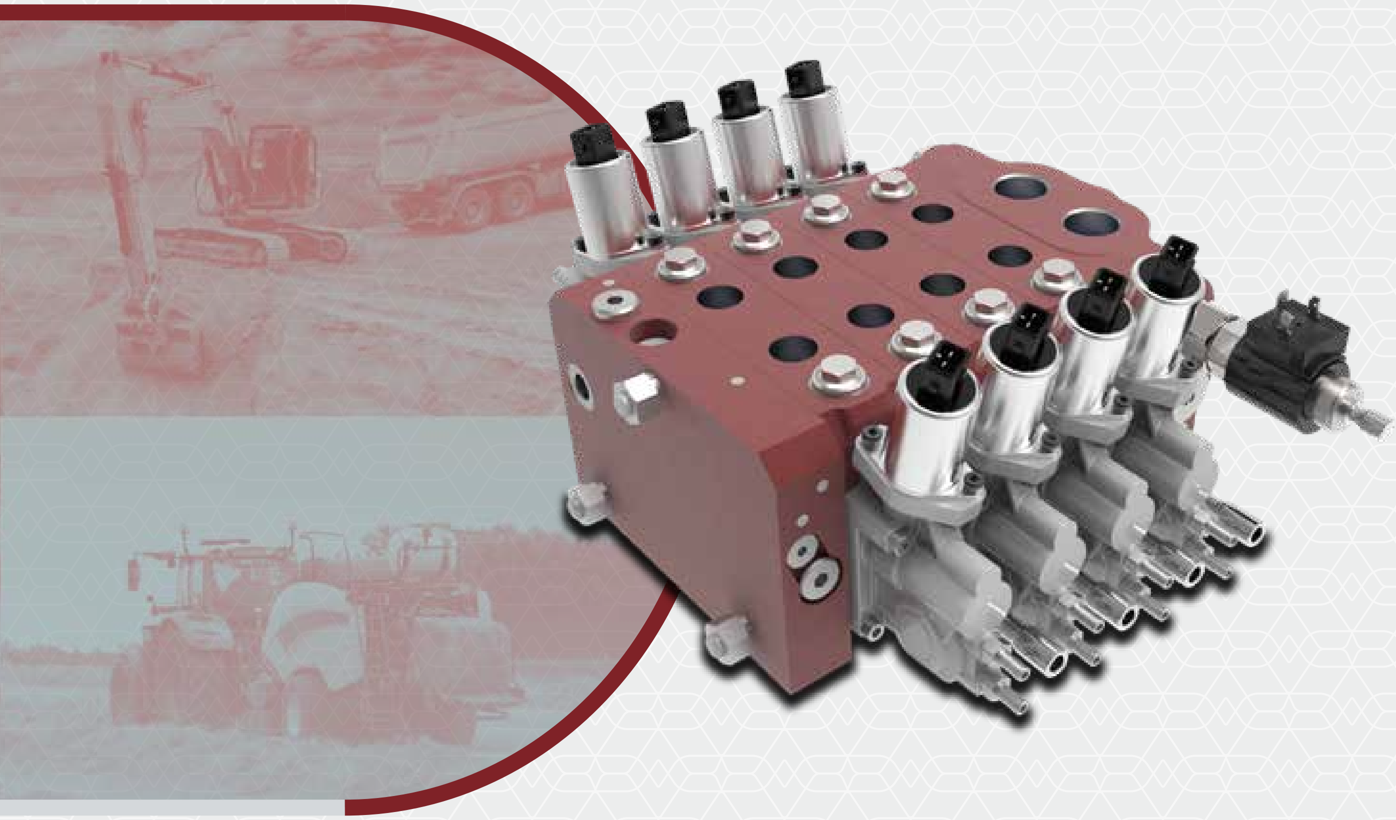
walvoil

MOTION BY PEOPLE

EX Series

Load Sensing
and Flow Sharing valves

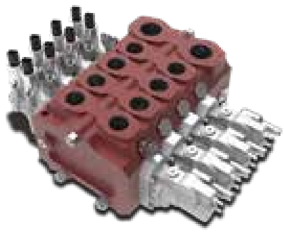


DIRECTIONAL VALVES

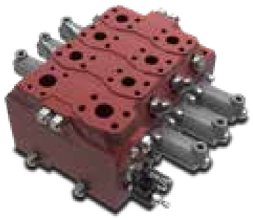
The EX Series

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.

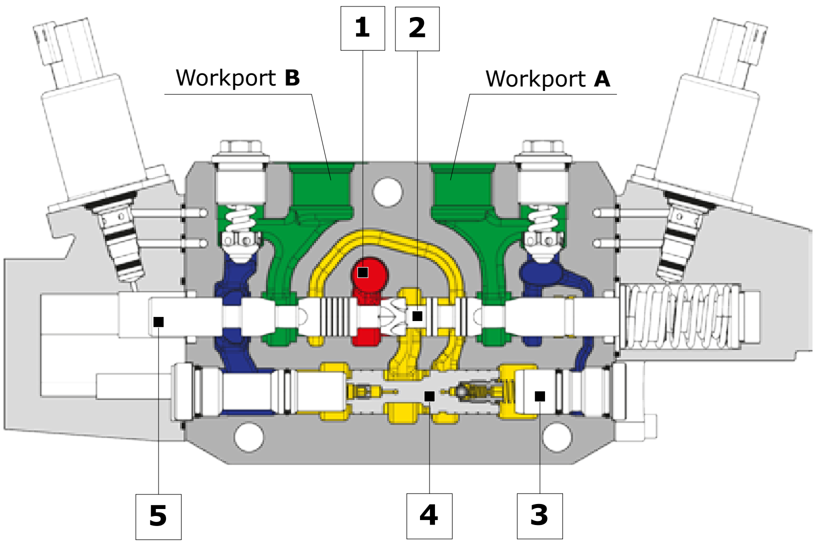
WARNING!
All specifications of this catalogue refer to the standard product at this date.
Walvoil, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

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 costant 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.



1. Inlet line (High pressure)
2. Metering area
3. Load Sensing line
4. Local compensator
5. Spool

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):

$$Q \alpha A \sqrt{\Delta P / \rho}$$

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 mantain 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.

Content

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 Std.	EX38 HF	EX54	EX72
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 Δp= 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 BS 2779	ISO 263 ANSI B1.1 unified	ANSI B1.20.3	ISO 6162 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)	**-**

EX54 PORTS THREADING					FLANGE CONNECTION (bolt 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)	**-**	-	-	-	-

EX72 PORTS THREADING					FLANGE CONNECTION (bolt 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)	**-**	-	-	-	-

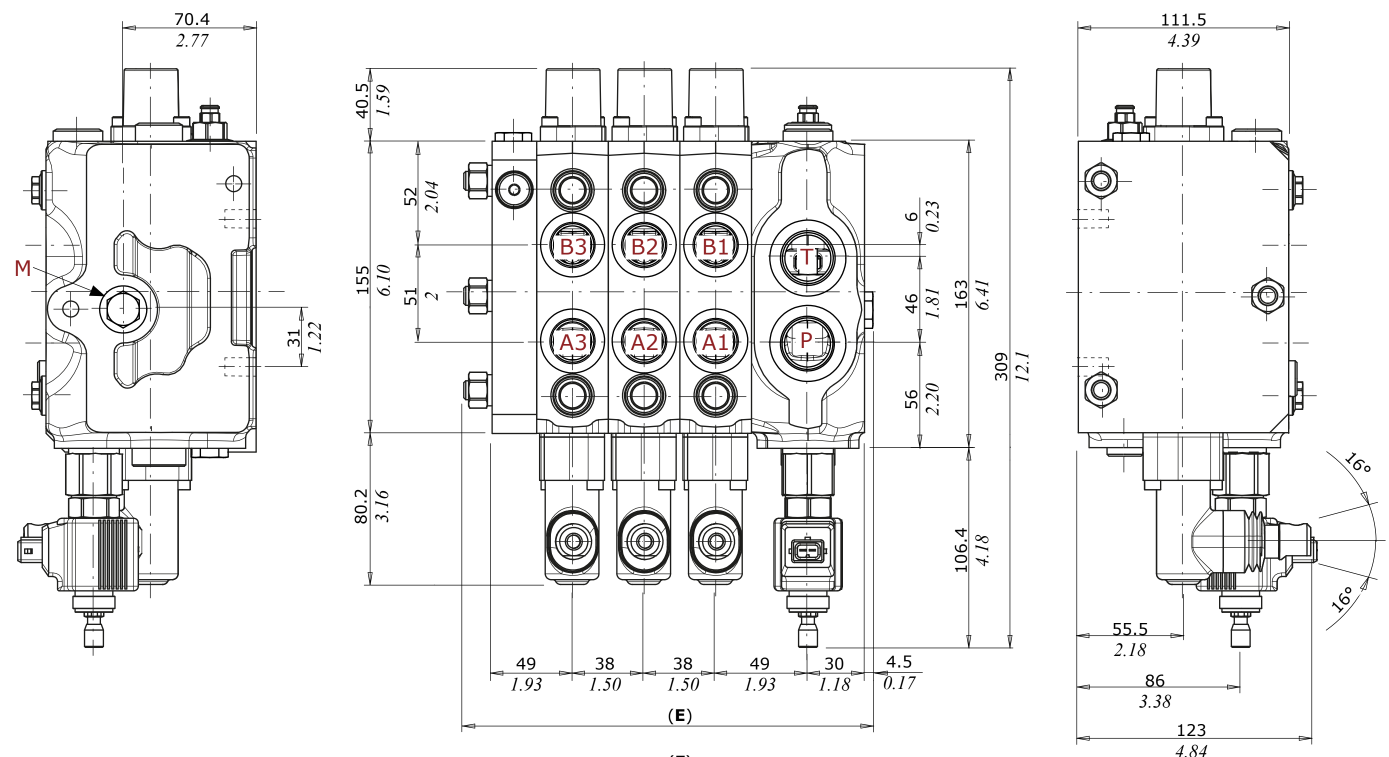
Content

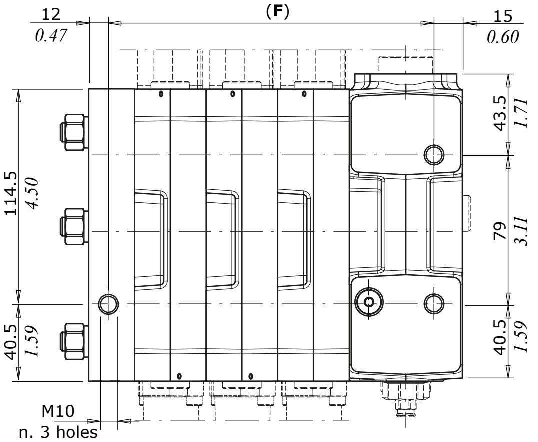
• EX38

Dimensional data

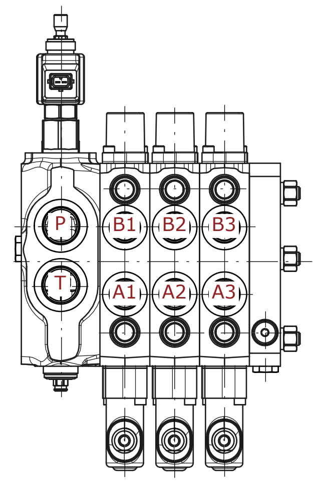
Mechanical control configuration example

Right Inlet (MR)

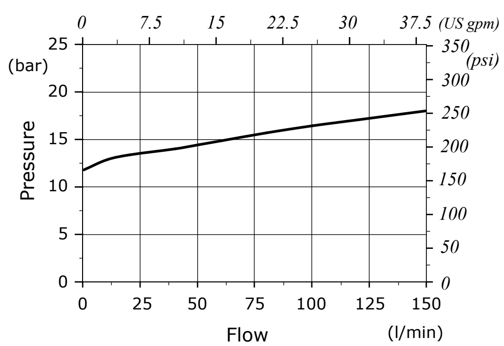




Left inlet (ML) configuration example



P⇒T Pressure drop inlet compensator (margin pressure)



Type	E mm - *in*	F 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*

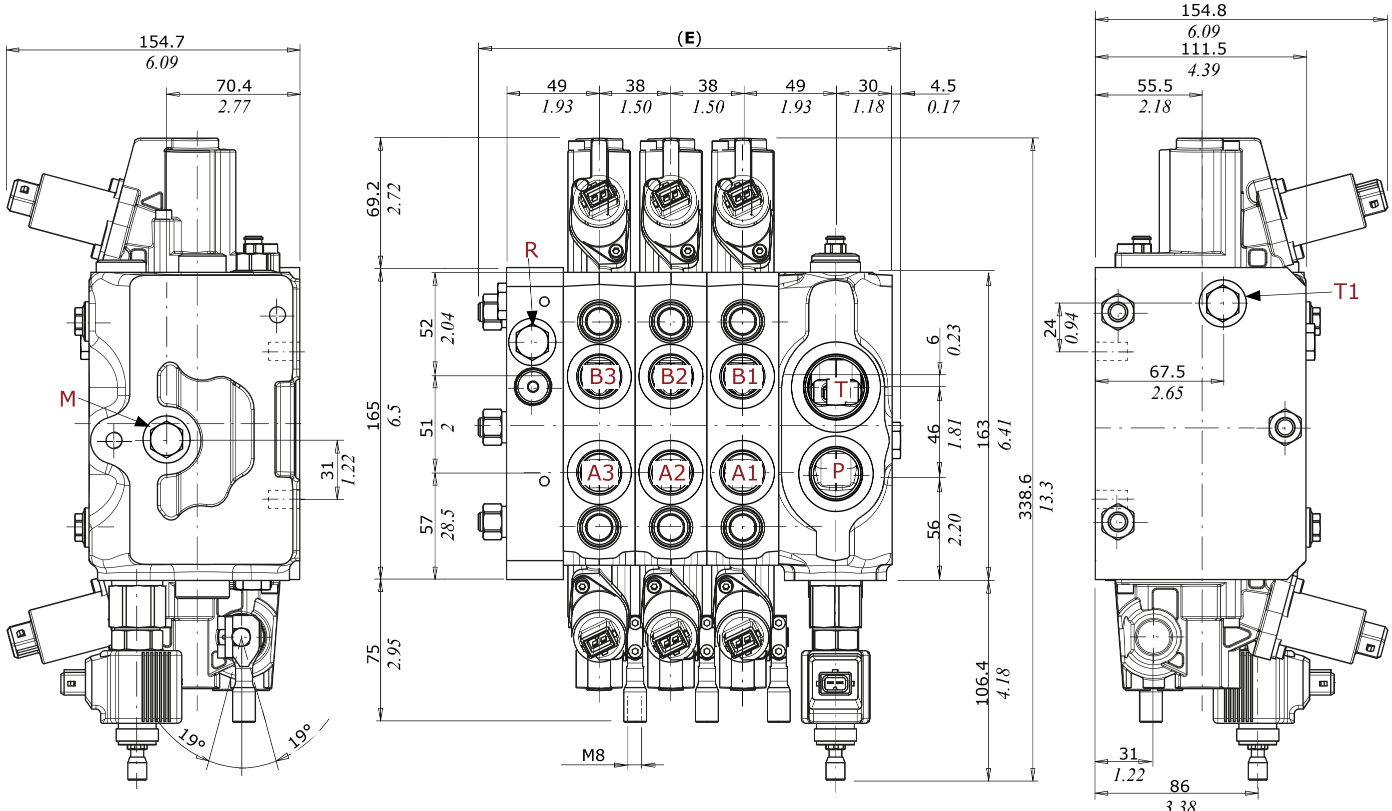
Type	E mm - *in*	F mm - *in*
EX38/6	331 - *13.03*	285 - *11.22*
EX38/7	369 - *14.52*	323 - *12.71*
EX38/8	407 - *16.02*	361 - *14.21*
EX38/9	445 - *17.50*	399 - *15.70*
EX38/10	483 - *19.01*	437 - *17.20*

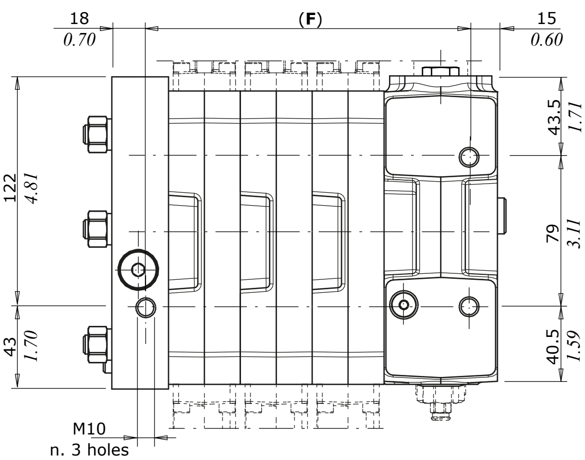
NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Dimensional data

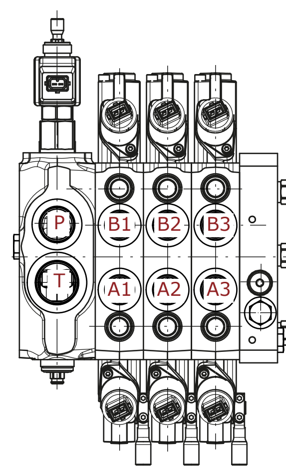
Two-side electrohydraulic control configuration example

Right Inlet (MR)





Left inlet (ML)
configuration example

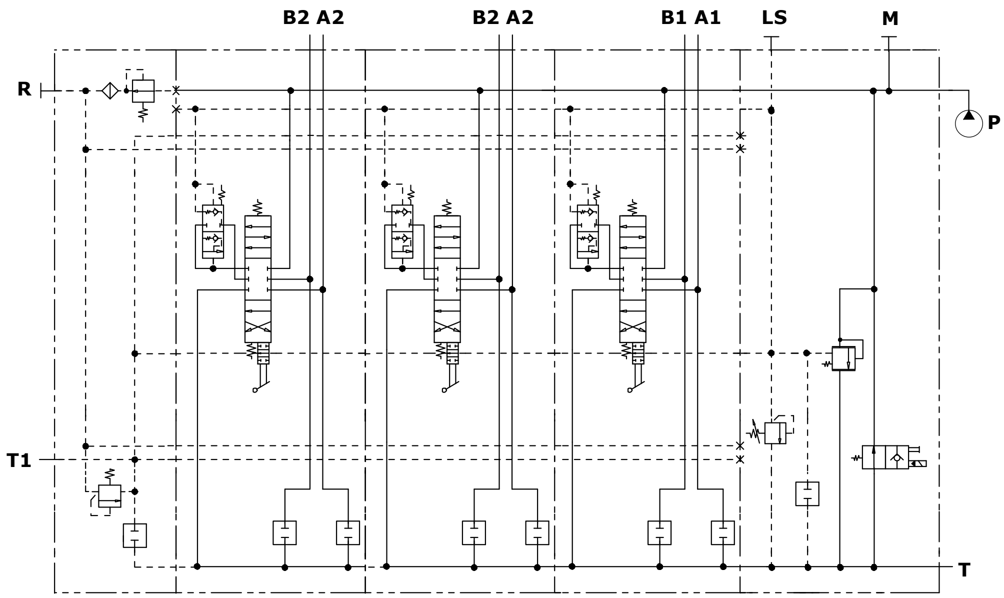


Type	E	F
	mm - *in*	mm - *in*
EX38/1	147.5 - *5.80*	95 - *3.74*
EX38/2	185.5 - *7.30*	133 - *5.23*
EX38/3	223.5 - *8.80*	171 - *6.73*
EX38/4	261.5 - *10.30*	209 - *8.22*
EX38/5	299.5 - *11.80*	247 - *9.72*

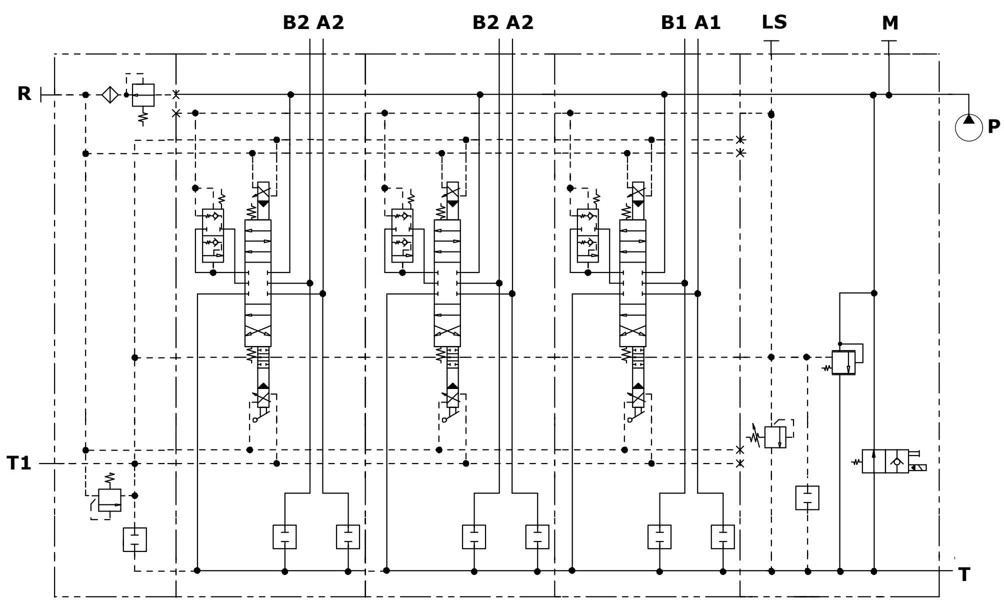
Type	E	F
	mm - *in*	mm - *in*
EX38/6	337.5 - *13.28*	285 - *11.22*
EX38/7	375.5 - *14.78*	323 - *12.71*
EX38/8	413.5 - *16.28*	361 - *14.21*
EX38/9	451.5 - *17.77*	399 - *15.70*
EX38/10	489.5 - *19.27*	437 - *17.20*

NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Hydraulic circuits



Right Inlet valve with mechanical controls configuration example (Post-compensated):
EX38/3/MR-V1A(200)-V7B(C12AY)-V10C-KV-U05/
W001C(80\80)-H001-F001A-RC1-U04.05TFPA\05TFPB/
W001C(80\80)-H001-F001A-RC1-U04.05TFPA\05TFPB/
W001C(80\80)-H001-F001A-RC1-U04.05TFPA\05TFPB/KZ10I



Right Inlet valve with two-side electrohydraulic controls configuration example (Post-compensated):
EX38/3/MR-V1A(200)-V7B(C12AY)-V10C-KV-U05/
W001C(80\80)-HP04-FP04-B12AJ-RC1-U04.05TFPA\05TFPB/
W001C(80\80)-HP04-FP04-B12AJ-RC1-U04.05TFPA\05TFPB/
W001C(80\80)-HP04-FP04-B12AJ-RC1-U04.05TFPA\05TFPB/KZ20EH

Complete section ordering code

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

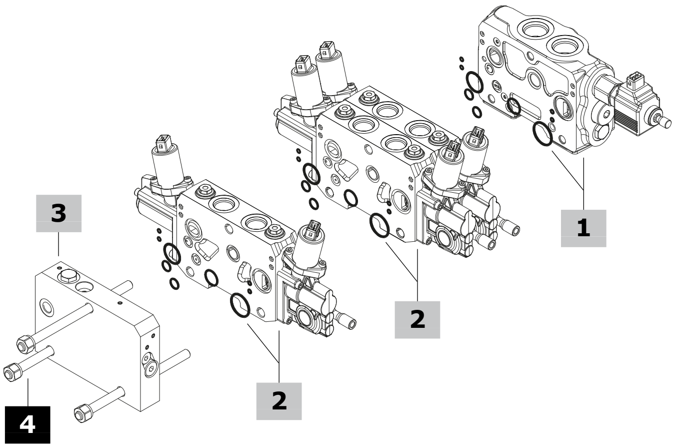
EX38/3/MR-V1A(200)-V7B-C12AJ-V10C-KVU05/W001C(25\25)-HP04-FP04-B12AJ-RC1U04-05TFPA-

Working sections — Right Inlet: **MR** / Left Inlet: **ML** — **1** — **2**

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

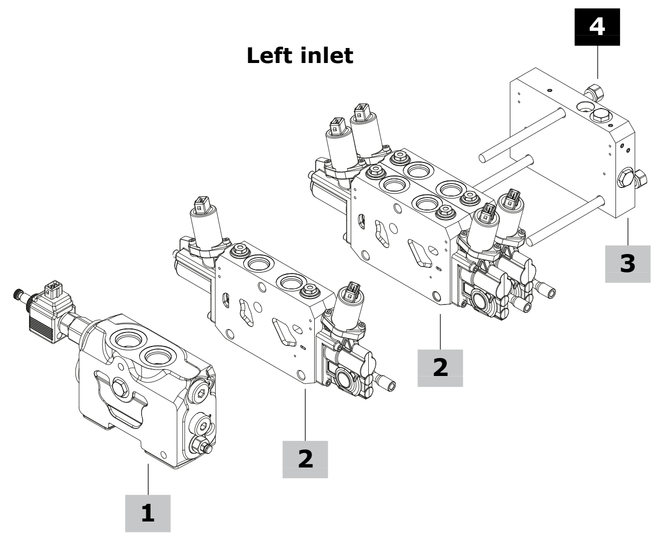
2 — **2** — **3** — Painted with RAL 9005 black primer

Right inlet



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

Left inlet

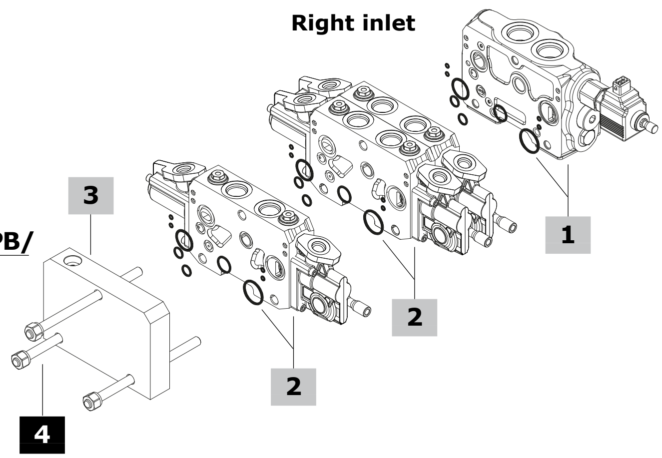


Hydraulic control valve configuration example - Right Inlet

1 — **EX38/3/MR-V1A(200)-V7B-C12AJ-V10C-KVU05/**
2 — **W001C(25/25)-HP01-FP01-RC1U04.05TFPA\05TFPB/**
2 — **.../.../**
3 — **KZ10I/P006/3 N10**

Painted with RAL 9005 black primer

Right inlet



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-U05**
CODE: SHE380040
DESCRIPTION: with LS pressure relief valve and valve blanking plugs on positions B and C
TYPE: **MR-L/V1A(200)-V7B(C12AY)-V10C-KV-U05**
CODE: SHE380041
DESCRIPTION: as previous one with full flow electric unloading valve
TYPE: **MR-L/V1A(200)-V4B-V11C(C12AY)-KV-U05**
CODE: SHE380042
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-U05**
CODE: SHE380043
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-U05**
CODE: SHE380044
DESCRIPTION: with LS pressure relief valve and valve blanking plugs on positions B and C
TYPE: **MR-L/V1A(200)-V7B(C12AY)-V10C-JV-U05**
CODE: SHE380045
DESCRIPTION: as previous one with full flow electric unloading valve
TYPE: **MR-L/V1A(200)-V4B-V11C(C12AY)-JV-U05**
CODE: SHE380046
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-U05**
CODE: SHE380047
DESCRIPTION: as previous one with full flow direct relief valve

NOTE (*): Codes are referred to **UN-UNF** 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-U04**
CODE: SHL380134
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-U04-05TFPA-05TFPB**
CODE: SHL380135
DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With hydraulic controls

TYPE: **SD/W001C(25\25)-HP01-FP01-RC2-U04**
CODE: SHL380136
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-U04-05TFPA-05TFPB**
CODE: SHL380137
DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With proportional electrohydraulic controls

TYPE: **SD/W001C(25\25)-HP04-FP04-B12AJ-RC2-U04**
CODE: SHL380138
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-U04-05TFPA-05TFPB**
CODE: SHL380139
DESCRIPTION: as previous one with port valve arrangement (seat plugged)

TYPE: **SD/W001C(25\25)-HP06-FP06-B12AJ-RCU2-U04**
CODE: SHL380140
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-U04-05TFPA-05TFPB**
CODE: SHL380141
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-U04-05TFPA-05TFPB**
CODE: SHL380142
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-U04-05TFPA-05TFPB**
CODE: SHL380143
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-U04-05TFPA-05TFPB**
CODE: SHL380144
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-U04**
CODE: SHL380145
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-U04-05TFPA-05TFPB**
CODE: SHL380146
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-U04**
CODE: SHL380147
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-U04-05TFPA-05TFPB**
CODE: SHL380148
DESCRIPTION: as previous one with port valve arrangement (seat plugged)

With proportional electrohydraulic controls

TYPE: **SS/W001C(25\25)-HP04-FP04-B12AJ-RC2-U04**
CODE: SHL380149
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-U04-05TFPA-05TFPB**
CODE: SHL380150
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-U04-05TFPA-05TFPB**
CODE: SHL380151
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-U04-05TFPA-05TFPB**
CODE: SHL380152
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-U04-05TFPA-05TFPB**
CODE: SHL380153
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: 320093103
DESCRIPTION: without pressure reducing valve, internal drain

TYPE: **KZ10E** CODE: 320093104
DESCRIPTION: without pressure reducing valve, external drain

For hydraulic and electrohydraulic controls

TYPE: **KZ20EC** CODE: 320093127
DESCRIPTION: with pressure reducing valve and pressure relief valve, external drain

TYPE: **KZ20EH** CODE: 320093128
DESCRIPTION: with pressure reducing valve and pressure relief valve, external-side drain

TYPE: **KZ30E** CODE: 320093114
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 **UN-UNF** thread

Parts ordering codes

Valve positions

EX38 / MR - V1 A (200) - V7 B - C12AJ - V10 C - JV-U05

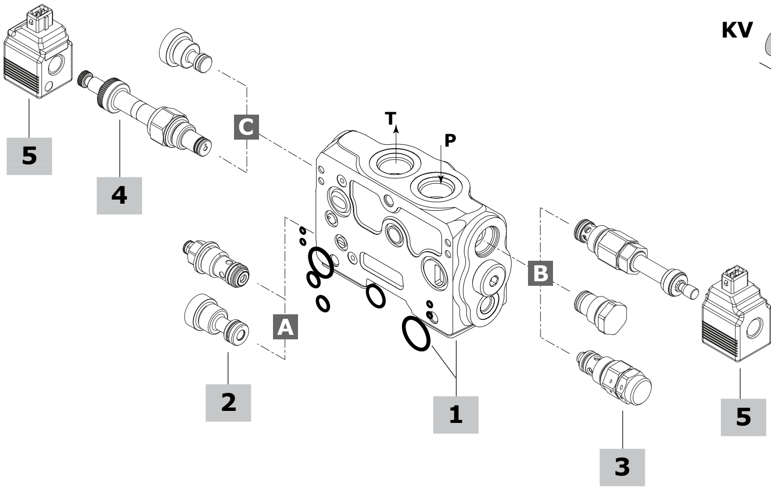
Right Inlet: **MR**
Left Inlet: **ML**

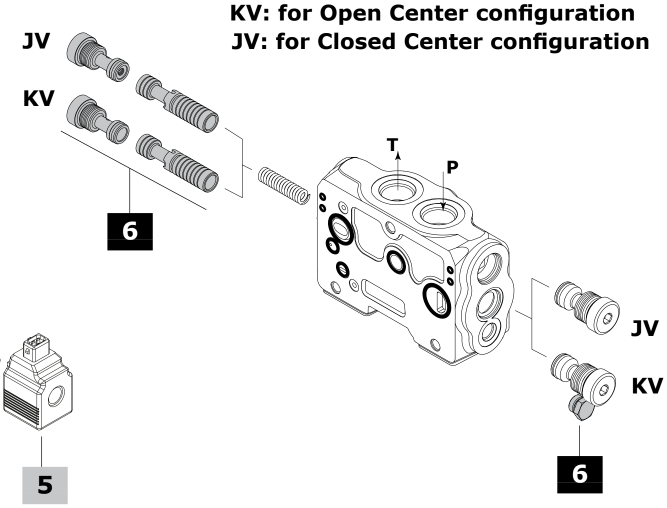
pressure relief valve setting (bar)

2 — 3 — 5 — 4 — 1

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 U05** CODE: 029300002
DESCRIPTION: For fixed displacement pumps, internal LS.
SAE12 ports

For Closed Center circuit (JV)
TYPE: **JV U05** CODE: 029300012
DESCRIPTION: For variable displacement pumps, external LS.
SAE12 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 138

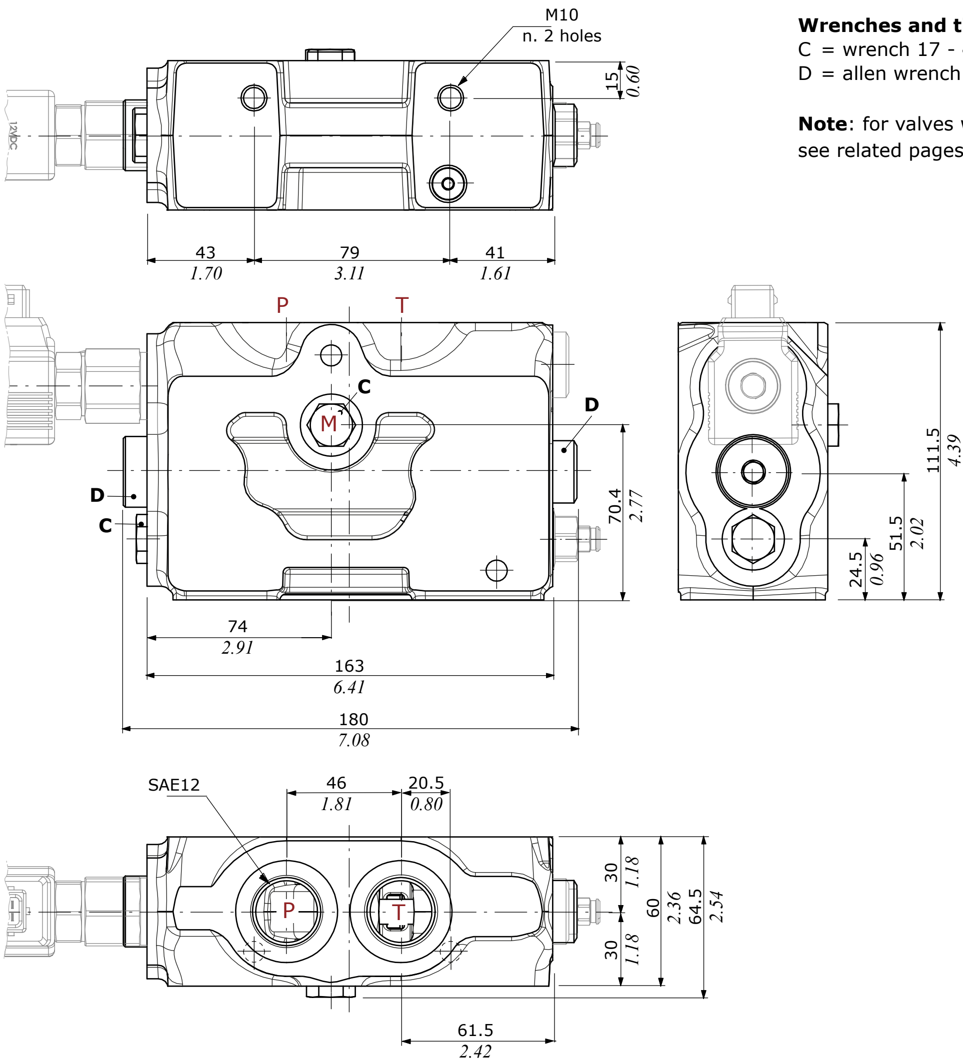
6 Trasformation kit page 18

TYPE	CODE	DESCRIPTION
KV kit	320093028*	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 **UN-UNF** thread

Dimensional data and hydraulic circuits

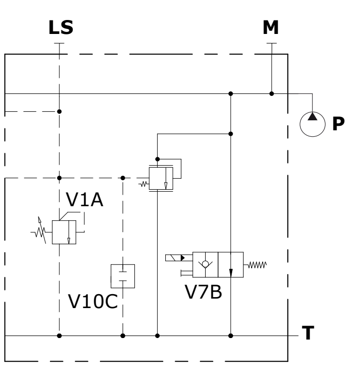
Drawing is referred to KV section; dimensions are the same for JV section



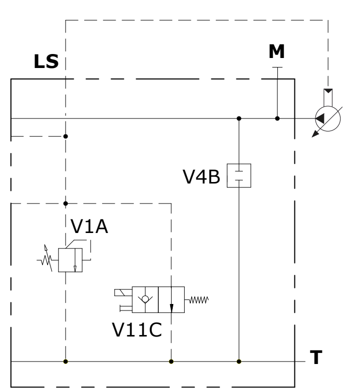
Wrenches and tightening torques
C = wrench 17 - 45 Nm *(33.2 lbft)*
D = allen wrench 8 - 30 Nm *(22 lbft)*

Note: for valves wrench and torque, see related pages

KV Open Center (example)



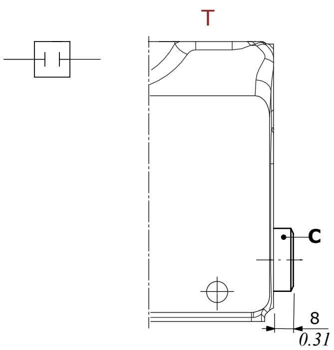
JV Closed Center (example)



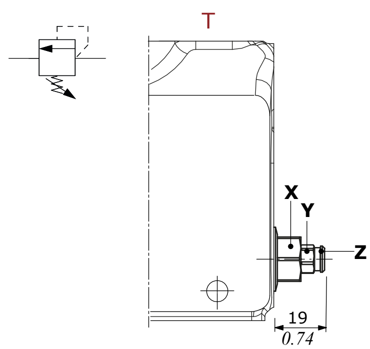
Inlet valves

Valves on position A

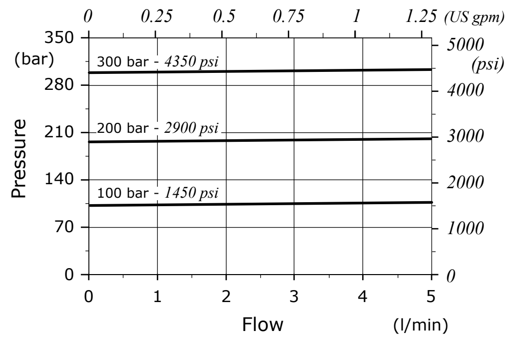
V2A type
Valve blanking plug



V1A type
LS pressure relief valve

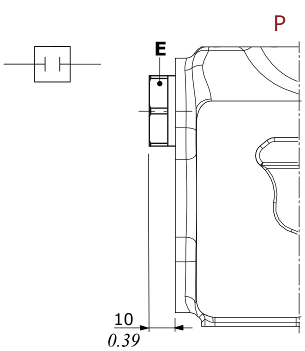


LS relief valve characteristics

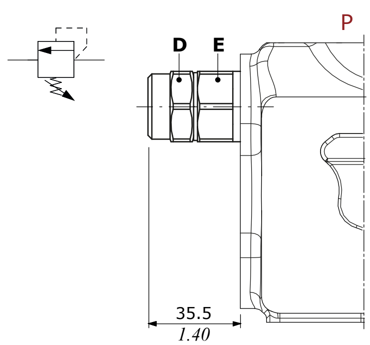


Valves on position B

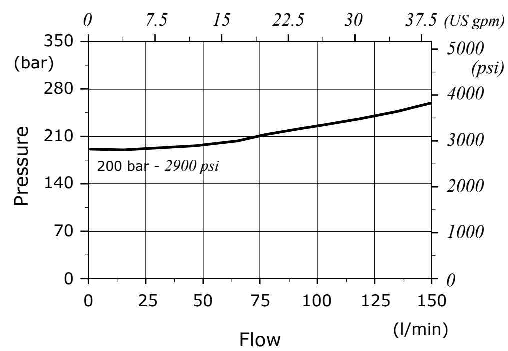
V4B type
Valve blanking plug



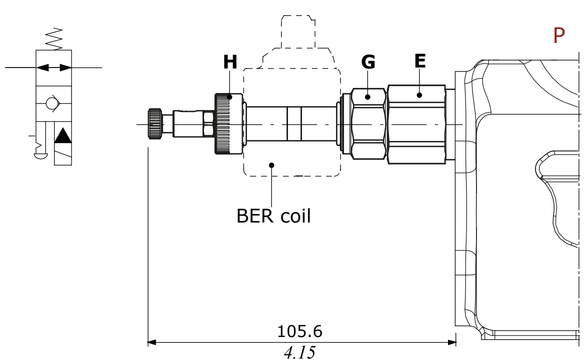
V3B type
Full Flow direct relief valve



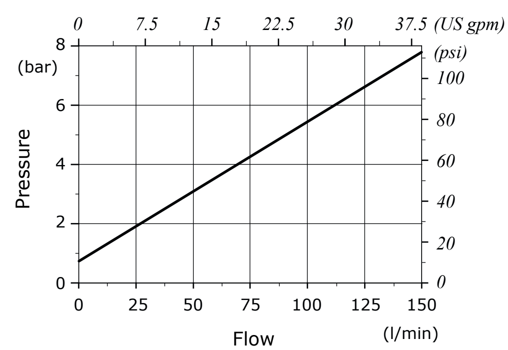
Full Flow relief valve characteristics



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

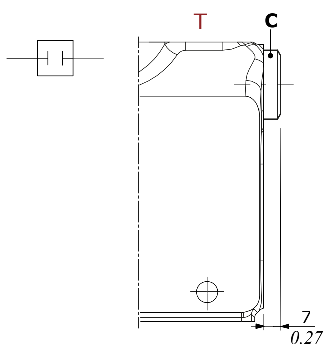
Nominal flow...............: 150 l/min *(0.53 US gpm)*
Max. pressure ....: 350 bar *(5100 psi)*
Max. internal leakage...: 0,25 cm³/min @ 210 bar *(0.015 in³/min @ 3050 psi)*

