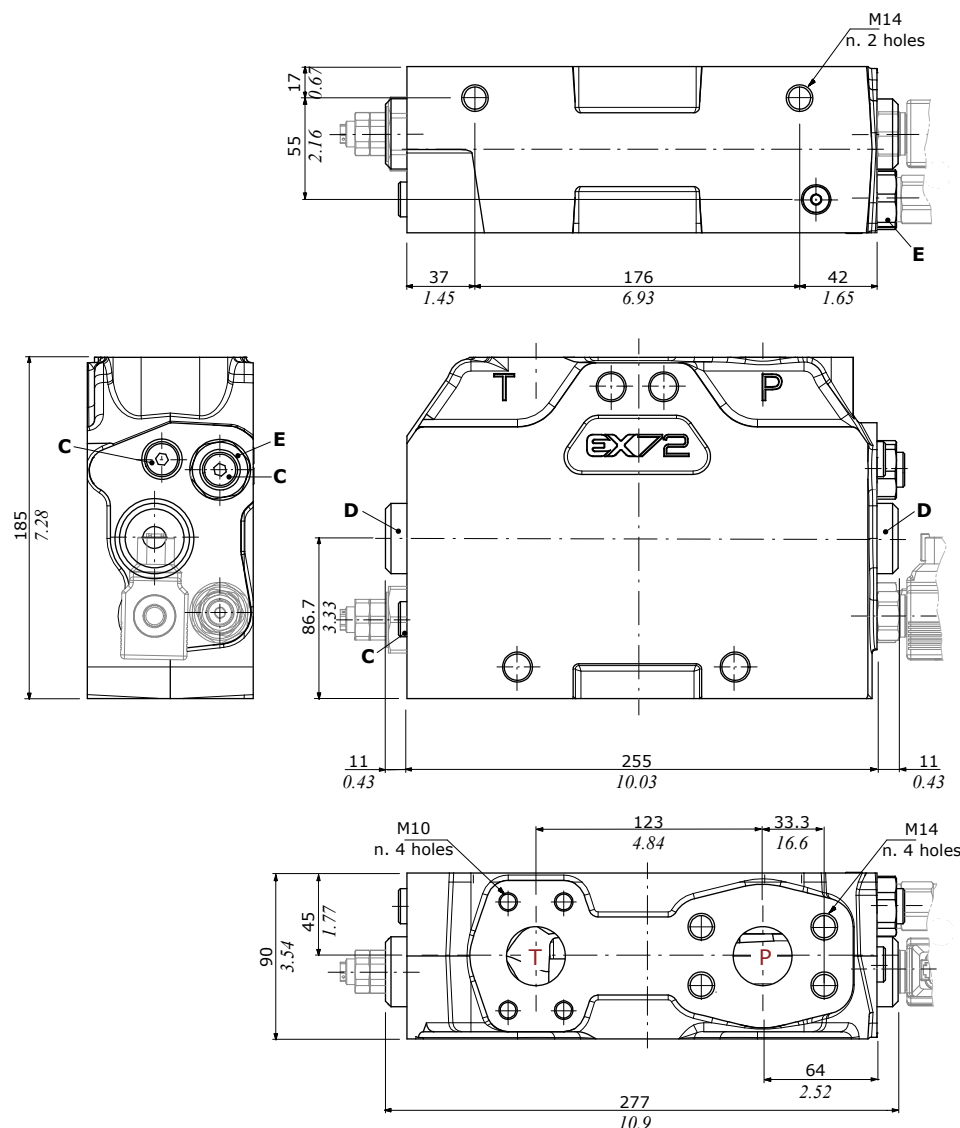
6 Transformation kit page 120

TYPE	CODE	DESCRIPTION
KV kit	320095004 ⁽¹⁾	Transformation kit, from JV (closed center) to KV (open center)
JV kit	320095003	Transformation kit, from KV (open center) to JV (closed center)

NOTE (*): Codes are referred to **MA** thread
(1): Codes are referred to **BSP** thread

Dimensional data and hydraulic circuits

Drawing is referred to KV section; dimensions are the same for JV section

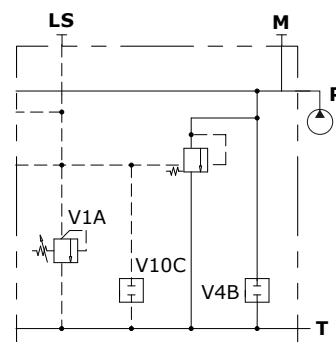


Wrenches and tightening torques

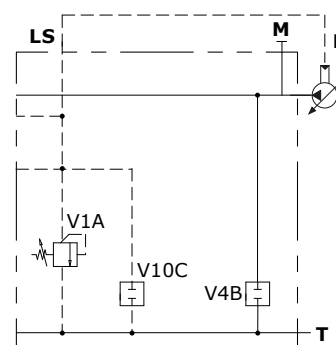
C = allen wrench 6 - 30 Nm (22 lbf_t)
D = allen wrench 10 - 80 Nm (59 lbf_t)
E = wrench 30 - 65 Nm (48 lbf_t)

NOTE: for valves wrench and torque, see related pages

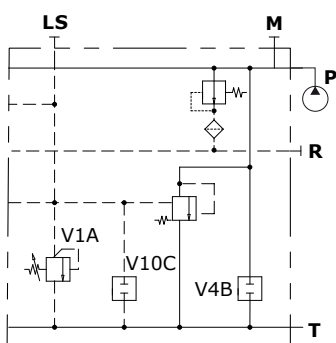
KV Open Center (example)



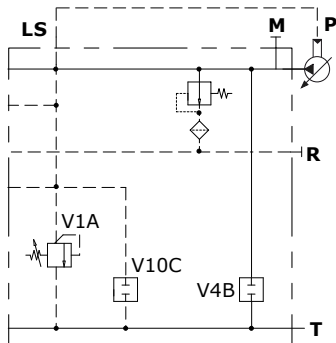
JV Closed Center (example)



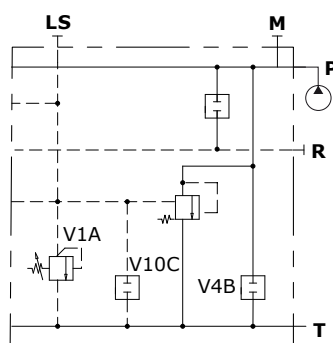
KVR Open Center
with pressure reducing valve
(example)



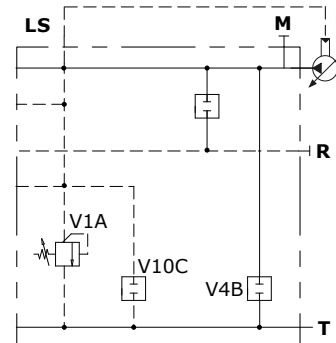
JVR Closed Center
with pressure reducing valve
(example)



KVE Open Center
for external pressure
reducing valve (example)

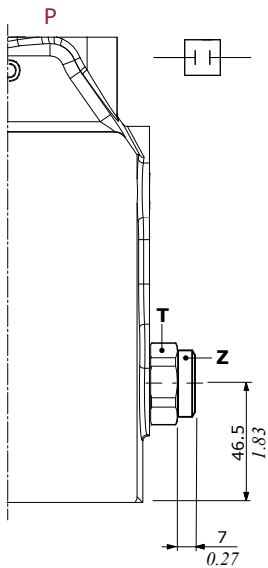


JVE Closed Center
for external pressure
reducing valve (example)

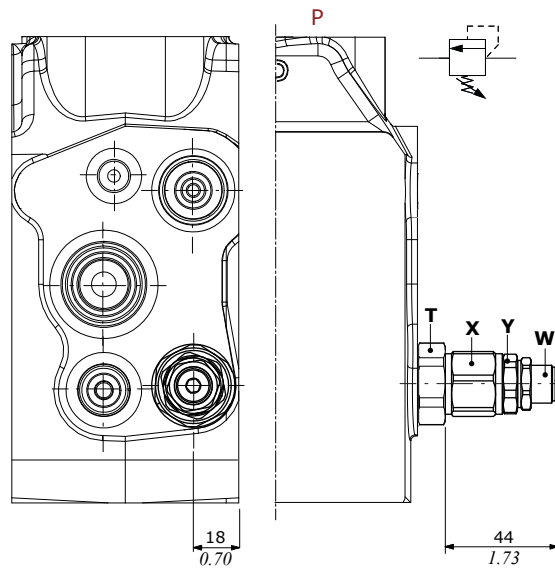


Valves on position A

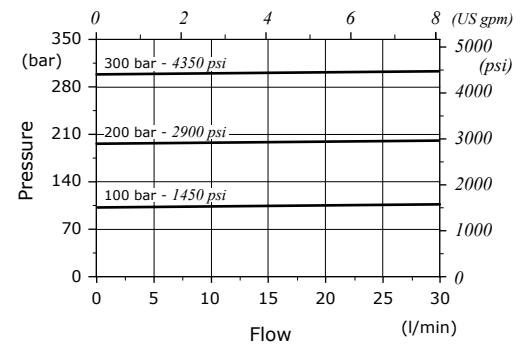
V2A type
Valve blanking plug



V1A type
LS pressure relief valve



LS relief valve
characteristics

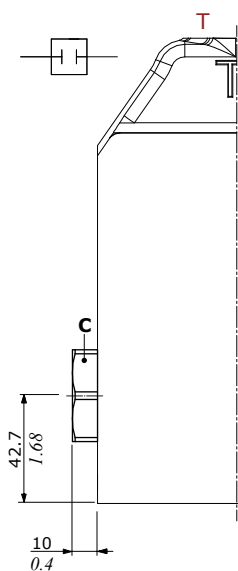


Wrenches and tightening torque

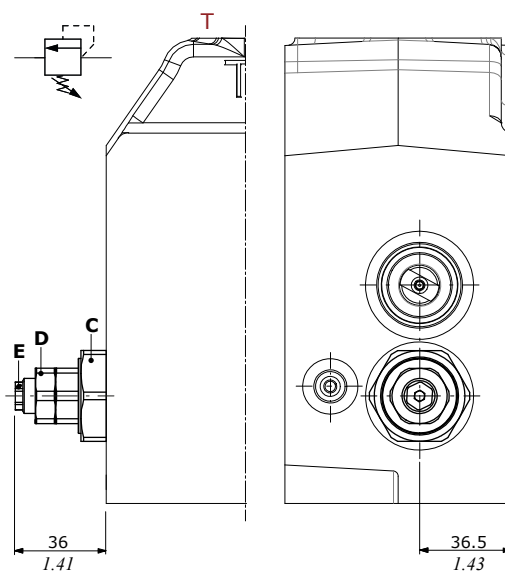
- T = wrench 30 - 65 Nm (48 lbft)
- X = wrench 24 - 45 Nm (33 lbft)
- Y = wrench 19 - 30 Nm (22 lbft)
- W = allen wrench 5
- Z = allen wrench 8 - 30 Nm (22 lbft)