For **BER** type coils see page 136

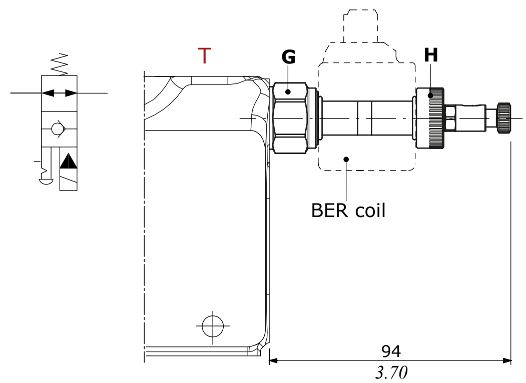
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



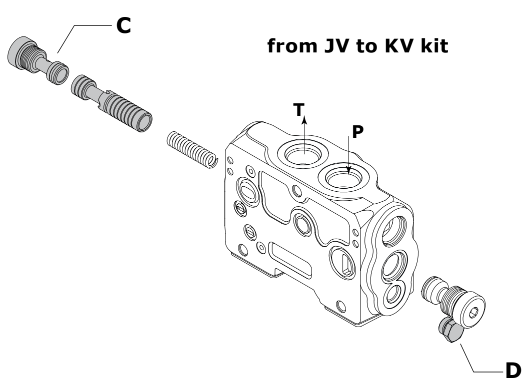
Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*
G = wrench 24 - 30 Nm *(22 lbft)*
H = manual tightening

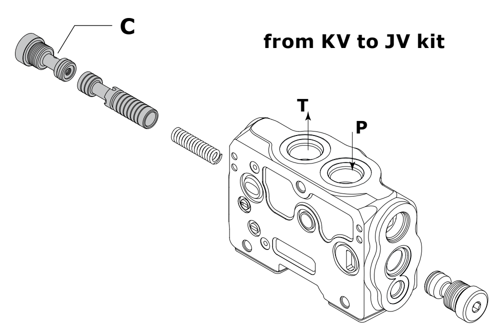
For **BER** type coils see page 136

NOTES:
Valve types V1A and V3B require factory setting (example: V1A - 150)
Valve combination V1A - V3B requires double setting (example: 200*240); the minimun 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 320093028, from JV to KV kit
code 320093007, from KV to JV kit





Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*
D = wrench 17 - 45 Nm *(33.2 lbft)*

Guide to configuration (valve general informations)

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

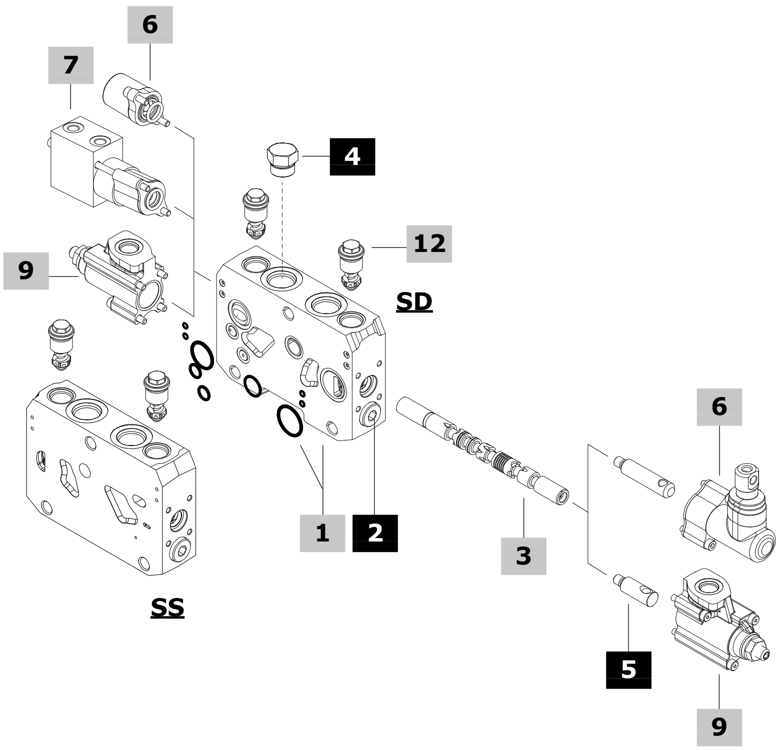
Has been conceived as a post-compensated Flow Sharing valve, but completely interchangeable pre-compensated sections are also available. Pre-compensated section can be freely mixed with post-compensated ones.
When using a pre-compensated section between post-compensated, priority is established for this 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 properely 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**
Left Inlet: **SS**

3 6 6

valve setting (bar)
A port B port

RC1-U04 . 03TF-PA(100) \ 03TF-PB(100)

1 12

Working section with pneumatic control

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

6 7

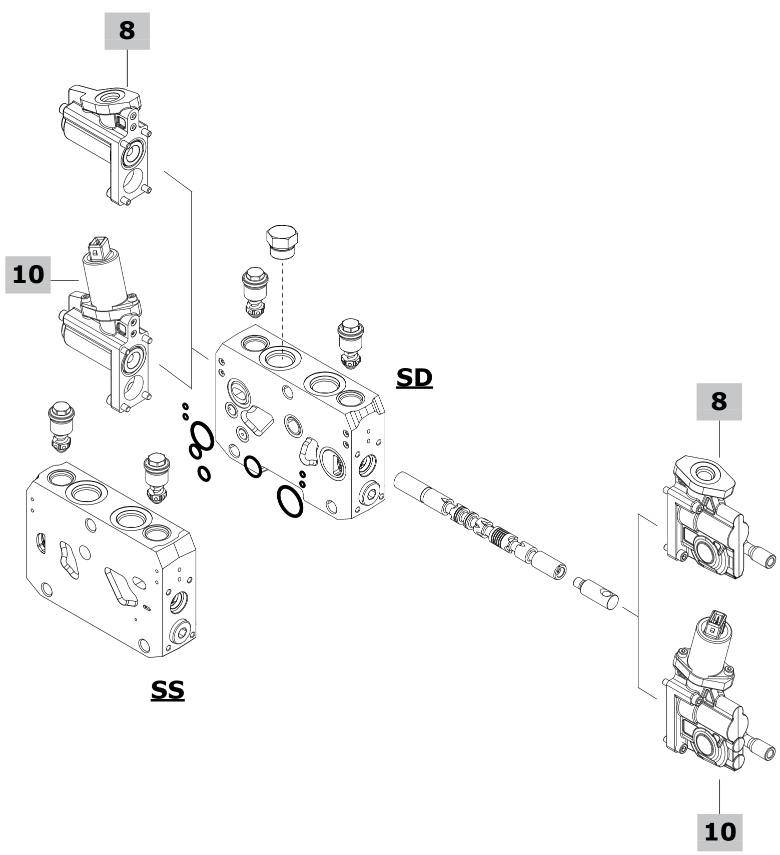
RC1-U04 . 03TF-PA(100)\03TF-PB(100)

Working section with prop. hydraulic control

EX38-SD/W001C(25\25) - HP05L - RC1-U04

9

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



Working section with hydraulic control

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

8 8

RL1-U04 . 03TF-PA(100)\03TF-PB(100)

Working section with electrohydraulic control

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

10 10

RL1-U04 . 03TF-PA(100)\03TF-PB(100)

Parts ordering codes

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 U04	039300002	With port valves arrangement
RC2 U04	039300004	Without port valves arrangement
Float section (only for SD configuration):		
RCF1 U04	039300068	With port valves arrangement, requires **H001** or **H004** controls. Only for **W012C** spool
RCF2 U04	039300070	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 U04	039300022	With port valves arrangement
RCS2 U04	039300024	Without port valves arrangement
For hydraulic and electrohydraulic controls		
Standard section:		
RC1 U04	039300102	With port valves arrangement
RC2 U04	039300104	Without port valves arrangement
Float section (only for SD configuration):		
RCF1 U04	039300168	With port valves arrangement, requires **HP04**, **HP04L** or **HP07** controls. Only for **W012C** spool
RCF2 U04	039300170	Without port valves arrangement, requires **HP04**, **HP04L** or **HP07** controls. Only for **W012C** spool
Standard section, for FP06 control:		
RCU1 U04	039300177	With port valves arrangement
RCU2 U04	039300178	Without port valves arrangement
Section with additional port for remoted LS relief valve (only for SS configuration):		
RCS1 U04	039300122	With port valves arrangement
RCS2 U04	039300124	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	430085035*	Additional 7/16-20 UNF 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 simmetric 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
-	300004003	SAE10 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 **UN-UNF** 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 4TH 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	321293001	Proportional type, SAE4 ports
F023A	321293001	Proportional type rotated 180°, SAE4 ports

8 Hydraulic controls* page 32

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP01	322593012	With lever
"B" side controls:		
FP01	322593014	Hydraulic control

9 Proportional hydraulic controls* page 38

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

TYPE	CODE	DESCRIPTION
HP05A	320593103	With SAE6 upper ports
HP05C	320593109	With SAE6 side ports
HP05L	320593115	With SAE6 upper ports and stroke limiter
HP05W	320593121	With SAE6 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 **RCF1-RCF2**
	322593326	24VDC, AMP JPT connector, for floating sections **RCF1-RCF2**
	322593327	12VDC, DEUTSCH DT connector, for floating sections **RCF1-RCF2**
	322593328	24VDC, DEUTSCH DT connector, for floating sections **RCF1-RCF2**
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

11 One-side electrohydraulic controls page 37

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	322593321	One-side control, 12VDC, AMP JPT connector
	322593322	One-side control, 24VDC, AMP JPT connector
	322593323	One-side control, 12VDC, DEUTSCH DT conn.
	322593324	One-side control, 24VDC, DEUTSCH DT conn.

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

Parts ordering codes

POST-COMPENSATED SECTION

12 Port valves page 55

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

TYPE	CODE	DESCRIPTION
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)*	

12 Port valves (cont.) page 55

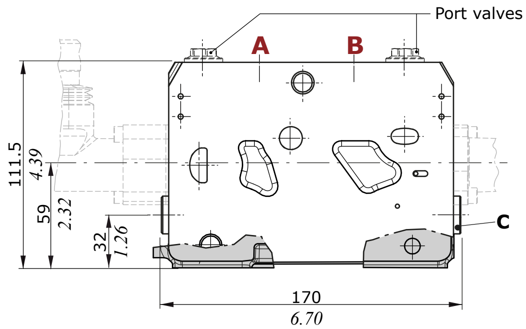
TYPE	CODE	DESCRIPTION
02TF PA/PB	915089001	Anticavitation valve
05TF PA/PB	430490001	Valve blanking plug

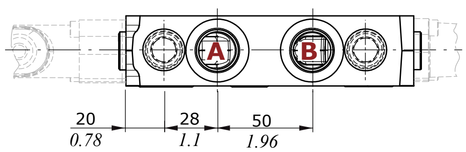
NOTE:
Always indicate setting value when using fixed setting combined valve: 03TF PA (120) - 03TF PB (120).

Dimensional data and hydraulic circuits

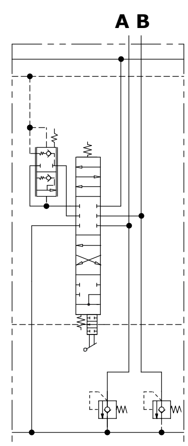
Post-compensated section

RC1 - RCF1 - RCU1 types
Standard section with
port valves arrangement
(RCF1 for floating circuit/RCU1 for FP06 control)

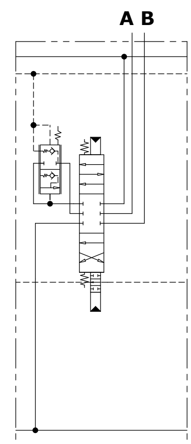




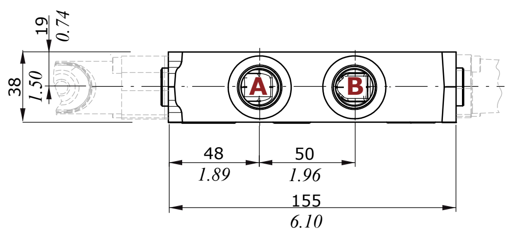
RCF1
Mechanical control
with port valves for
floating circuit



RC2
Hydraulic control
without port valves

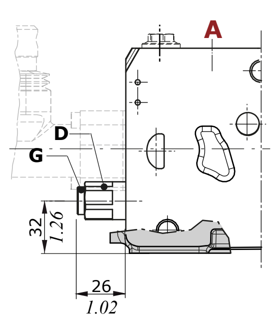


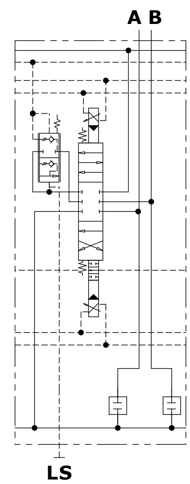
RC2 - RCF2 - RCU2 types
Standard section without
port valves arrangement
(RCF2 for floating circuit/RCU2 for FP06 control)



RCS1
Electrohydraulic control
with port valves and
additional 7/16-20 UNF port for
remoted LS relief valve

RCS1 - RCS2 types
With additional 7/16-20 UNF port for
remoted LS relief valve, with port
valves arrangement (RCS1) and without
port valves arrangement (RCS2)

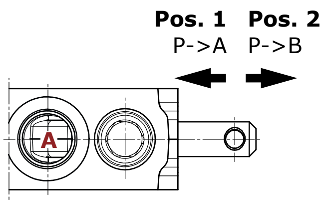




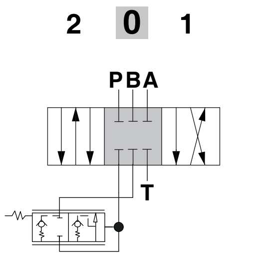
Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*
D = wrench 19 - 60 Nm *(44.2 lbft)*
G = allen wrench 5 - 13 Nm *(9.58 lbft)*

Spools

Post-compensated section

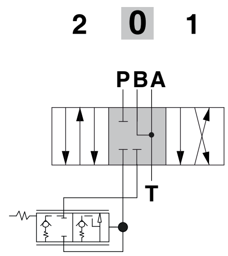


W001C type
A and B closed in
neutral position



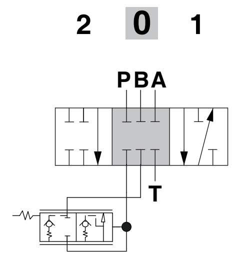
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W002C type
A and B to tank
in neutral position



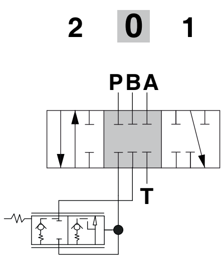
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W005C type
Single acting in A,
B plugged



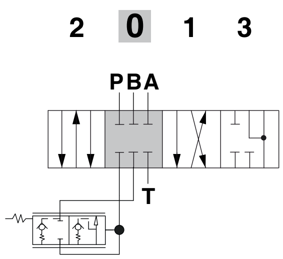
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W006C type
Single acting in B,
A plugged



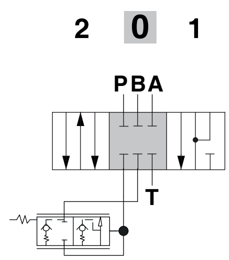
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W012C type
With floating in the 4th position



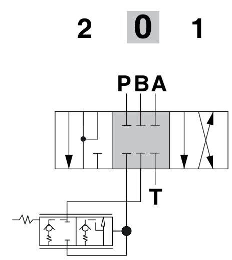
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*
Position 3: - 11 mm *(- 0.45 in)*

W013A type
With rigenerative in A



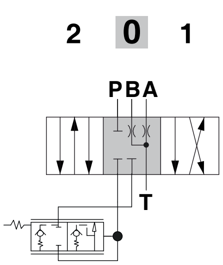
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W013B type
With rigenerative in B



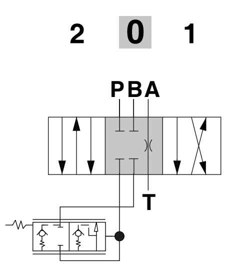
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W001C-J10 type
A and B partially to tank
in neutral position



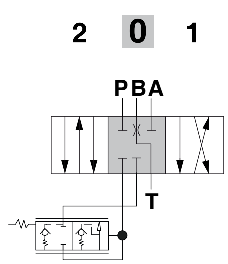
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

W001C-K10 type
A partially to tank and
B closed in neutral position



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

W001C-Y10 type
B partially to tank and
A closed in neutral position



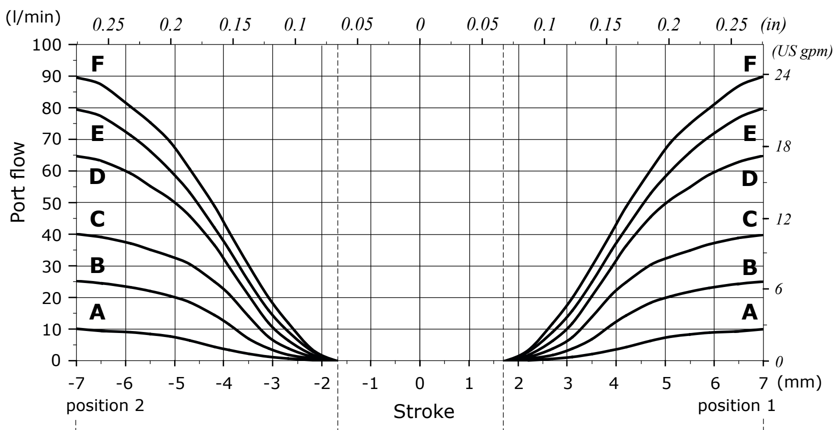
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

Spools

Post-compensated section

3 position spools metering curve

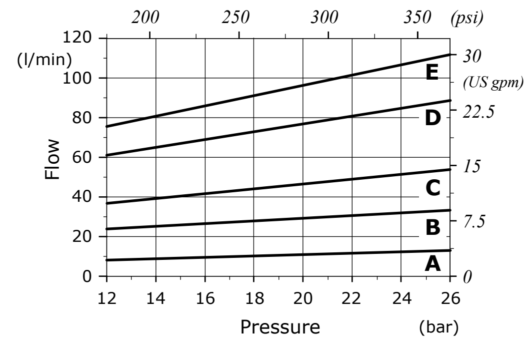
Qin: 120 l/min *(31.7 US gpm)* - open center circuit (KV)
Pump compensator @ 14 bar *(200 psi)*



Hydraulic control													
20.1	17.3	14.5	11.7	8.9	**6.2**	0	**6.2**	8.9	11.7	14.5	17.3	**20.1**	(bar)
291	*250*	*210*	*169*	*129*	*90*		*90*	*129*	*169*	*210*	*250*	*291*	*(psi)*
1300	1160	1020	880	740	**600**	0	**600**	740	880	1020	1160	**1300**	(mA@12VDC)
650	580	510	440	370	**300**	0	**300**	370	440	510	580	**650**	(mA@24VDC)

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)*

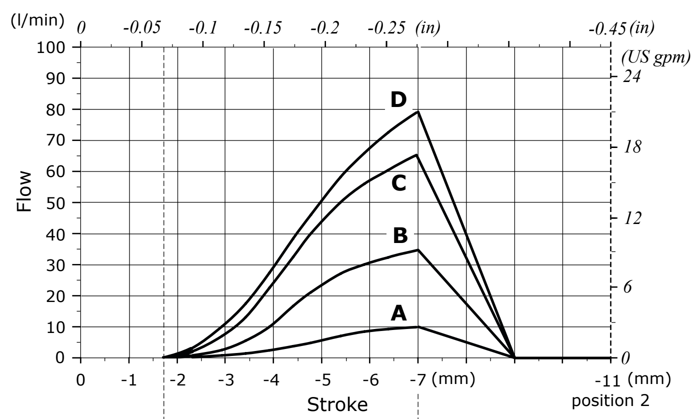
Spool flow vs. stand-by pressure (margin pressure) on closed center circuit (JV)



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)*

Floating spools metering curve

Qin: 120 l/min *(31.7 US gpm)* - open center circuit (KV)
Pump compensator @ 14 bar *(200 psi)*



Hydraulic control								
0	**6**	7.8	9.6	11.4	13.2	**15**	(bar)	min. 30
	87	*113*	*139*	*165*	*191*	*217*	*(psi)*	*min. 435*
0	**600**	680	760	840	920	**1000**	(mA@12VDC)	min. 1800
0	**300**	340	380	420	460	**500**	(mA@24VDC)	min. 900

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)*

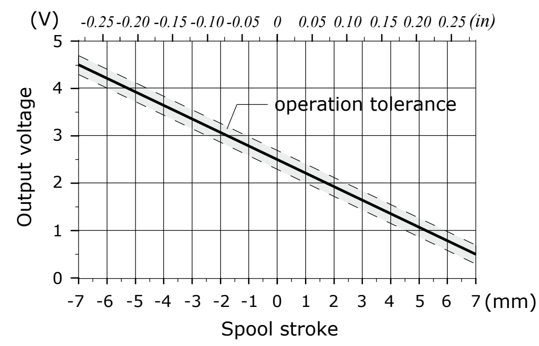
Spools position sensor

SPSL sensor

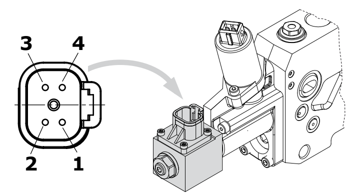
The SPSL position sensor converts the spool movements into a voltage linear signal.

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



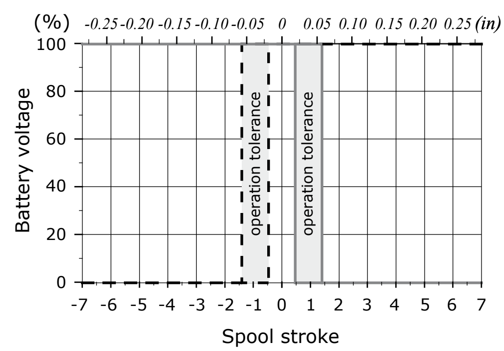
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

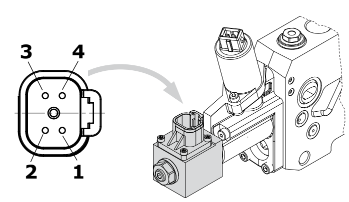
The SPSD position sensor converts the spool movements into an electric digital signal.

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



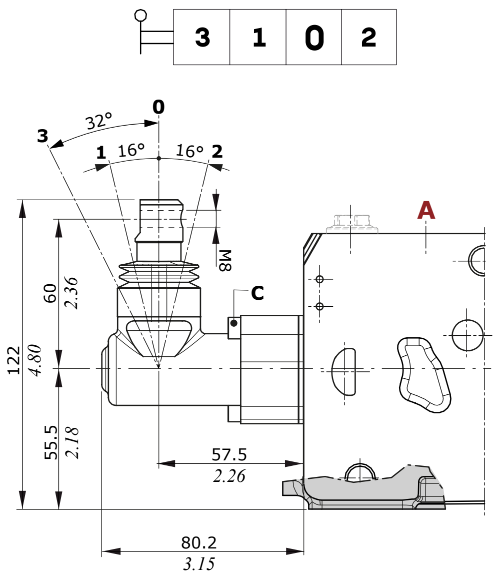
Deutsch DT06-4S mating connector, code 5CON140072

Post-compensated sections

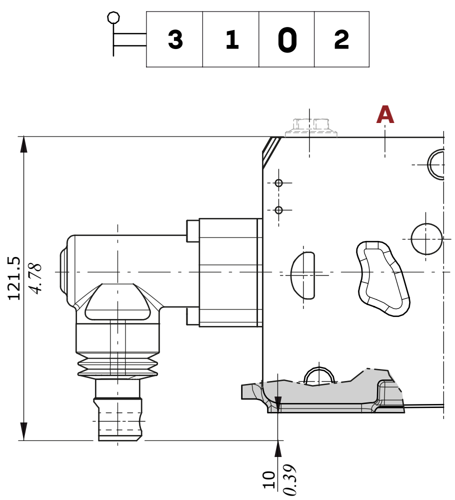
Mechanical controls

"A" side controls

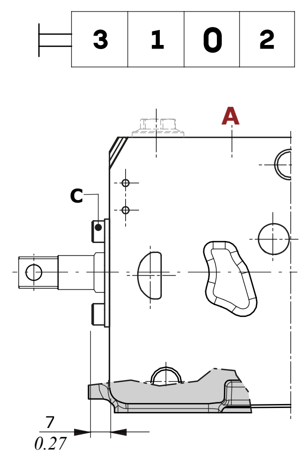
H001 type
With lever box



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

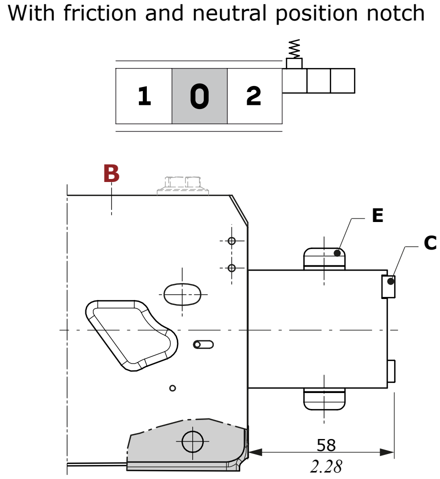


H004 type
Without lever box



"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)*

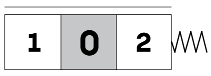
Post-compensated sections

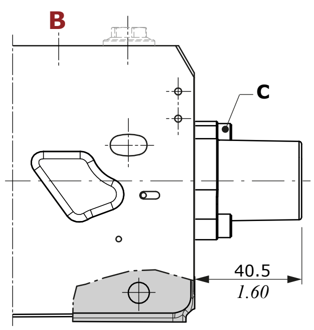
Mechanical controls

"B" side controls

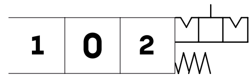
Controls are available with standard spring A type (F001A) or soft spring B type (F001B)

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

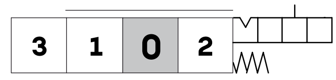


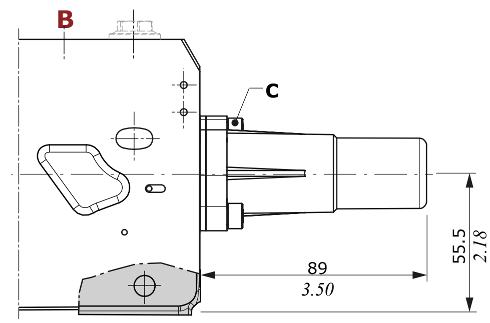


F002A type
With spring A, detent in A and B

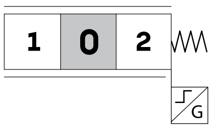


F005A type
With spring A, detent in 4th pos.
For floating section

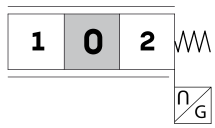


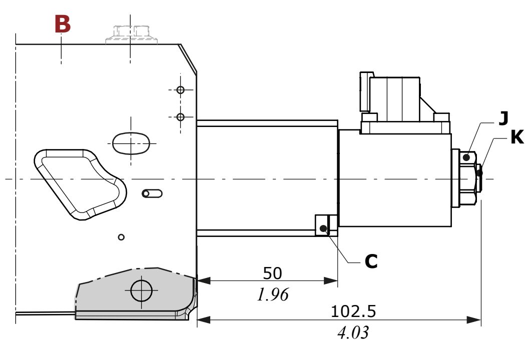


F001ASD type
With spring A, digital SPSD spool position sensor



F001ASL type
With spring A, analog SPSL spool position sensor

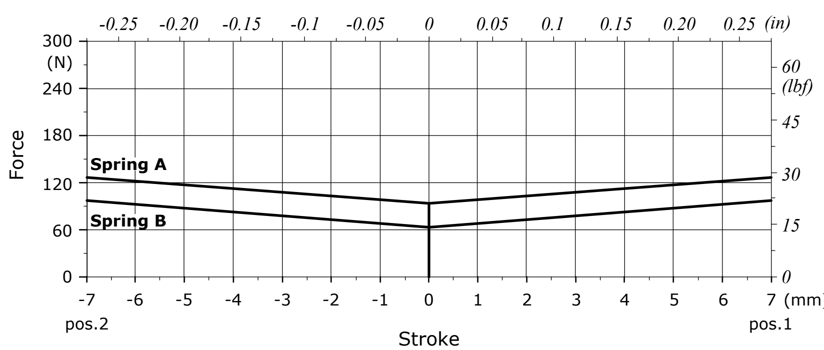




Note: for sensor types, see page 27

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

Force vs Stroke diagram



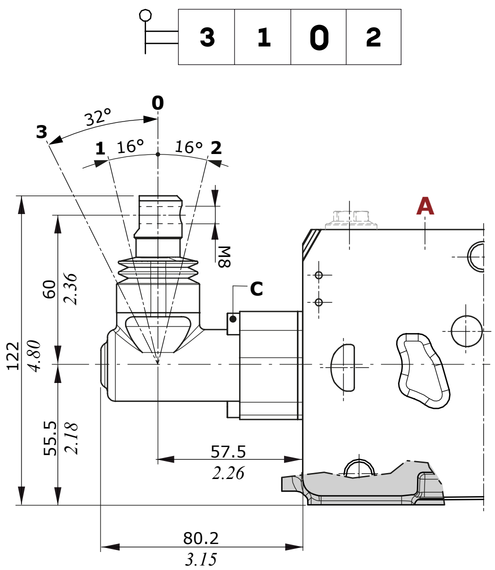
Legenda
Spring A = from 98 N to 125 N *(22 lbf to 28 lbf)*
Spring B = from 68.6 N to 98.6 N *(15.4 lbf to 22.1 lbf)*

Post-compensated sections

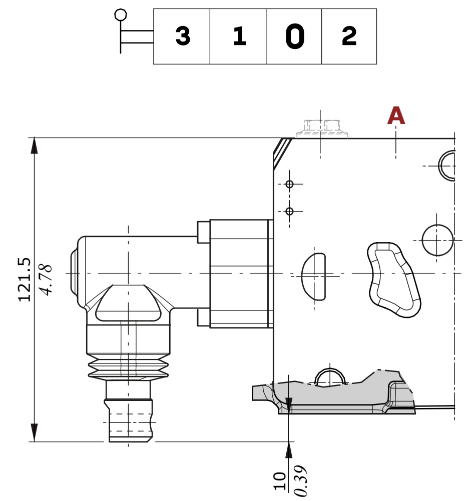
Pneumatic controls

"A" side controls

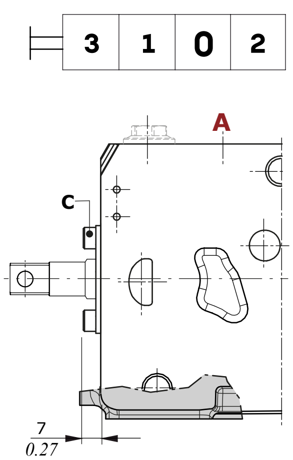
H001 type
With lever box



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



H004 type
Without lever box



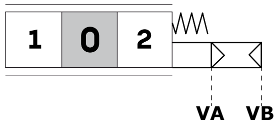
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*

Post-compensated sections

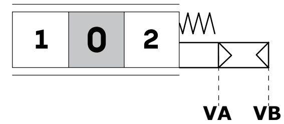
Pneumatic controls

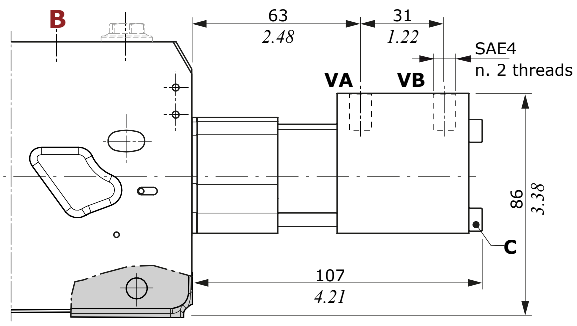
"B" side controls

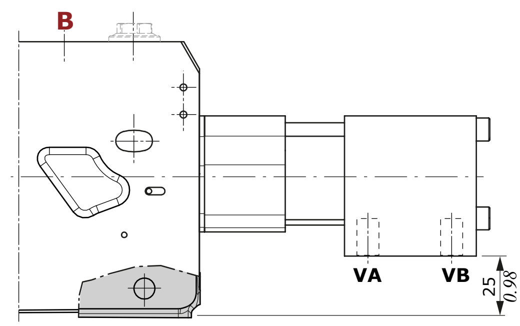
F022A type
Proportional pneumatic control



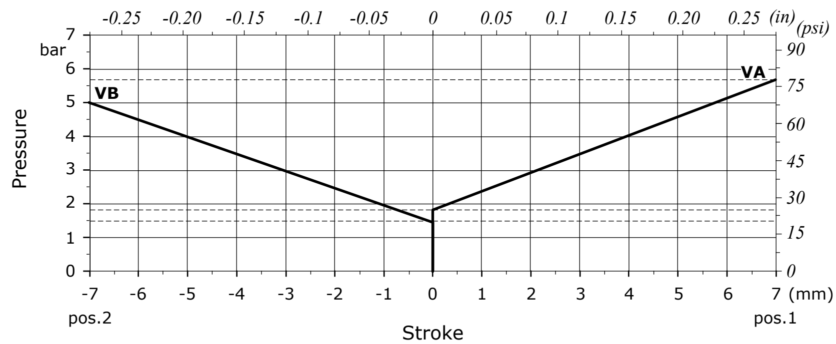
F023A type
As F022A type, rotated 180°







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)*

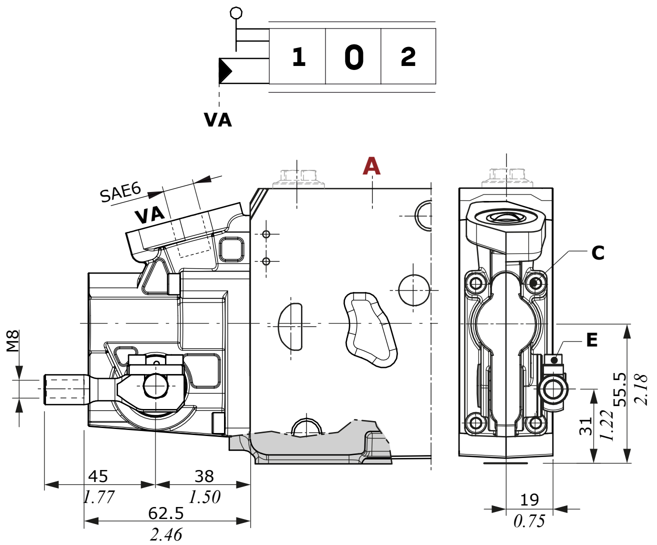
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*

Post-compensated sections

Hydraulic controls

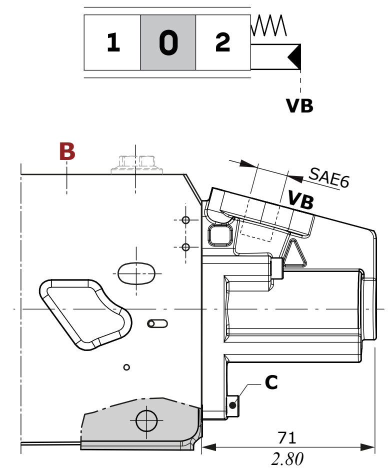
"A" side controls

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

Proportional electrohydraulic controls

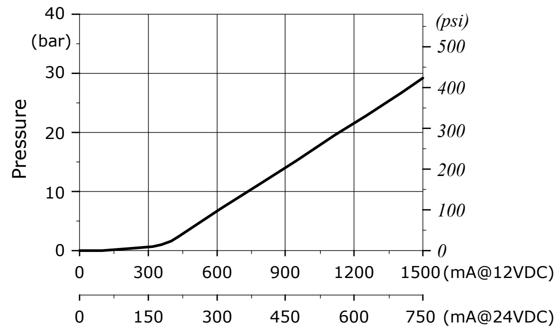
Following specifications are measured with:

- 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.