Valves on position B

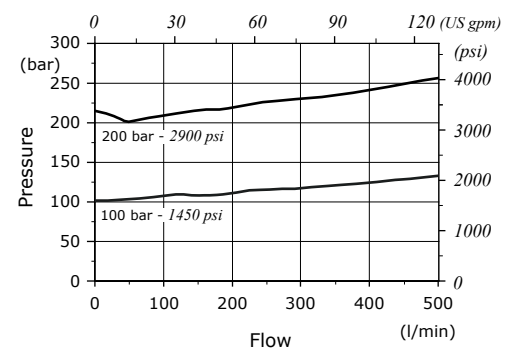
V4B type
Valve blanking plug



V3B type
Full Flow direct relief valve



Full Flow relief valve
characteristics



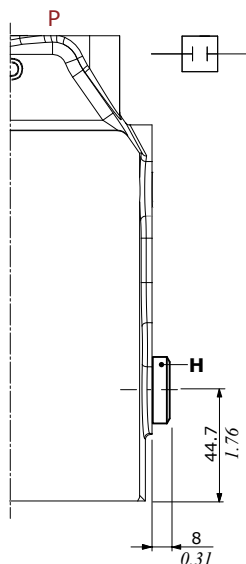
Wrenches and tightening torque

- C = wrench 36 - 80 Nm (59 lbft)
- D = wrench 22 - 20 Nm (14.7 lbft)
- E = wrench 10

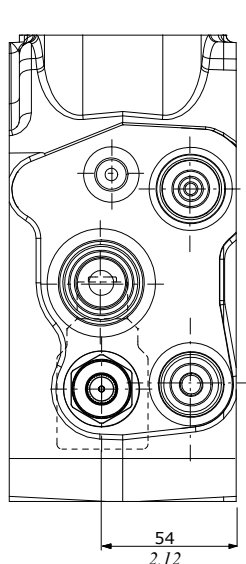
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



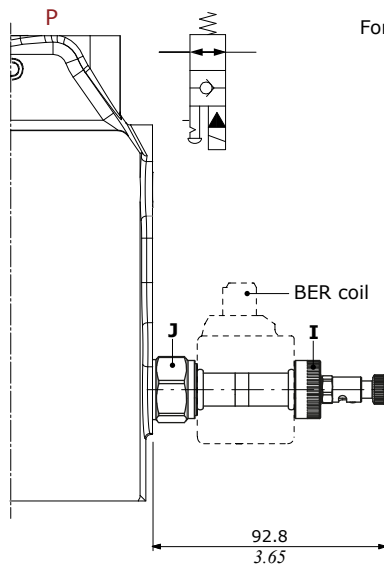
Wrenches and tightening torques

H = allen wrench 8 - 30 Nm (22 lbft)

J = wrench 24 - 30 Nm (22 lbft)

I = manual tightening

For **BER** type coils see page 136



NOTES:

Valve types V1A and V3B require factory setting (example: V1A - 150)

Valve combination V1A - V3B requires double setting (example: 200*240); the minimum difference between settings is 40 bar - 580 psi

Valve type V11C requires coil kit type (example: C12AJ).

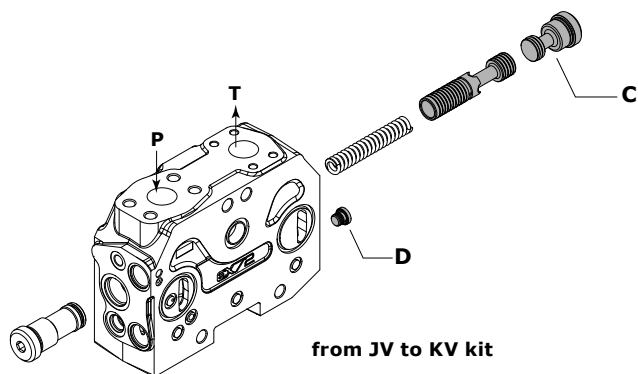
Trasformation kit

In order to trasform the inlet section from Closed Center (JV) to Open Center (KV) and viceversa.

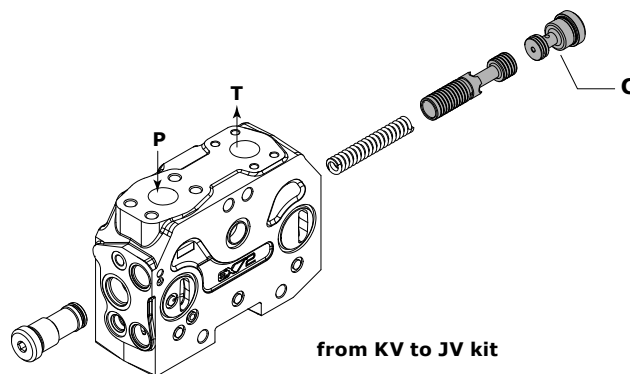
The following kit are available:

code 320095004, from JV to KV kit

code 320095003, from KV to JV kit



from JV to KV kit



from KV to JV kit

Wrenches and tightening torques

C = allen wrench 8 - 80 Nm (59 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

Guide to configuration (valve general informations)

EX72 working section and Integrated end section are only available in POST-COMPENSATED configuration.

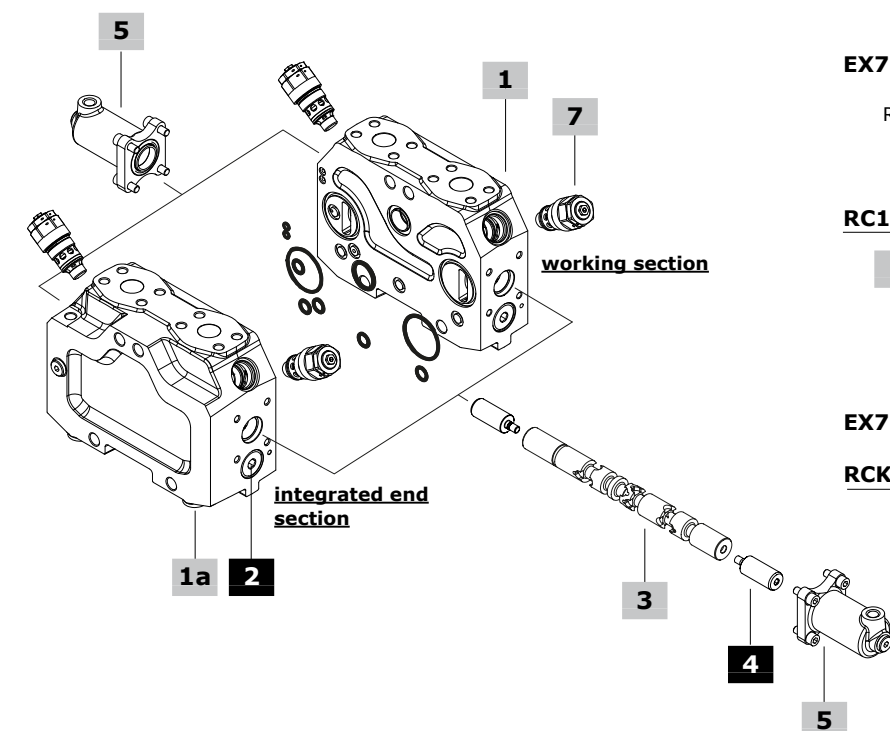
POST-COMPENSATED section with additional port for remoted LS relief valve (RCS)

It is possible to bring local signal to a remoted relief valve by means of a dedicated 1/4 BSP or 9/16" UNF port.

Remoted relief valve must be provided separately in the hydraulic circuit.

The local pressure limitation works properly if the section is actuated alone or if the section is the most charged.

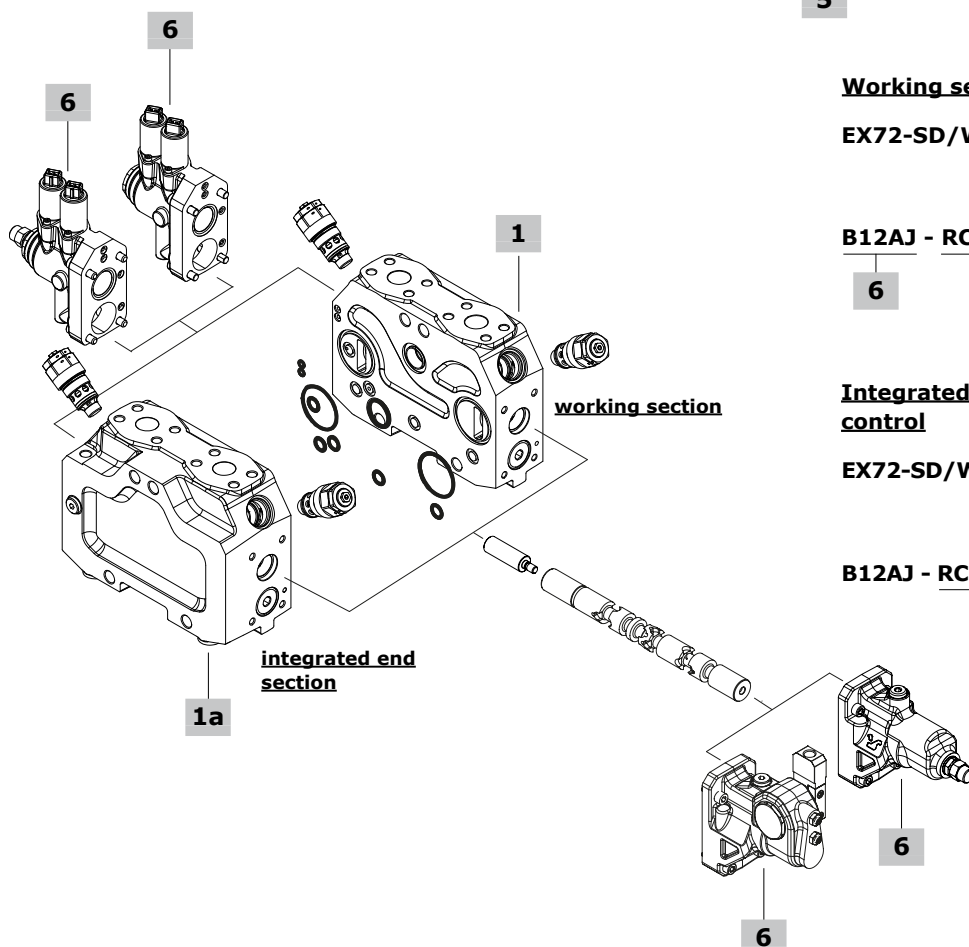
Part ordering codes

**Working section with prop. hydraulic control**

flow on A/B ports (l/min)
 EX72-SD/W001C(250\250) - HP05A -
 Right Inlet 3 5
 valve setting (bar)
 A port B port
 RC1-S35 . 04-PA(150)\04-PB(150)
 1 7

Integrated end section with hydraulic control

EX72-SD/W001C(250\250) - HP05A -
 RCK1A-S35 . 04-PA(150)\04-PB(150)
 1a

**Working section with electrohydraulic control**

EX72-SD/W001C(250\250) - HP04L - FP04
 6 6
 B12AJ - RC1-S35 . 04-PA(150)\04-PB(150)
 6 1

Integrated end section with electrohydraulic control

EX72-SD/W001C(250\250) - HP07L - FP04L
 6 6
 B12AJ - RCK1A-S35 . 04-PA(150)\04-PB(150)
 1a

Part ordering codes

1 Working sections* page 124

The codes are referred to sections with O-ring seals

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

For proportional hydraulic controls

Standard section, with port valves arrangement:

RC1 S35 039500001 ISO 6162 type 2 flange connection ports

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCS1 S35 039500021 ISO 6162 type 2 flange connection ports

For electrohydraulic controls

Standard section, with port valves arrangement:

RC1 S35 039500101 ISO 6162 type 2 flange connection ports

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCS1 S35 039500121 ISO 6162 type 2 flange connection ports

NOTE: for seal kit codes, see page 140

1a Integrated end sections* page 125

The codes are referred to sections with O-ring seals

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

For proportional hydraulic controls

Standard section, with port valves arrangement:

RCK1A S35 039500201 G1/4 upper T1 drain, ISO 6162 type 2 flange connection ports

RCK1C S35 039500203 G1/4 side T1 drain, ISO 6162 type 2 flange connection ports

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCSK1A S35 039500301 G1/4 upper T1 drain, ISO 6162 type 2 flange connection ports

RCSK1C S35 039500303 G1/4 side T1 drain, ISO 6162 type 2 flange connection ports

For electrohydraulic controls

Standard section, with port valves arrangement:

RCK1A S35 039500221 G1/4 upper T1 drain, ISO 6162 type 2 flange connection ports

RCK1C S35 039500223 G1/4 side T1 drain, ISO 6162 type 2 flange connection ports

Section with additional port for remoted LS relief valve, with port valves arrangement:

RCSK1A S35 039500331 G1/4 upper T1 drain, ISO 6162 type 2 flange connection ports

RCSK1C S35 039500333 G1/4 side T1 drain, ISO 6162 type 2 flange connection ports

Standard section with P1 port and port valves arrangement:

RCP1A S35 039500401 G1/4 upper T1 drain, A, B and side P1 ISO 6162 type 2 flange connection port

RCP1C S35 039500403 G1/4 side T1 drain, A, B and side P1 ISO 6162 type 2 flange connection port

Section with P1 port and additional port for remoted LS relief valve, with port valves arrangement:

RCSP1A S35 039500411 G1/4 upper T1 drain, A, B and side P1 ISO 6162 type 2 flange connection port

RCSP1C S35 039500413 G1/4 side T1 drain, A, B and side P1 ISO 6162 type 2 flange connection port

NOTE: for seal kit codes, see page 140

2 Trasformation kit page 124

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

RC 430095002 Standard kit

RCS 430095020 Additional G1/4 port for remoted LS relief valve

3 Spools page 128

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

3 pos., double-acting, A and B closed in neutral position:

W001C 160160 421295021 160 l/min (42.26 Us gpm)

W001C 200200 421295007 200 l/min (52.83 Us gpm)

W001C 250250 421295009 250 l/min (66 Us gpm)

W001C 280280 421295005 280 l/min (74 Us gpm)

W001C 340340 421295001 340 l/min (89.8 Us gpm)

3 pos., double-acting, A and B to tank in neutral position:

W002C 160160 421295025 160 l/min (42.26 Us gpm)

W002C 200200 421295031 200 l/min (52.83 Us gpm)

W002C 250250 421295015 250 l/min (66 Us gpm)

W002C 280280 421295023 280 l/min (74 Us gpm)

W002C 340340 421295022 340 l/min (89.8 Us gpm)

NOTE: not simmetric spools are available on request; contact Sales Department.

4 Spool end kit page 138

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

A and B sides:

- 422501231 Only for hydraulic controls

B side:

- 422501250 Only for electrohydraulic controls

5 Proportional hydraulic controls page 132

Type and code referred to the complete control (A+B sides)

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

HP05A 320595100 With G1/4 upper ports

HP05C 320595106 With G1/4 side ports

HP05L 320595112 With G1/4 upper ports and stroke limiter

6 Two-side electrohydraulic controls page 129

Please choose A+B side controls

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

"A" side controls:

HP04 322595002 With lever

HP04L 322595003 With lever and stroke limiter

HP07 322595004 Without lever

HP07L 322595005 Without lever with stroke limiter

"B" side controls:

FP04 322595107 12VDC, AMP JPT connector

322595108 24VDC, AMP JPT connector

322595109 12VDC, DEUTSCH DT connector

322595110 24VDC, DEUTSCH DT connector

FP04L 322595111 With stroke limiter, 12VDC, AMP JPT connector

322595112 With stroke limiter, 24VDC, AMP JPT connector

322595113 With stroke limiter, 12VDC, DEUTSCH DT conn.

322595114 With stroke limiter, 24VDC, DEUTSCH DT conn.

NOTE (*): Codes are referred to **MA** thread

Part ordering codes

7 Port valves page 134

Setting is referred to 10 l/min (2.6 US gpm)

TYPE	CODE	DESCRIPTION
02 PA/PB	915088801	Anticavitation valve
05 PA/PB	430488001	Valve blanking plug

Pilot combined valve (example of setting):

TYPE: **04PA/PB(250)**
 setting (bar) @ full flow - 450 l/min (118.8 US gpm)

TYPE	CODE	DESCRIPTION
04 PA/PB	915078801	setting @ full flow from 50 to 390 bar (from 725 to 5650 psi)

NOTE:

Always indicate setting value when using fixed setting combined valve: 04PA (120) - 04PB (120).

7 Port valves (cont.) page 134**Antishock valve (example of setting):**

TYPE: **01PA/PB(100)**
 setting (bar) @ full flow - 450 l/min (118.8 US gpm)

TYPE: **01PA/PB(80-A)**

setting (bar) @ min. flow - 5 l/min (1.3 US gpm)

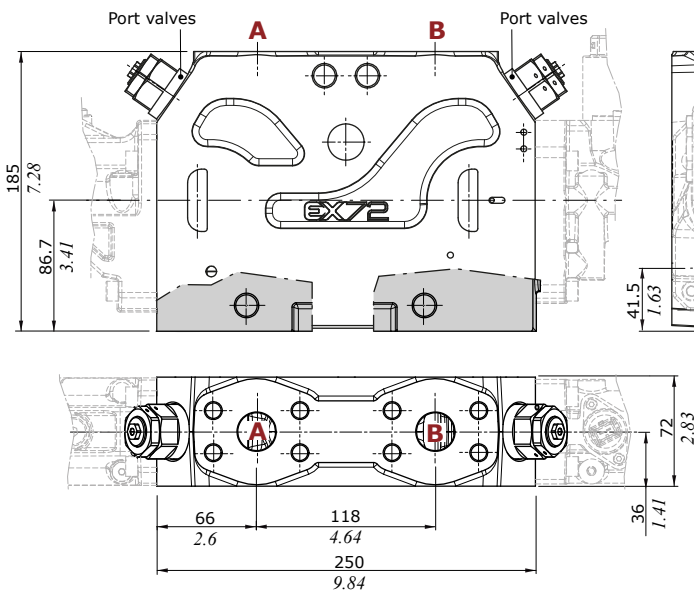
TYPE	CODE	DESCRIPTION
01 PA/PB	915068804	setting @ full flow from 60 to 100 bar (from 870 to 1450 psi), setting @ min. flow from 10-A to 60-A bar (from 145-A to 870-A psi)
	915068805	setting @ full flow from 101 to 160 bar (from 1460 to 2300 psi), setting @ min. flow from 61-A to 130-A bar (from 880-A to 1890-A psi)
	915068806	setting @ full flow from 161 to 250 bar (from 2330 to 3600 psi), setting @ min. flow from 131-A to 250-A bar (from 1900-A to 3600-A psi)

Dimensional data and hydraulic circuits

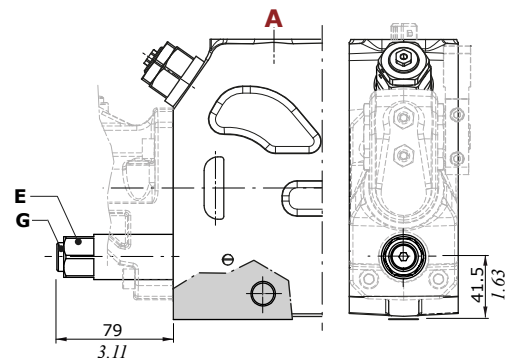
Working sections

RC1 type

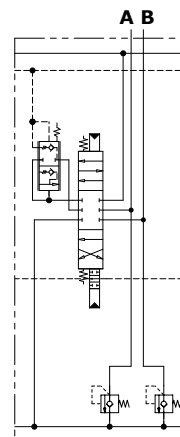
Standard section with port valves arrangement

**RCS1 type**

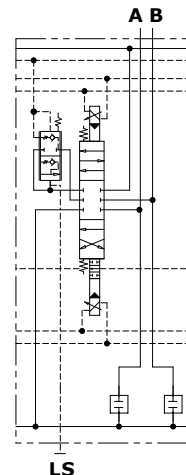
Section with additional G1/4 port for remoted LS relief valve, and port valves arrangement

**RC1**

Hydraulic control with port valves arrangement

**RCS1**

Electrohydraulic control with port valves arrangement and additional G1/4 port for remoted LS relief valve

**Wrenches and tightening torques**

C = allen wrench 10 - 80 Nm (59 lbft)

E = wrench 27 - 55 Nm (40.5 lbft)

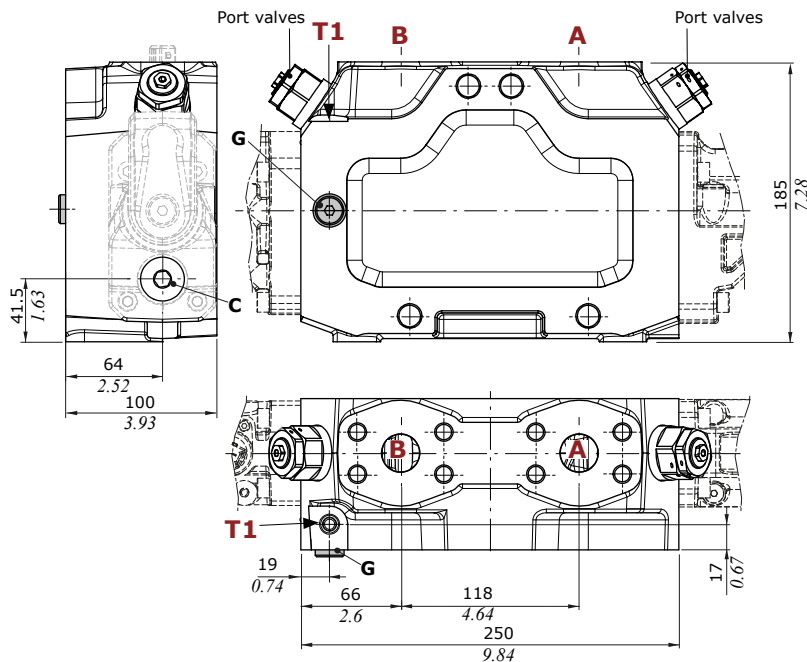
G = allen wrench 6 - 30 Nm (22 lbft)

Dimensional data

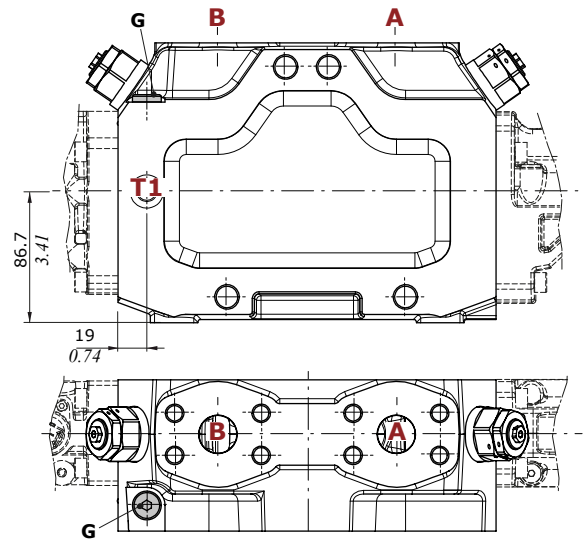
Integrated end sections

RCK1A Type

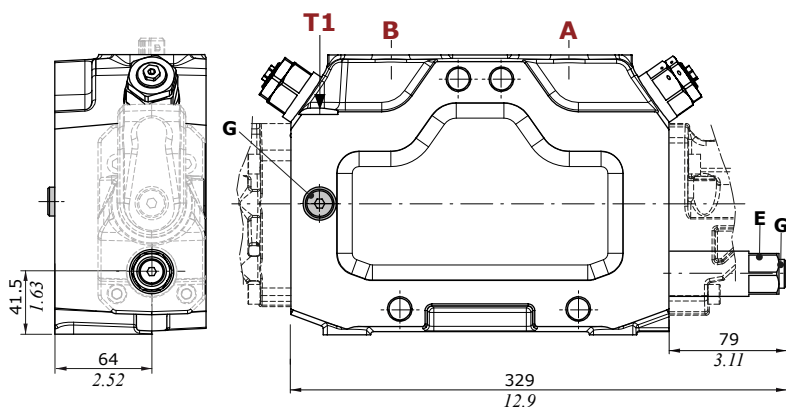
Standard section with upper T1 drain
and port valves arrangement