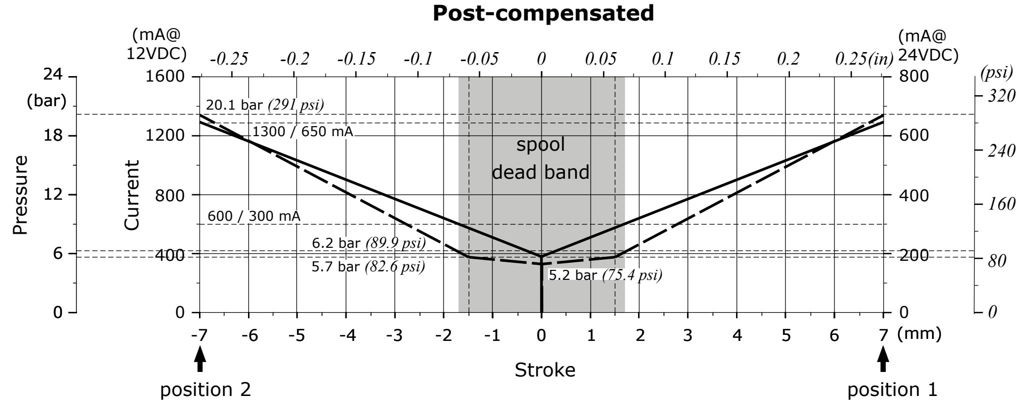
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

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 insulance		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

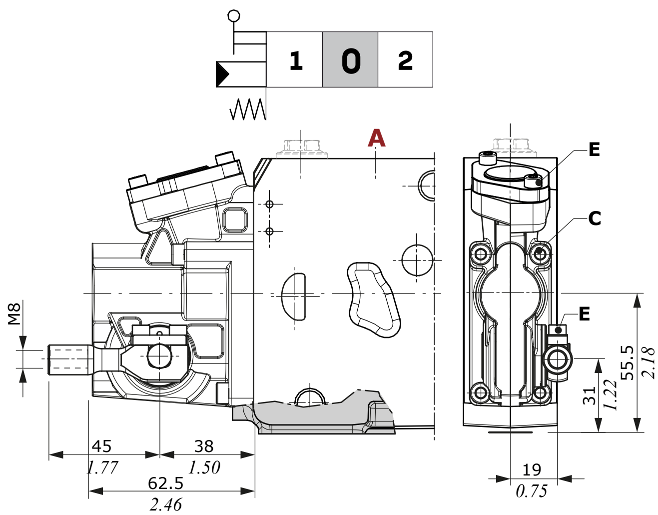
Two-side electrohydraulic controls

"A" side controls

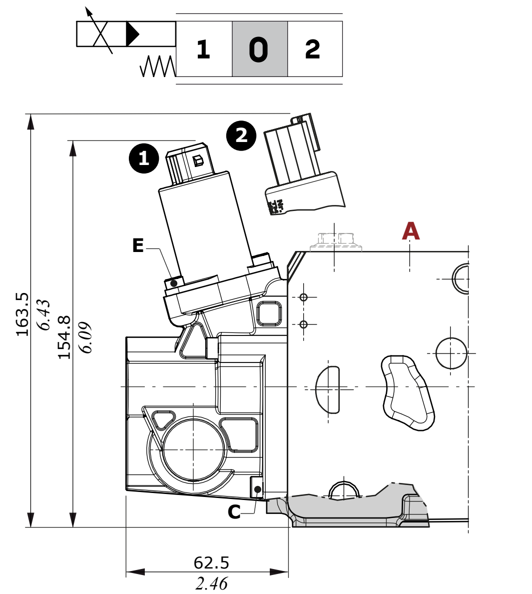
Control Types

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

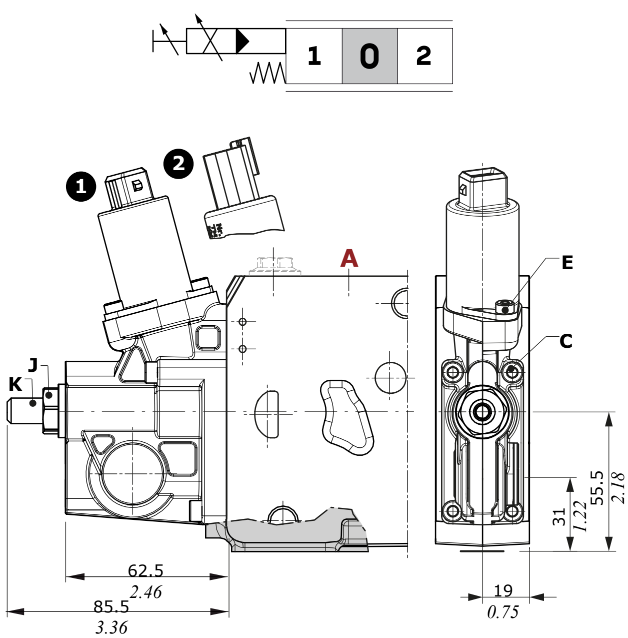
HP00 type
With lever,
electrohydraulic arrangement



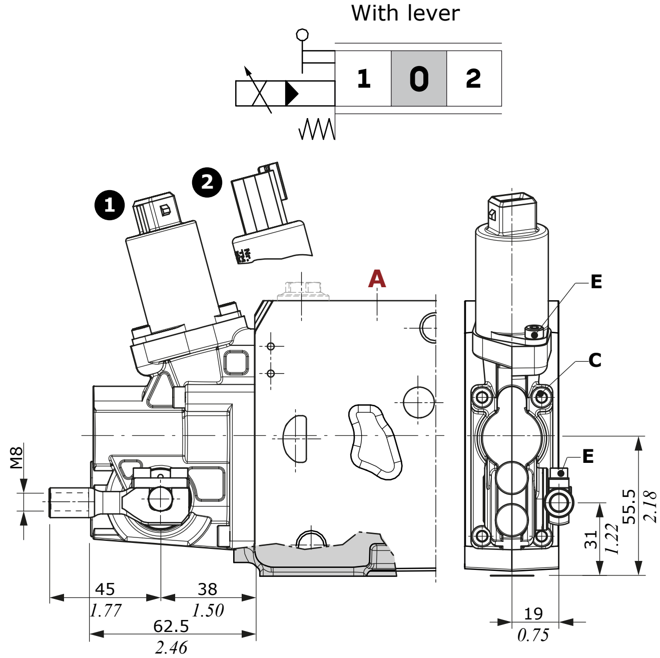
HP07 type
Without lever



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 lbft)*
E = allen wrench 3 - 2 Nm *(1.5 lbft)*
J = wrench 17 - 24 Nm *(17.7 lbft)*
K = allen wrench 5

Post-compensated sections

Two-side electrohydraulic controls

"A" side controls

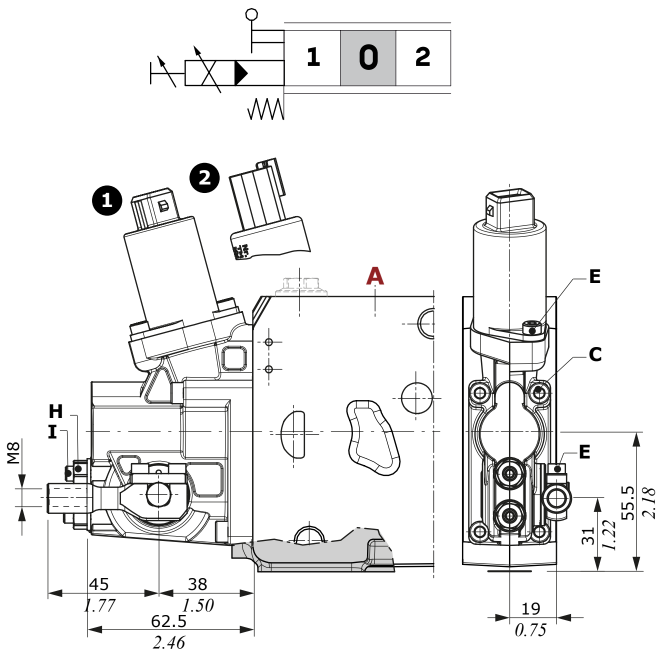
Control Types

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 lbft)*

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

H = wrench 10 - 9.8 Nm *(7.2 lbft)*

I = allen wrench 3

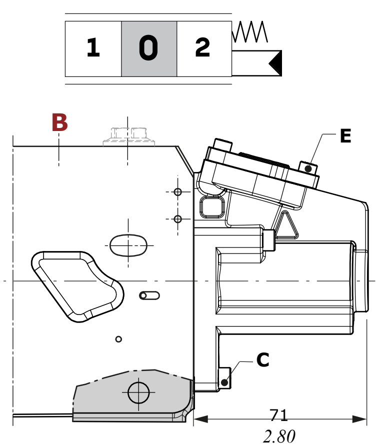
J = wrench 17 - 9.8 Nm *(7.2 lbft)*

K = allen wrench 4

"B" side controls

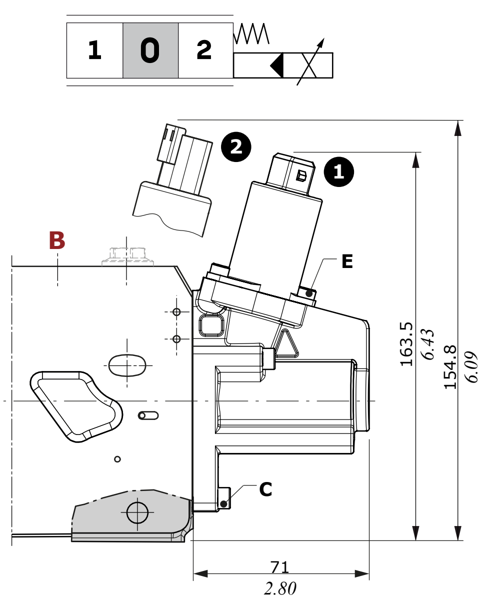
FP00 type

Electrohydraulic arrangement



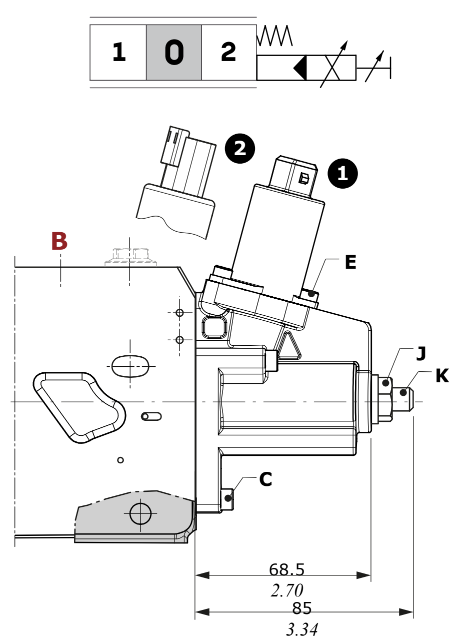
FP04 type

Electrohydraulic control



FP04L type

With stroke limiter



Post-compensated sections

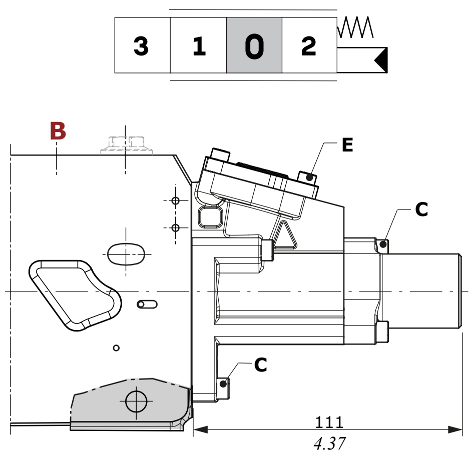
Two-side electrohydraulic controls

"B" side controls

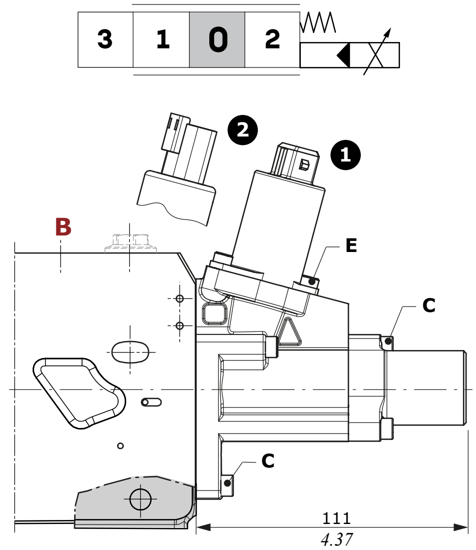
Control Types

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

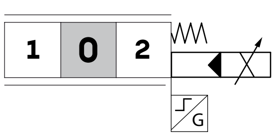
FP00 type
Electrohydraulic arrangement
for floating section



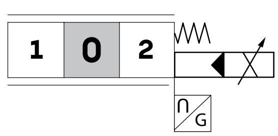
FP04 type
Electrohydraulic control
for floating section

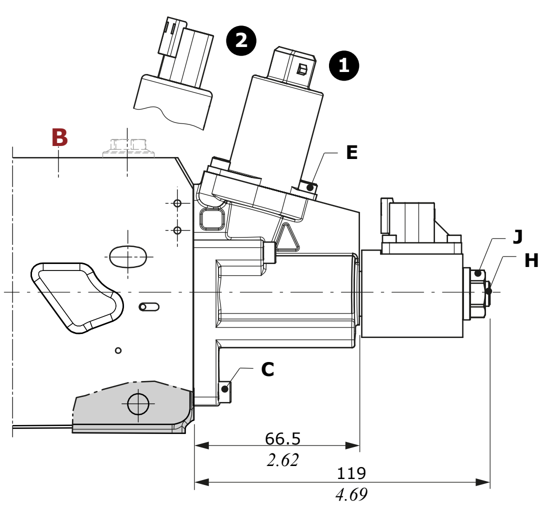


FP04SD type
With digital SPSD
spool position sensor



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)*
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

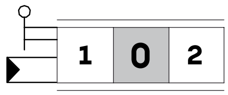
One-side electrohydraulic controls

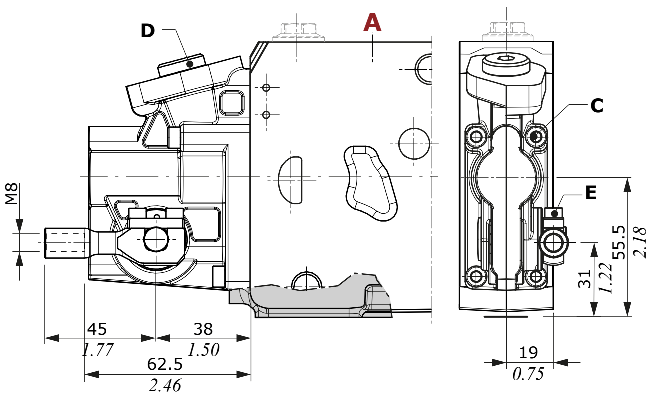
"A" side controls

Control Types*

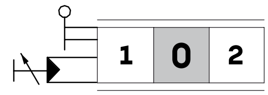
❶: With AMP JPT connector - AMP JPT mating connector, code: 5CON003
❷: With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

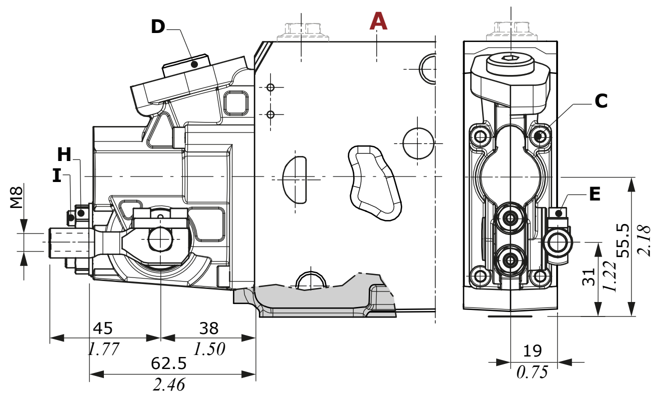
HP06 type
With lever



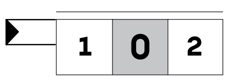


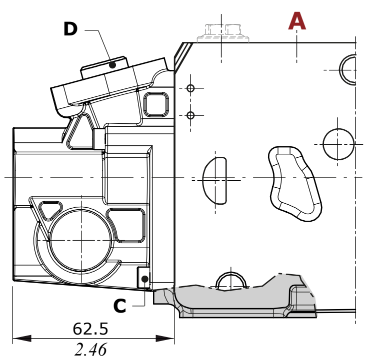
HP06L type
With lever
and stroke limiter





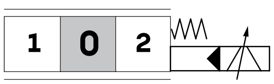
HP10 type
Without lever

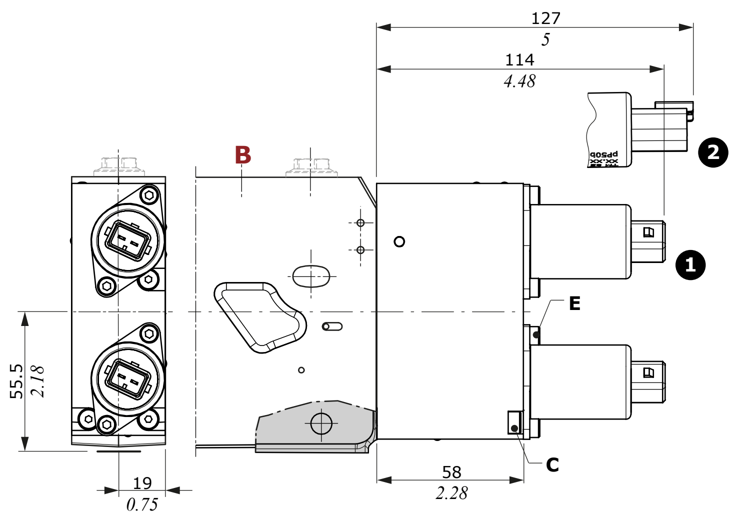




"B" side controls*

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

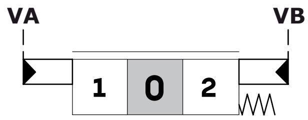
Post-compensated sections

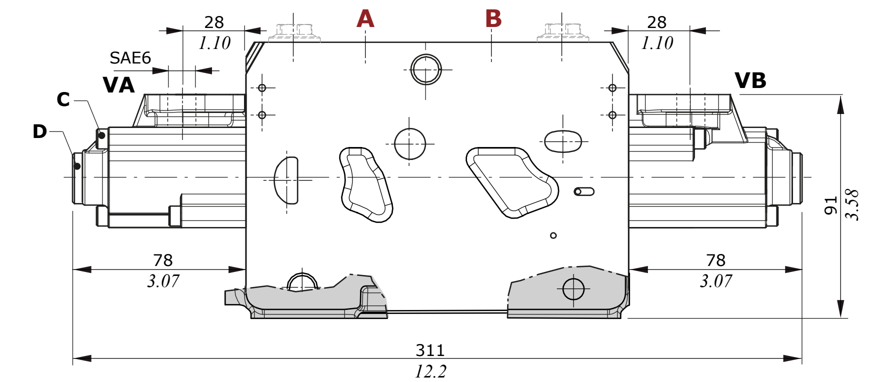
Hydraulic controls

Proportional controls (A+B sides)

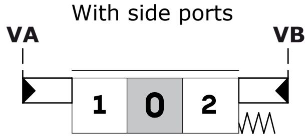
Controls are available with upper or side ports.

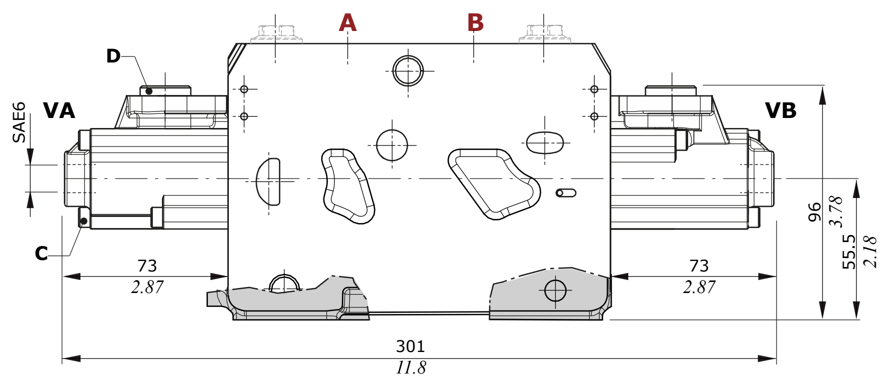
HP05A type
With upper ports



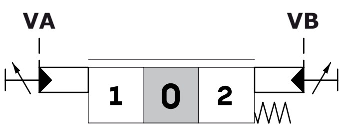


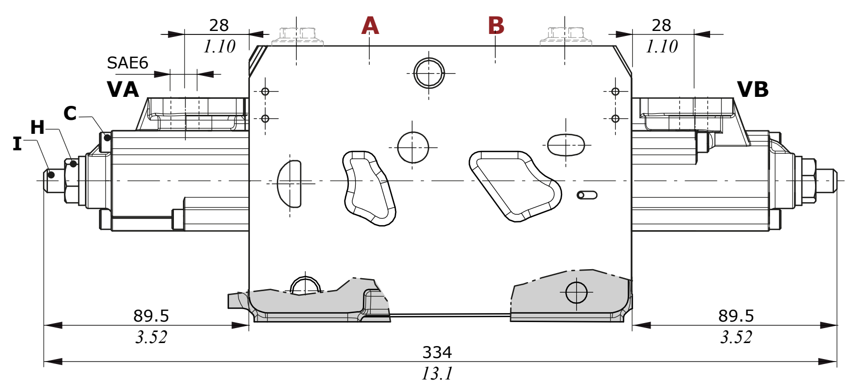
HP05C type
With side ports



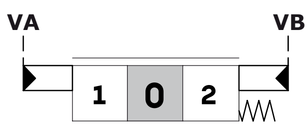


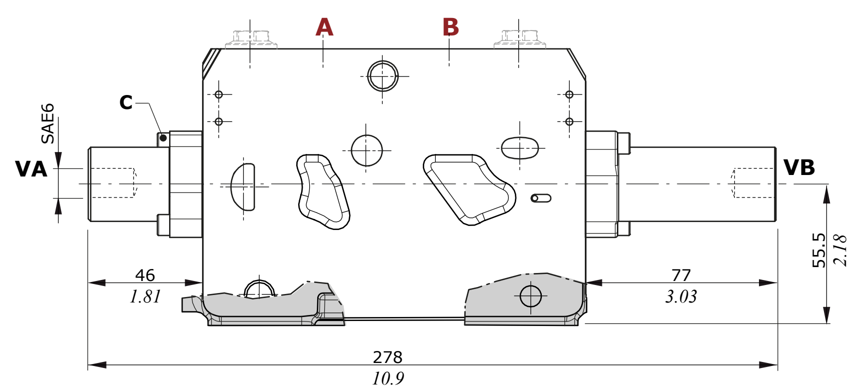
HP05L type
With upper ports
and stroke limiter





HP05W type
With 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

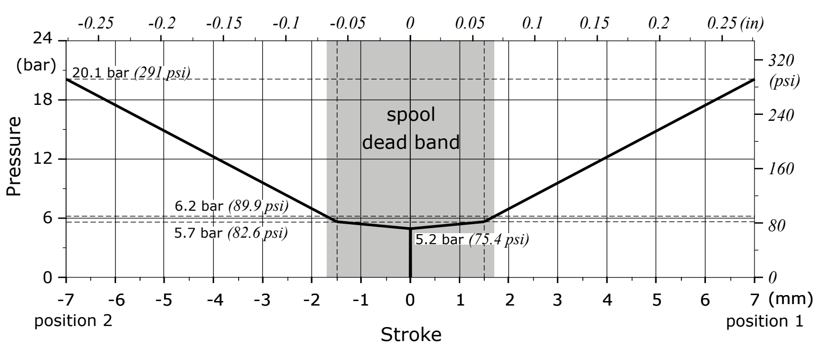
Post-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page

Stroke vs. Pressure diagram



Compatibility table

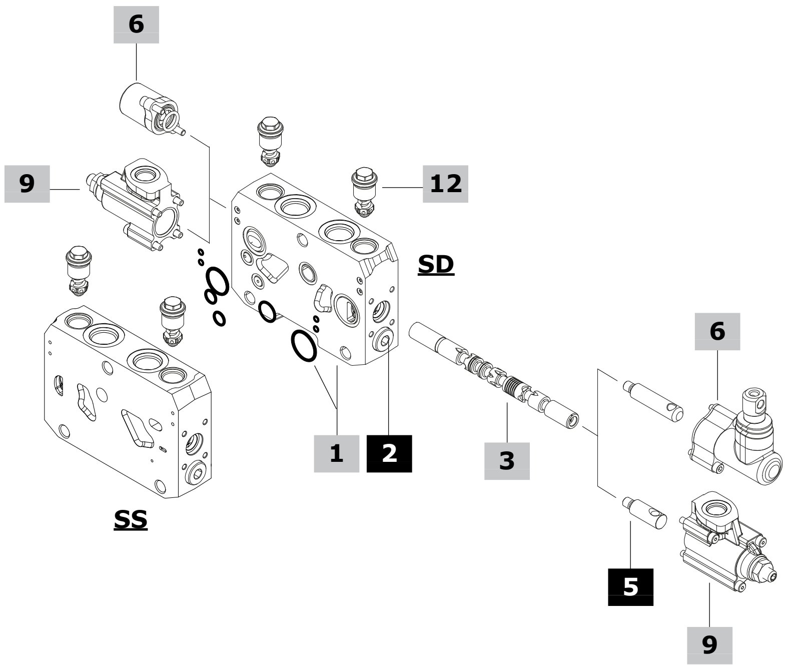
Combination controls and spool end kit	"A" side controls											
"B" side controls	H001 H002	H004	HP00	HP01	HP04	HP04L	HP06	HP06L	HP07	HP07L	HP10	HP05
F001A	422501205	422501153										
F001B	422501205	422501153										
F002A	422501205	422501153										
F005A	430093105	430093106										
F145	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**
Left Inlet: **SS**

3 6 6

valve setting (bar)
A port B port

RC1-U04 . 03TF-PA(100) \ 03TF-PB(100)

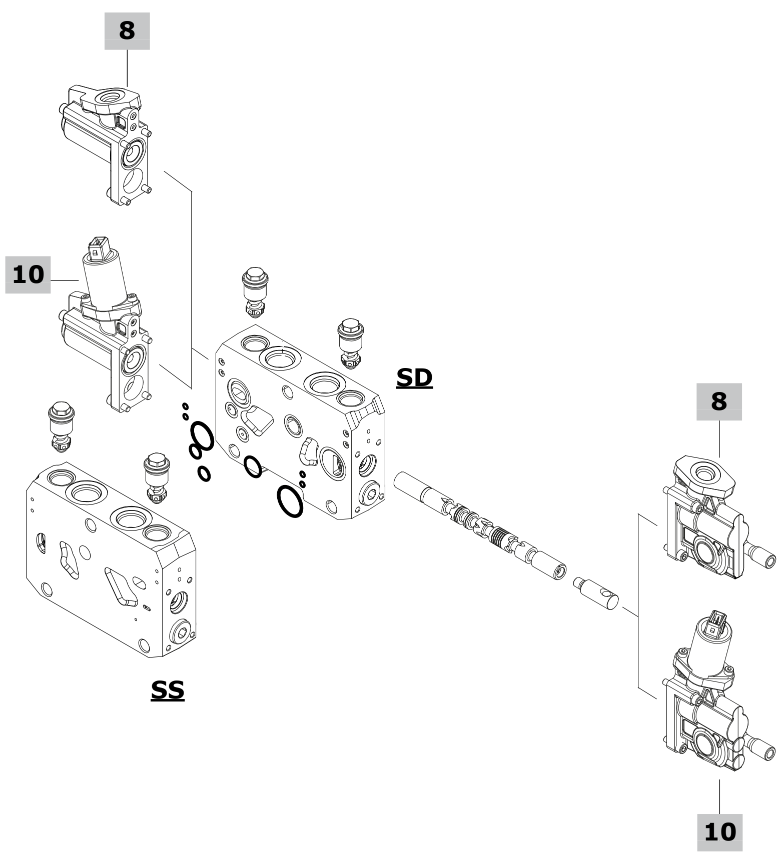
1 12

Working section with prop. hydraulic control

EX38-SD/W001C(25\25) - HP05L - RC1-U04

9

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



Working section with hydraulic control

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

8 8

RL1-U04 . 03TF-PA(100)\03TF-PB(100)

Working section with electrohydraulic control

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

10 10

RL1-U04 . 03TF-PA(100)\03TF-PB(100)

Parts ordering codes

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 U04	039300052	With port valves arrangement
RL2 U04	039300054	Without port valves arrangement
Section with additional port for remoted LS relief valve (for SD/SS configurations):		
RLS1 U04	039300064	With port valves arrangement
RLS2 U04	039300066	Without port valves arrangement
For hydraulic and electrohydraulic controls		
Standard section:		
RL1 U04	039300152	With port valves arrangement
RL2 U04	039300154	Without port valves arrangement
Section with additional port for remoted LS relief valve (only for SS configuration):		
RLS1 U04	039300164	With port valves arrangement
RLS2 U04	039300166	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	430085066*	Additional 7/16-20 UNF port for remoted LS relief valve

3 Spools page 44

TYPE	CODE	DESCRIPTION
3 pos., double acting, A and B closed in neutral position:		
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)
3 pos., double acting, A and B to tank in neutral position:		
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 simmetric 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 SPSD spool position sensor
F001ASL	320093026	3 pos., with analog SPSL spool position sensor

8 Hydraulic controls* page 48

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP01	322593012	With lever
"B" side controls:		
FP01	320593232	Hydraulic control

9 Proportional hydraulic controls* page 53

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

TYPE	CODE	DESCRIPTION
HP05A	320593203	With SAE6 upper ports
HP05C	320593209	With SAE6 side ports
HP05L	320593215	With SAE6 upper ports and stroke limiter
HP05W	320593221	With SAE6 side ports

NOTE (*): Codes are referred to **UN-UNF** 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 SPSD spool position sensor, 12VDC, AMP JPT connector
	322593234	Digital SPSD spool position sensor, 24VDC, AMP JPT connector
	322593235	Digital SPSD spool position sensor, 12VDC, DEUTSCH DT connector
	322593236	Digital SPSD spool position sensor, 24VDC, DEUTSCH DT connector
FP04SL	322593228	Analog SPSL spool position sensor, 12VDC, AMP JPT connector
	322593229	Analog SPSL spool position sensor, 24VDC, AMP JPT connector
	322593230	Analog SPSL spool position sensor, 12VDC, DEUTSCH DT connector
	322593231	Analog SPSL spool position sensor, 24VDC, DEUTSCH DT connector

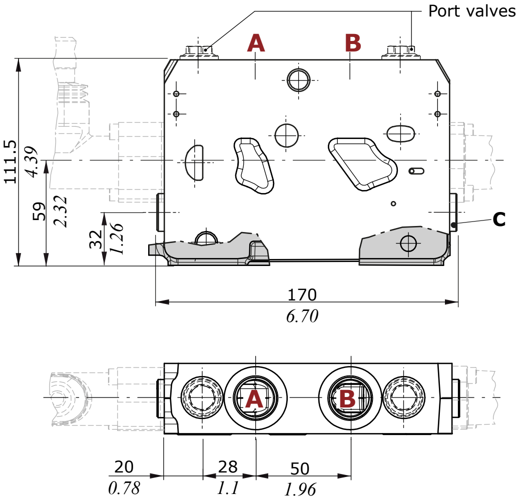
12 Port valves page 55

For port valves, see #12 page 23

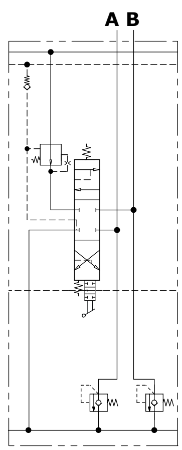
Dimensional data and hydraulic circuits

Pre-compensated section

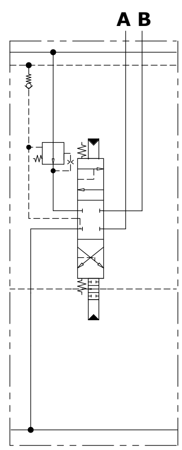
RL1 type
Standard section with port valves arrangement



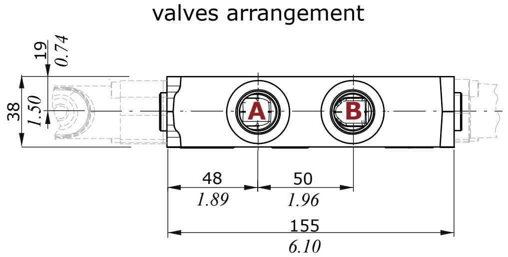
RL1
Mechanical control with port valves



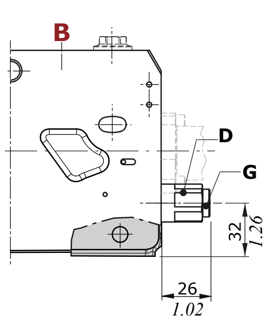
RL2
Hydraulic control without port valves



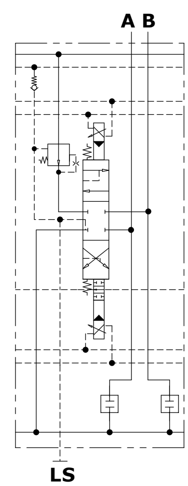
RL2 type
Standard section without port valves arrangement



RLS1 - RLS2 types
With additional 7/16-20 UNF port for remoted LS relief valve, with port valves arrangement (RLS1) and without port valves arrangement (RLS2)



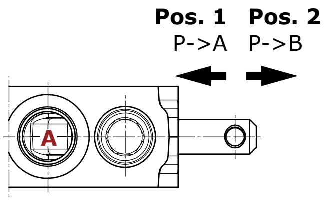
RLS1
Electrohydraulic control with port valve and with additional 7/16-20 UNF port for remoted LS relief valves



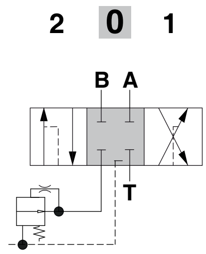
Wrenches and tightening torques
C = allen wrench 8 - 60 Nm *(44.2 lbft)*
D = wrench 19 - 60 Nm *(44.2 lbft)*
G = allen wrench 5 - 13 Nm *(9.58 lbft)*

Spools

Pre-compensated section

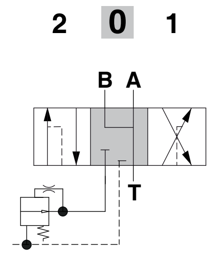


W001C type
A and B closed in
neutral position



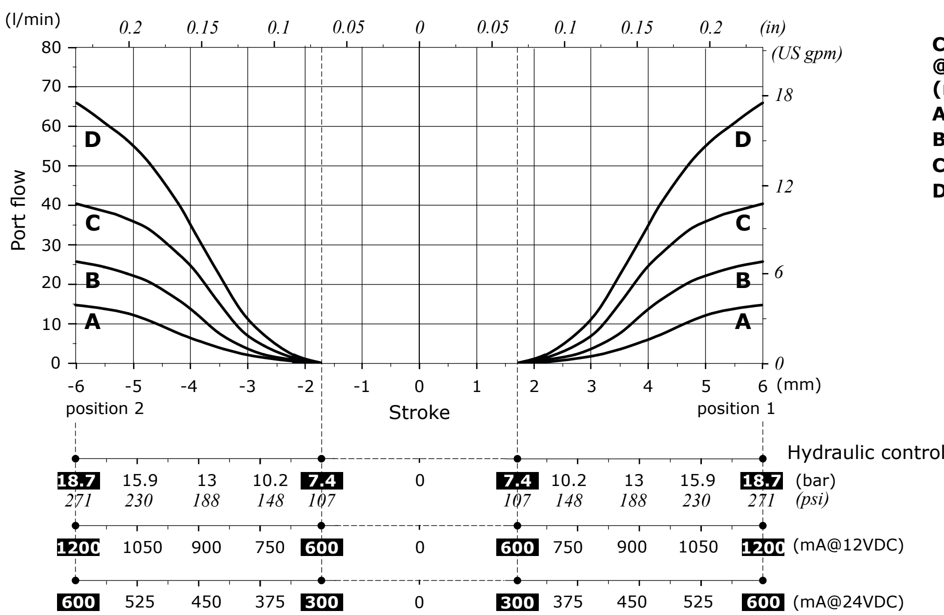
Spool stroke
Position 1: + 6 mm *(+ 0.23 in)*
Position 2: - 6 mm *(- 0.23 in)*

W002C type
A and B to tank
in neutral position



Spool stroke
Position 1: + 6 mm *(+ 0.23 in)*
Position 2: - 6 mm *(- 0.23 in)*

3 position spools metering curve
Qin: 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 = 15 l/min *(3.9 US gpm)*
B = 25 l/min *(6.6 US gpm)*
C = 40 l/min *(10.6 US gpm)*
D = 65 l/min *(17.1 US gpm)*

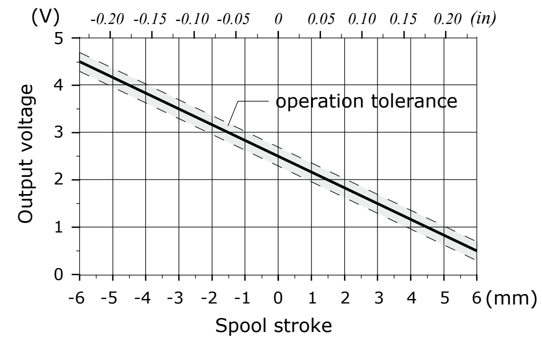
Spools position sensor

SPSL sensor

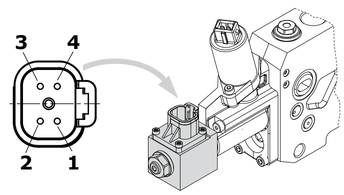
The SPSL position sensor converts the spool movements into a voltage linear signal.

Working conditions		
Voltage supply		5 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10⁶
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



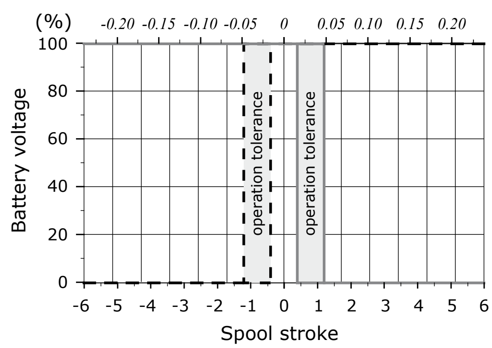
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

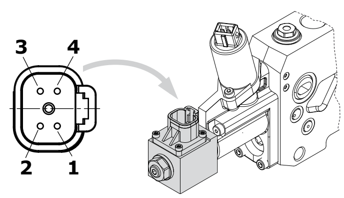
The SPSD position sensor converts the spool movements into an electric digital signal.

Working conditions		
Voltage supply		from 9 to 32 VDC
Current absorption		< 10 mA (no load)
Mechanical life		3x10⁶
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

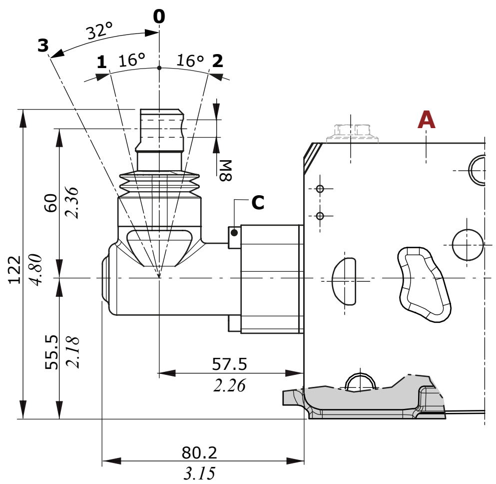
Pre-compensated sections

Mechanical controls

"A" side controls

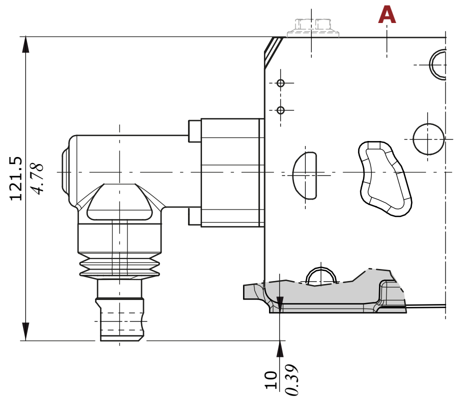
H001 type
With lever box

3	1	0	2



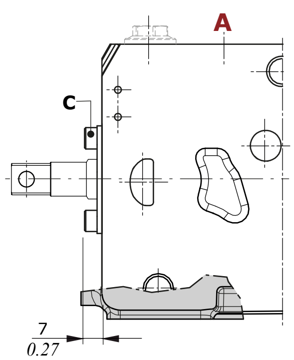
H002 type
With lever box, rotated 180°
Dimensions are the same of H001 type

3	1	0	2



H004 type
Without lever box

3	1	0	2



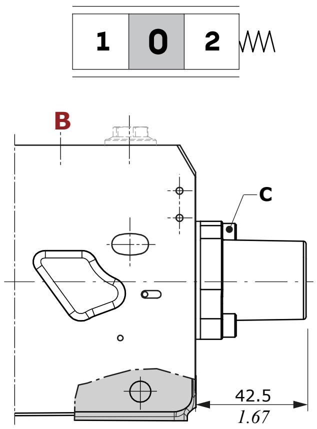
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*

Mechanical controls

"B" side controls

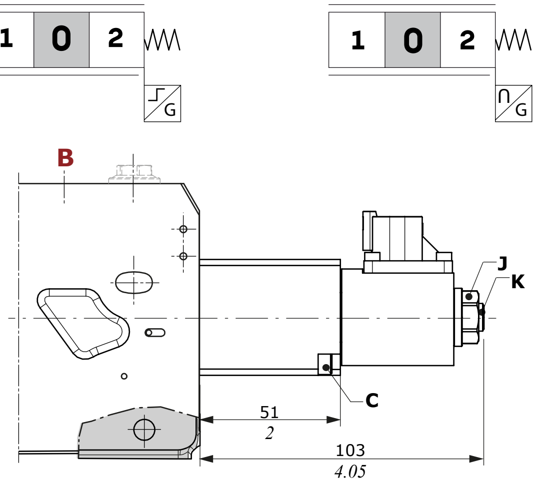
Controls are available with standard spring A type (F001A) or soft spring B type (F001B)

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



F001ASD type
With spring A, digital SPSD
spool position sensor

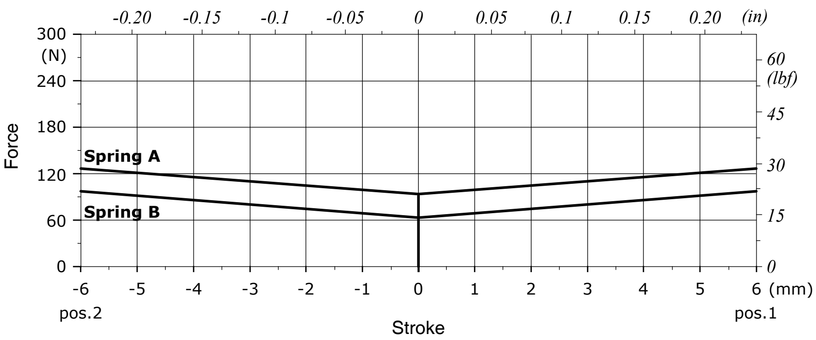
F001ASL type
With spring A, analog SPSL
spool position sensor



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

Note: for sensor types, see page 45

Force vs Stroke diagram



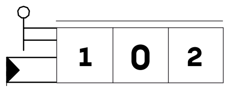
Legenda
Spring A = from 98 N to 125 N *(22 lbf to 28 lbf)*
Spring B = from 68.6 N to 98.6 N *(15.4 lbf to 22 lbf)*

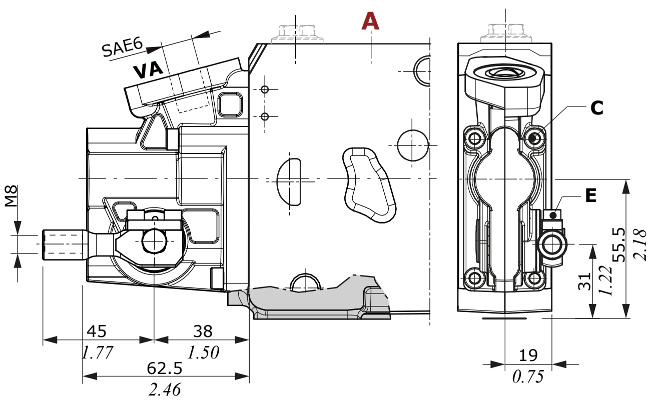
Pre-compensated sections

Hydraulic controls

"A" side controls

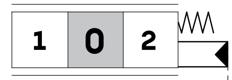
HP01 type
Proportional hydraulic control with lever

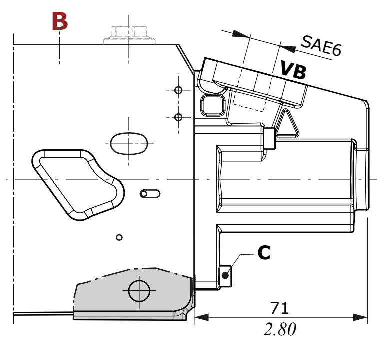




"B" side controls

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)*

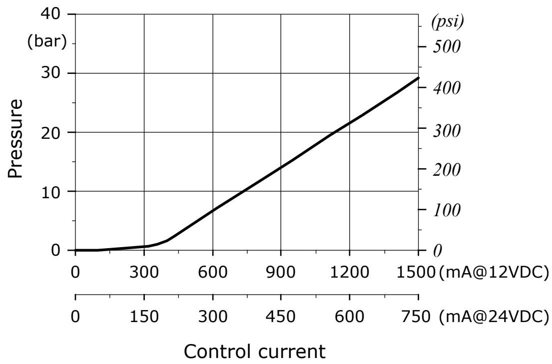
Proportional electrohydraulic controls

Following specifications are measured with:
- mineral oil of 32 mm^2/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.