**RCK1C Type**

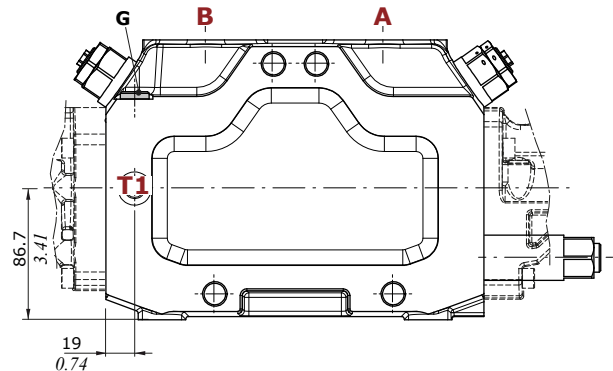
Standard section with side T1 drain
and port valves arrangement

**RCSK1A Type**

Section with upper T1 drain, additional G1/4
port for remoted LS relief valve and port valves
arrangement

**RCSK1C Type**

Section with side T1 drain, additional G1/4
port for remoted LS relief valve and port
valves arrangement

**Wrenches and tightening torques**

C = allen wrench 10 - 80 Nm (59 lbft)

E = wrench 27 - 55 Nm (40.5 lbft)

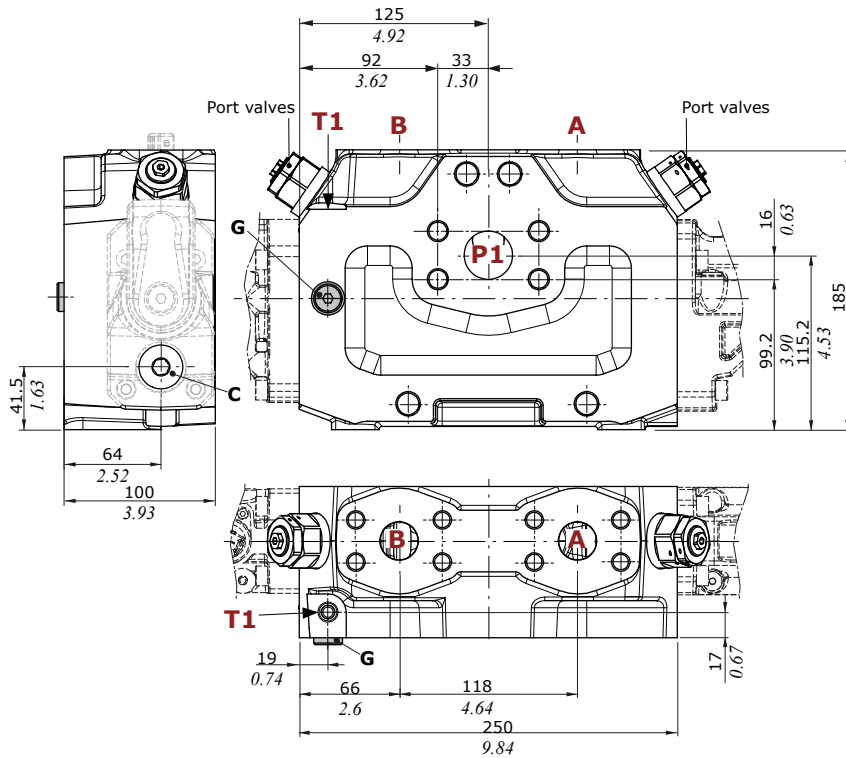
G = allen wrench 6 - 30 Nm (22 lbft)

Dimensional data

Integrated end sections

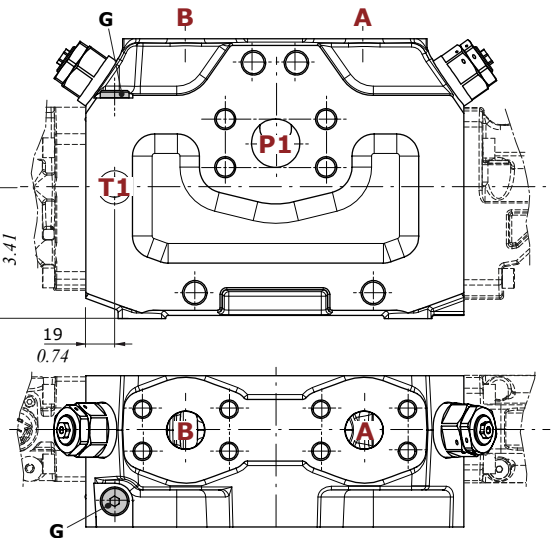
RCP1A type

Standard section with upper T1 drain,
side P1 inlet and port valves arrangement



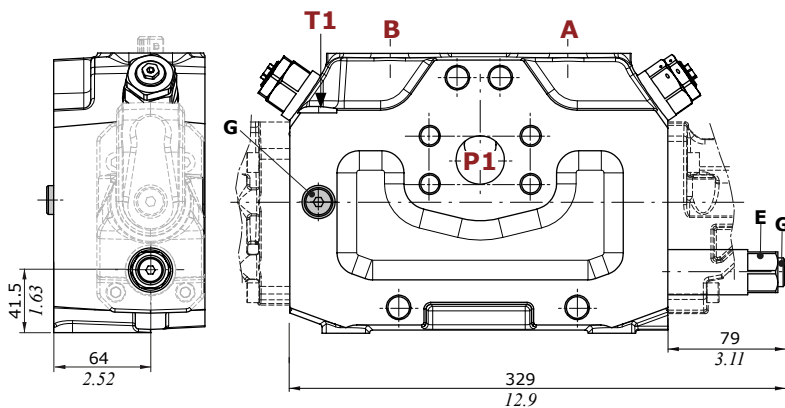
RCP1C type

Standard section with side T1 drain,
side P1 inlet and port valves arrangement



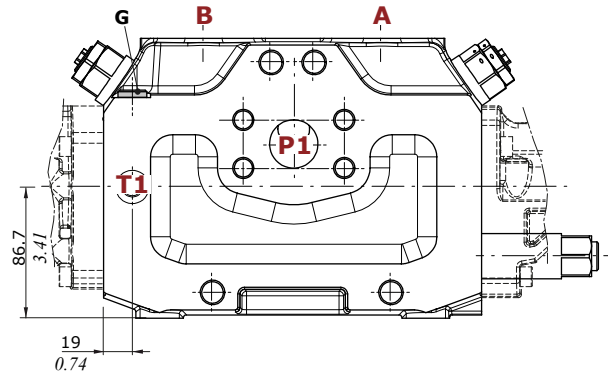
RCSP1A type

With upper T1 drain, side P1 inlet, additional G1/4
port for remoted LS relief valve and
port valves arrangement



RCSP1C type

With side T1 drain, side P1 inlet, additional G1/4
port for remoted LS relief valve and
port valves arrangement

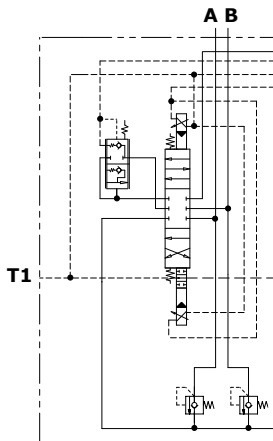


Wrenches and tightening torques

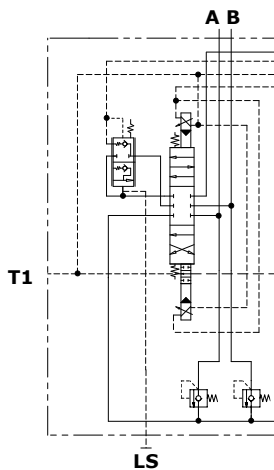
C = allen wrench 8 - 65 Nm (48 lbft)
F = wrench 24 - 55 Nm (40.5 lbft)
G = allen wrench 6 - 30 Nm (22 lbft)

Integrated end sections

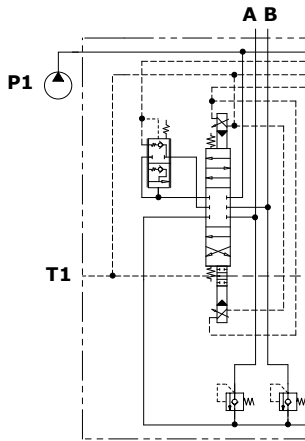
RCK1A - RCK1C
Electrohydraulic control
with port valves



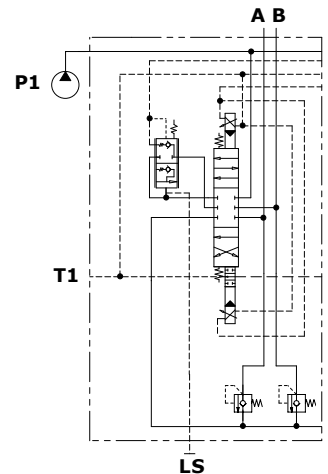
RCSK1A - RCSK1C
Electrohydraulic control
with port valves and additional
G1/4 port for remoted LS
relief valve



RCP1A - RCP1C
Electrohydraulic control
with port valves



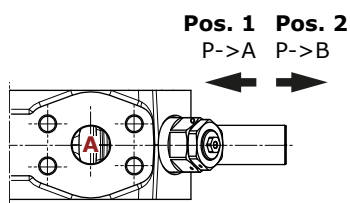
RCSP1A - RCSP1C
Electrohydraulic control
with port valves and additional
G1/4 port for remoted LS
relief valve



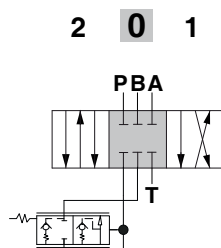
Port configurations

Types	T1 port (side)	T1 port (upper)		Types	T1 port (side)	T1 port (upper)	P1 port (side)	
RCK1A	plugged	open		RCP1A	plugged	open	open	
RCK1C	open	plugged		RCP1C	open	plugged	open	
RCSK1A	plugged	open		RCSP1A	plugged	open	open	
RCSK1C	open	plugged		RCSP1C	open	plugged	open	

Spools

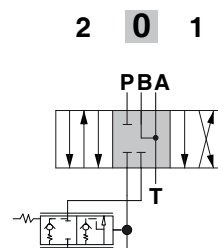


W001C type
A and B closed in
neutral position



Spool stroke
Position 1: + 11 mm (- 0.43 in)
Position 2: - 11 mm (+ 0.43 in)

W002C type
A and B to tank
in neutral position

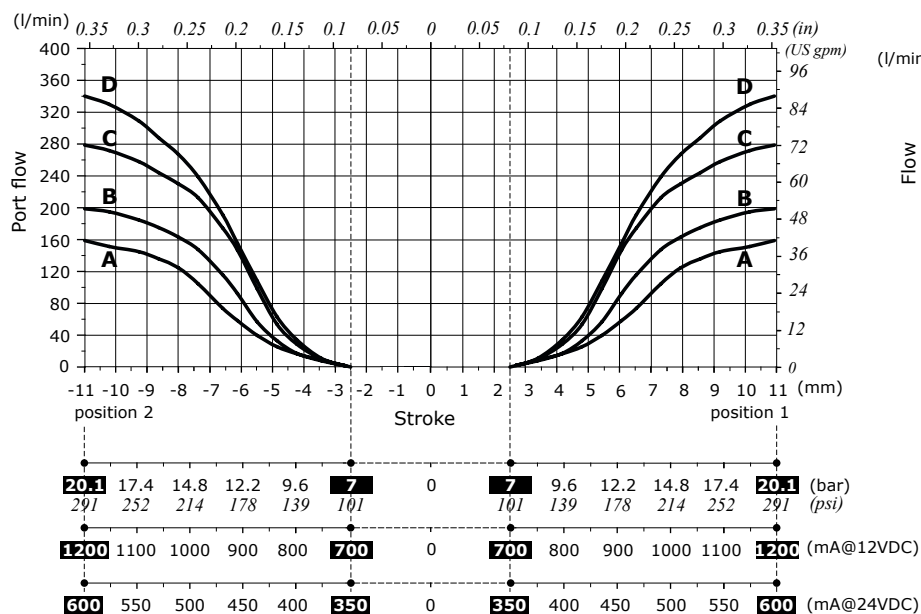


Spool stroke
Position 1: + 11 mm (- 0.43 in)
Position 2: - 11 mm (+ 0.43 in)

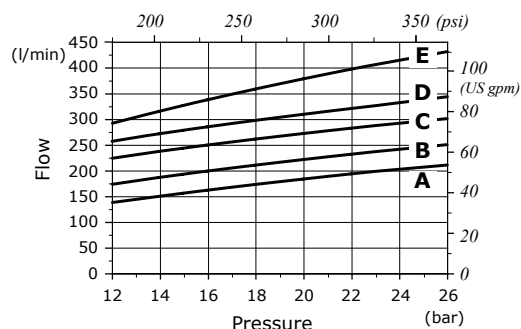
3 position spool metering curve

Qin: 450 l/min (118.8 US gpm) - open center circuit (KV)

Pump compensator @ 16 bar (232 psi)



Spool flow vs. stand-by pressure (margin pressure) on closed center circuit (JV)



Curves with spool nominal flow @ 16 bar (232 psi) stand-by (margin pressure)

- A = 160 l/min (42.26 US gpm)
- B = 200 l/min (52.83 US gpm)
- C = 250 l/min (66 US gpm)
- D = 280 l/min (74 US gpm)
- E = 340 l/min (89.8 US gpm)

Proportional electrohydraulic control

Following specifications are measured with:

- mineral oil of 46 mm²/s - 46 cSt viscosity at 40°C - 104°F temperature,
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

A and B sides spool controls

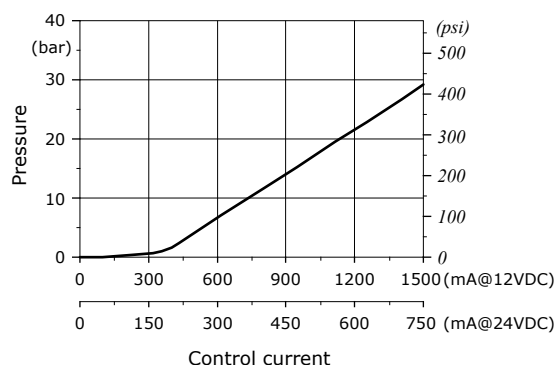
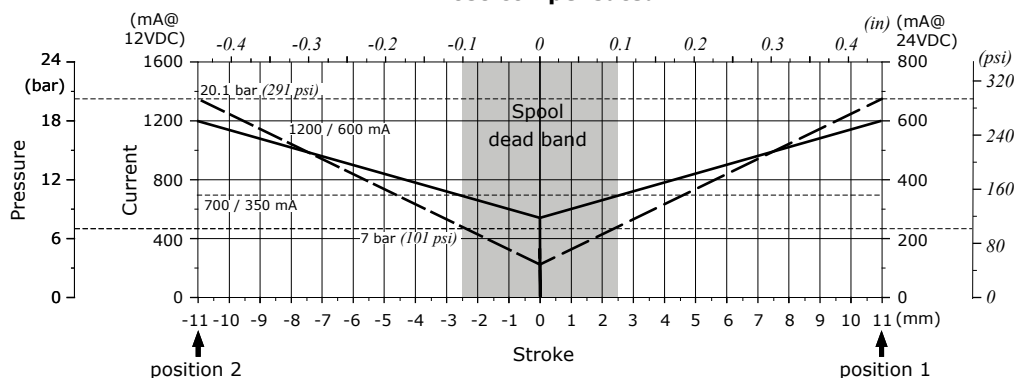
Electric specifications

Coil impedance	12 VDC	4.7 Ω
	24 VDC	20.8 Ω
Max. operating current	12 VDC	1.5 A
	24 VDC	0.75 A
No load current consumption	0	
Min. flow control signal	12 VDC	400 mA
	24 VDC	200 mA
Flow control signal	12 VDC	1200 mA
	24 VDC	600 mA
Dither frequency	70 - 90 Hz	
Insertion	100%	
Coil insulation	Class H (180°C - 356°F)	
Connector type	AMP JPT Deutsch DT	
Weather protection (connector)	IP65 (JPT type) IP69K (DT type)	

Hydraulic specifications

Max. pressure	40 bar (580 psi)
Max. back pressure on solenoid valve drain	5 bar (72.5 psi)

Solenoid pressure reducing valve performance

Stroke vs. Current/Pressure diagram
Post-compensated

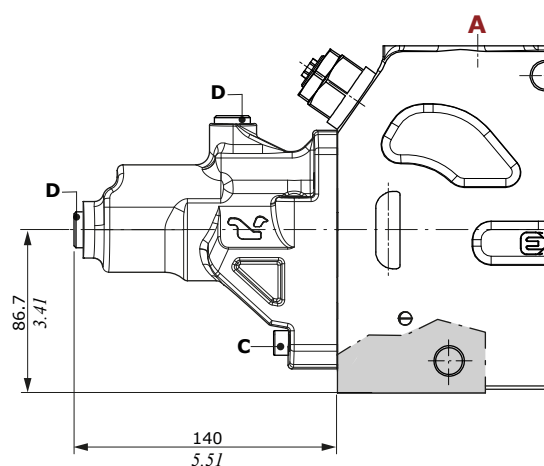
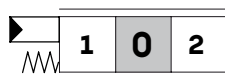
A and B side controls

Two-side electrohydraulic controls

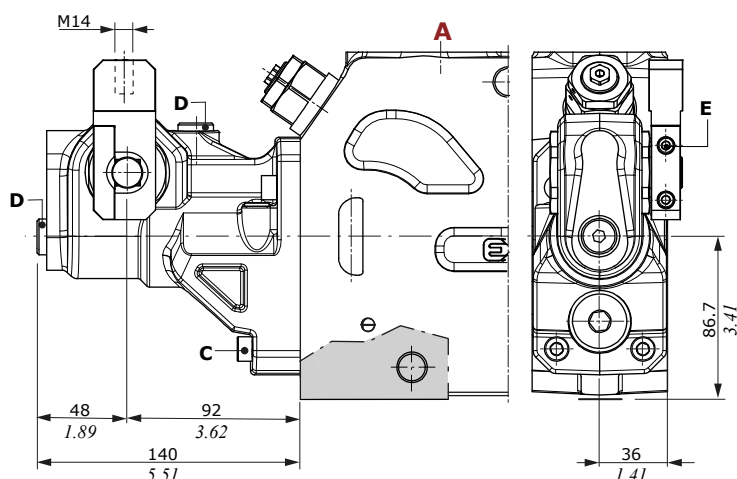
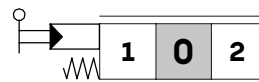
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

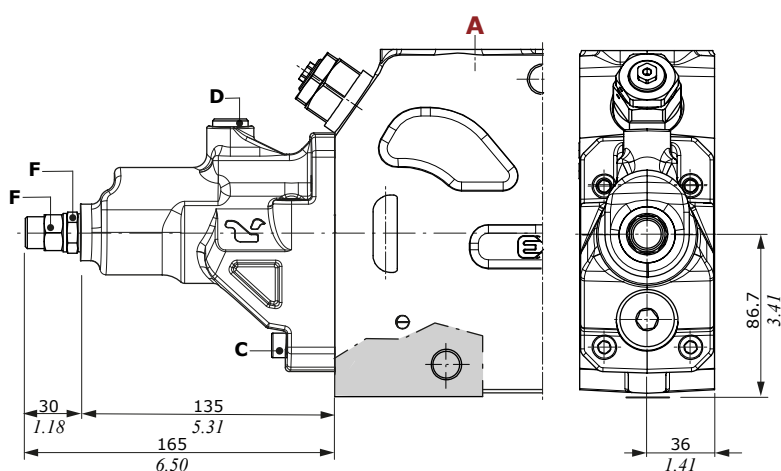
HP07 type
Without lever



HP04 type
With lever



HP07L type
Without lever with stroke limiter



Wrenches and tightening torques

- C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)
- D = allen wrench 6 - 30 Nm (22 lbft)
- E = allen wrench 3 - 2 Nm (1.5 lbft)
- F = wrench 19 - 15 Nm (11 lbft)

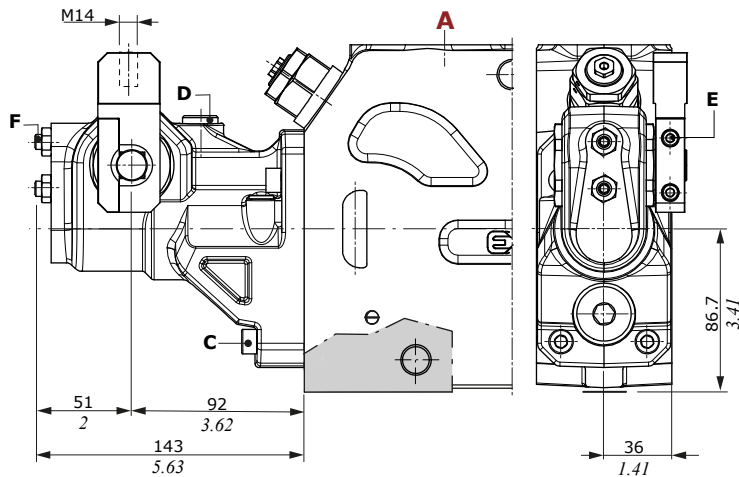
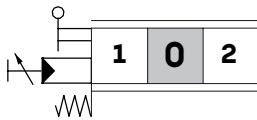
A and B side controls

Two-side electrohydraulic controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

HP04L type
With lever and stroke limiter

**Wrenches and tightening torques**

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

D = allen wrench 6 - 30 Nm (22 lbft)

E = allen wrench 3 - 2 Nm (1.5 lbft)

F = allen wrench 3

G = wrench 19 - 15 Nm (11 lbft)