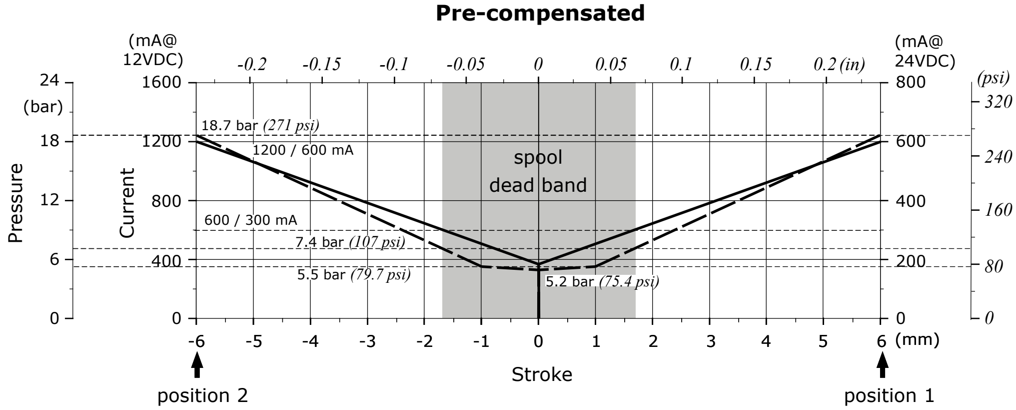
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

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 insulance		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

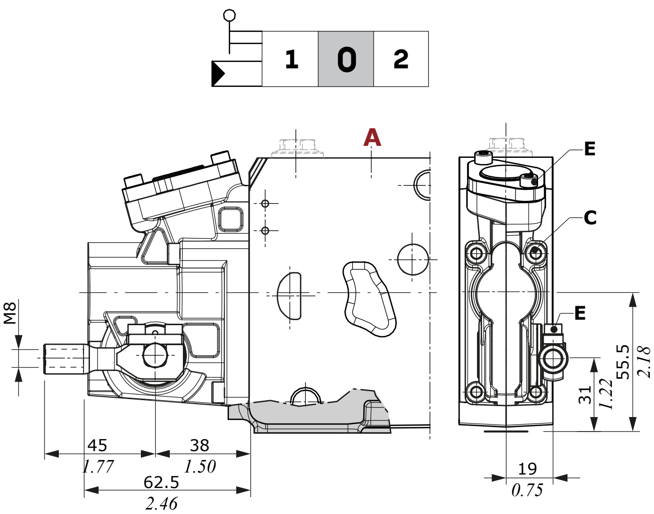
"A" side controls

Control Types

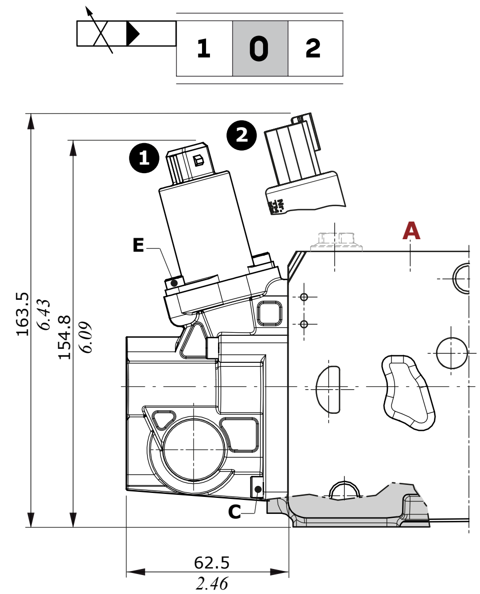
1: With AMP JPT connector - AMP JPT mating connector, code: 5CON003

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

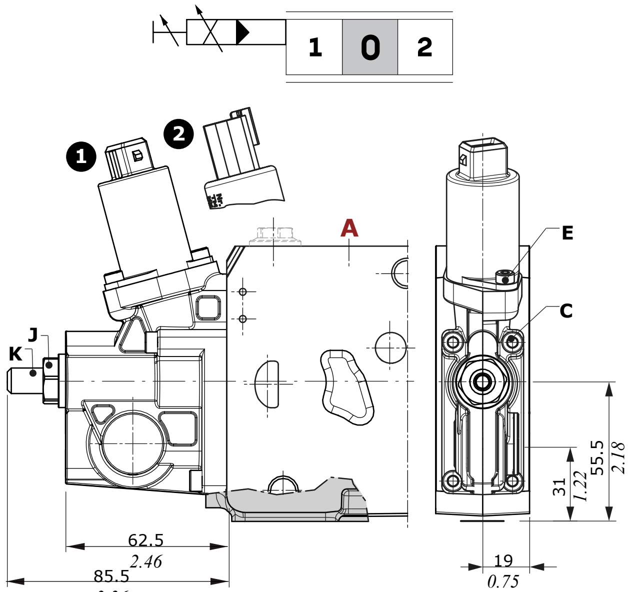
HP00 type
With lever,
electrohydraulic arrangement



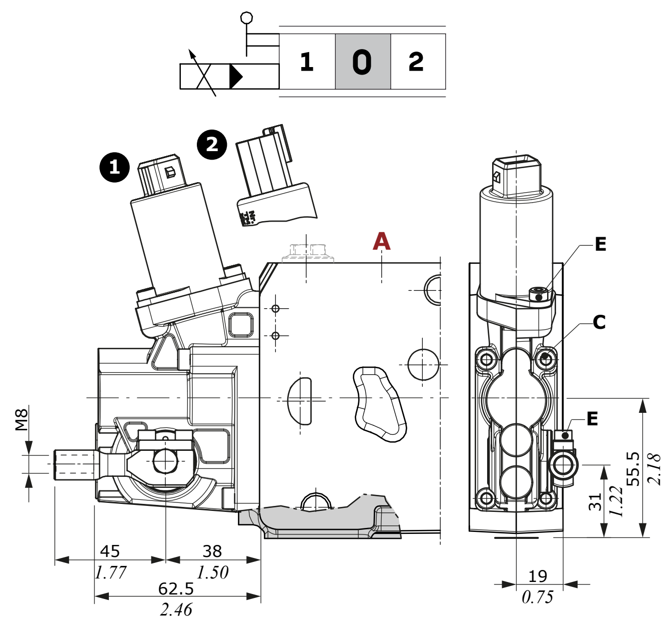
HP07 type
Without lever



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 lbft)*
E = allen wrench 3 - 2 Nm *(1.5 lbft)*
J = wrench 17 - 24 Nm *(17.7 lbft)*
K = allen wrench 5

Two-side electrohydraulic controls

"A" side controls

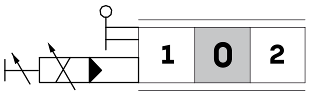
Control Types

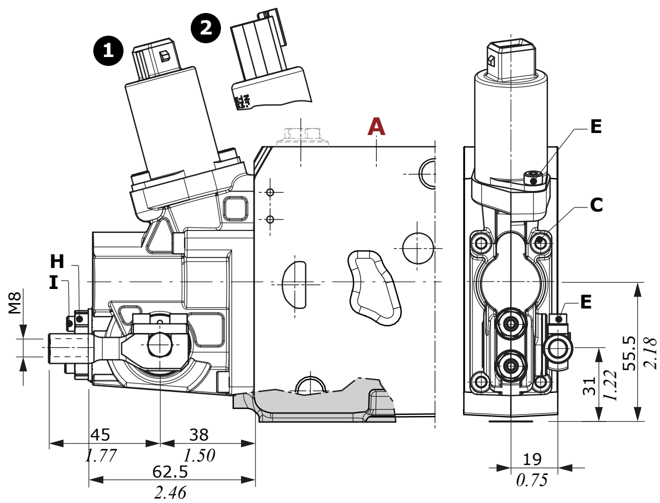
1: With AMP JPT connector - AMP JPT mating connector, code: 5CON003

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 lbft)*

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

H = wrench 10 - 9.8 Nm *(7.2 lbft)*

I = allen wrench 3

Pre-compensated sections

Two-side electrohydraulic controls

"B" side controls

Control Types

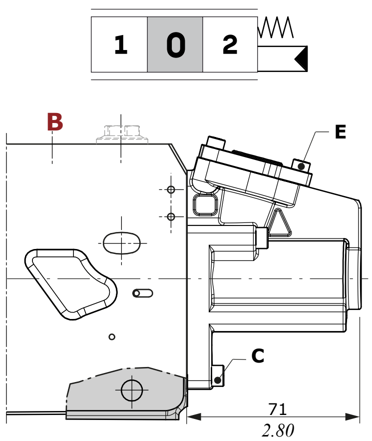
1: With AMP JPT connector - AMP JPT mating connector, code: 5CON003

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

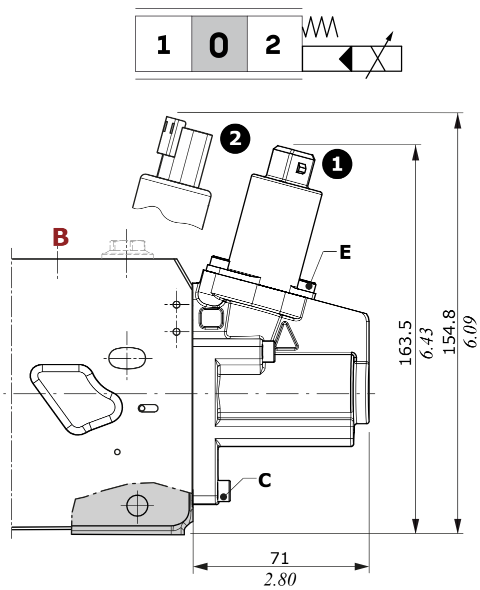
Wrenches and tightening torques

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

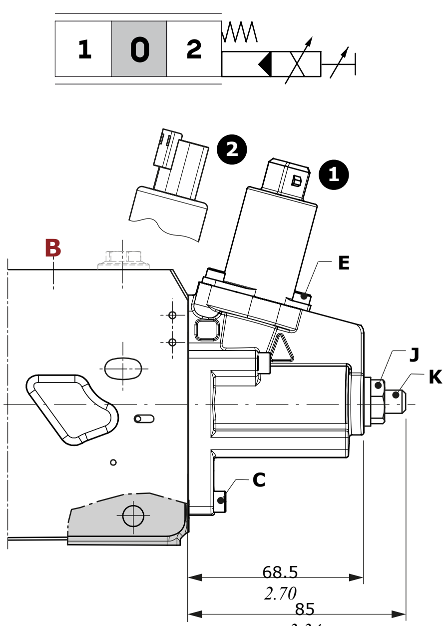
FP00 type
Electrohydraulic arrangement



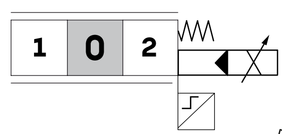
FP04 type
Electrohydraulic control



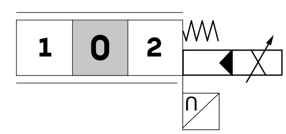
FP04L type
With stroke limiter

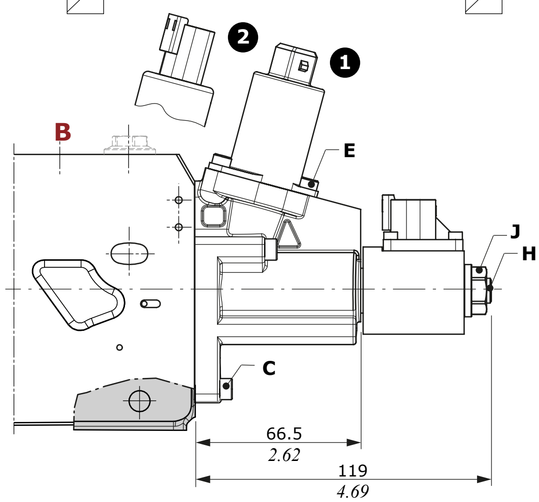


FP04SD type
With digital SPSD
spool position sensor



FP04SL type
With analog SPSL
spool position sensor





Note: for sensor types, see page 45

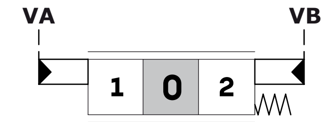
Pre-compensated sections

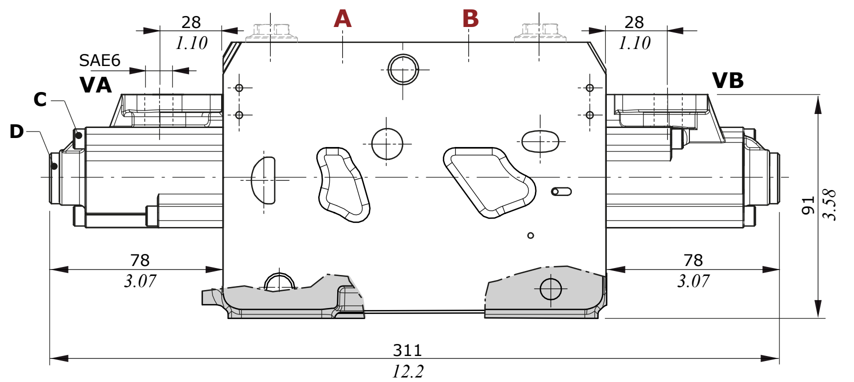
Hydraulic controls

Proportional controls (A+B sides)

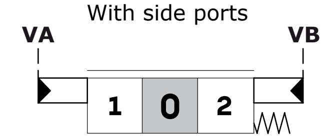
Controls are available with upper or side ports.

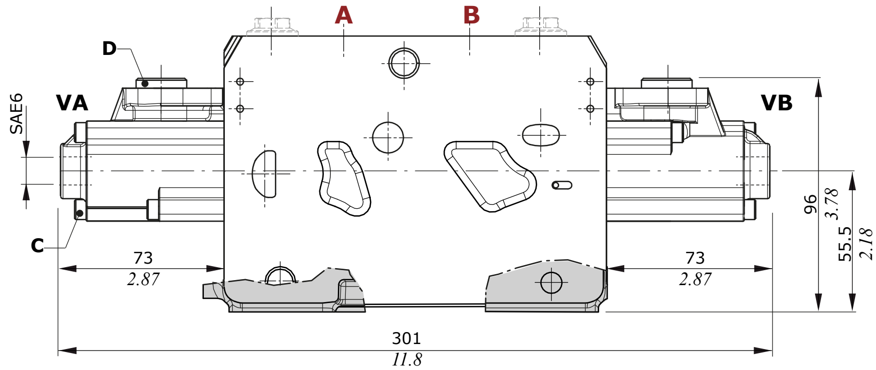
HP05A type
With upper ports



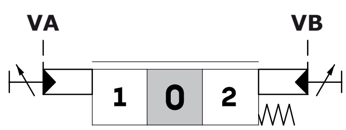


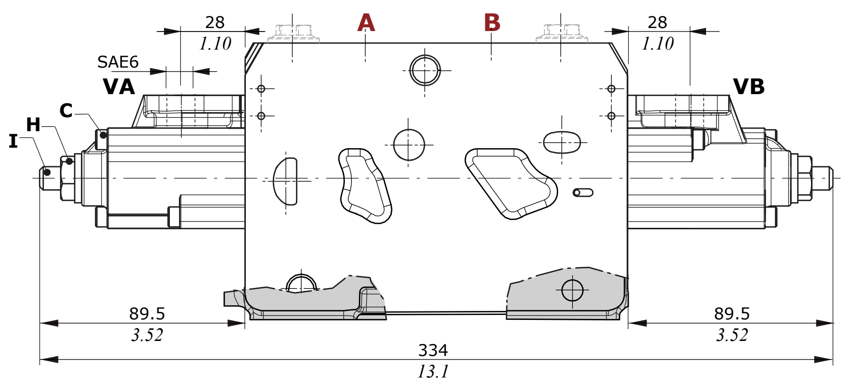
HP05C type
With side ports



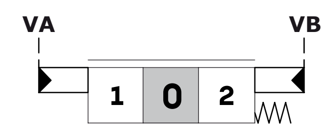


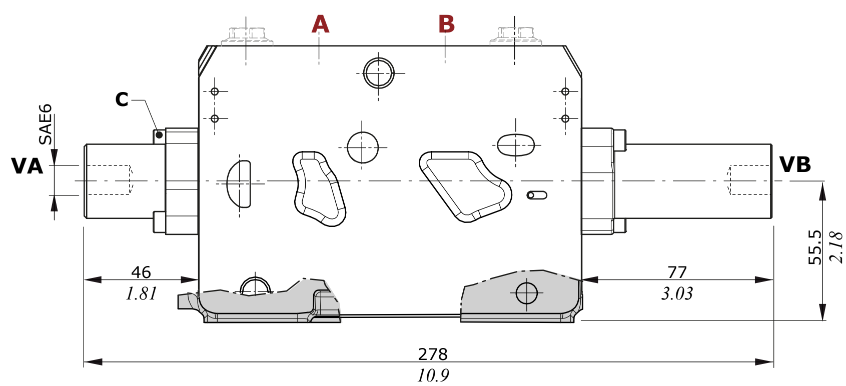
HP05L type
With upper ports
and stroke limiter





HP05W type
With 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

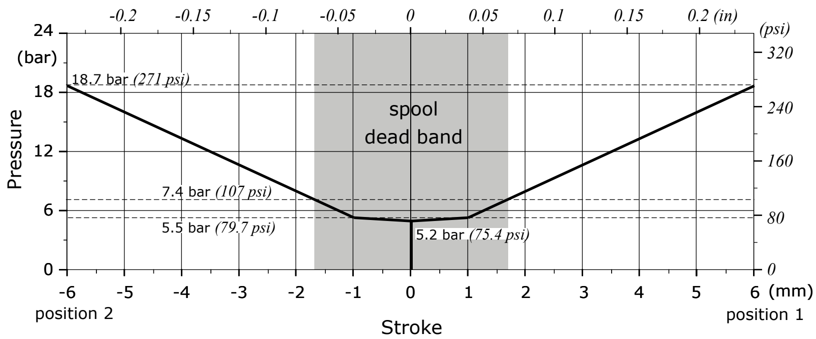
Pre-compensated sections

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page

Stroke vs. Pressure diagram



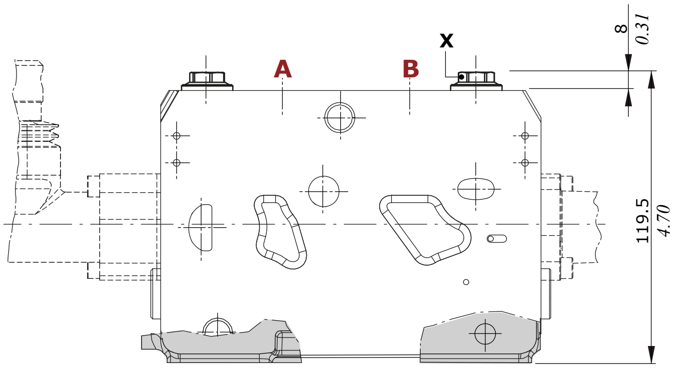
Compatibility tables

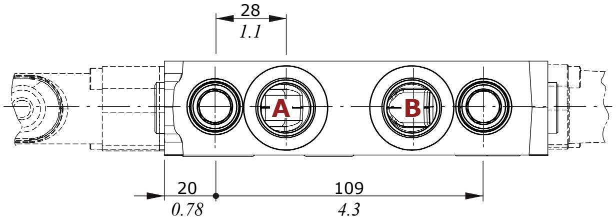
Combination controls and spool end kit		"A" side controls								
		H001 H002	H004	HP00	HP01	HP04	HP04L	HP07	HP07L	HP05
"B" side controls	F001A	430085044	430085045							
	F001B	430085044	430085045							
	FP00			430085026						
	FP01				430085026					
	FP04					430085026	430085026	430085026	430085026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

For spool end types, see page 138

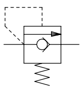
Port valves

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

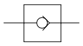




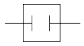
03TF type
Pilot combined valve



02TF type
Anticavitation valve

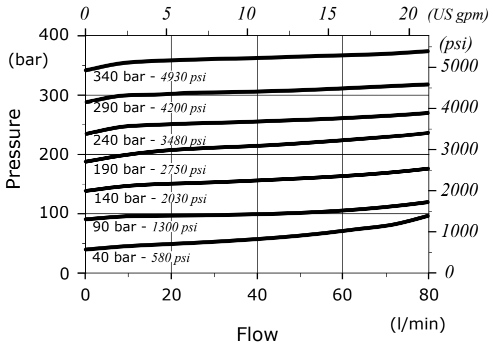


05TF type
Valve blanking plug

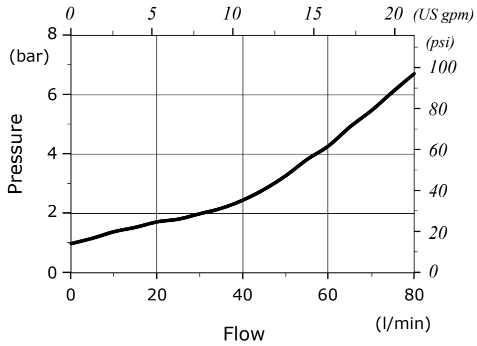


Wrenches and tightening torques
X = wrench 13 - 40 Nm *(29.5 lbft)*

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



03TF type
combined valves (anticavitation function)

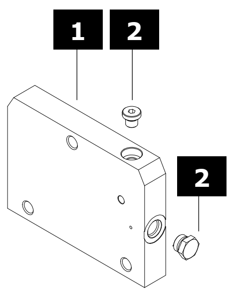


Parts ordering codes

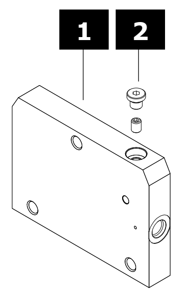
There are two main types of End plate:
- **Mechanical and hydraulic controls configuration**: to be used when no electrohydraulic controls are present in the valve: this plate is simply collecting the LS signal drain that can be connected to tank internally or externally without significant differences.
- **Electrohydraulic controls configuration**: to be used when at least one section in the valve has electrohydraulic operated: 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

EX38/ ... / KZ10I

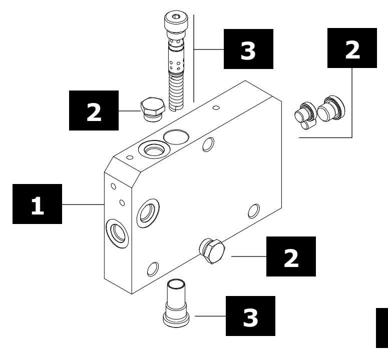


EX38/ ... / KZ10E

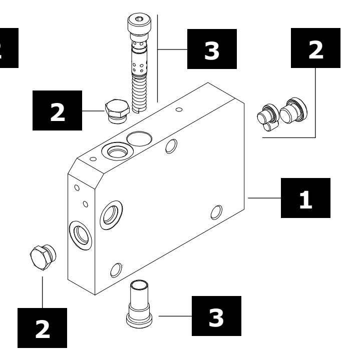


For hydraulic and electrohydraulic controls

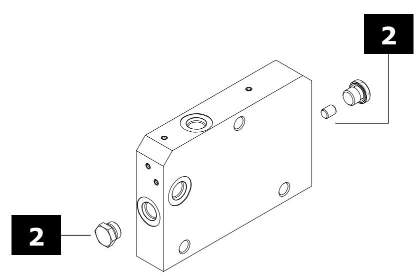
EX38/ ... / KZ20EC



EX38/ ... / KZ20EH



EX38/ ... / KZ30E



1 End plate* pag. 57

For mechanical and hydraulic controls
TYPE: **-** CODE: 420705080
DESCRIPTION: End plate without pressure reducing valve kit, internal drain (type **KZ10I**) or external drain (type **KZ10E**)

For electrohydraulic controls
TYPE: **-** CODE: 420705075
DESCRIPTION: End plate with pressure reducing valve kit, external drain (type **KZ20EC**) or external-side drain (type **KZ20EH** or **KZ30E**)

2 Plugs*

TYPE	CODE	DESCRIPTION
Grub PPCE	411110807	Grub screw
-	430000016	G1/8 plug
-	430000017	G1/4 plug
	300037001	SAE6 plug

3 Pressure reducing valve kit

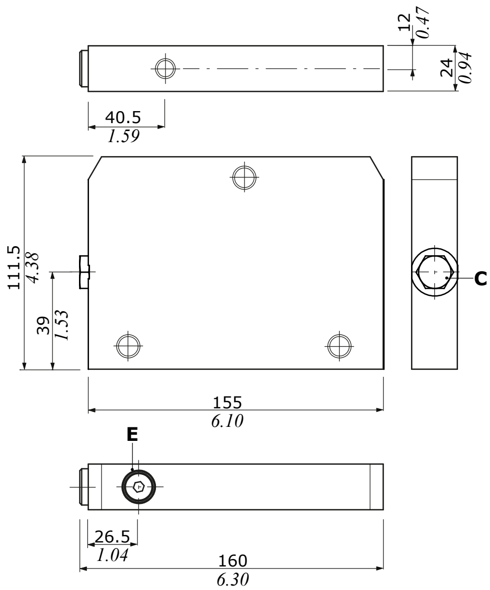
TYPE	CODE	DESCRIPTION
-	320285002	Pressure reducing valve kit (40 bar - *580 psi*)
-	430085053	Spring holder kit (40 bar - *580 psi*)

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

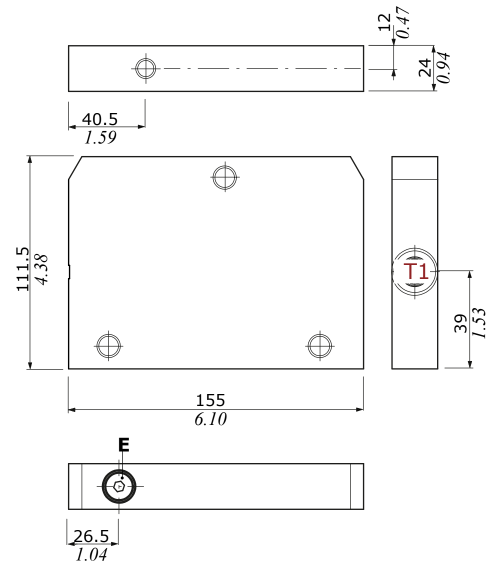
Dimensional data and hydraulic circuits

For mechanical and prop. hydraulic controls

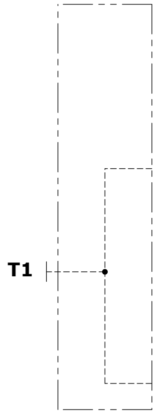
KZ10I



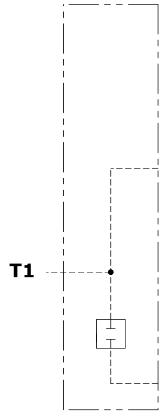
KZ10E



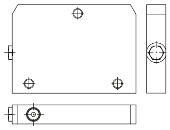
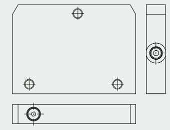
KZ10I
End plate without
reducing pressure valve.
Internal drain



KZ10E
End plate without
reducing pressure valve.
External drain



Port configurations

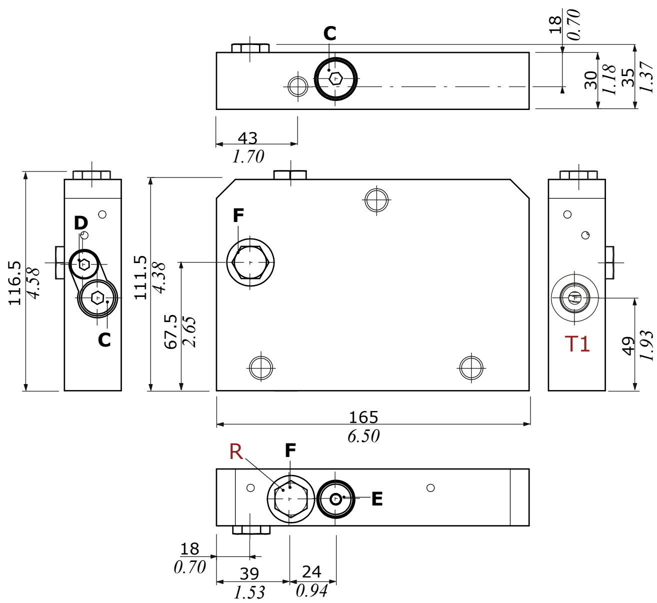
Types	T1 port (front)	T1 port (side)	R port	
KZ10I	plugged	no	no	
KZ10E	open	no	no	

Wrenches and tightening torques
C = allen wrench 17 - 30 Nm *(22 lbft)*
E = allen wrench 5 - 30 Nm *(22 lbft)*

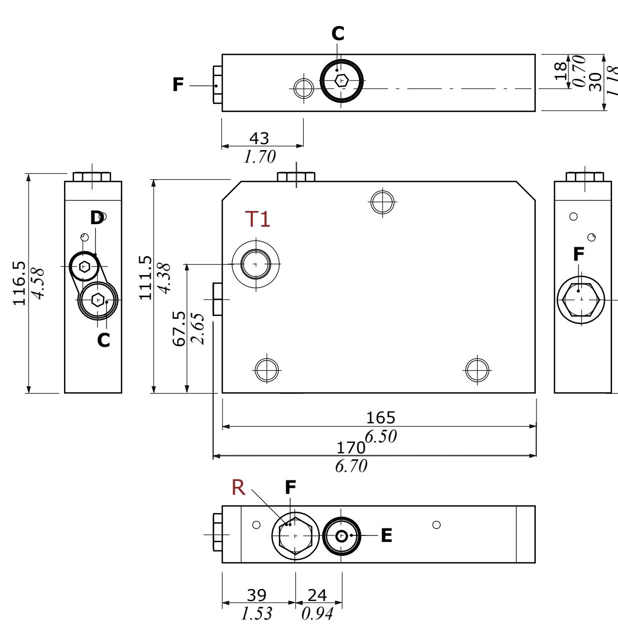
Dimensional data and hydraulic circuits

For hydraulic and electrohydraulic controls

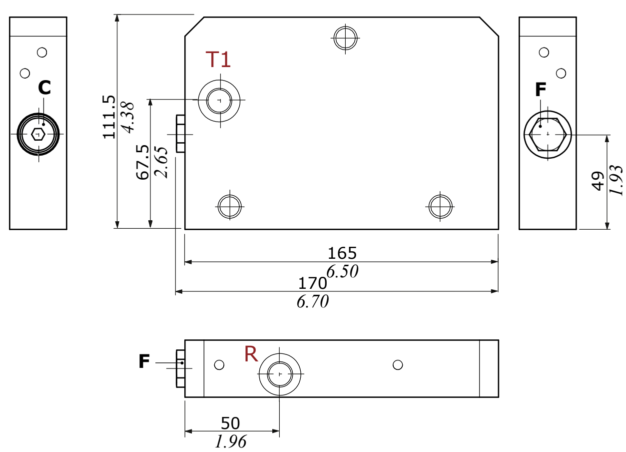
KZ20EC



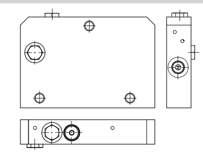
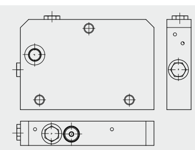
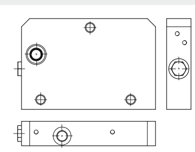
KZ20EH

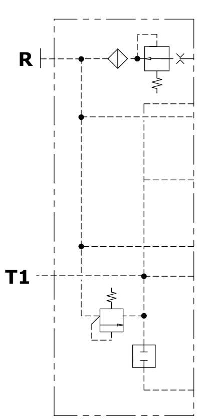


KZ30E



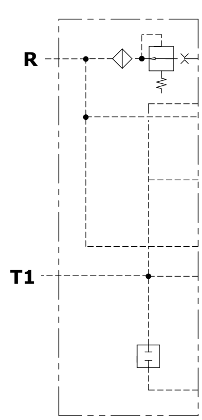
Port configurations

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



KZ20EC
End plate with
reducing pressure valve
and pressure relief valve
External drain

KZ20EH
End plate with
reducing pressure valve
and pressure relief valve
External-side drain



KZ30E
End plate with
reducing pressure valve,
without pressure relief valve
External-side drain

Wrenches and tightening torques
C = allen wrench 6 - 30 Nm *(22 lbft)*
D = allen wrench 5 - 13 Nm *(9 lbft)*
E = allen wrench 5 - 30 Nm *(22 lbft)*
F = allen wrench 17 - 30 Nm *(22 lbft)*

Content

- **EX38-HF**

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-U05/W001C(140\140)-HP10-FP06-B12AJ-HF-RCU1-U05.03TF-PA(100)

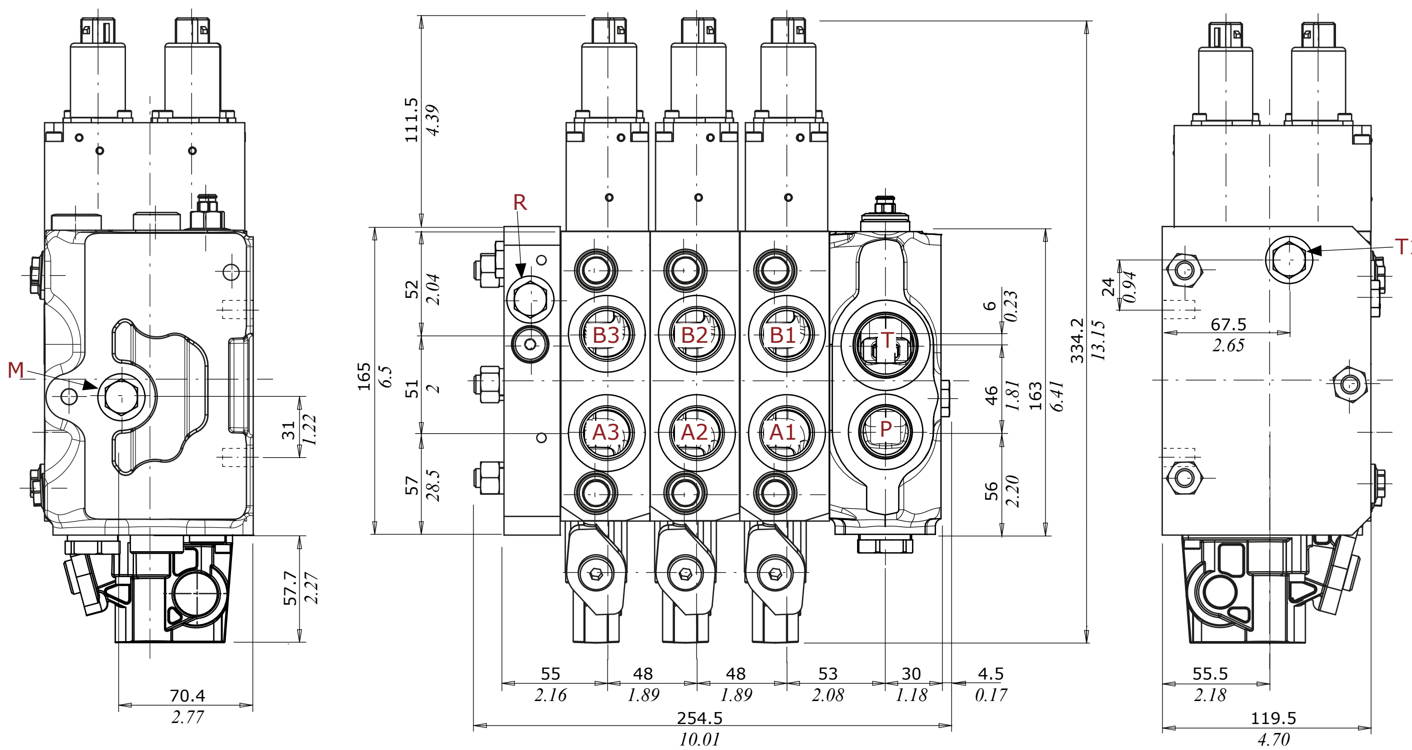
N° working sections — HF Open Center inlet section — HF working section

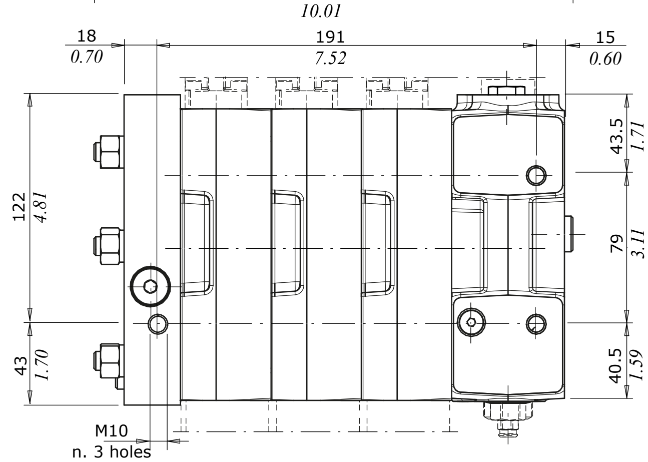
03TF-PB(100)/W001C(140\140)-HP10-FP06-B12AJ-HF-RCU1-U05.03TF-PA(100)\03TF-PB(100)/

HF working section — HF working section

W001C(140\140) -HP10-FP06-B12AJ-HF-RCU1-U05.03TF-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 **UN-UNF** threading configuration

Dimensional data

High Flow valve configuration example with one-side electrohydraulic control

Example of mixed - High Flow (HF) / Standard sections

EX38-HF/3/MR-V1A(50)-V7B-C12AJ-V10C-KV-G05/W001C(140\140)-HP10-FP06-B12AJ-HF-RCU1-U05.03TF-

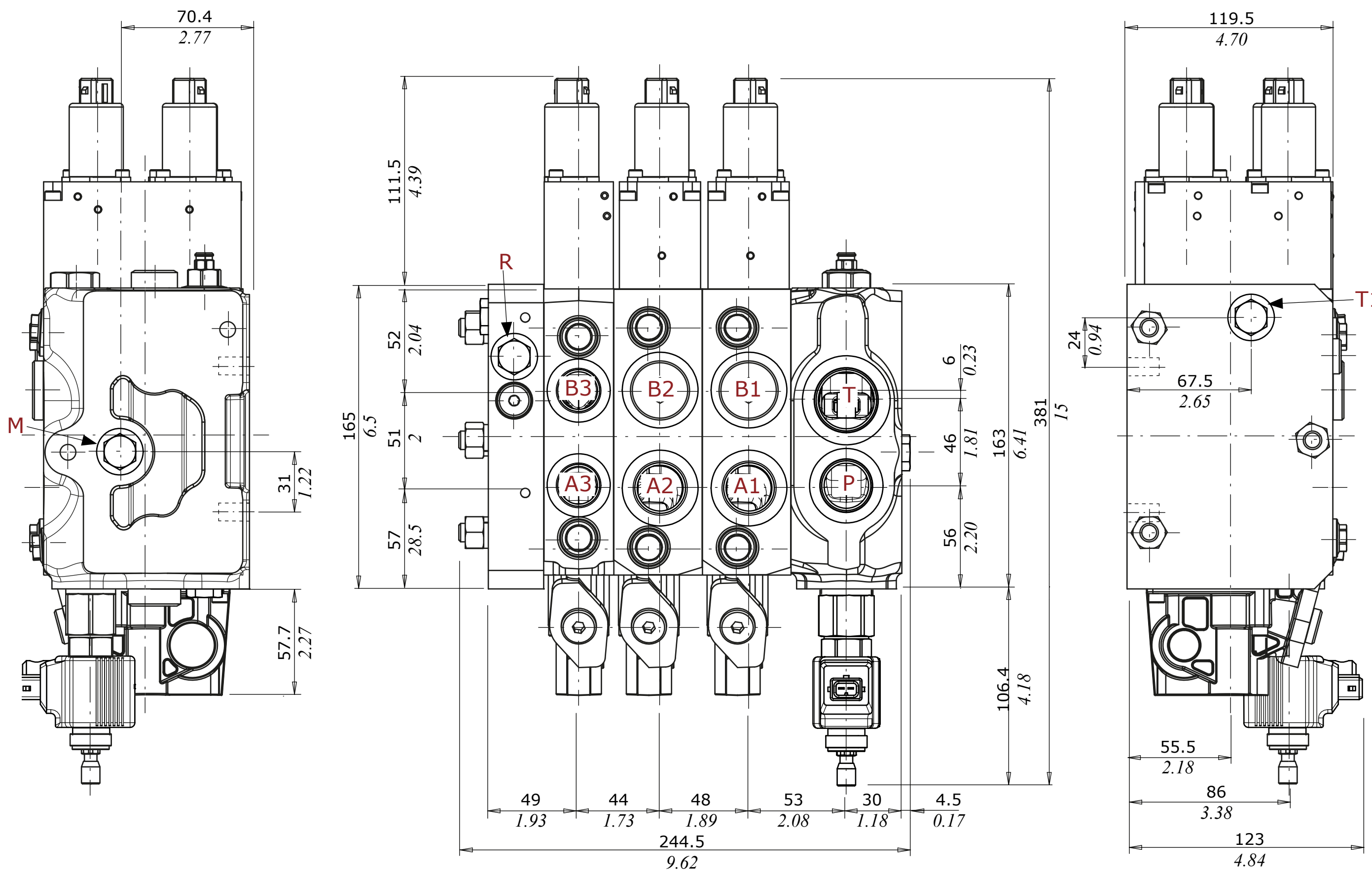
N° working sections — HF Open Center inlet section — HF working section