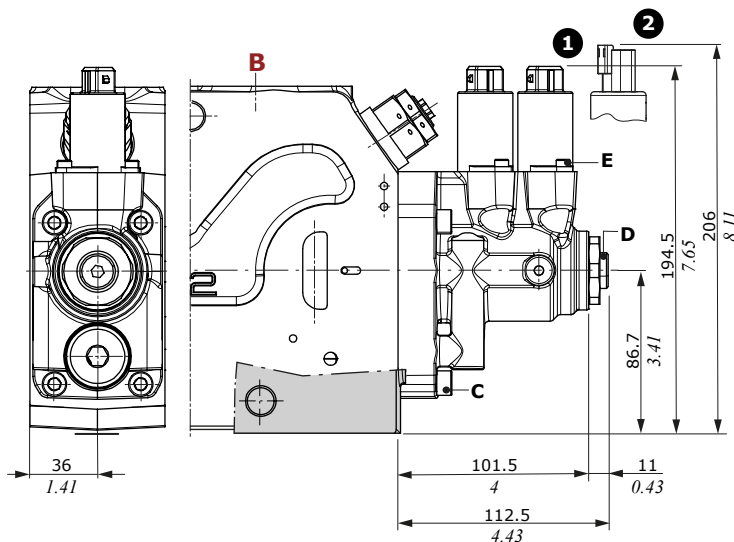
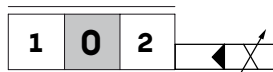
"B" side controls

Control Types

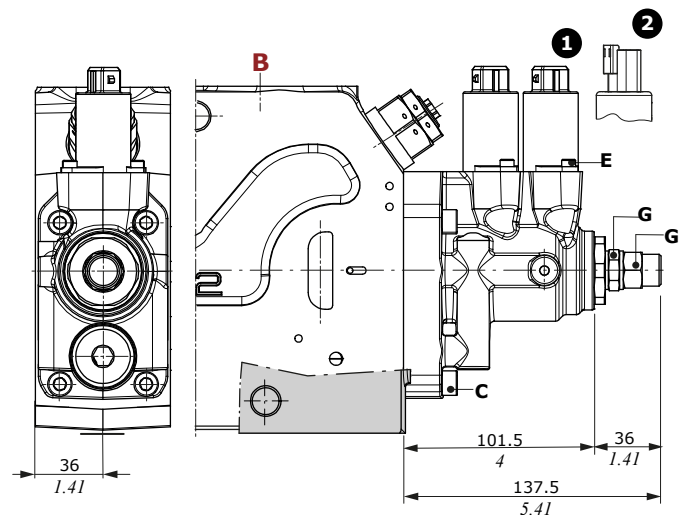
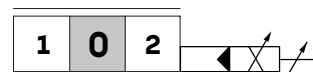
① : With AMP JPT connector - AMP JPT mating connector, code: 5CON003

② : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

FP04 type
Electrohydraulic control



FP04L type
With stroke limiter



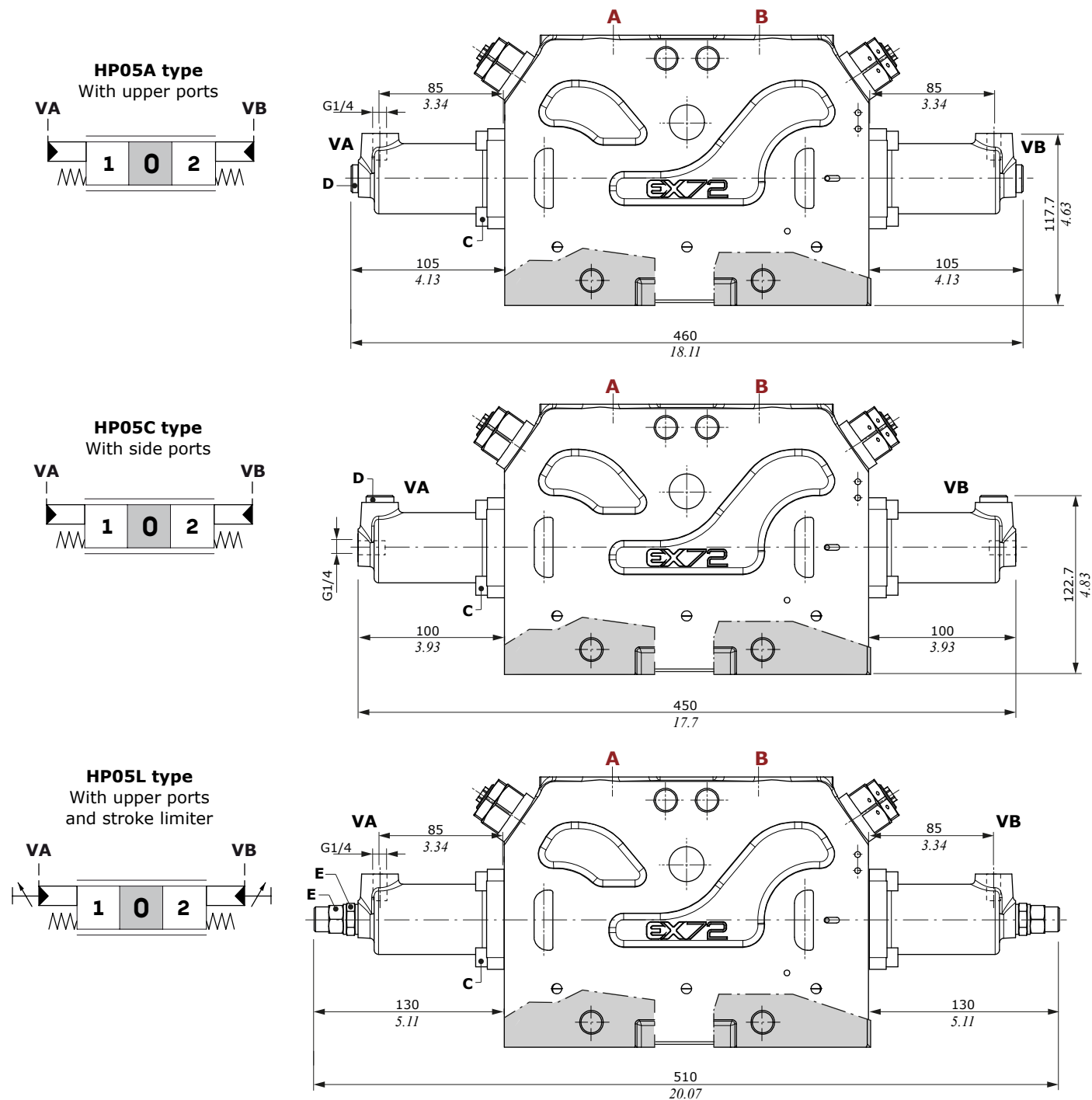
A and B side controls

Hydraulic controls

Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

Proportional controls (A+B sides)

Controls are available with upper or side ports.



Wrenches and tightening torques

C = allen wrench 4 - 5/7 Nm (3.7/5.2 lbft)

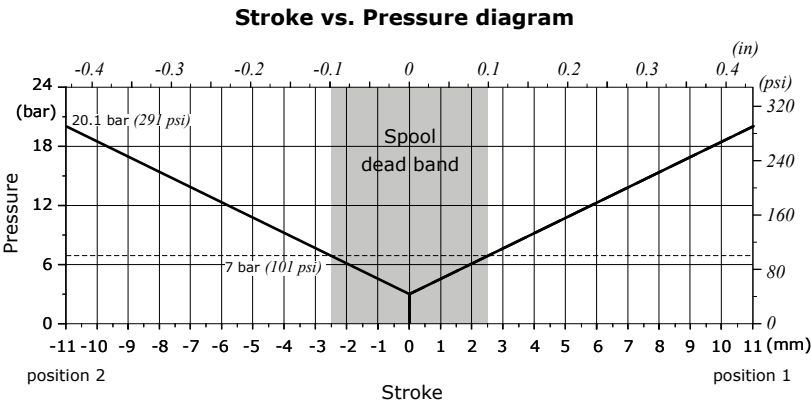
D = allen wrench 6 - 30 Nm (22 lbft)

E = wrench 19 - 15 Nm (11 lbft)

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page



Compatibility table

Combination controls and spool end kit		"A" side controls				
		HP04	HP04L	HP07	HP07L	HP05
"B" side controls	FP04	422501250	422501250	422501250		
	FP04L				422501250	
	HP05					422501231

For spool end types, see page 138

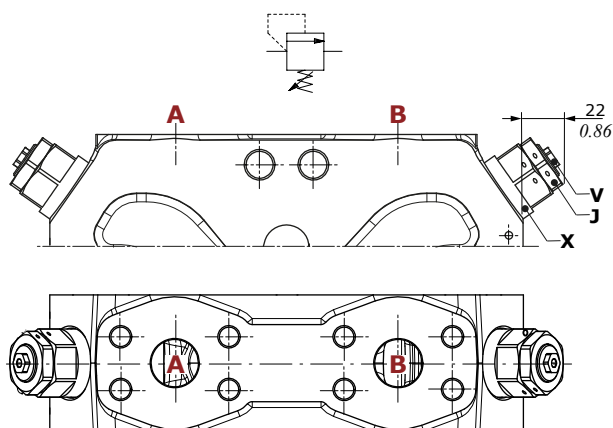
Port valves

Always indicate setting value when using antishock valve or pilot combined valve:

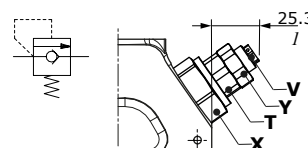
Example: 01 PA (120) = setting at full flow / 01 PA (120-A) = setting at min. flow

Example: 04 PA (120) = setting at full flow / 04 PA (120-A) = setting at min. flow

01 PA/PB type
Antishock valve



04 PA/PB type
Pilot combined valve



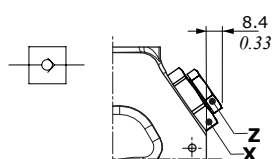
setting range (bar - psi)

Type	pressure @ 450 l/min (118.8 US gpm)
A	50/390 - 725/5650

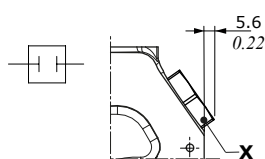
setting range (bar - psi)

Type	pressure @ 450 l/min (118.8 US gpm)	Type	pressure @ 5 l/min (1.3 US gpm)
A	60/100 - 870/1450	A	10-A/60-A - 145-A/870-A
B	101/160 - 1460/2300	B	61-A/130-A - 880-A/1890-A
C	161/250 - 2330/3600	C	131-A/250-A - 1900-A/3600-A

02 PA/PB type
Anticavitation valve



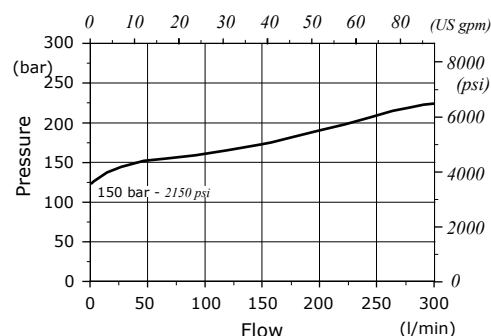
05 PA/PB type
Valve blanking plug



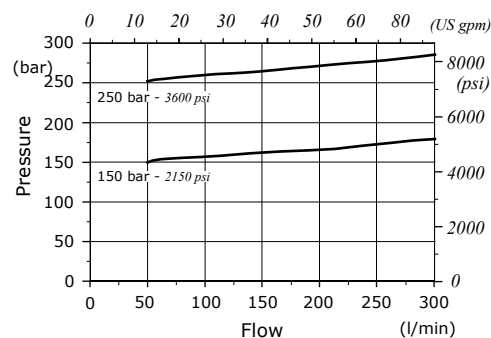
Wrenches and tightening torques

X = wrench 32 - 80 Nm (59 lbf)
J = wrench 30 - 20 Nm (14.7 lbf)
V = wrench 10
Y = wrench 22 - 20 Nm (14.7 lbf)
T = wrench 22 - 80 Nm (59 lbf)
Z = wrench 22 - 25 Nm (18.4 lbf)

01 type
antishock valve
(50 l/min - 13.2 US gpm)



04 type
combined valve (antishock function)
(50 l/min - 13.2 US gpm)