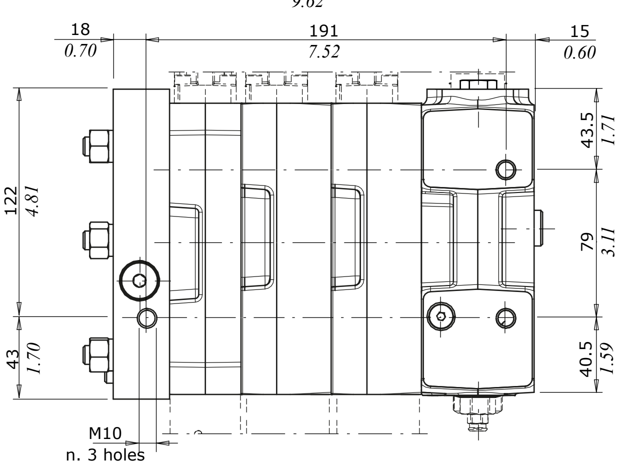
PA(100)\ 03TF-PB(100)/W001C(140\140)-HP10-FP06-B12AJ-HF-RCU1-U05.03TF-PA(100)\03TF-PB(100)

HF working section — HF working section

W001C(25\25)-HP10-FP06-B12AJ-RC1-U04.03TF-PA(100)\-03TF-PB(100)/KZ20EC/P006/3 N10

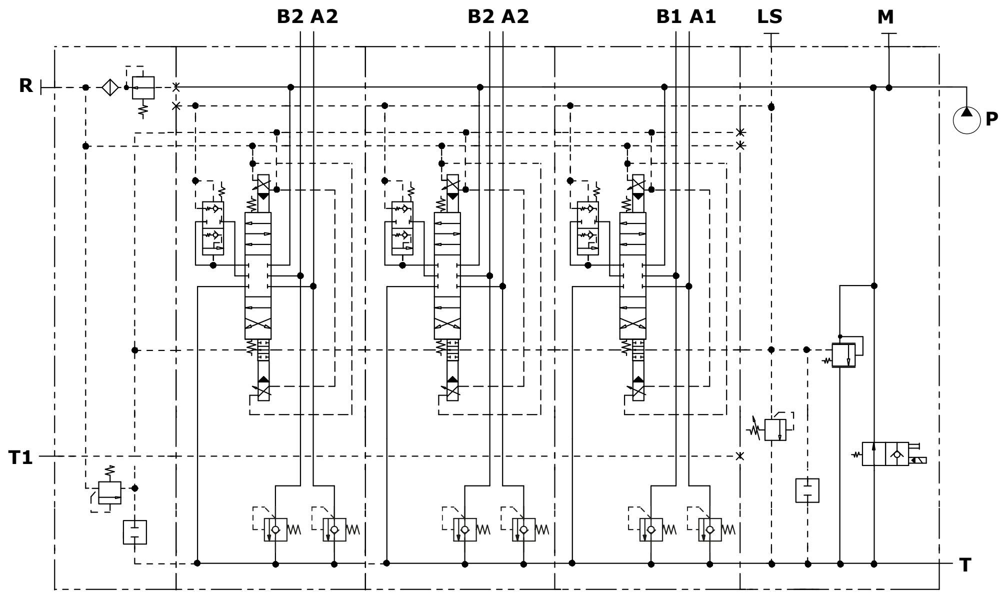
Standard working section — End plate — Painted with RAL 9005 black primer



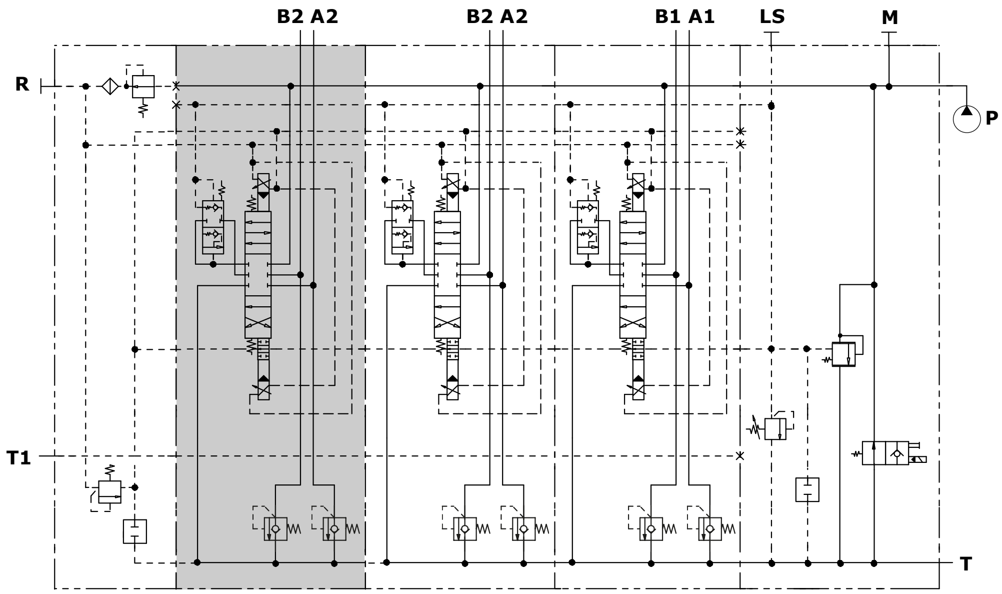


NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Hydraulic circuits



Right Inlet valve with one-side electrohydraulic controls
configuration example:
EX38-HF/3/MR-V1A(50)-V4B-V10C-KV-U05/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-U05.03TFPA(100/100)\03TFPB(100/100)
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-U04.03TFPA(100/100)\03TFPB(100/100)/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-U04.03TFPA(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-U05/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-U05.03TFPA(100/100)\03TFPB(100/100)/
W001C(140\140)-HP10-FP06-B12AJ-HF-RC1-U05.03TFPA(100/100)\03TFPB(100/100)/
W001C(25\25)-HP10-FP06-B12AJ-RC1-U04.03TFPA(100/100)\03TFPB(100/100)/KZ20EC

EX std. section

Complete section ordering codes

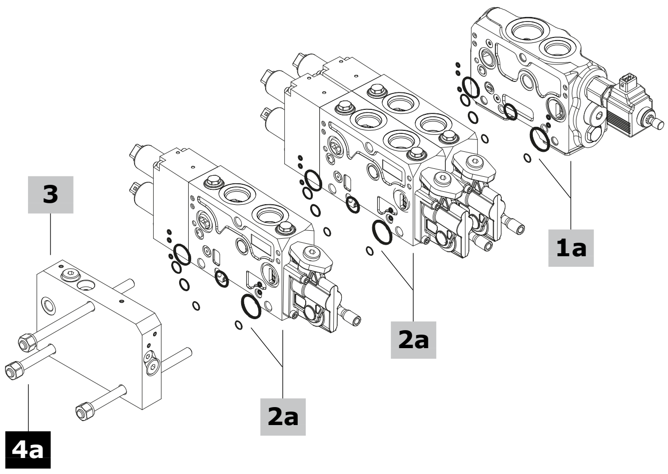
One-side electrohydraulic control valve configuration example - Right Inlet

EX38-HF/3/MR-V1A(200)-V7B-C12AJ-V10C-KVU05/W001C(120\120)-HP06-FP06-B12AJ-HF-RC1U05

Working sections — Right Inlet — 1a — 2a

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

2a — 2a — 3 — Painted with RAL 9005 black primer



1a 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-U05**
CODE: SHE380048
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-U05**
CODE: SHE380049
DESCRIPTION: as previous one with full flow electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V4B-V11C(C12AY)-KV-U05**
CODE: SHE380050
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-U05**
CODE: SHE380051
DESCRIPTION: as previous one with full flow direct relief valve

For Closed Center circuit (JV)

TYPE: **HF/MR-L/V1A(200)-V4B-V10C-JV-U05**
CODE: SHE380052
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-U05**
CODE: SHE380053
DESCRIPTION: as previous one and full flow electric unloading valve

TYPE: **HF/MR-L/V1A(200)-V4B-V11C(C12AY)-KV-U05**
CODE: SHE380054
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-U05**
CODE: SHE380055
DESCRIPTION: as previous one with full flow direct relief valve

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

2a 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-U05-05TFPA-05TFPB**
CODE: SHL380056
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-U05-05TFPA-05TFPB**
CODE: SHL380057
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-U05-05TFPA-05TFPB**
CODE: SHL380058
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: 320093103
DESCRIPTION: end plate without pressure reducing valve, internal drain

TYPE: **KZ10E** CODE: 320093104
DESCRIPTION: end plate without pressure reducing valve, external drain

For hydraulic and electrohydraulic controls

TYPE: **KZ20EC** CODE: 320093127
DESCRIPTION: end plate with pressure reducing valve, external drain

TYPE: **KZ20EH** CODE: 320093128
DESCRIPTION: end plate with pressure reducing valve, external-side drain

TYPE: **KZ30E** CODE: 320093114
DESCRIPTION: end plate with pressure reducing valve, external-side drain

4a Assembly kit

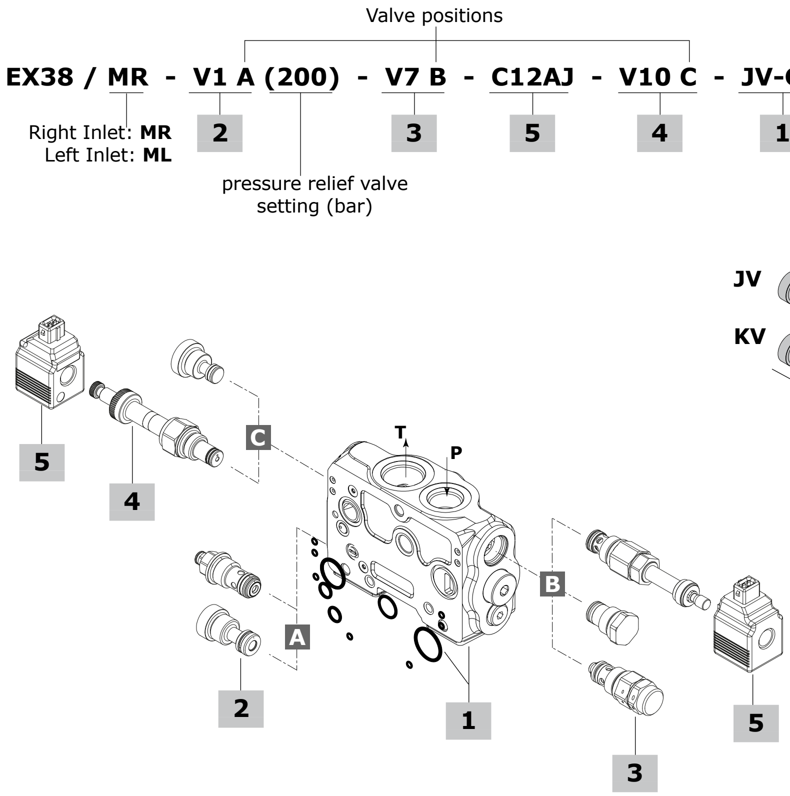
CODE	DESCRIPTION
300193042	For 1 HF section valve
300193039	For 2 HF sections valve
300193040	For 3 HF sections valve
300193043	For 4 HF sections valve

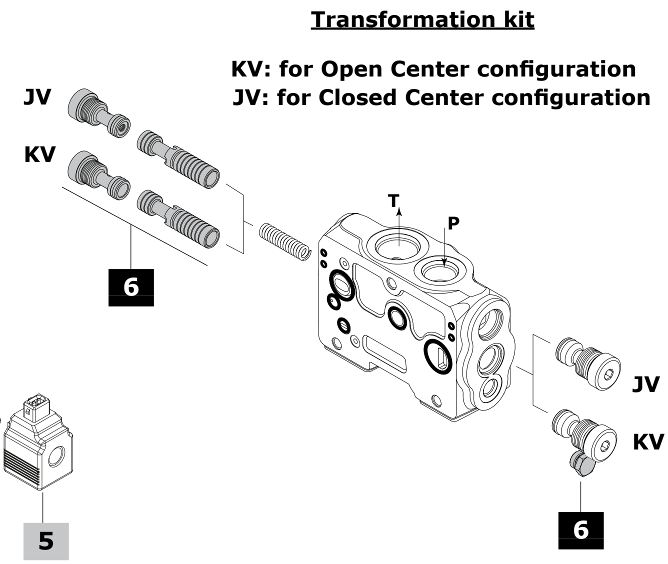
Tie rods kit for Std+HF sections:

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

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 U05-U06** CODE: 029300034

DESCRIPTION: For fixed displacement pumps, internal LS.

SAE12 P port - SAE16 T port

For Closed Center circuit (JV)

TYPE: **HF/JV U05-U06** CODE: 029300033

DESCRIPTION: For variable displacement pumps, external LS.

SAE12 P port - SAE16 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

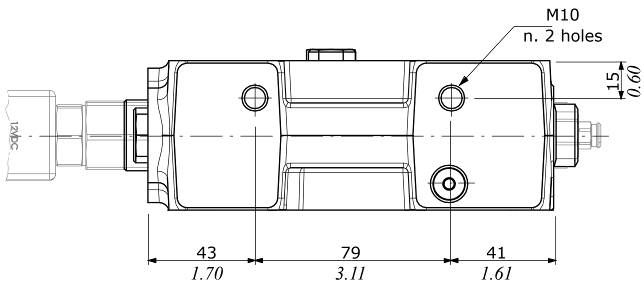
6 Trasformation kit page 67

TYPE	CODE	DESCRIPTION
KV kit	320093028*	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 **UN-UNF** thread

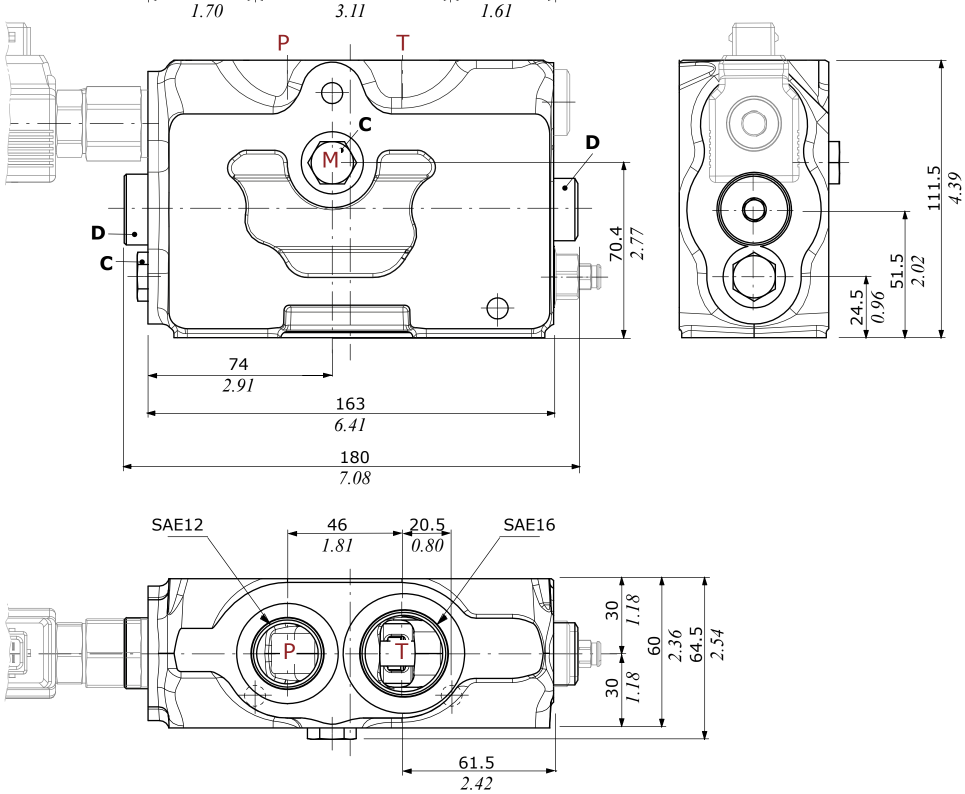
Dimensional data and hydraulic circuits

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

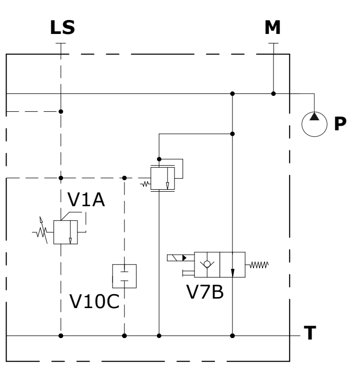


Wrenches and tightening torques
C = wrench 17 - 45 Nm *(33.2 lbft)*
D = allen wrench 8 - 30 Nm *(22 lbft)*

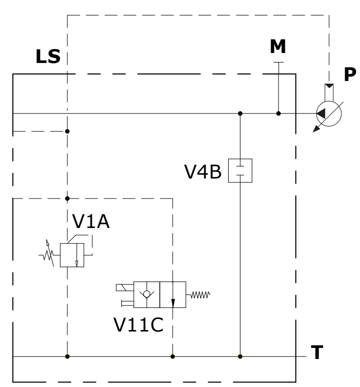
Note: for valves wrench and torque, see related pages



KV Open Center (example)



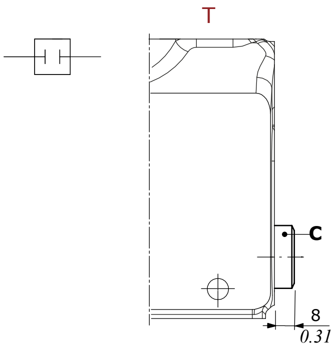
JV Closed Center (example)



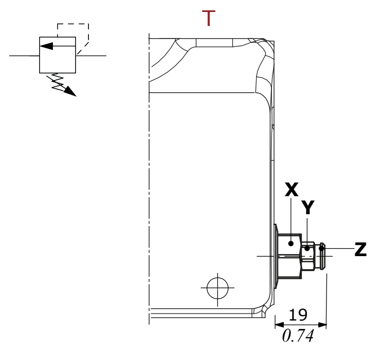
Inlet valves

Valves on position A

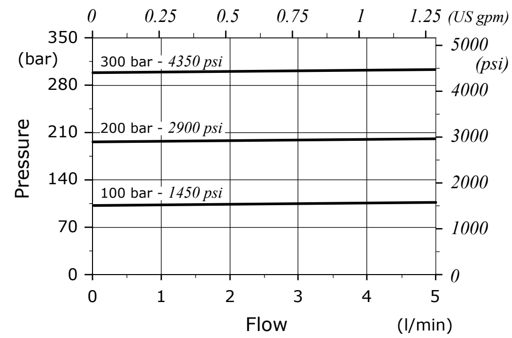
V2A type
Valve blanking plug



V1A type
LS pressure relief valve

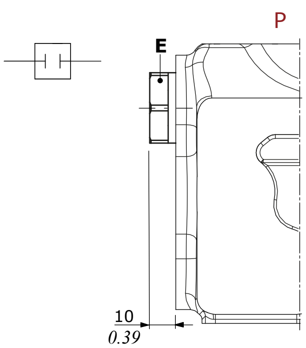


LS relief valve
characteristics

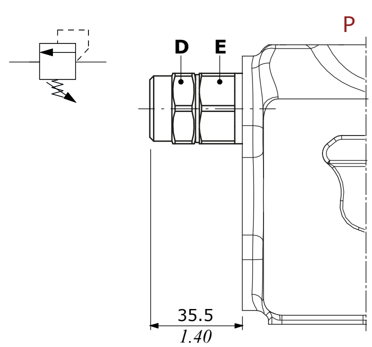


Valves on position B

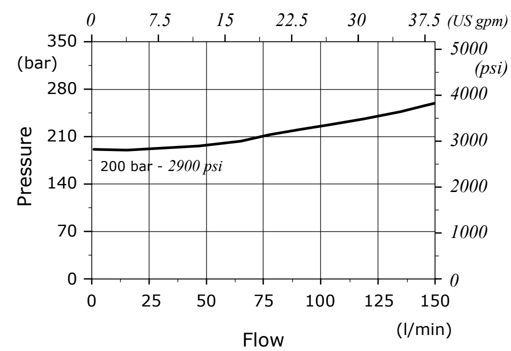
V4B type
Valve blanking plug



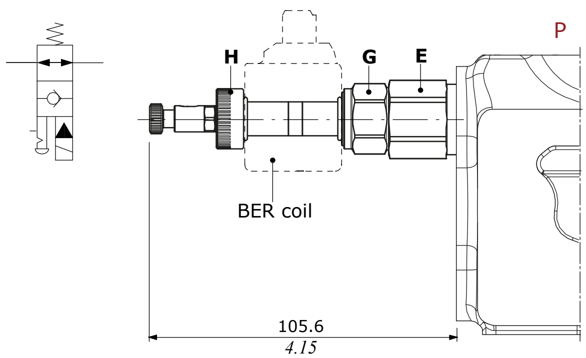
V3B type
Full Flow direct relief valve



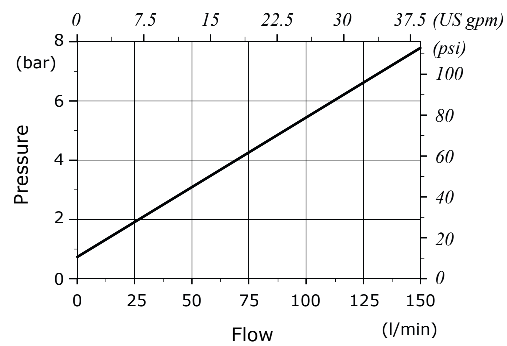
Full Flow relief valve
characteristics



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

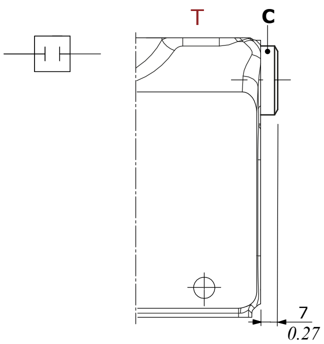
Nominal flow...............: 150 l/min *(0.53 US gpm)*
Max. pressure ....: 350 bar *(5100 psi)*
Max. internal leakage...: 0,25 cm^3/min @ 210 bar
(0.015 in^3/min @ 3050 psi)

For **BER** type coils see page 136

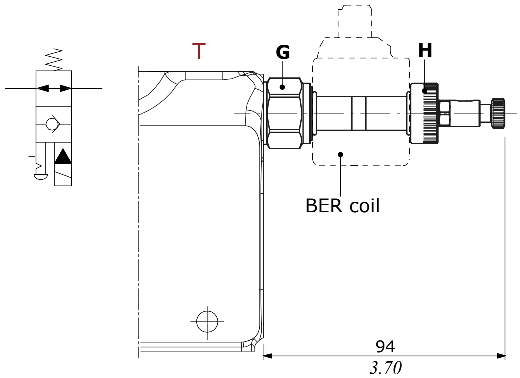
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



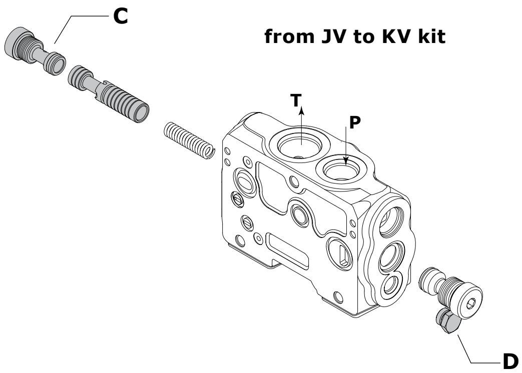
Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*
G = wrench 24 - 30 Nm *(22 lbft)*
H = manual tightening

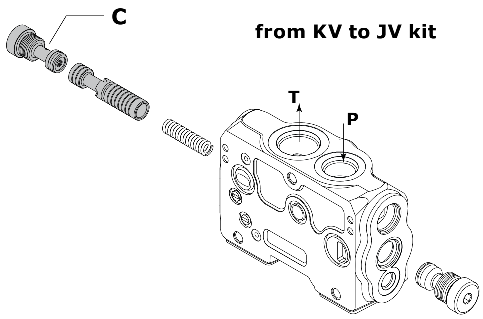
For **BER** type coils see page 136

NOTES:
Valve types V1A and V3B require factory setting (example: V1A - 150)
Valve combination V1A - V3B requires double setting (example: 200*240); the minimun 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 320093028, from JV to KV kit
code 320093007, from KV to JV kit

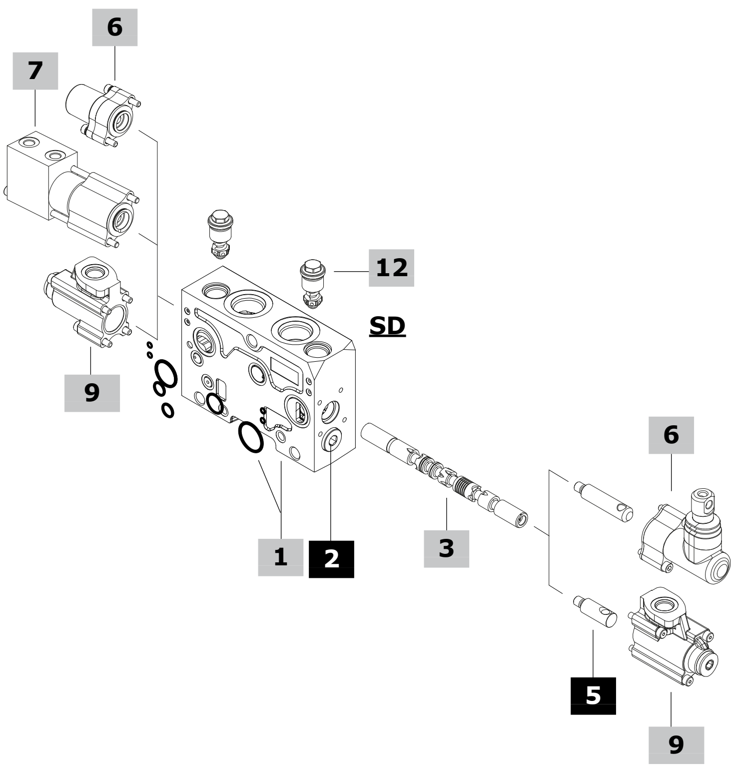




Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*
D = wrench 17 - 45 Nm *(33.2 lbft)*

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-U05 . 03TFPA(100) \ 03TFPB(100)

1 12

Working section with pneumatic control

EX38-HF-SD/W001C(120\120) - H001 - F022A

6 7

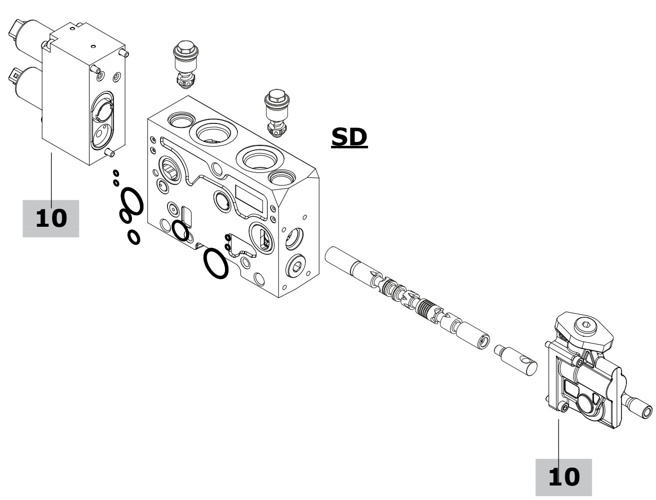
HF-RC1-U05 . 03TFPA(100)\03TFPB(100)

Working section with proportional hydraulic control

EX38-HF-SD/W001C(120\120) - HP05A

9

HF-RC1-U05 . 03TFPA(100)\03TFPB(100)



Working section with electrohydraulic control

EX38-HF-SD/W001C(120\120)- HP06 - FP06

10 10

B12AJ - HF-RCU1-U05 . 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 U05	039300074	With port valves arrangement
For electrohydraulic controls		
Standard section (only for SD configuration):		
HF-RCU1 U05	039300180	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	321293003	Proportional type, SAE4 ports
F023A	321293003	Proportional type, rotated 180°, SAE4 ports

9 Proportional hydraulic controls* page 77

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

TYPE	CODE	DESCRIPTION
HP05A	320593153	With SAE6 upper ports
HP05C	320593154	With SAE6 side ports
HP05L	320593155	With SAE6 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 (190 = setting (bar))	Combined valve

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)*	

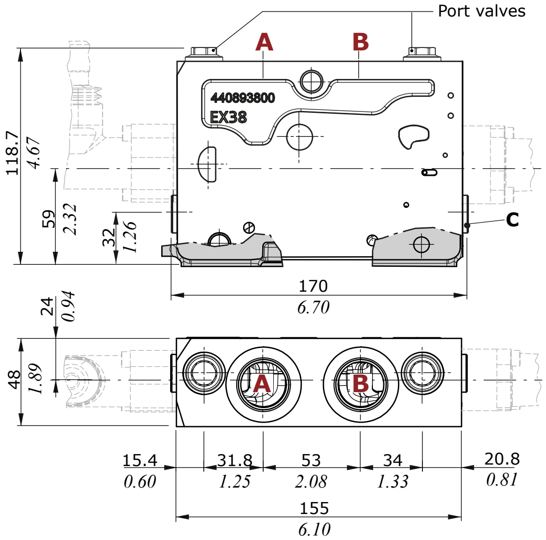
NOTE:
Always indicate setting value when using fixed setting combined valve: 03TF PA (120) - 03TF PB (120).

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

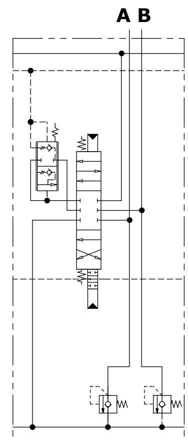
Dimensional data and hydraulic circuits

High Flow post-compensated section

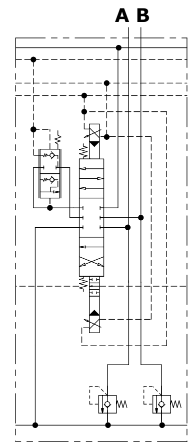
HF-RC1 - HF-RCU1 types
Standard section with port valves arrangement



HF-RC1
Hydraulic control with port valves



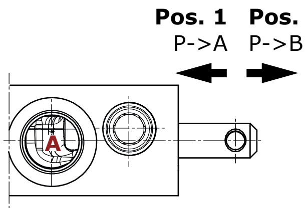
HF-RCU1
Electrohydraulic control with port valves



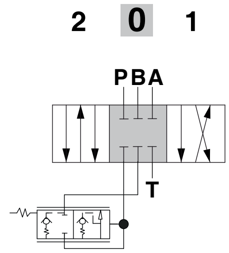
Wrenches and tightening torques
C = allen wrench 8 - 30 Nm *(22 lbft)*

Spools

High Flow post-compensated section

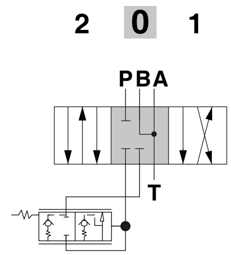


W001C type
A and B closed in
neutral position



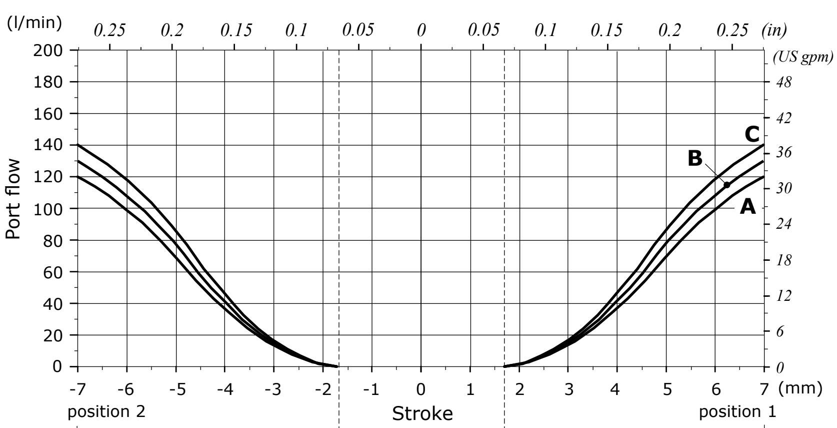
Spool stroke
Position 1: + 7 mm *(+ 0.27 in)*
Position 2: - 7 mm *(- 0.27 in)*

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)*

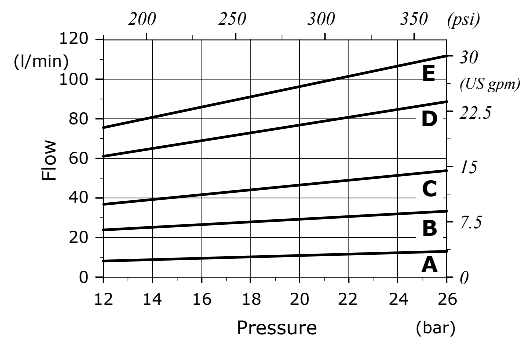
3 position spools metering curve
Qin: 140 l/min *(37 US gpm)* - closed center circuit (JV)
Pump compensator @ 16 bar *(232 psi)*



Hydraulic control (bar)	20.1	17.3	14.5	11.7	8.9	6.2	0	6.2	8.9	11.7	14.5	17.3	20.1
(psi)	*291*	*250*	*210*	*169*	*129*	*90*		*90*	*129*	*169*	*210*	*250*	*291*
(mA@12VDC)	1300	1160	1020	880	740	600	0	600	740	880	1020	1160	1300
(mA@24VDC)	650	580	510	440	370	300	0	300	370	440	510	580	650

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)



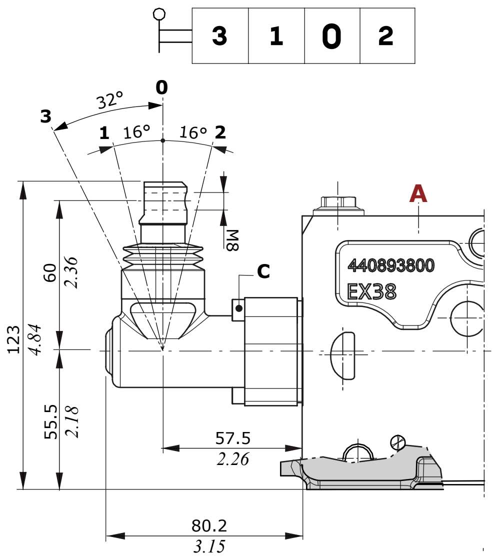
Curves with spool nominal flow
@ 14 bar *(200 psi)* stand-by
(margin pressure)
A = 10 l/min *(2.6 US gpm)*
B = 25 l/min *(6.6 US gpm)*
C = 40 l/min *(10.6 US gpm)*
D = 65 l/min *(17 US gpm)*
E = 80 l/min *(21 US gpm)*

High Flow post-compensated sections

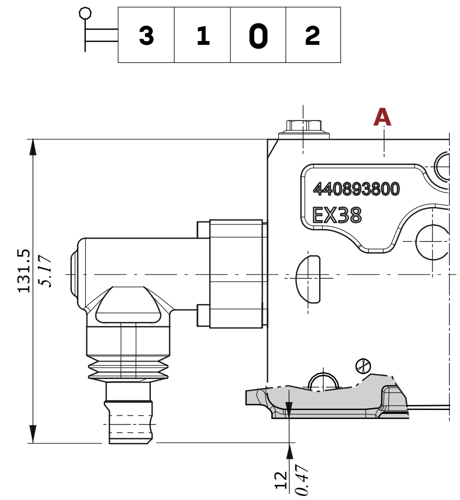
Mechanical controls

"A" side controls

H001 type
With lever box

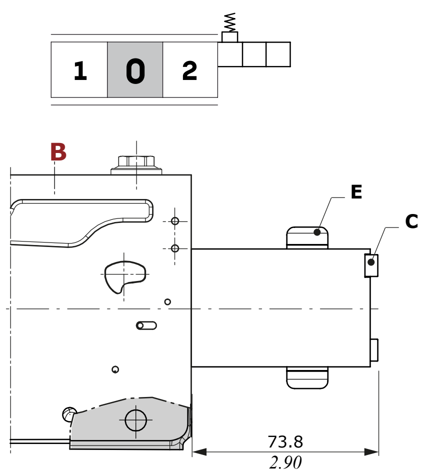


H002 type
With lever box, rotated 180°
Dimensions are the same of H001 type



"B" side controls

F145 type
With friction and neutral position notch



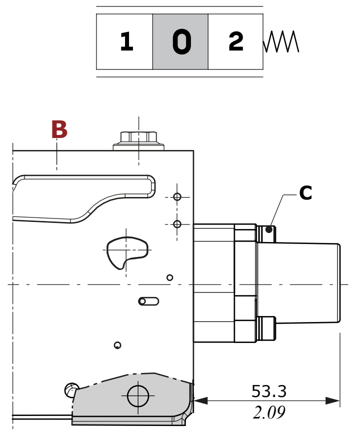
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*
E = allen wrench 7 - 20 Nm *(14.7 lbft)*

Mechanical controls

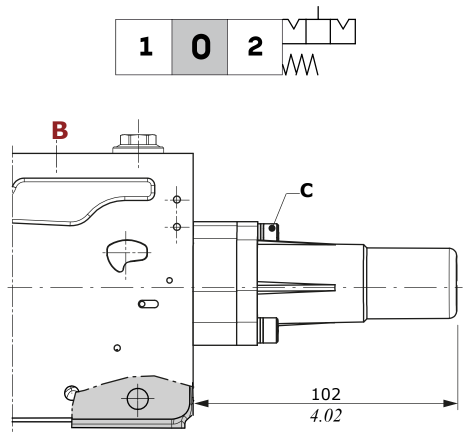
"B" side controls

Controls are available with standard spring A type (F001A)

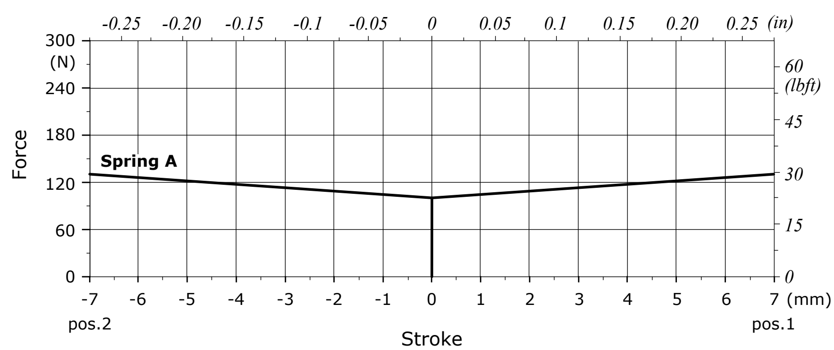
F001A type
With spring return in neutral position



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)*

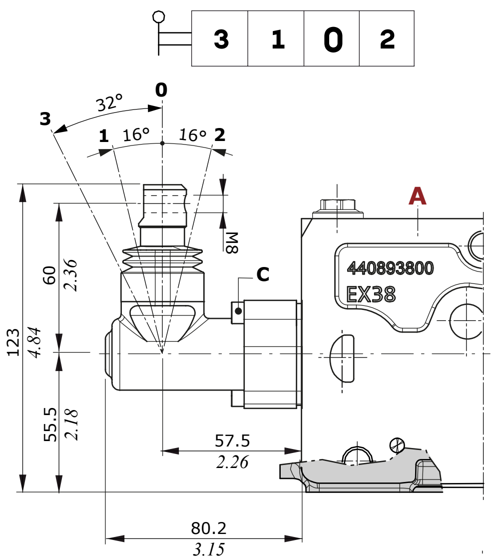
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*

High Flow post-compensated sections

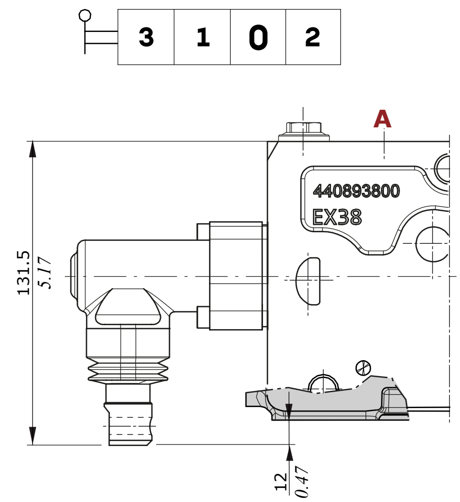
Pneumatic controls

"A" side controls

H001 type
With lever box

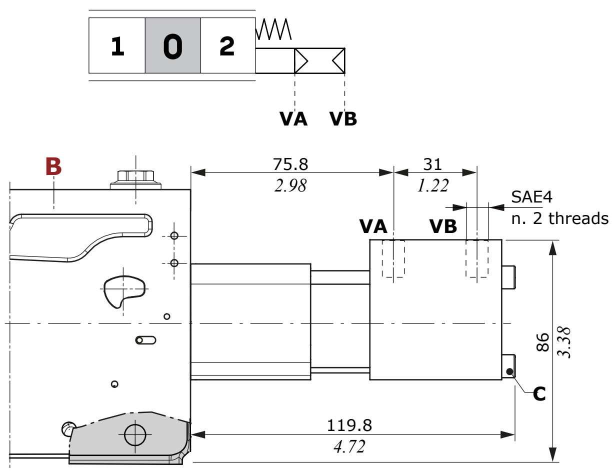


H002 type
With lever box, rotated 180°
Dimensions are the same of H001 type

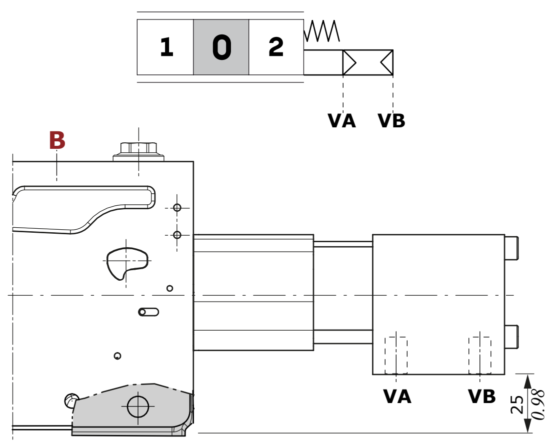


"B" side controls

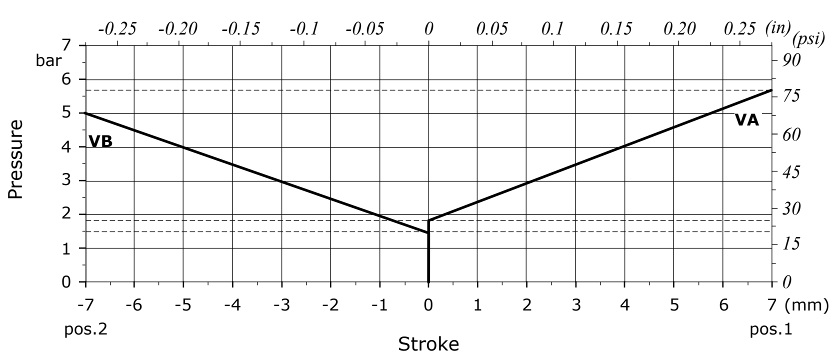
F022A type
Proportional pneumatic control



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)*

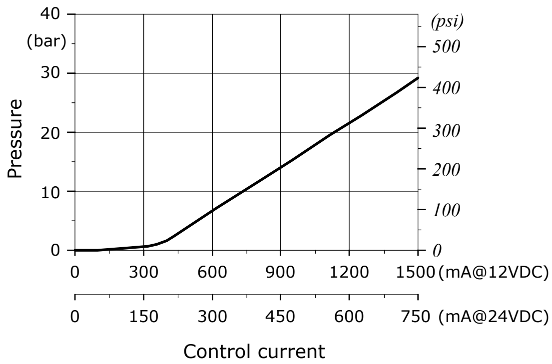
Proportional electrohydraulic controls

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.