Content**• EX series**

Accessories

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Installation and Maintenance

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Coils and connectors

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⁾ 4SLE001202A ⁽⁶⁾ 4SLE001216A ⁽³⁻⁶⁾ 4SLE001206A ⁽²⁾	4SLE001203A ⁽⁵⁾ 4SLE001211A ⁽³⁻⁵⁾	4SLE001210A ⁽²⁾	4SLE001214A ⁽²⁾	4SLE001207A
	14 VDC	-	4SLE001400A ⁽⁶⁾ 4SLE001401A ⁽³⁻⁶⁾ 4SLE001402A ⁽³⁻⁵⁾	4SLE001403A ⁽³⁻⁵⁾	-	-	-
	24 VDC	4SLE002400A 4SLE002408A ⁽³⁾ 4SLE302400A ⁽¹⁾	4SLE002401A ⁽⁵⁾ 4SLE002407A ⁽³⁻⁵⁾ 4SLE002402A ⁽⁶⁾	4SLE002403A ⁽⁵⁾	-	-	4SLE002404A
	28 VDC	-	4SLE002802A ⁽⁶⁾	4SLE002800A ⁽⁵⁾	-	-	-
	48 VDC	4SLE004800A 4SLE304800A ⁽¹⁾	-	-	-	-	-
	110VDC	4SLE011000A 4SLE311000A ⁽¹⁾	-	-	-	-	-
	220 VDC	4SLE022000A 4SLE322000A ⁽¹⁾	-	-	-	-	-
	Mating connectors (for connector with rectifier see following table)	4CN1009995	5CON140031	5CON003	5CON001	5CON017	-

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

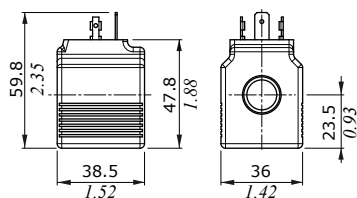
Voltage	ISO 4400 mating connector with rectifier
	BER type coil
24 VDC	4CN1010240
48 VDC	4CN1010480
110 VDC	4CN1011100
220 VDC	4CN1012200

Coils and connectors

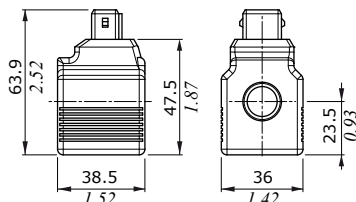
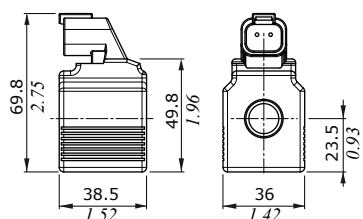
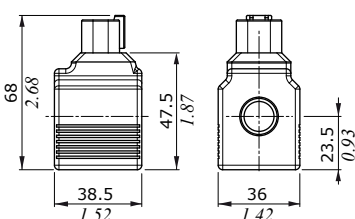
Dimensional data and features

BER type

ISO4400 connector



AMP JPT connector

DEUTSCH DT04 connector
(parallel type)DEUTSCH DT04 connector
(perpendicular type)

Features

Nominal voltage tolerance : $\pm 10\%$

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

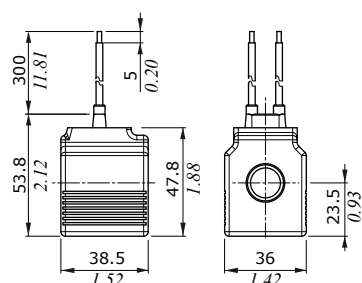
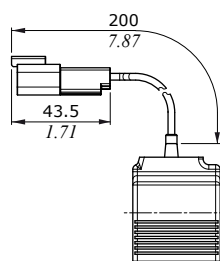
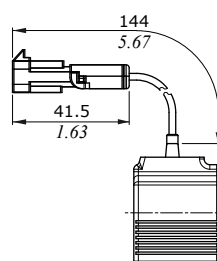
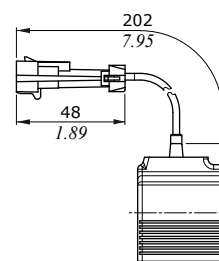
Max. operating current . . : 1,90 A - 10 VDC
 : 1,60 A - 12 VDC
 : 1,36 A - 14 VDC
 : 0,80 A - 24 VDC
 : 0,68 A - 28 VDC
 : 0,40 A - 48 VDC
 : 0,17 A - 110 VDC
 : 0,09 A - 220 VDC
 : 0,89 A - 24 RAC
 : 0,45 A - 48 RAC
 : 0,19 A - 110 RAC
 : 0,09 A - 220 RAC

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

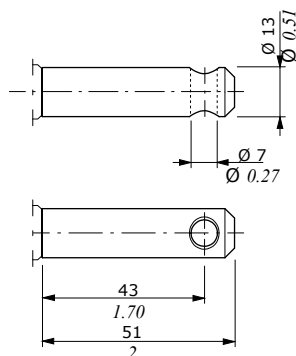
Flying leads with
DEUTSCH DT04 connectorFlying leads with PACKARD
WEATHER-PACK connectorFlying leads with PACKARD
METRI-PACK connector

Spool end kit

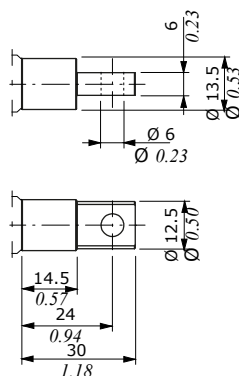
EX38

For post-compensated standard section (A side)

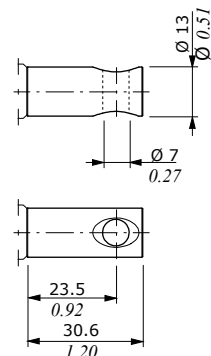
Only for mechanical controls



Only for without lever control

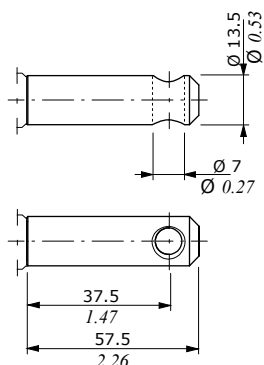


Only for hydraulic and electrohydraulic controls

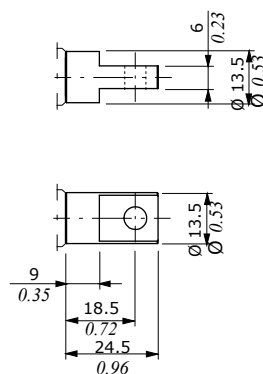


For post-compensated float section (A side)

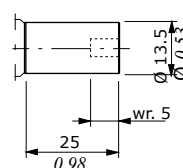
Only for mechanical controls



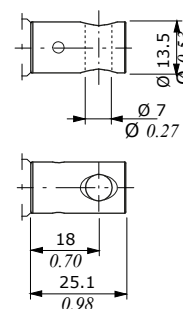
Only for without lever control



Only for HP07 control

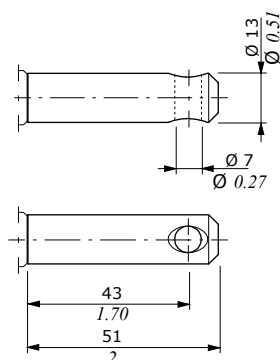


Only for HP04/HP04L controls

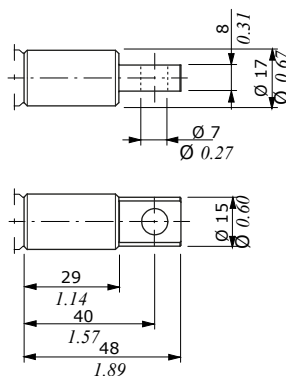


For pre-compensated section (A side)

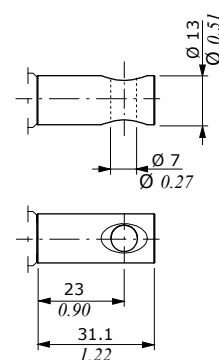
Only for mechanical controls



Only for without lever control



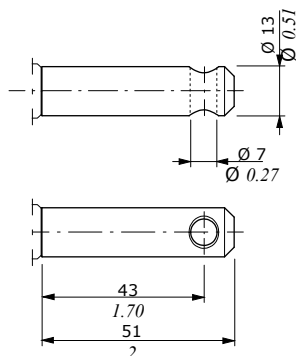
Only for hydraulic and electrohydraulic controls



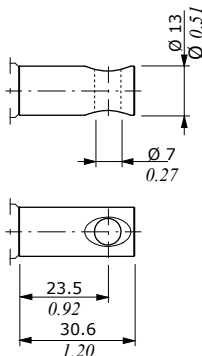
EX38-HF

For post-compensated standard section (A side)

Only for mechanical controls



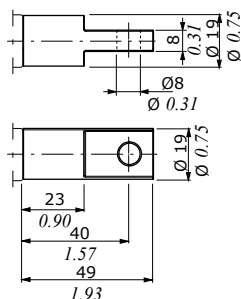
Only for hydraulic and electrohydraulic controls