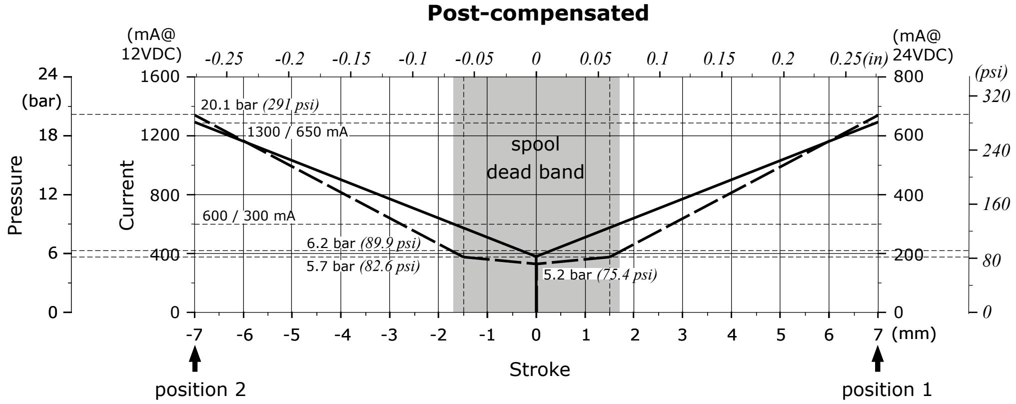
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

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 insulance		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

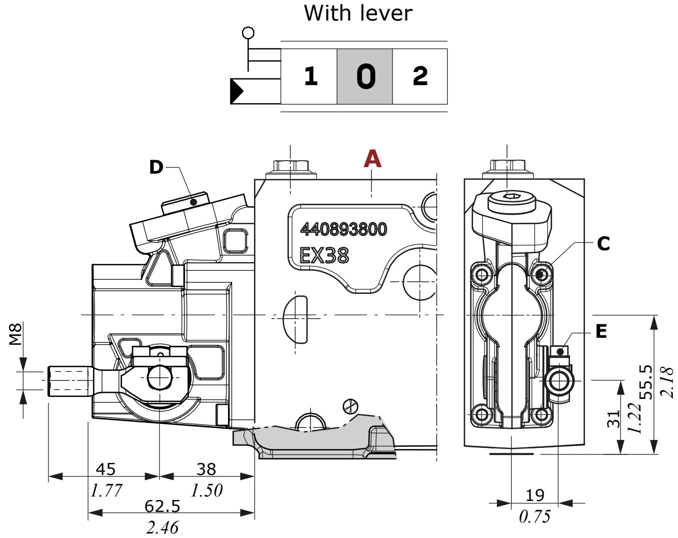
One-side electrohydraulic controls

"A" side controls

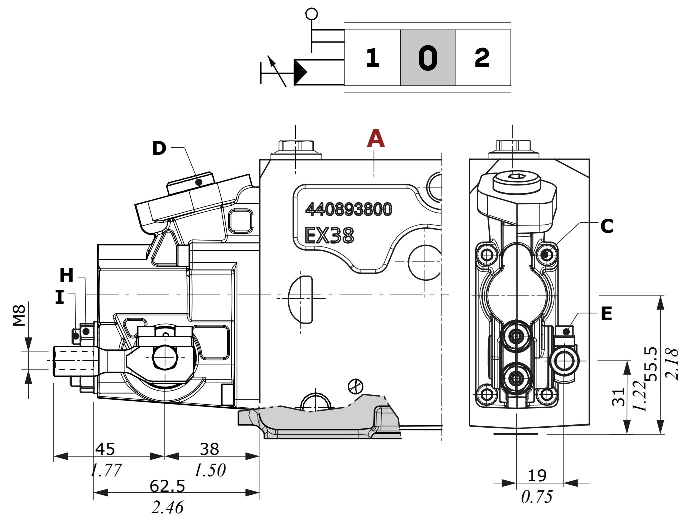
Control Types

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

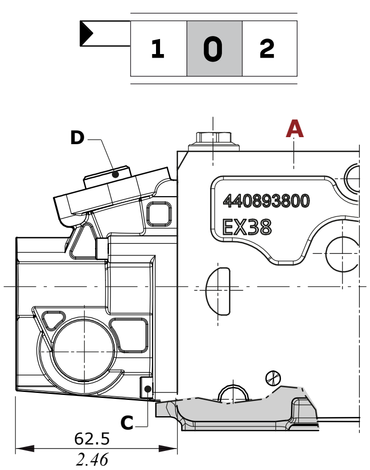
HP06 type
With lever



HP06L type
With lever and stroke limiter

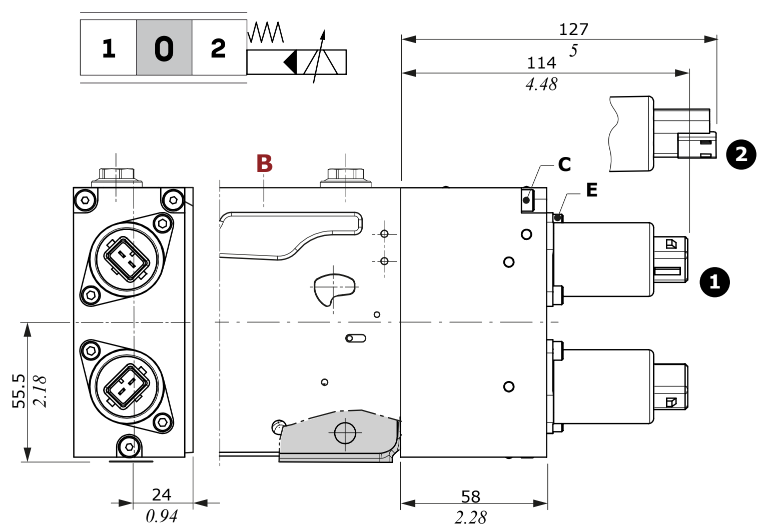


HP10 type
Without lever



"B" side controls

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

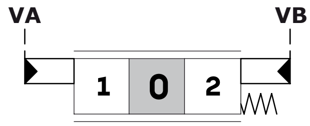
High Flow post-compensated sections

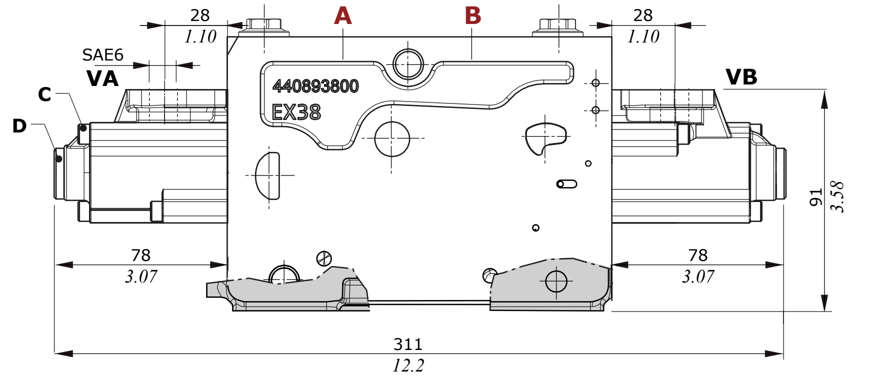
Hydraulic controls

Proportional controls (A+B sides)

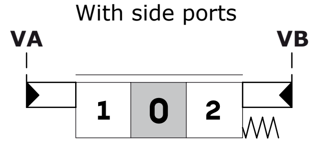
Controls are available with upper or side ports.

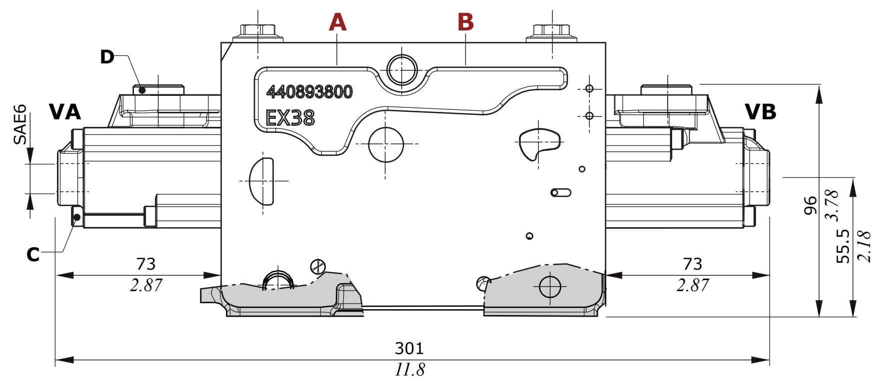
HP05A type
With upper ports



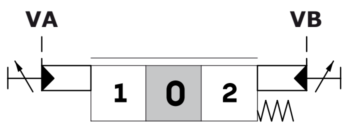


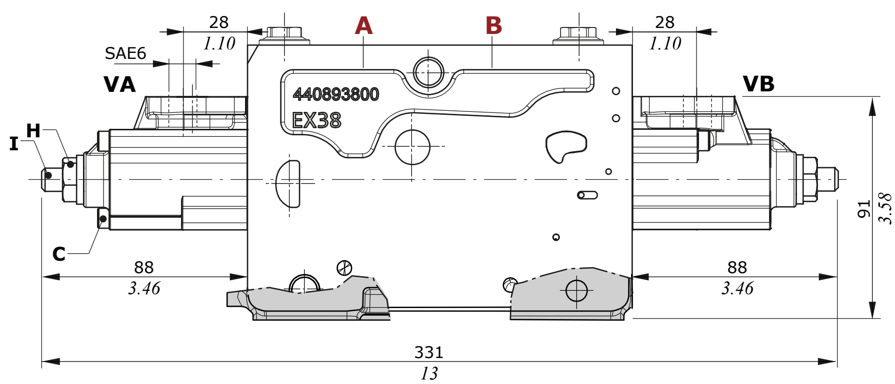
HP05C type
With side ports



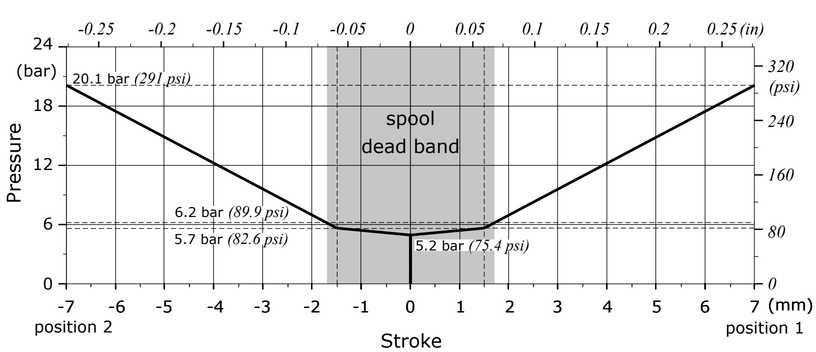


HP05L type
With upper ports
and spool stroke limiter





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

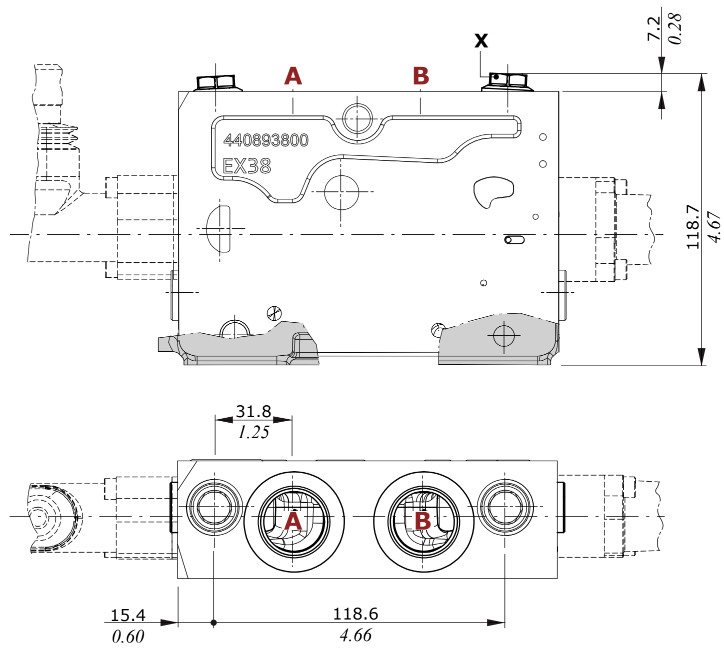
Compatibility table

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

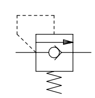
For spool end types, see page 138

Port valves

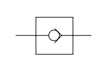
Always indicate setting value when using fixed setting combined valve:
Example: 03TF PA (120) = setting



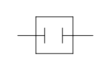
03TF type
Pilot combined valve



02TF type
Anticavitation valve

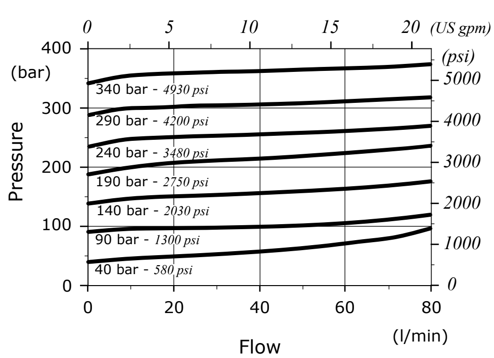


05TF type
Valve blanking plug

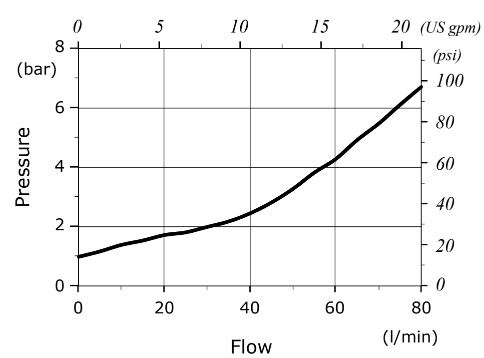


Wrenches and tightening torques
X = wrench 13 - 40 Nm *(29.5 lbft)*

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



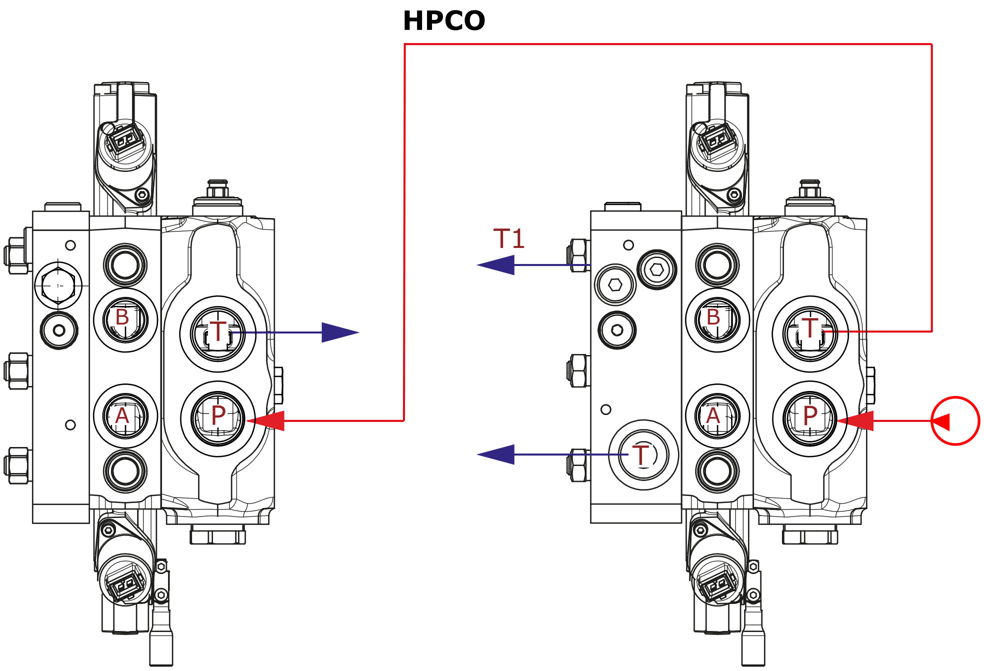
03TF type
combined valves (anticavitation function)

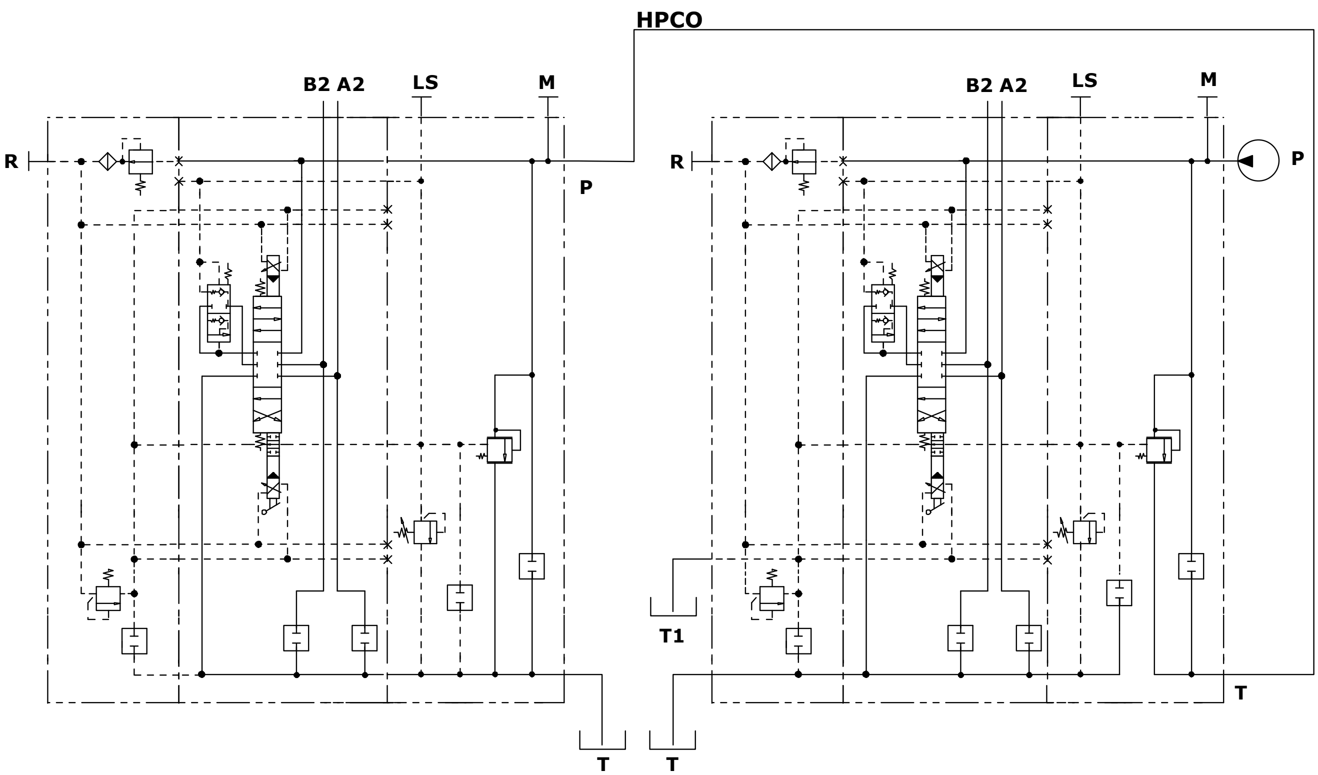


Two valves connection

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.

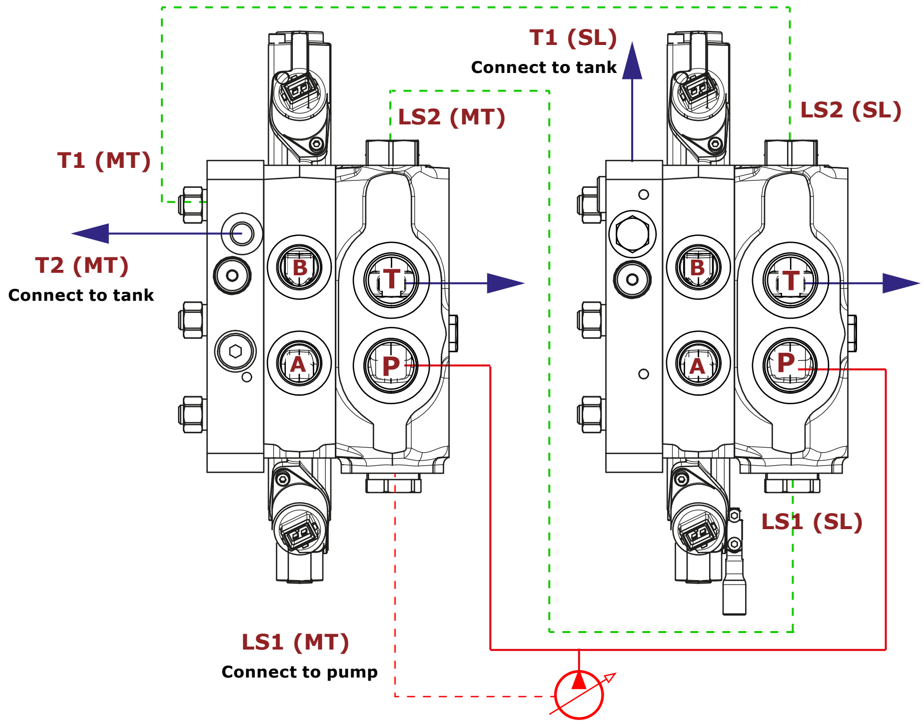


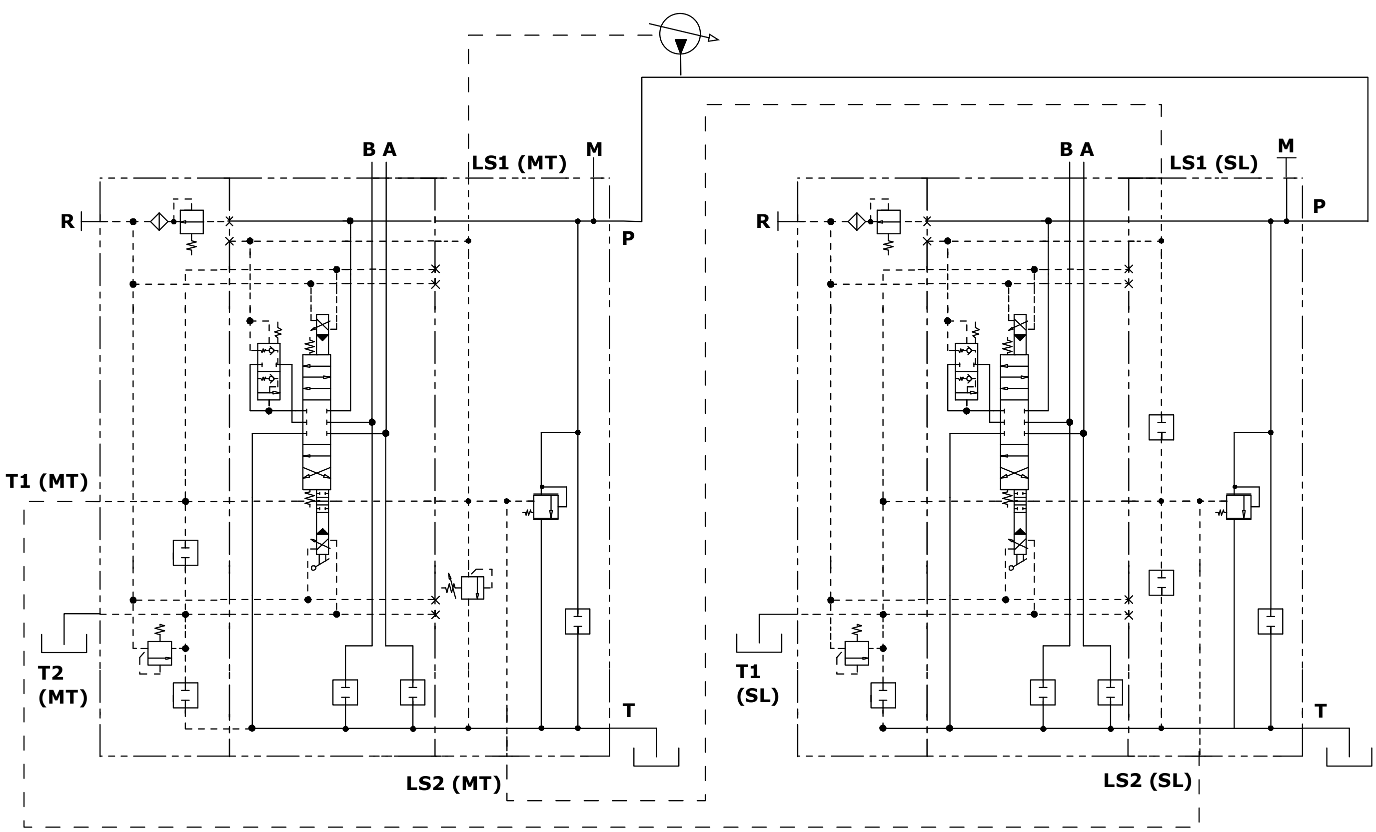


Two valves connection

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.



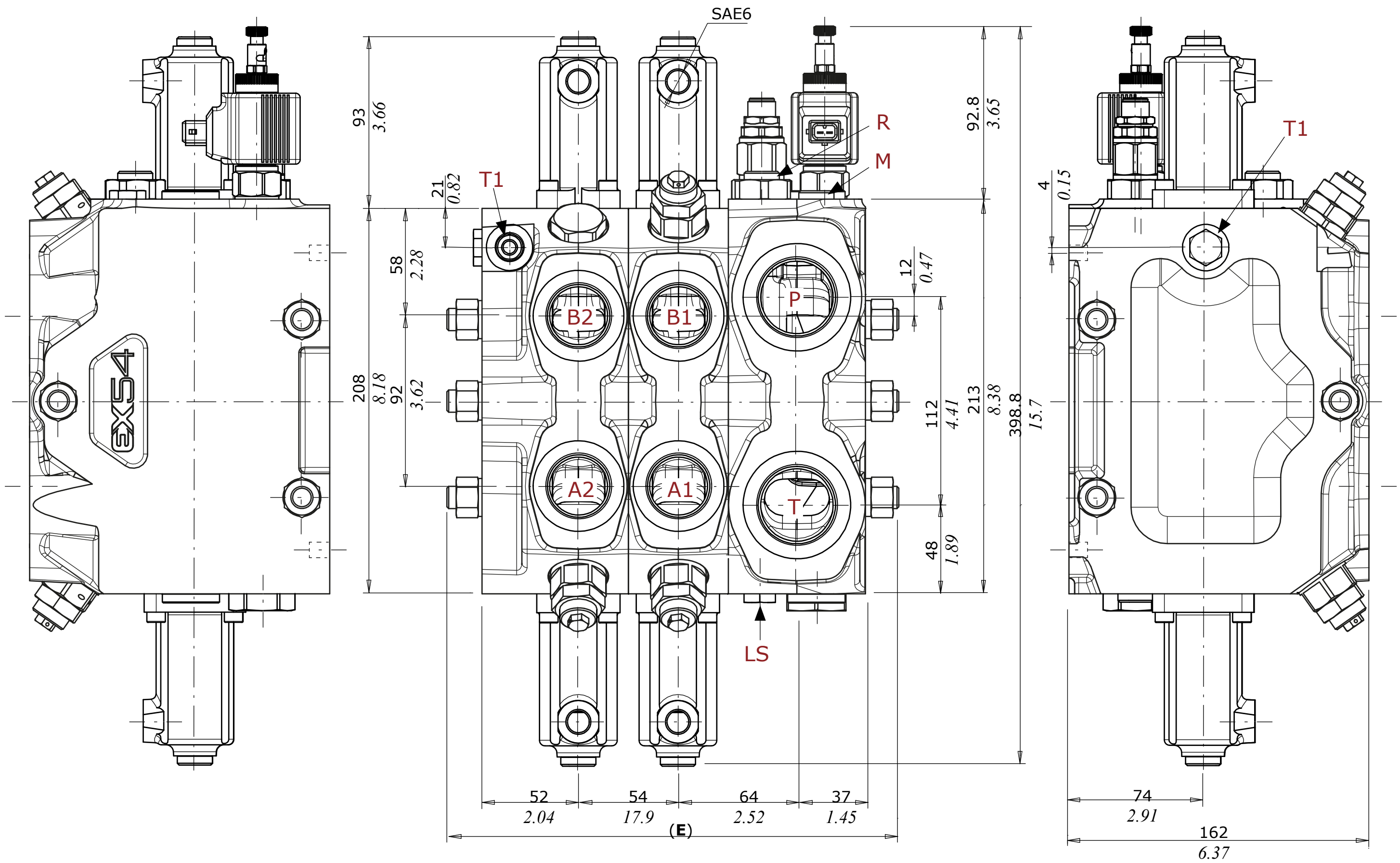


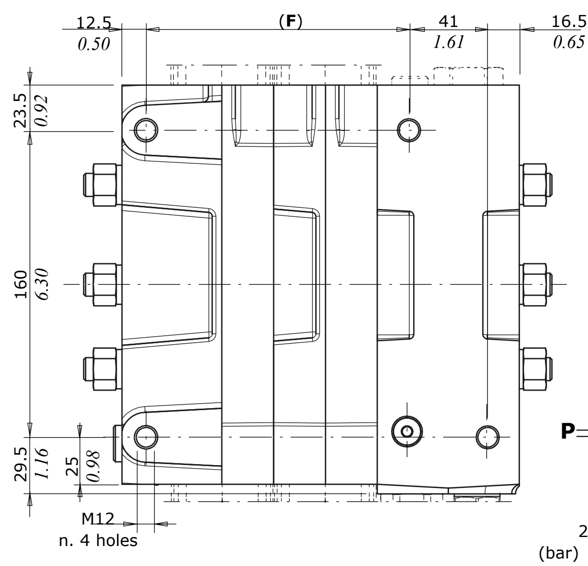
Content

- **EX54**

Dimensional data

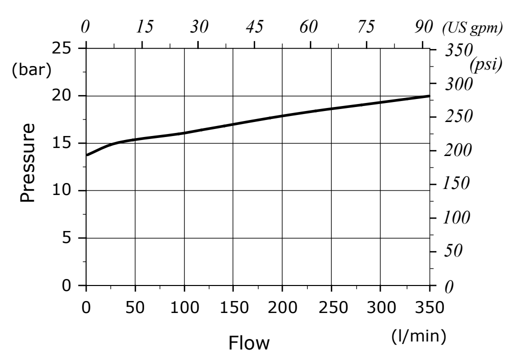
Hydraulic control configuration example





Type	E	F	Type	E	F
	mm - *in*	mm - *in*		mm - *in*	mm - *in*
EX54/1	192 - *7.56*	83 - *3.26*	**EX54/5**	408 - *16.06*	299 - *11.77*
EX54/2	246 - *9.68*	137 - *5.39*	**EX54/6**	462 - *18.18*	353 - *13.90*
EX54/3	300 - *11.8*	191 - *7.52*	**EX54/7**	516 - *20.31*	407 - *16.02*
EX54/4	354 - *13.9*	245 - *9.64*	**EX54/8**	570 - *22.44*	461 - *18.15*

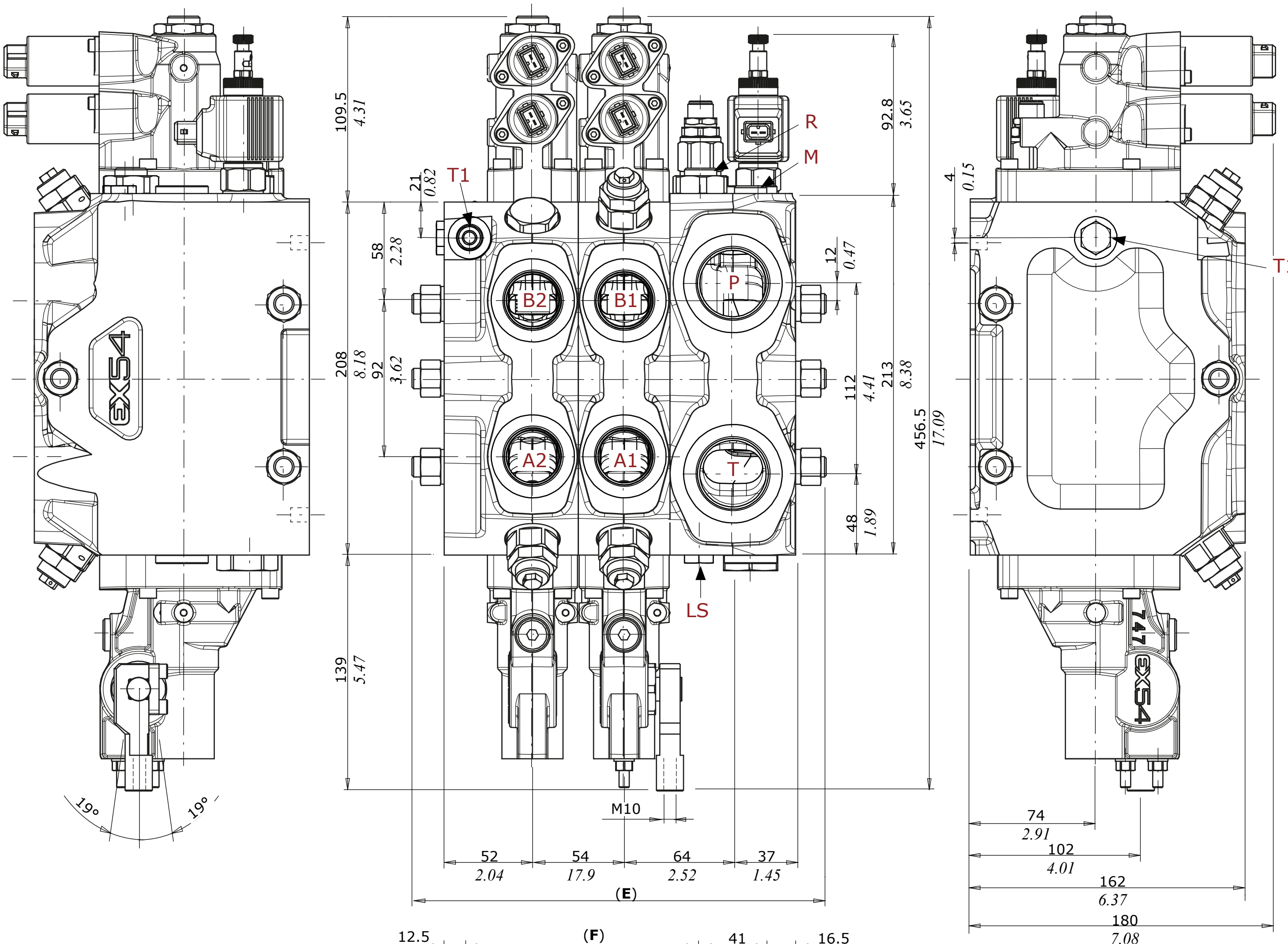
P⇒T Pressure drop inlet compensator (margin pressure)

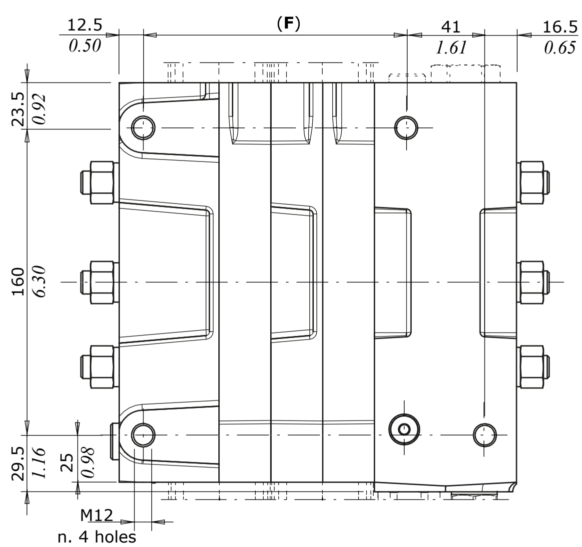


NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Dimensional data

Two-side electrohydraulic control configuration example

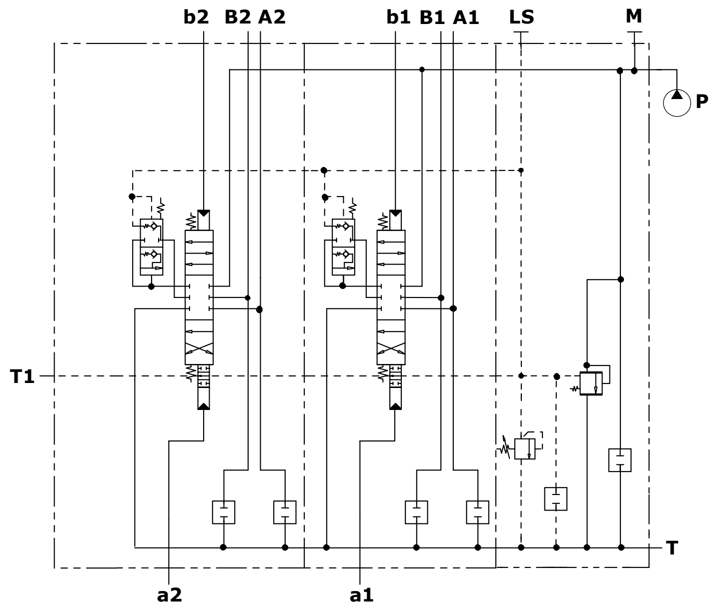




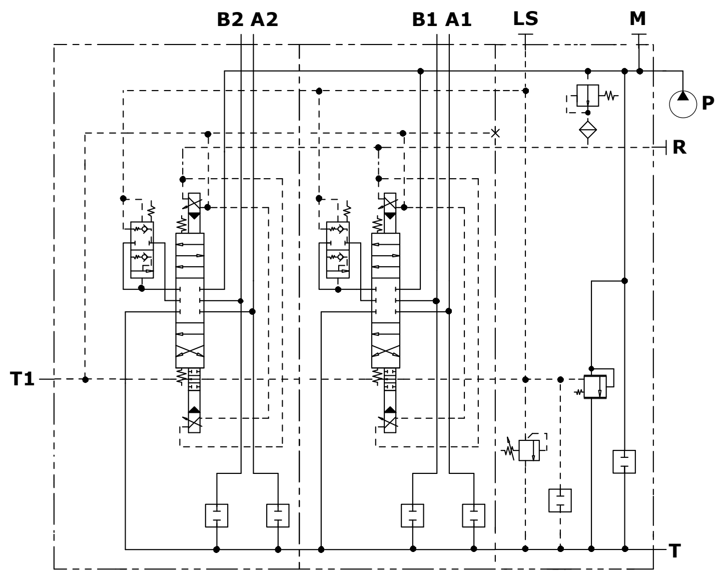
Type	E mm - *in*	F mm - *in*
EX54/1	192 - *7.56*	83 - *3.26*
EX54/2	246 - *9.68*	137 - *5.39*
EX54/3	300 - *11.8*	191 - *7.52*
EX54/4	354 - *13.9*	245 - *9.64*
EX54/5	408 - *16.06*	299 - *11.77*
EX54/6	462 - *18.18*	353 - *13.90*
EX54/7	516 - *20.31*	407 - *16.02*
EX54/8	570 - *22.44*	461 - *18.15*

NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Hydraulic circuits



Right Inlet valve with hydraulic controls configuration (Fixed displacement pump):
EX54/2/MR-V1A(200)-V4B-V10C-KV-U07/
W001C(250\250)-HP05A-RC1-U06.05PA\05PB/
W001C(250\250)-HP05A-RCK1A-U06.05PA\05PB



Right Inlet valve with two-side electrohydraulic controls configuration (Fixed displacement pump):
EX54/2/MR-V1A(200)-V4B-V10C-KVR-U07/
W001C(250\250)-HP07-FP04-B12AJ-RC1-U06.05PA\05PB/
W001C(250\250)-HP07-FP04-B12AJ-RCK1A-U06.05PA\05PB

Complete section ordering codes

Hydraulic control valve configuration example - Right Inlet

Working sections | Right Inlet

1 **EX54/2/MR-V1A(200)-V4B-V10C-KVU07/**

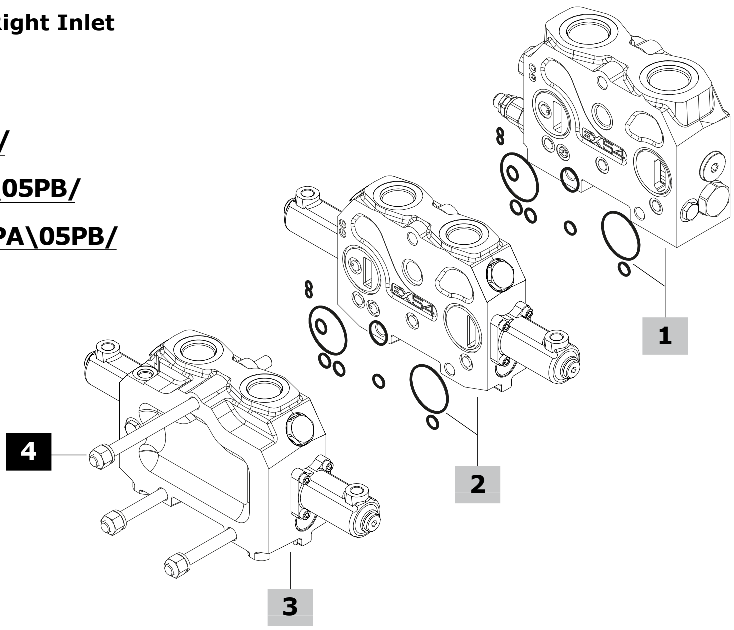
2 **W001C(250/250)-HP05A-RC1U06.05PA\05PB/**

3 **W001C(250/250)-HP05A-RCK1AU06.05PA\05PB/**

P006/2 N10

Painted with RAL 9005 black primer

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



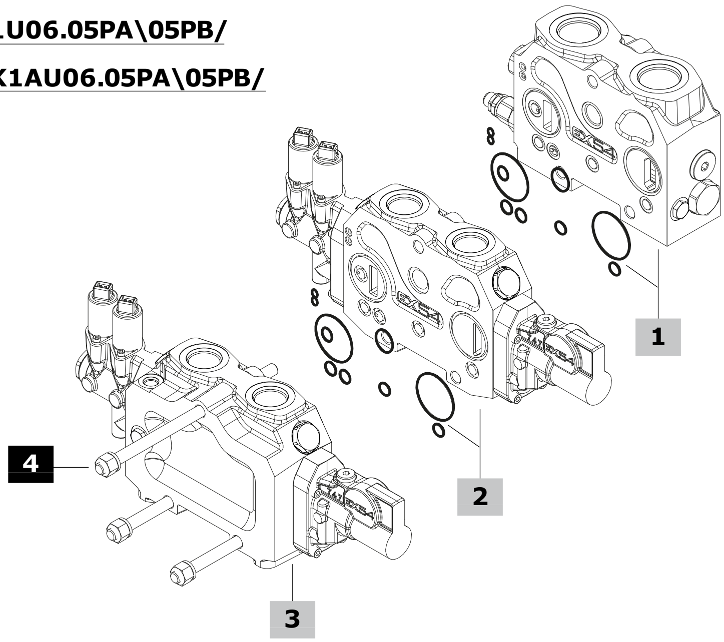
Two-side electrohydraulic control valve configuration example - Right Inlet

1 **EX54/2/MR-V1A(200)-V4B-V10C-KVU07/**

2 **W001C(250/250)-HP07-FP04-B12AJ-RC1U06.05PA\05PB/**

3 **W001C(250/250)-HP07-FP04-B12AJ-RCK1AU06.05PA\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-U07**
CODE: SHE540017
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-U07**
CODE: SHE540018
DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-KVR-U07**
CODE: SHE540019
DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-KVE-U07**
CODE: SHE540020
DESCRIPTION: As previous one for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **MR/V1A(200)-V4B-V10C-JV-U07**
CODE: SHE540021
DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C

TYPE: **MR/V1A(200)-V4B-V10C-JVR-U07**
CODE: SHE540022
DESCRIPTION: As previous one with pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V10C-JVE-U07**
CODE: SHE540023
DESCRIPTION: As previous one for external pressure reducing valve

TYPE: **MR/V1A(200)-V4B-V11C(C12AJ)-JVR-U07**
CODE: SHE540024
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-U06-05PA-05PB**
CODE: SHL540029
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-U06-04PA(150)-04PB(150)**
CODE: SHL540030
DESCRIPTION: As previous one with pilot combined valves

With proportional hydraulic controls

TYPE: **SD/W001C(250\250)-HP05A-RC1-U06-05PA-05PB**
CODE: SHL540031
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-U06-04PA(150)-04PB(150)**
CODE: SHL540032
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-U06-05PA-05PB**
CODE: SHL540025
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-U06-04PA(150)-04PB(150)**
CODE: SHL540026
DESCRIPTION: As previous one with pilot combined valves

TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-U06-05PA-05PB**
CODE: SHL540027
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-U06-04PA(150)-04PB(150)**
CODE: SHL540028
DESCRIPTION: As previous one with pilot combined valves

3 Integrated end sections*

With mechanical controls

TYPE: **SD/W001C(250\250)-H001-F001A-RCK1A-U06-05PA-05PB**
CODE: SHU540008
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-U06-05PA-05PB**
CODE: SHU540009
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-U06-05PA-05PB**
CODE: SHL540010
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 **UN-UNF** thread

Part ordering codes

Valve positions

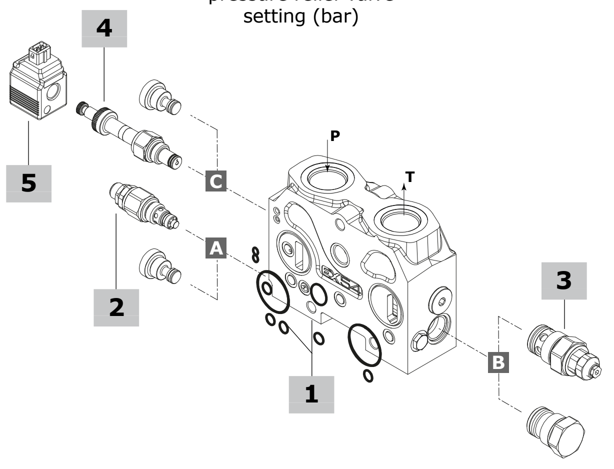
EX54 / MR - V1 A (200) - V4 B - V11 C - C12AJ - KV-U07

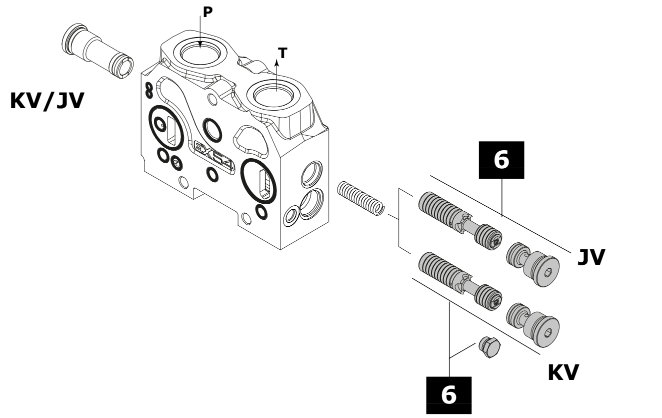
Right Inlet | 2 | 3 | 4 | 5 | 1

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 U07** - SAE20 ports CODE: 029800002
KV S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port . .
CODE: 029800004
DESCRIPTION: For fixed displacement pumps, internal LS and without pressure reducing valve

TYPE: **KVR U07** - SAE20 ports CODE: 029800022
KVR S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port . .
CODE: 029800024
DESCRIPTION: For fixed displacement pumps, internal LS with pressure reducing valve

TYPE: **KVE U07** - SAE20 ports CODE: 029800042
KVE S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port . .
CODE: 029800044
DESCRIPTION: For fixed displacement pumps, internal LS, for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **JV U07** - SAE20 ports CODE: 029800012
JV S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port
CODE: 029800014
DESCRIPTION: For variable displacement pumps, external LS and without pressure reducing valve

TYPE: **JVR U07** - SAE20 ports CODE: 029800032
JVR S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port . .
CODE: 029800034
DESCRIPTION: For variable displacement pumps, external LS with pressure reducing valve

TYPE: **JVE U07** - SAE20 ports CODE: 029800052
JVE S36 - SAEJ518 type 2 flange connection - P port
SAEJ518 type 1 flange connection - T port . .
CODE: 029800054
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

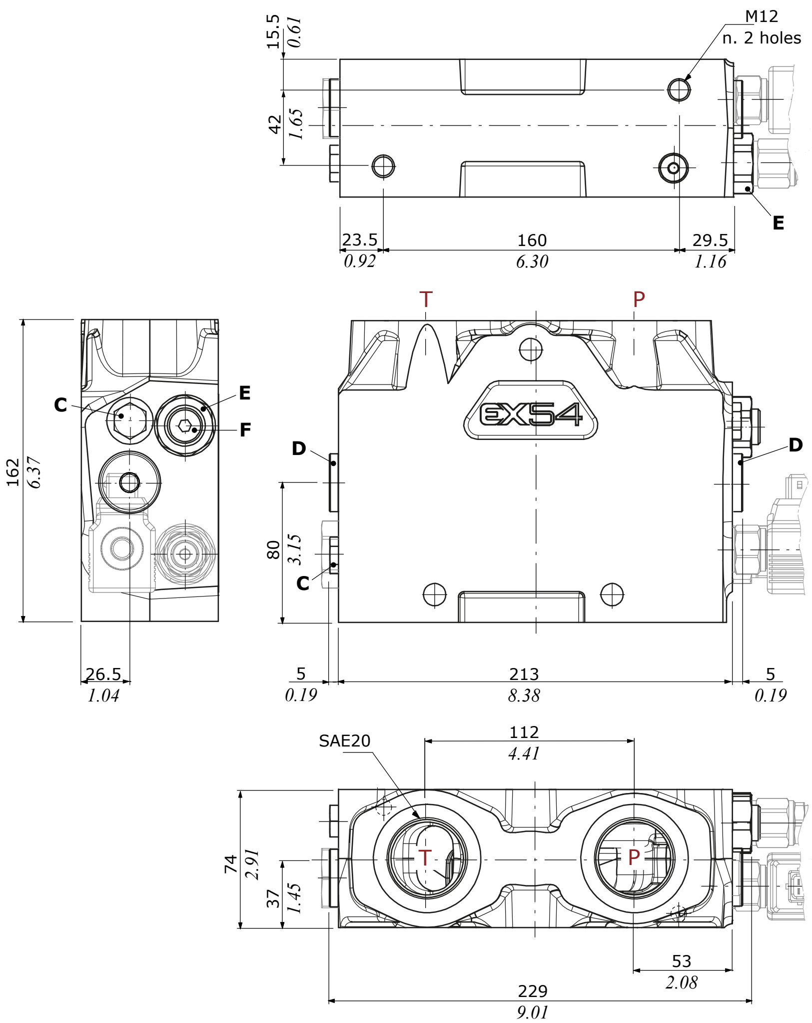
6 Trasformation kit page 90

TYPE	CODE	DESCRIPTION
KV kit	320098015[1]	Trasformation kit, from JV (closed center) to KV (open center)
JV kit	320098006	Trasformation kit, from KV (open center) to JV (closed center)

NOTE (*): Codes are referred to **UN-UNF-UNC** thread
([1]): Codes are referred to **UN-UNF** thread

Dimensional data and hydraulic circuits

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

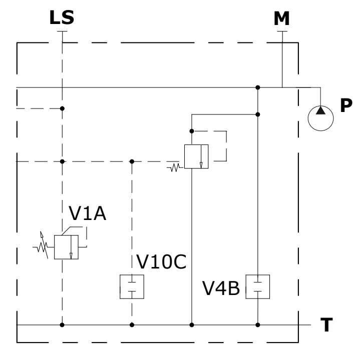


Wrenches and tightening torques

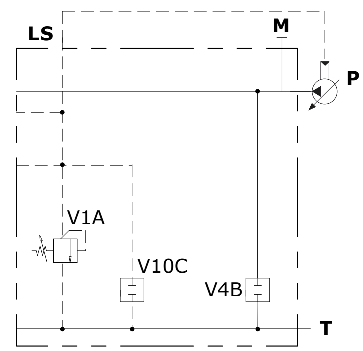
C = wrench 17 - 45 Nm *(33.2 lbft)*
D = allen wrench 8 - 65 Nm *(48 lbft)*
E = wrench 30 - 65 Nm *(48 lbft)*
F = allen wrench 6 - 30 Nm *(22 lbft)*

NOTE: for valves wrench and torque, see related pages

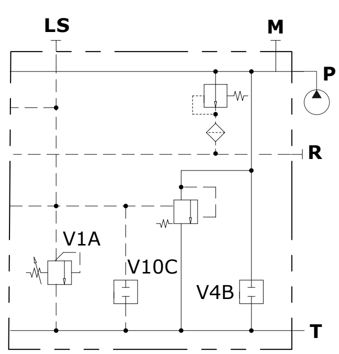
KV Open Center (example)



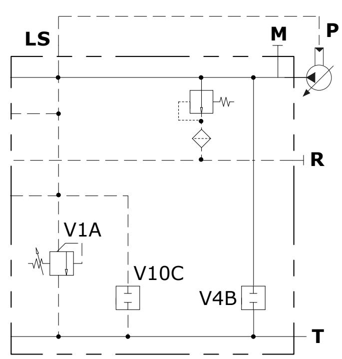
JV Closed Center (example)



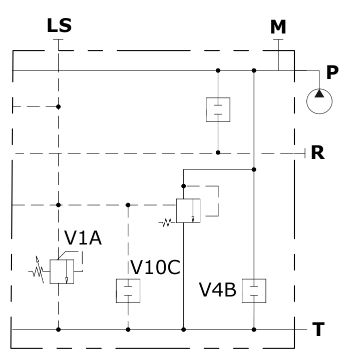
KVR Open Center
with pressure reducing valve
(example)



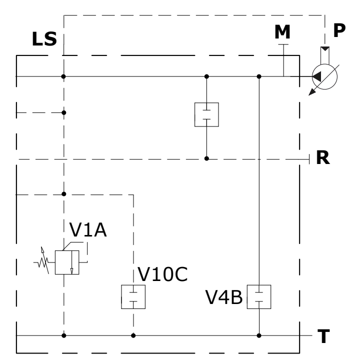
JVR Closed Center
with pressure reducing valve
(example)



KVE Open Center
for external pressure
reducing valve (example)



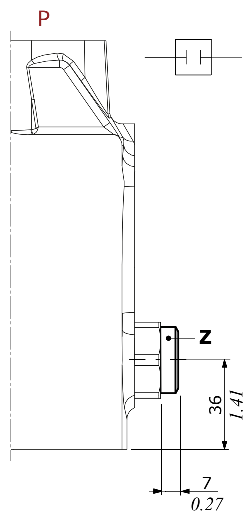
JVE Closed Center
for external pressure
reducing valve (example)



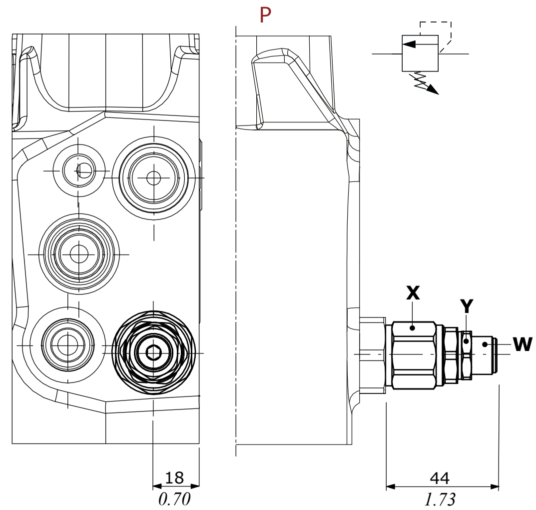
Inlet valves

Valves on position A

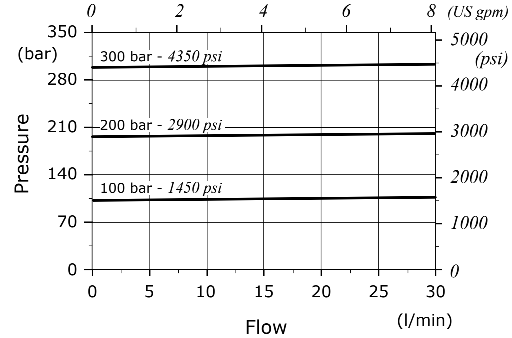
V2A type
Valve blanking plug



V1A type
LS pressure relief valve



LS relief valve characteristics

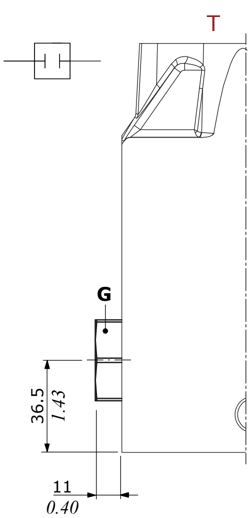


Wrenches and tightening torque

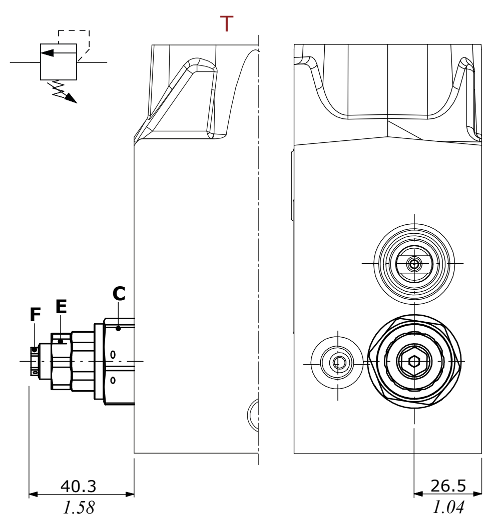
X = wrench 24 - 45 Nm *(33 lbft)*
Y = wrench 19 - 30 Nm *(22 lbft)*
W = allen wrench 5
Z = allen wrench 8 - 30 Nm *(22 lbft)*

Valves on position B

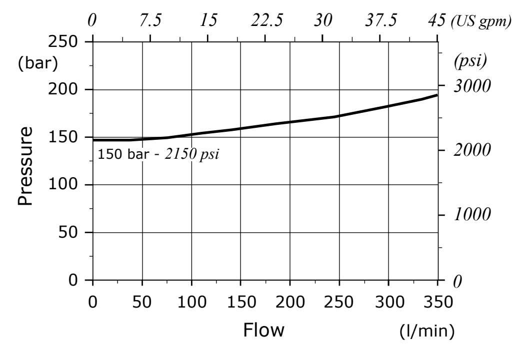
V4B type
Valve blanking plug



V3B type
Full Flow direct relief valve



Full Flow relief valve characteristics



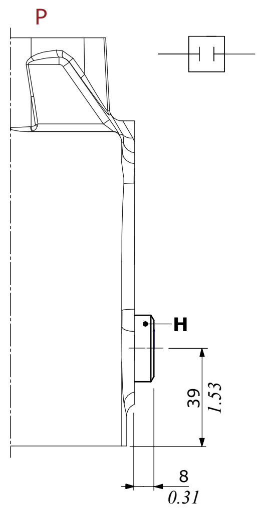
Wrenches and tightening torque

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)*

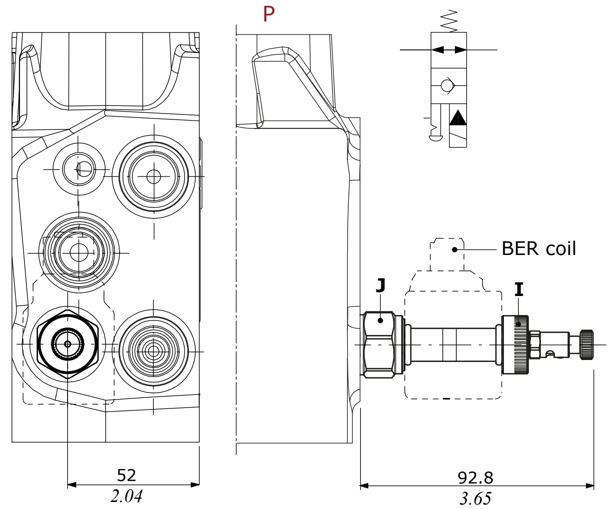
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



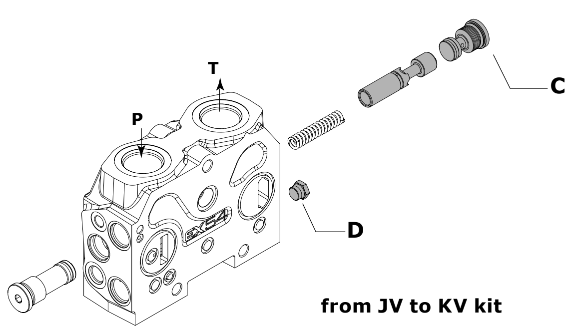
Wrenches and tightening torques
H = allen wrench 8 - 30 Nm *(22 lbft)*
J = wrench 24 - 30 Nm *(22 lbft)*
I = manual tightening

For **BER** type coils see page 136

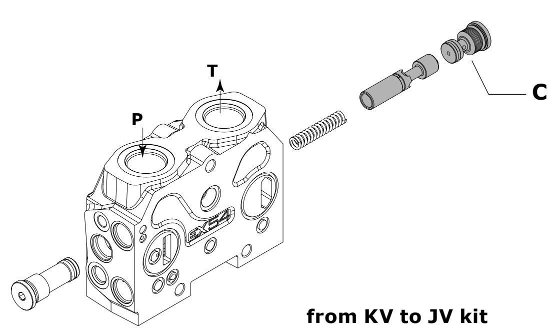
NOTES:
Valve types V1A and V3B require factory setting (example: V1A - 150)
Valve combination V1A - V3B requires double setting (example: 200*240); the minimun difference between settings is 40 bar - *580 psi*
Valve type V11C requires coil kit type (example: C12AJ)

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 320098015, from JV to KV kit
code 320098006, from KV to JV kit



from JV to KV kit



from KV to JV kit

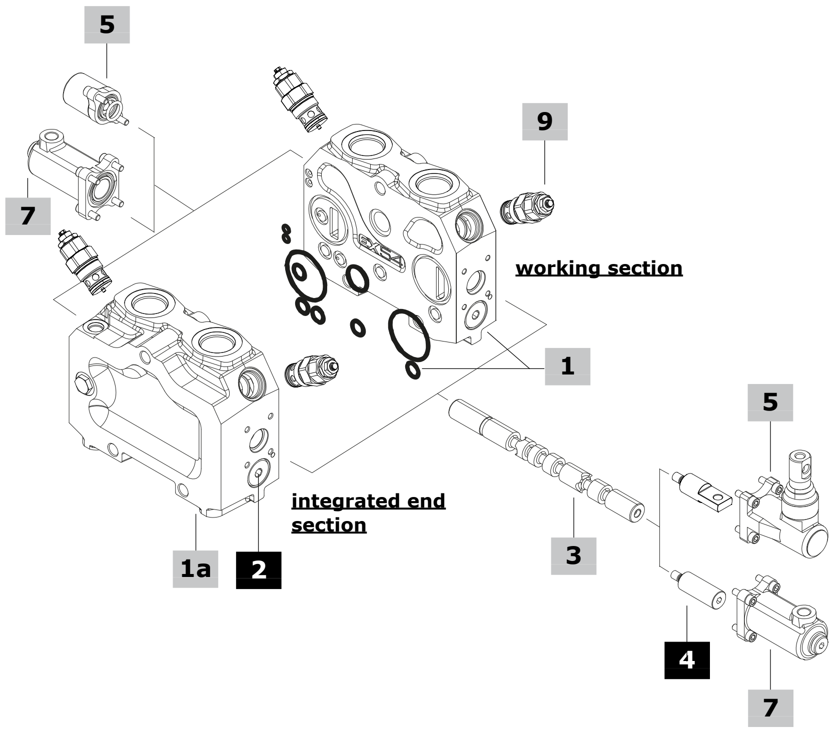
Wrenches and tightening torques
C = allen wrench 8 - 65 Nm *(48 lbft)*
D = wrench 17 - 45 Nm *(33.2 lbft)*

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 properely 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-U06 . 04-PA(150)\04-PB(150)

1 9

Working section with prop. hydraulic control

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

7

RC1-U06 . 04-PA(150)\04-PB(150)

Integrated end section with mechanical control

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

RCK1A-U06 . 04-PA(150)\04-PB(150)

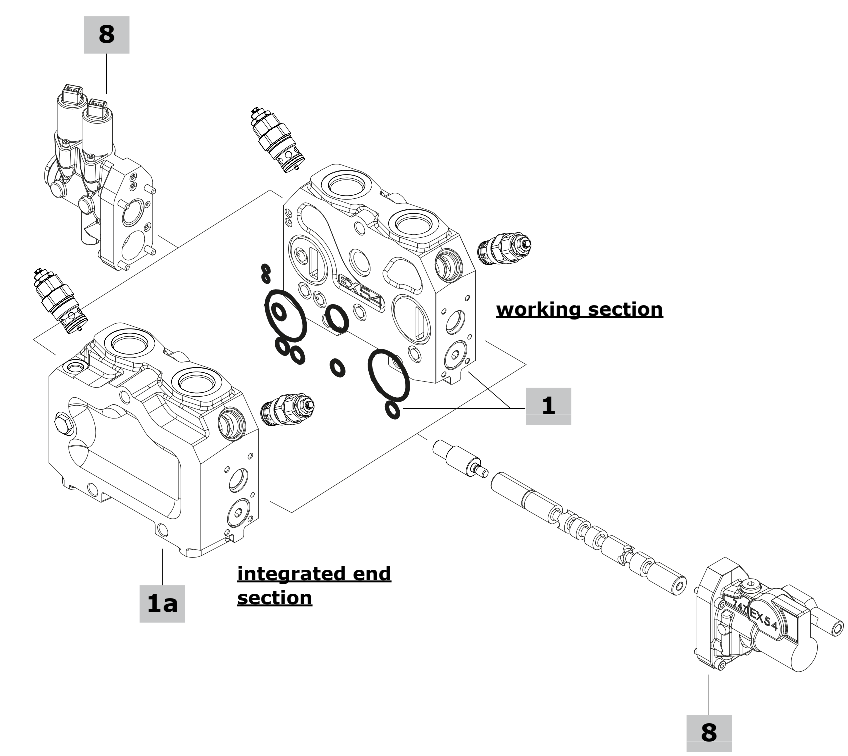
1a

Integrated end section with prop. hydraulic control

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

RCK1A-U06 . 04-PA(150)\04-PB(150)

1a



Working section with electrohydraulic control

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

8 8

B12AJ - RC1-U06 . 04-PA(150)\04-PB(150)

8 1

Integrated end section, with electrohydraulic control

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

B12AJ - RCK1A-U06 . 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 U06	039800002	SAE16 ports
RC1 S04	039800004	SAEJ518 type 1 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCS1 U06	039800022	SAE16 ports
RCS1 S04	039800024	SAEJ518 type 1 flange connection ports
For hydraulic and electrohydraulic controls		
Standard section, with port valves arrangement:		
RC1 U06	039800102	SAE16 ports
RC1 S04	039800104	SAEJ518 type 1 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCS1 U06	039800122	SAE16 ports
RCS1 S04	039800124	SAEJ518 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 U06	039800202	SAE6 upper T1 drain, SAE16 ports
RCK1A S04	039800204	SAE6 upper T1 drain, SAEJ518 type 1 flange connection ports
RCK1C U06	039800206	SAE6 side T1 drain, SAE16 ports
RCK1C S04	039800208	SAE6 side T1 drain, SAEJ518 type 1 flange connection ports
Section with additional port for remoted LS relief valve, with aux valves arrangement:		
RCSK1A U06	039800302	SAE6 upper T1 drain, SAE16 ports
RCSK1A S04	039800304	SAE6 upper T1 drain, SAEJ518 type 1 flange connection ports
RCSK1C U06	039800306	SAE6 side T1 drain, SAE16 ports
RCSK1C S04	039800308	SAE6 side T1 drain, SAEJ518 type 1 flange connection ports
For hydraulic and electrohydraulic controls		
Standard section, with port valves arrangement:		
RCK1A U06	039800232	SAE6 upper T1 drain, SAE16 ports
RCK1A S04	039800234	SAE6 upper T1 drain, SAEJ518 type 1 flange connection ports
RCK1C U06	039800236	SAE6 side T1 drain, SAE16 ports
RCK1C S04	039800238	SAE6 side T1 drain, SAEJ518 type 1 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCSK1A U06	039800332	SAE6 upper T1 drain, SAE16 ports
RCSK1A S04	039800334	SAE6 upper T1 drain, SAEJ518 type 1 flange connection ports
RCSK1C U06	039800336	SAE6 side T1 drain, SAE16 ports
RCSK1C S04	039800338	SAE6 side T1 drain, SAEJ518 type 1 flange connection ports
Standard section with P1 port and port valves arrangement:		
RCP1A U06	039800262	SAE6 upper T1 drain, A and B SAE16 ports, side P1 inlet SAE20 port
RCP1A S04	039800266	SAE6 upper T1 drain, A and B SAEJ518 type 1 and side P1 SAEJ518 type 2 flange connection ports
RCP1C U06	039800264	SAE6 side T1 drain, A and B SAE16 ports, side P1 inlet SAE20 port
RCP1C S04	039800268	SAE6 side T1 drain, A and B SAEJ518 type 1 and side P1 SAEJ518 type 2 flange connection ports

NOTE (*): Codes are referred to **UN-UNF-UNC** thread
(1): Codes are referred to **UN-UNF** 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 U06	039800292	SAE6 upper T1 drain, A and B SAE16 ports, side P1 inlet SAE20 port
RCSP1A S04	039800296	SAE6 upper T1 drain, A and B SAEJ518 type 1 and side P1 SAEJ518 type 2 flange connection ports
RCSP1C U06	039800294	SAE6 side T1 drain, A and B SAE16 ports, side P1 inlet SAE20 port
RCSP1C S04	039800298	SAE6 upper T1 drain, A and B SAEJ518 type 1 and side P1 SAEJ518 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	430098007(1)	Additional SAE6 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 simmetric 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. Spring return in neutral position
F001B	320798002	3 pos., soft spring type B. Spring return in neutral position
F001ASD	320098013	3 pos., std. spring type A. With digital SPSD spool position sensor
F001BSD	320098014	3 pos., soft spring type B. With digital SPSD spool position sensor
F001ASL	320098011	3 pos., std. spring type A. With analog SPSL spool position sensor
F001BSL	320098012	3 pos., soft spring type B. With analog SPSL spool position sensor

Part ordering codes

6 Hydraulic controls* page 103

Please choose A+B side controls

TYPE	CODE	DESCRIPTION
"A" side controls:		
HP01	320598132	With lever
"B" side controls:		
FP01	320598133	Hydraulic control

7 Proportional hydraulic controls* page 107

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

TYPE	CODE	DESCRIPTION
HP05A	320598103	With SAE6 upper ports
HP05C	320598109	With SAE6 side ports
HP05L	320598115	With SAE6 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 SPSD spool position sensor, 12VDC, AMP JPT connector
	322598134	Digital SPSD spool position sensor, 24VDC, AMP JPT connector
	322598135	Digital SPSD spool position sensor, 12VDC, DEUTSCH DT connector
	322598136	Digital SPSD spool position sensor, 24VDC, DEUTSCH DT connector
FP04SL	322598129	Analog SPSL spool position sensor, 12VDC, AMP JPT connector
	322598130	Analog SPSL spool position sensor, 24VDC, AMP JPT connector
	322598131	Analog SPSL spool position sensor, 12VDC, DEUTSCH DT connector
	322598132	Analog SPSL 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)**

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

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)*

Pilot combined valve (example of setting):

TYPE: **04PA/PB(250)**

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

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)*

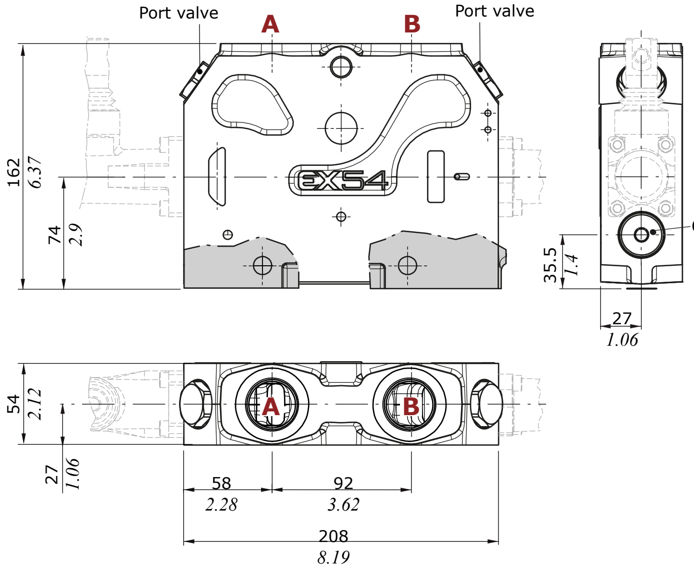
NOTE:
Always indicate setting value when using fixed setting combined valve: 04PA (120) - 04PB (120).

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

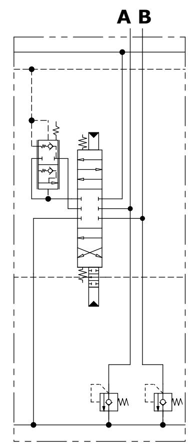
Dimensional data and hydraulic circuits

Post-compensated section

RC1 type
Standard section with port valves arrangement

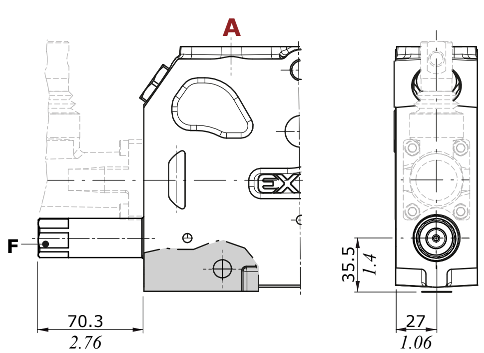


RC1
Hydraulic control
with port valves

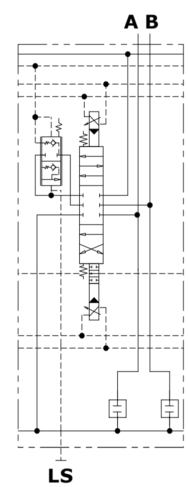


Wrenches and tightening torques
C = allen wrench 8 - 65 Nm *(48 lbft)*
F = wrench 24 - 55 Nm *(40.5 lbft)*

RCS1 type
With additional SAE6 port for remoted LS relief valve, and port valves arrangement



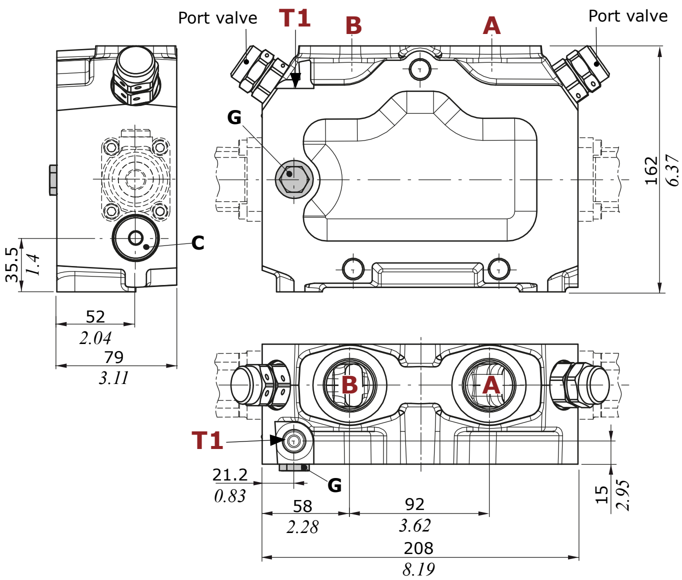
RCS1
Electrohydraulic control
with port valves and
additional SAE6 port for remoted
LS relief valve



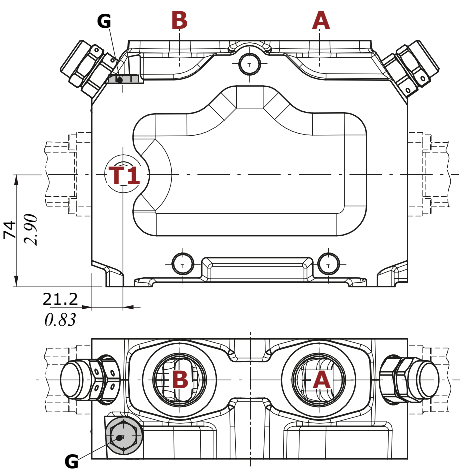
Dimensional data

Integrated end sections

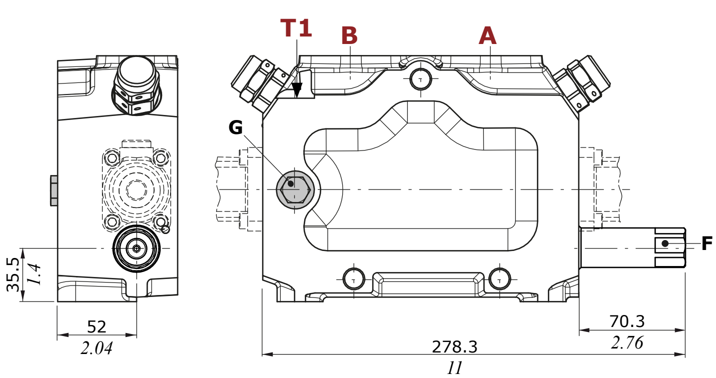
RCK1A type
Standard section with upper T1 drain
and port valves arrangement



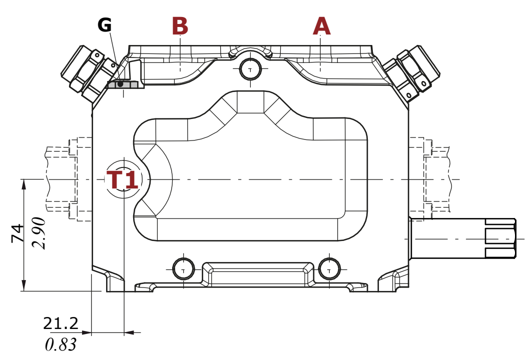
RCK1C type
Standard section with side T1 drain
and port valves arrangement



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

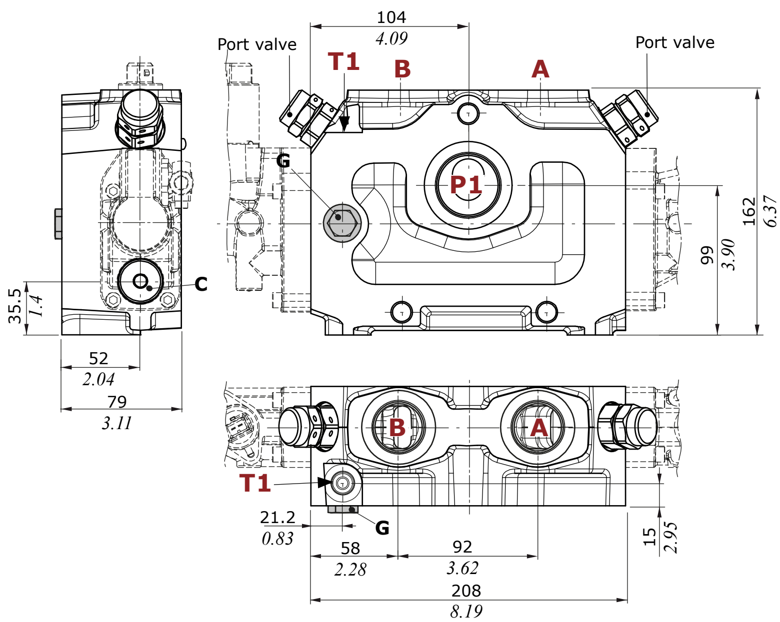


Wrenches and tightening torques
C = allen wrench 8 - 65 Nm *(48 lbft)*
F = wrench 24 - 55 Nm *(40.5 lbft)*
G = allen wrench 6 - 30 Nm *(22 lbft)*