**EX54**

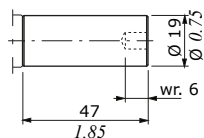
For post-compensated section

A side

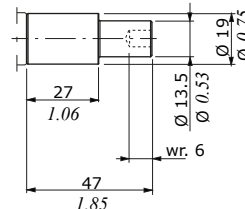
Only for mechanical controls



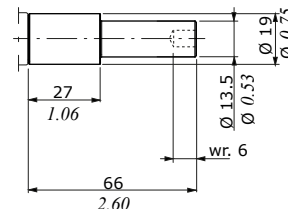
Only for hydraulic control

**B side**

Only for electrohydraulic control



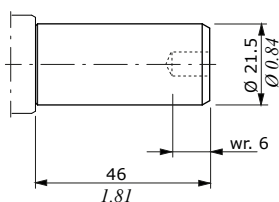
Only for spool position sensor controls

**EX72**

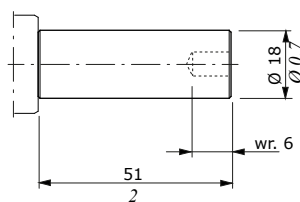
For post-compensated section

A + B sides

Only for hydraulic control

**B side**

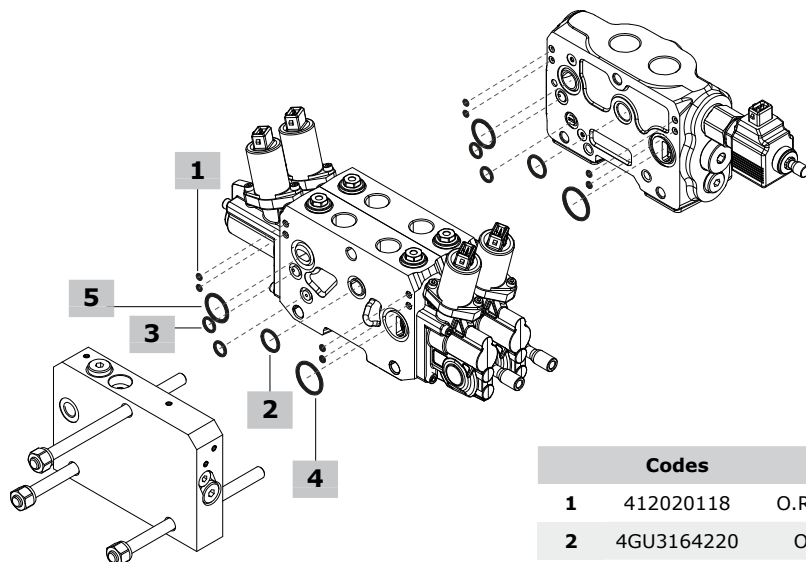
Only for electrohydraulic control



Seal kits

EX38

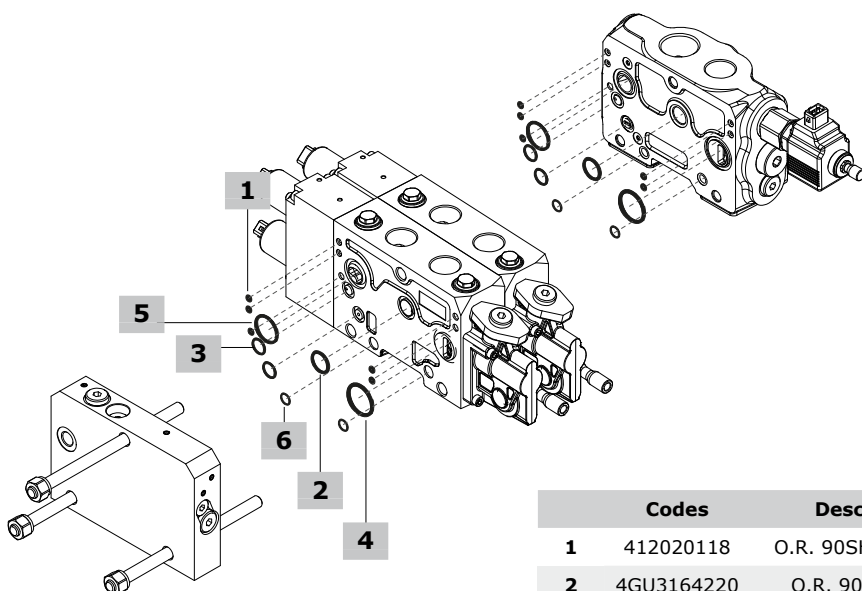
For inlet/working sections (post/pre-compensated)



	Codes	Descriptions	Q.ty	Complete seal kit code
1	412020118	O.R. 90SH (n27or050)	4	350993001
2	4GU3164220	O.R. 90SH (3-908)	1	
3	412020303	O.R. 90SH (6-532)	2	
4	4GUA325126	O.R. 90SH (25.7x2.62)	1	
5	4GUA321926	O.R. 90SH (21.89x2.62)	1	

EX38-HF

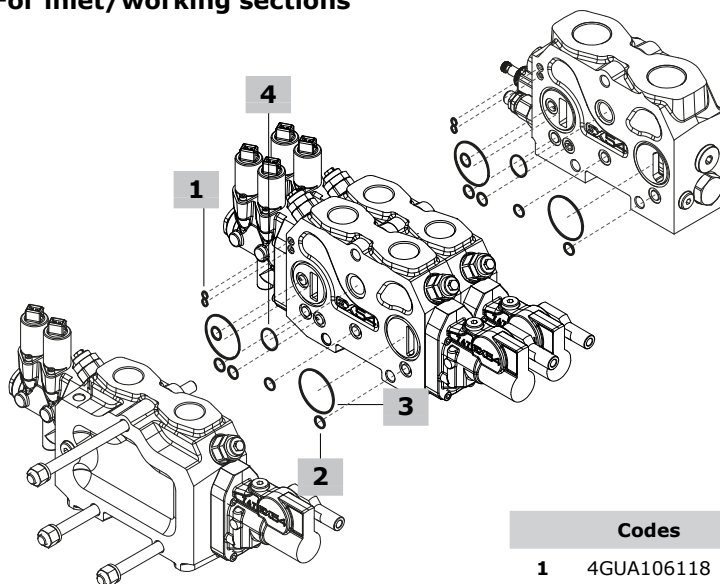
For inlet/working sections (post-compensated)



	Codes	Descriptions	Q.ty	Complete seal kit code
1	412020118	O.R. 90SH (n27or050)	5	350993003
2	4GU3164220	O.R. 90SH (3-908)	1	
3	412020303	O.R. 90SH (6-532)	2	
4	4GUA325126	O.R. 90SH (25.7x2.62)	1	
5	4GUA321926	O.R. 90SH (21.89x2.62)	1	
6	412010124	O.R. 70SH (2-11)	2	

EX54

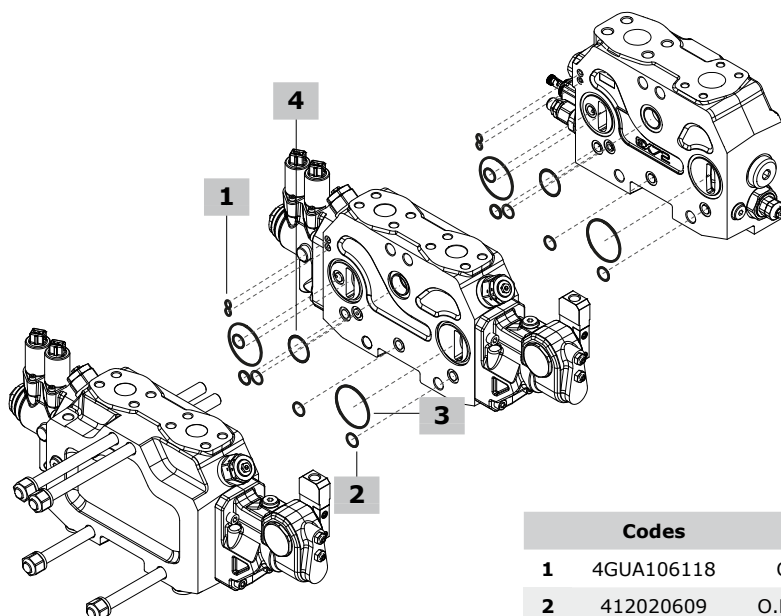
For inlet/working sections



	Codes	Descriptions	Q.ty	Complete seal kit code
1	4GUA106118	O.R. 70SH 6.07 (2-10)	2	350998001
2	412020609	O.R. 90SH 13.11 (5-616)	5	
3	4GUA348926	O.R. 90SH 48.90 (2-135)	2	
4	4GUA323530	O.R. 90SH 23.47 (3-912)	1	

EX72

For inlet/working sections



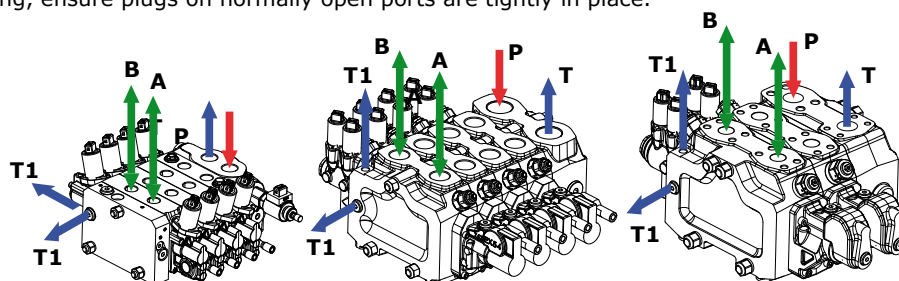
	Codes	Descriptions	Q.ty	Complete seal kit code
1	4GUA106118	O.R. 70SH 6.07x1.78	2	350995001
2	412020609	O.R. 90SH 13.11 (5-616)	5	
3	612020501	O.R. 90SH 50.39 (1BWG4)	2	
4	4GU3297350	O.R. 90SH 29.74x3.53	1	

Main rules

The EX series valves are assembled and tested as per the technical specifications of this catalogue.

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

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



FITTING TIGHTENING TORQUE - Nm (lbft)

	P port	A and B ports	T and HPCO ports	T1 port
EX38	BSP	G 3/4	G 1/2	G 3/4
	With O-Ring seal	90 (66.3)	60 (44.2)	90 (66.3)
	With copper washer	90 (66.3)	60 (44.2)	90 (66.3)
	With steel and rubber washer	90 (66.3)	60 (44.2)	90 (66.3)
	UN-UNF	1" 1/16-12 (SAE 12)	7/8-14 (SAE 10)	1" 1/16-12 (SAE 12)
EX38-HF	With O-Ring seal	90 (66.3)	90 (66.3)	90 (66.3)
	BSP	G 3/4	G 3/4	G 1"
	With O-Ring seal	90 (66.3)	90 (66.3)	100 (73.7)
	With copper washer	90 (66.3)	90 (66.3)	120 (88.5)
	With steel and rubber washer	90 (66.3)	90 (66.3)	120 (88.5)
EX54	UN-UNF	1" 1/16-12 (SAE 12)	1" 1/16-12 (SAE 12)	1" 5/16-12 (SAE 16)
	With O-Ring seal	90 (66.3)	90 (66.3)	120 (88.5)
	BSP	G 1" 1/4	G 1"	G 1" 1/4
	With O-Ring seal	120 (88.5)	120 (88.5)	120 (88.5)
	With copper washer	120 (88.5)	120 (88.5)	120 (88.5)
EX72	With steel and rubber washer	120 (88.5)	120 (88.5)	120 (88.5)
	UN-UNF	1" 5/8-12 (SAE20)	1" 5/16-12 (SAE 16)	1" 5/8-12 (SAE 20)
	With O-Ring seal	120 (88.5)	120 (88.5)	120 (88.5)
	ISO 6162 type 1	1" (M12) - type 2	3/4 (M10) - type 1	1" 1/4 (M10) - type 1
	ISO 6162 type 2	1" (M12) - type 2	3/4 (M10) - type 1	1" 1/4 (M10) - type 1
EX72	bolts torque; min - max	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)	50 - 55 (36.8 - 40.5)
	SAE J518 code 61	1" (7/16-14 UNC) - type 2	3/4 (3/8-16 UNC) - type 1	1" 1/4 (7/16-14 UNC) - type 1
	SAE J518 code 62	1" (7/16-14 UNC) - type 2	3/4 (3/8-16 UNC) - type 1	1" 1/4 (7/16-14 UNC) - type 1
	bolts torque; min - max	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)	50 - 55 (36.8 - 40.5)
	BSP	-	-	-
EX72	With O-Ring seal	-	-	-
	With copper washer	-	-	-
	With steel and rubber washer	-	-	-
	UN-UNF	-	-	-
	With O-Ring seal	-	-	-
EX72	ISO 6162 type 1	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	ISO 6162 type 2	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)
	SAE J518 code 61	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
	SAE J518 code 62	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
EX72	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)
	BSP	-	-	-
	With O-Ring seal	-	-	-
	With copper washer	-	-	-
	With steel and rubber washer	-	-	-
EX72	UN-UNF	-	-	-
	With O-Ring seal	-	-	-
	ISO 6162 type 1	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	ISO 6162 type 2	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)
EX72	SAE J518 code 61	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
	SAE J518 code 62	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)
	BSP	-	-	-
	With O-Ring seal	-	-	-
EX72	With copper washer	-	-	-
	With steel and rubber washer	-	-	-
	UN-UNF	-	-	-
	With O-Ring seal	-	-	-
	ISO 6162 type 1	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	ISO 6162 type 2	1" 1/4 (M14) - type 2	1" (M12) - type 2	1" (M10) - type 2
	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)
	SAE J518 code 61	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
	SAE J518 code 62	1" 1/4 (1/2-13 UNC) - type 2	1" (7/16-14 UNC) - type 2	1" (7/16-14 UNC) - type 2
	bolts torque; min - max	130 - 146 (95.8 - 107.6)	92 - 100 (67.8 - 73.7)	50 - 55 (36.8 - 40.5)

WALVOIL NEL MONDO | WALVOIL WORLDWIDE

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