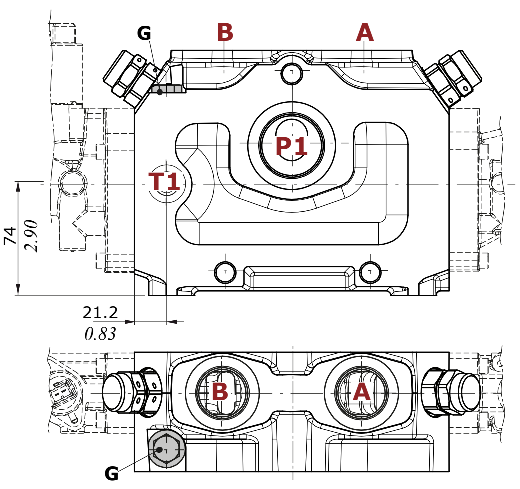
Dimensional data

Integrated end sections

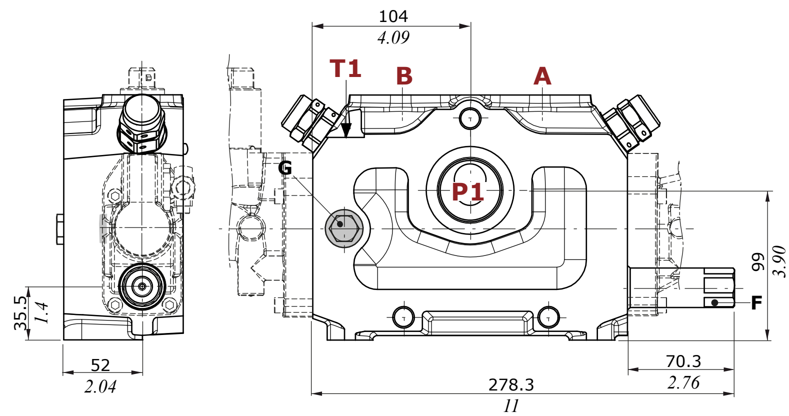
RCP1A type
Standard section with upper T1 drain,
side P1 inlet and port valves arrangement



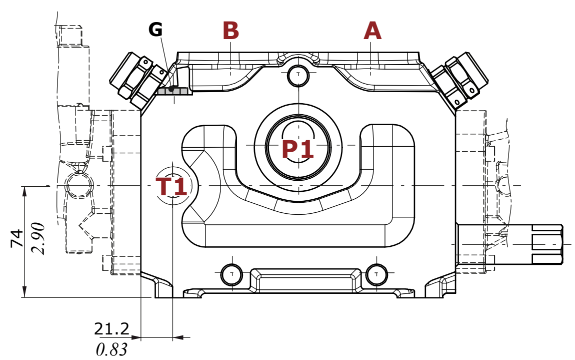
RCP1C type
Standard section with side T1 drain,
side P1 inlet and port valves arrangement



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

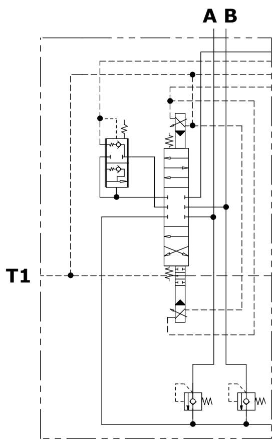


Wrenches and tightening torques
C = allen wrench 8 - 65 Nm *(48 lbft)*
F = wrench 24 - 55 Nm *(40.5 lbft)*
G = allen wrench 6 - 30 Nm *(22 lbft)*

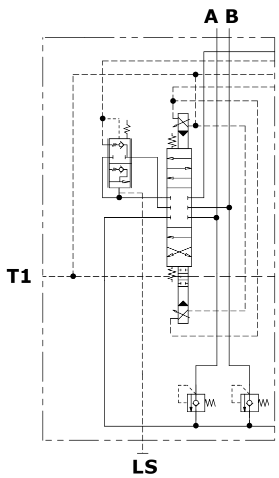
Hydraulic circuits

Integrated end sections

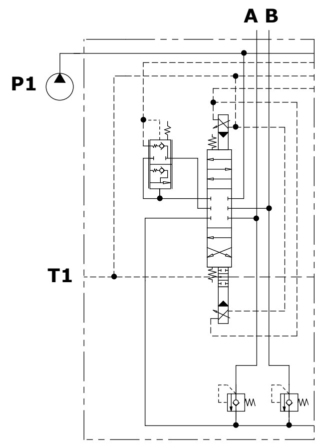
RCK1A - RCK1C
Electrohydraulic control
with port valves



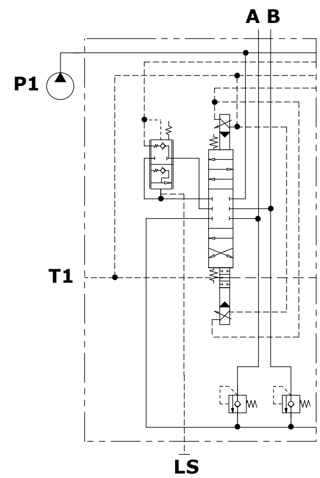
RCSK1A - RCSK1C
Electrohydraulic control
with port valves and additional
G1/4 port for remoted
LS relief valve



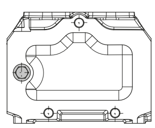
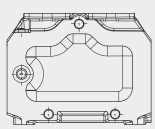
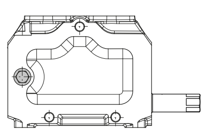
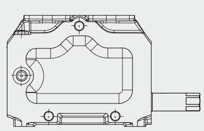
RCP1A - RCP1C
Electrohydraulic control
with port valves

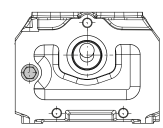
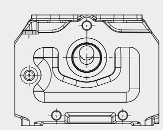
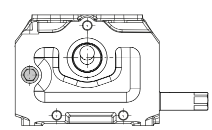
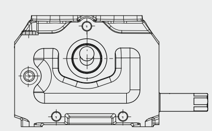


RCSP1A - RCSP1C
Electrohydraulic control
with port valves and additional
G1/4 port for remoted
LS relief valve



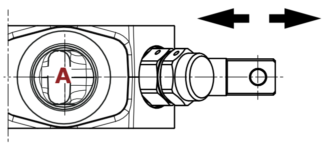
Port configurations

Types	T1 port (side)	T1 port (upper)	
RCK1A	plugged	open	
RCK1C	open	plugged	
RCSK1A	plugged	open	
RCSK1C	open	plugged	

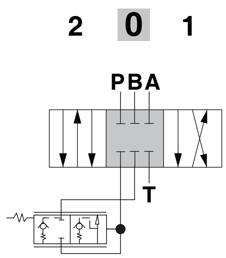
Types	T1 port (side)	T1 port (upper)	P1 port (side)	
RCP1A	plugged	open	open	
RCP1C	open	plugged	open	
RCSP1A	plugged	open	open	
RCSP1C	open	plugged	open	

Spools

Pos. 1 P->A **Pos. 2** P->B

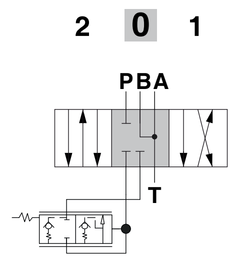


W001C type
A and B closed in
neutral position



Spool stroke
Position 1: + 9 mm *(+ 0.35 in)*
Position 2: - 9 mm *(- 0.35 in)*

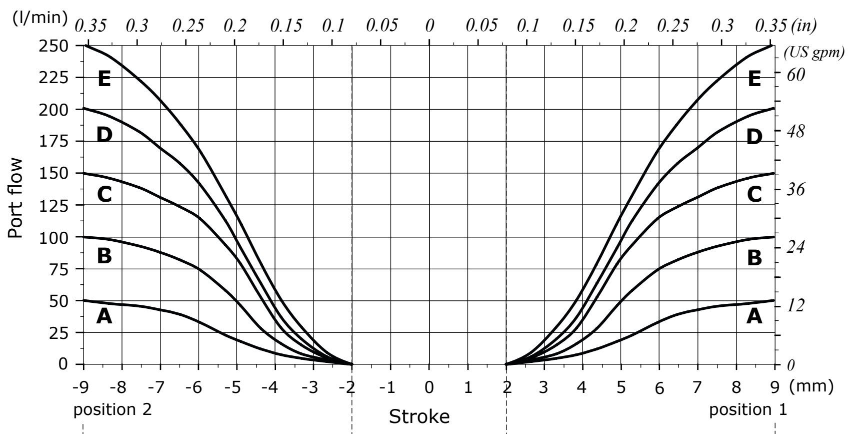
W002C type
A and B to tank
in neutral position



Spool stroke
Position 1: + 9 mm *(+ 0.35 in)*
Position 2: - 9 mm *(- 0.35 in)*

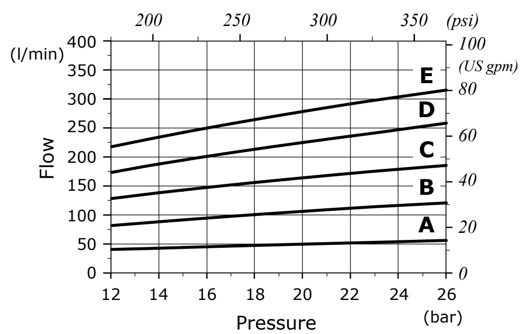
3 position spools metering curve

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



													Hydraulic control
20.8	18.4	16.1	13.7	11.4	**9.1**	0	**9.1**	11.4	13.7	16.1	18.4	**20.8**	(bar)
302	*266*	*233*	*198*	*165*	*132*		*132*	*165*	*198*	*233*	*266*	*302*	*(psi)*
1250	1140	1030	920	810	**700**	0	**700**	810	920	1030	1140	**1250**	(mA@12VDC)
625	570	515	460	405	**350**	0	**350**	405	460	515	570	**625**	(mA@24VDC)

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)*

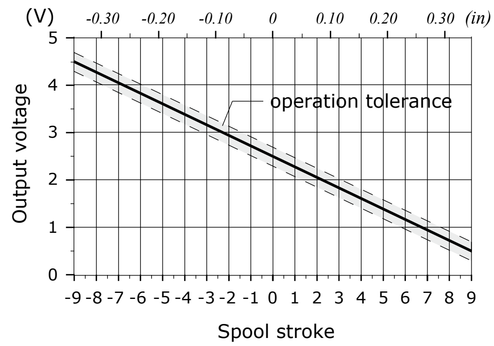
Spool position sensors

SPSL sensor

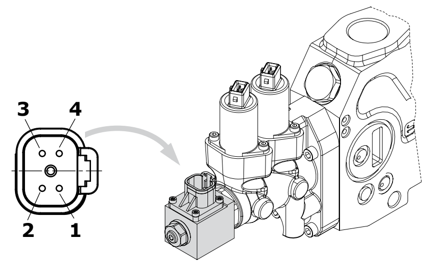
The SPSL position sensor converts the spool movements into a voltage linear signal.

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



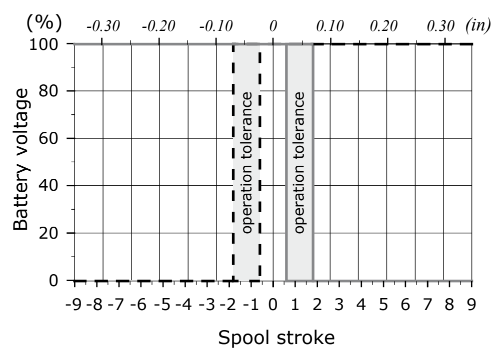
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

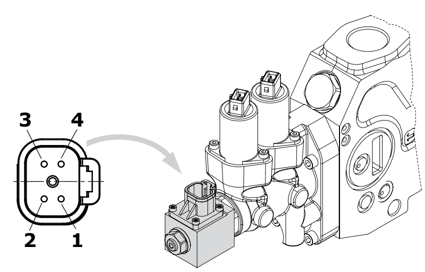
The SPSD position sensor converts the spool movements into an electric digital signal.

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

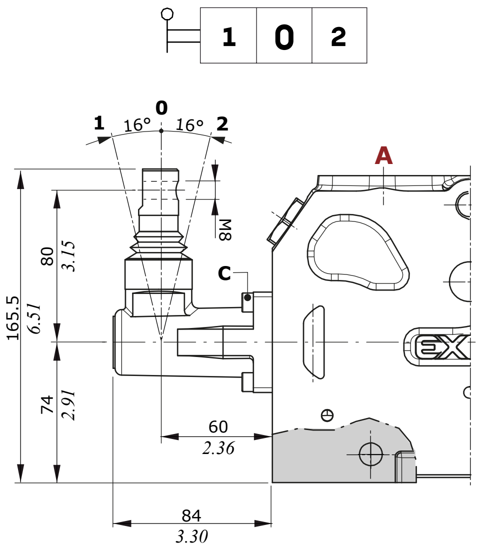
A and B side controls

Mechanical controls

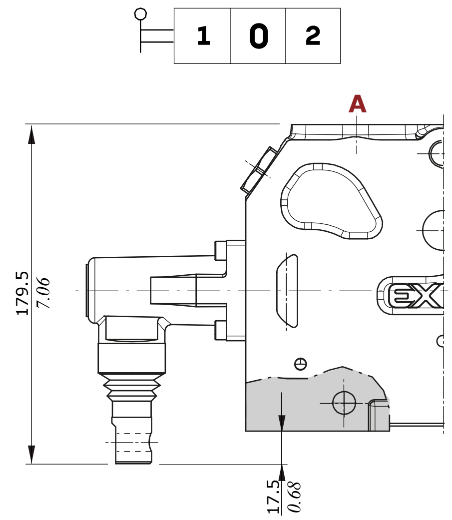
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

H001 type
With lever box

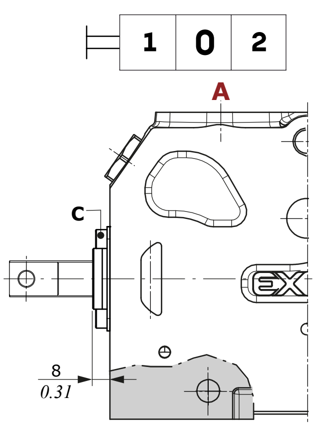


H002 type
With lever box, rotated 180°
Dimensions are the same of H001 type



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

H004 type
Without lever box



A and B side controls

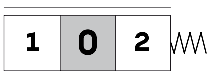
Mechanical controls

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

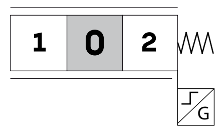
"B" side controls

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

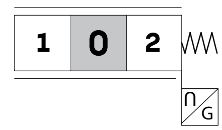
F001A - F001B types
With spring A or B,
return in neutral position

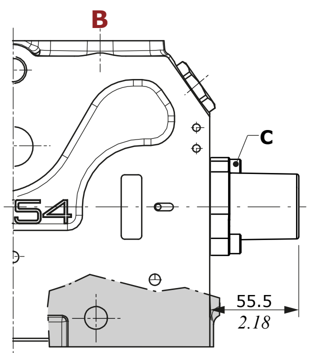


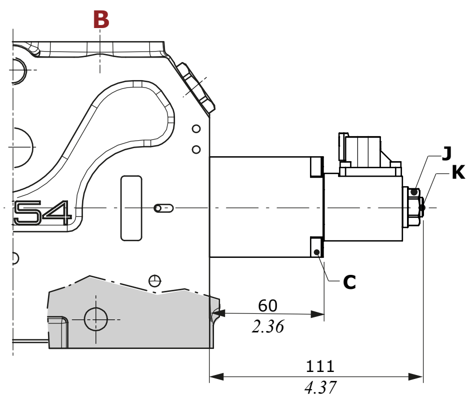
F001ASD/F001BSD types
With spring A or B,
digital SPSD spool position sensors



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

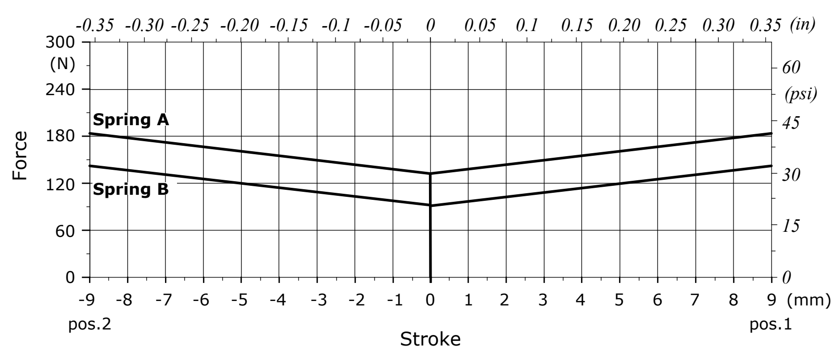






Note: for sensor types, see page 100

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 lbft)*
J = wrench 17 - 9.8 Nm *(7.2 lbft)*
K = allen wrench 4 - 9.8 Nm *(7.2 lbft)*

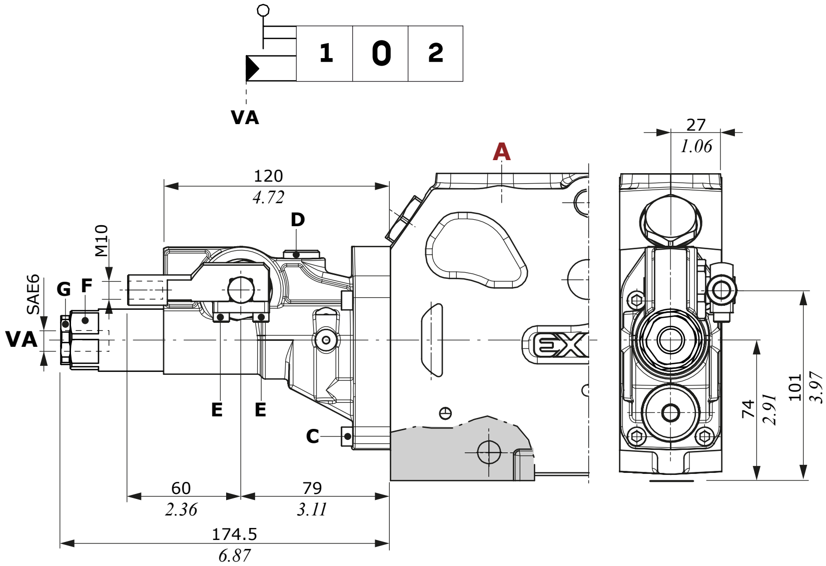
A and B side controls

Hydraulic controls

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

"A" side controls

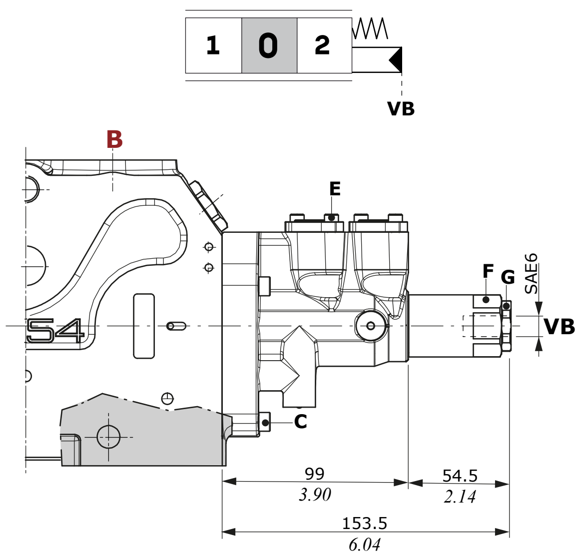
HP01 type
Proportional hydraulic control with lever



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



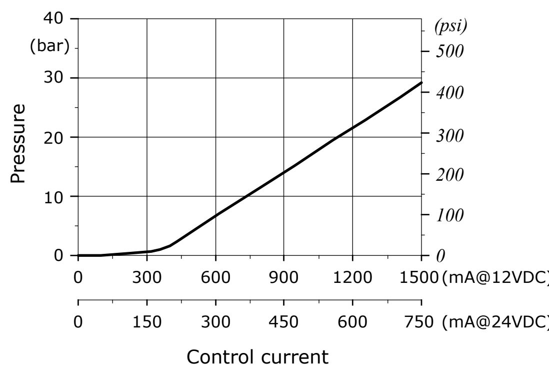
Proportional electrohydraulic control

Following specifications are measured with:
- mineral oil of 32 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.

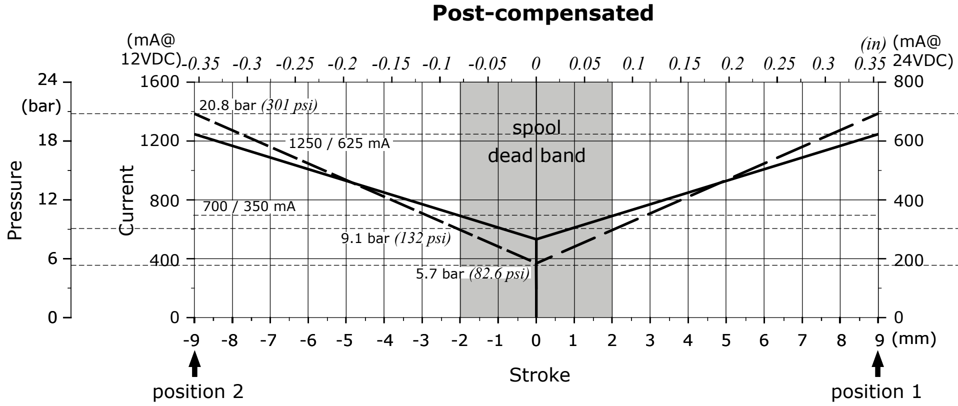
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

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 insulance		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



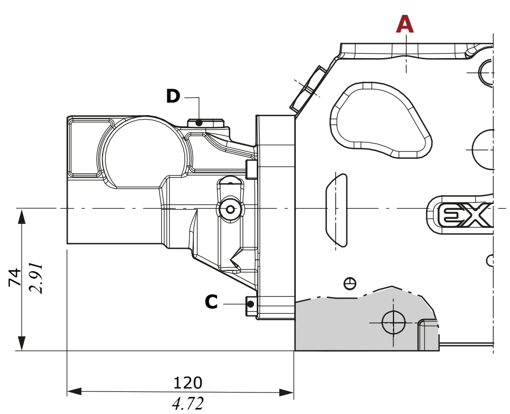
A and B side controls

Two-side electrohydraulic controls

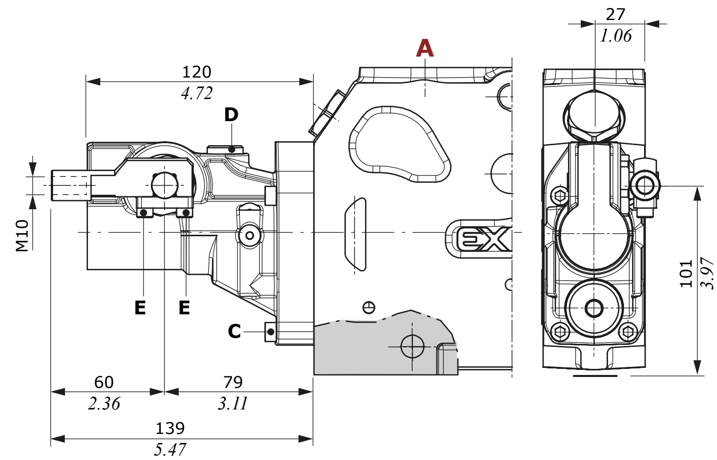
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

"A" side controls

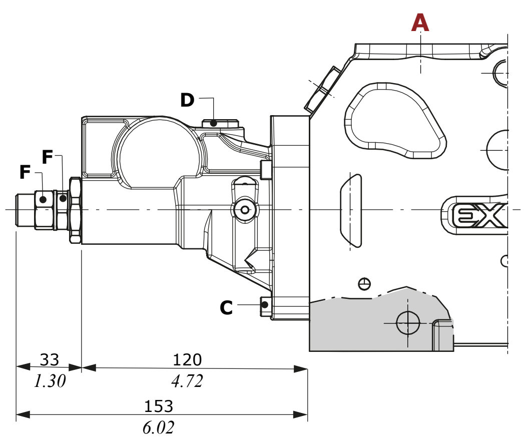
HP07 type
Without lever



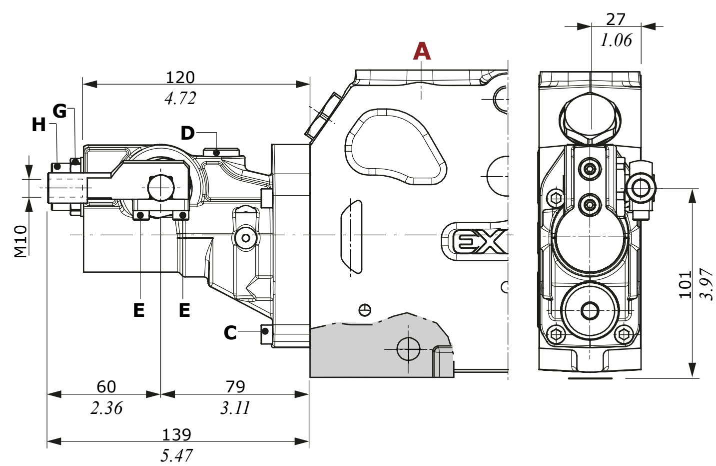
HP04 type
With lever



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 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)*
G = wrench 10 - 10 Nm *(7.37 lbft)*
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.

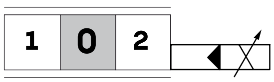
"B" side controls

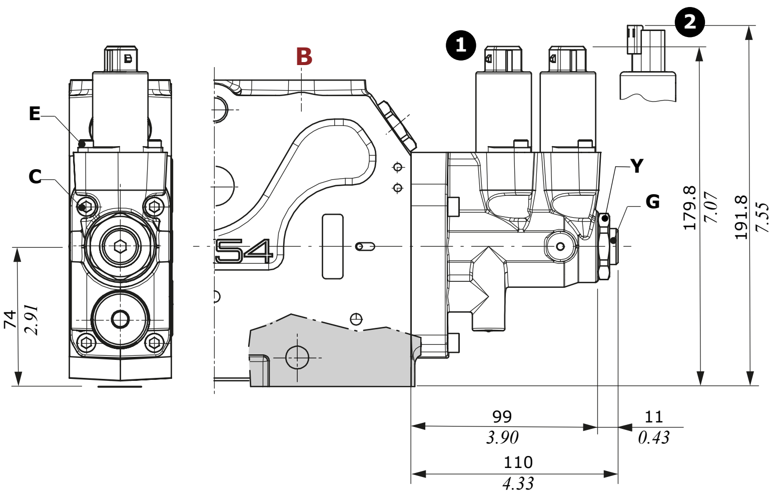
Control Types

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

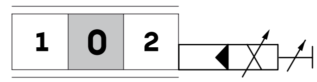
2: With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

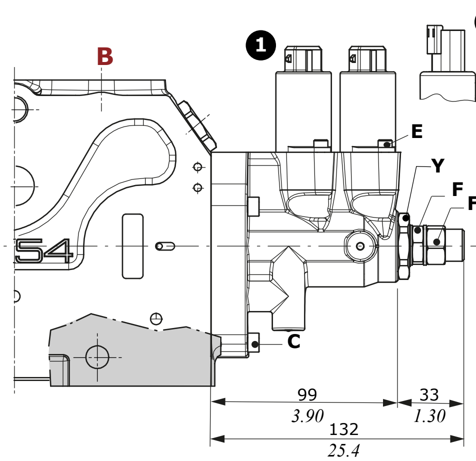
FP04 type
Electrohydraulic control



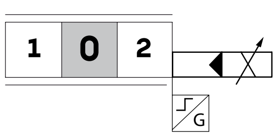


FP04L type
With stroke limiter

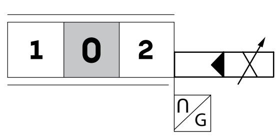


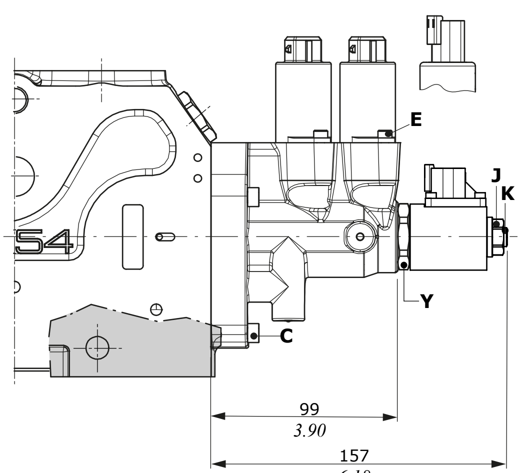


FP04SD type
With digital SPSD
spool position sensor



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

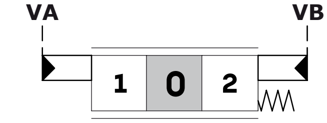
Hydraulic controls

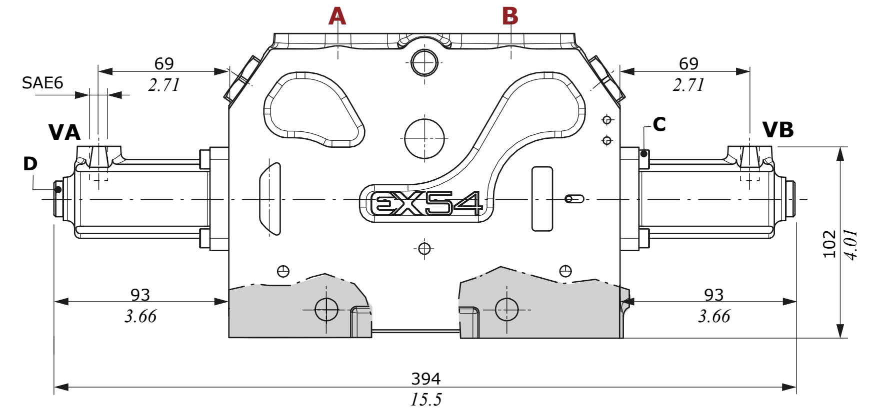
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

Proportional controls (A+B sides)

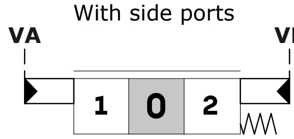
Controls are available with upper or side ports.

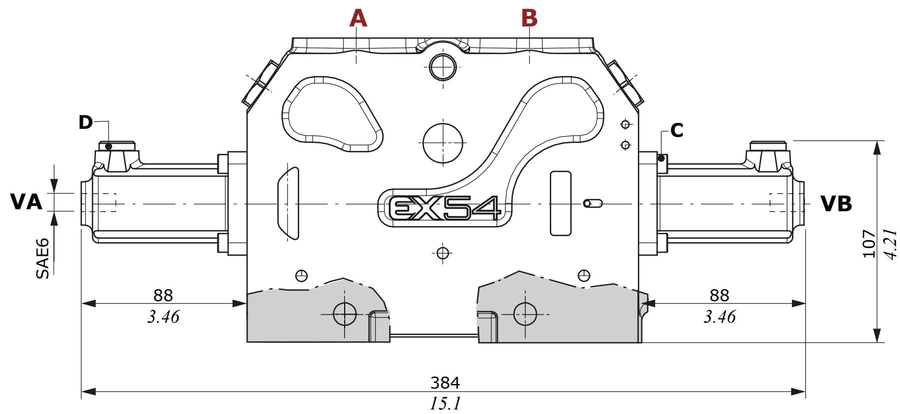
HP05A type
With upper ports



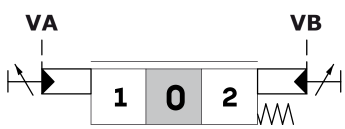


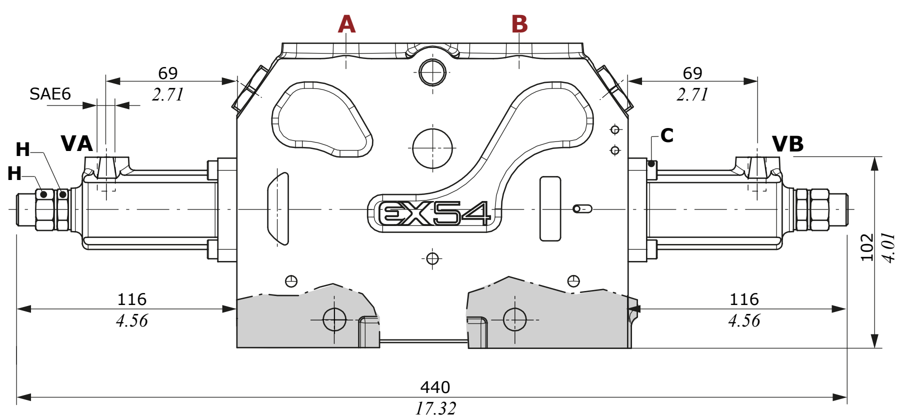
HP05C type
With side ports





HP05L type
With upper ports
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)*
H = wrench 19 - 15 Nm *(11 lbft)*

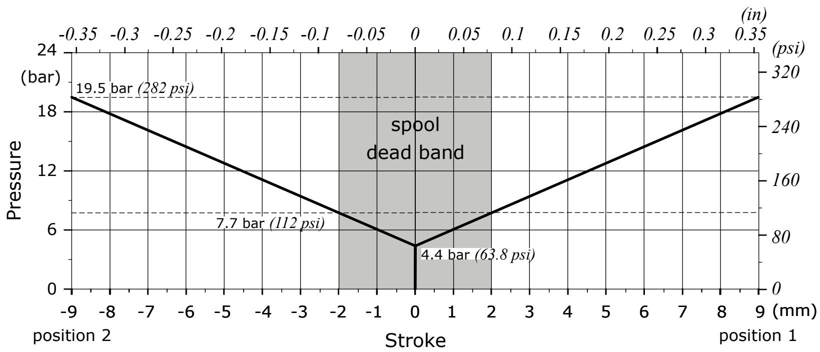
A and B side controls

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page

Stroke vs. Pressure diagram



Compatibility table

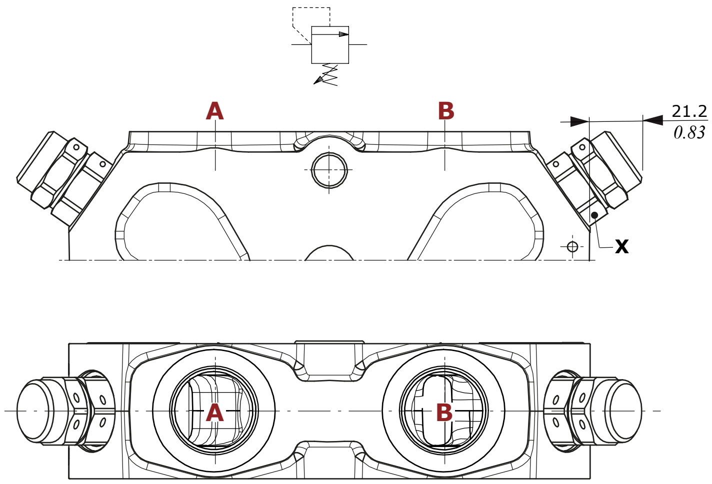
Combination controls and spool end kit		"A" side controls							
		H001 H002	H004	HP01	HP04	HP04L	HP07	HP07L	HP05
"B" side controls	F001A	422501289	422501289						
	F001B	422501289	422501289						
	F001ASL/SD	422501289	422501289						
	F001BSL/SD	422501289	422501289						
	FP01			422501240					
	FP04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

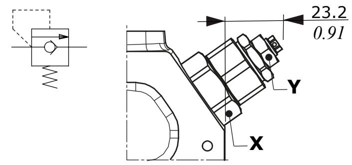
Port valves

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



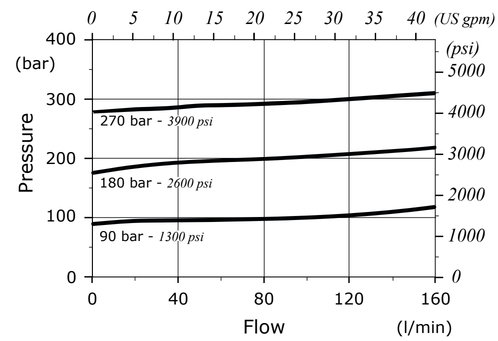
04 PA/PB type
Pilot combined valve



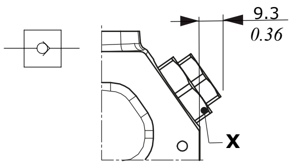
Type	setting ranges (bar - *psi*)	
	pressure @ 300 l/min *(79.2 US gpm)*	**pressure @ 5 l/min** *(1.3 US gpm)*
A	50/420 - *725/6090*	50-A/420-A - *725-A/6090-A*

Type	setting ranges (bar - *psi*)	
	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*

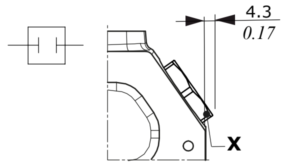
04 type
combined valves (antishock function)
(10 l/min - *2.6 US gpm*)



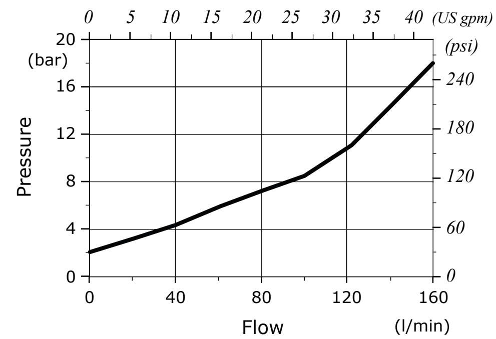
02 PA/PB type
Anticavitation valve



05 PA/PB type
Valve blanking plug



04 type
combined valves (anticavitation function)



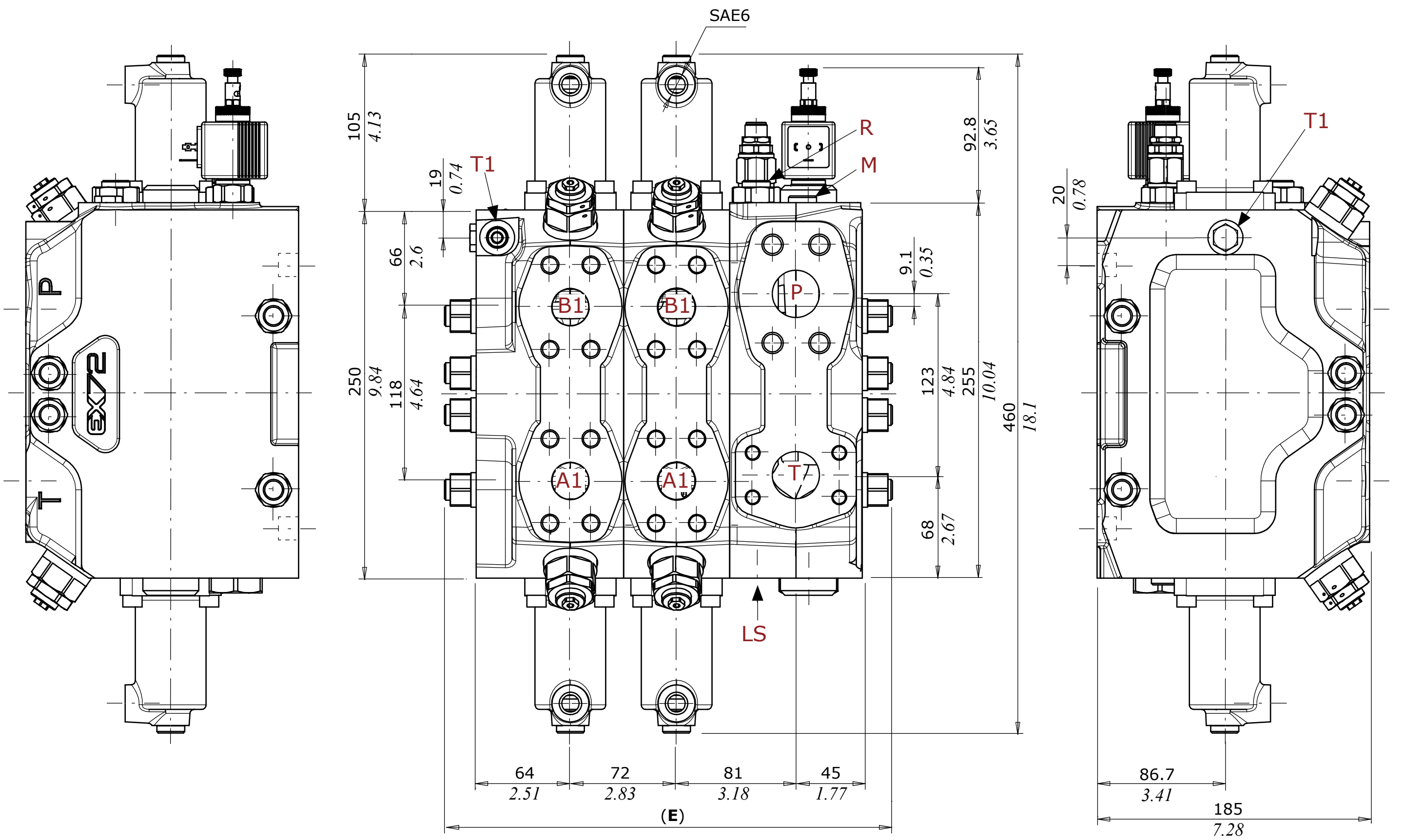
Wrenches and tightening torques
X = wrench 27 - 70 Nm *(51.6 lbft)*
Y = wrench 13 - 20 Nm *(14.7 lbft)*

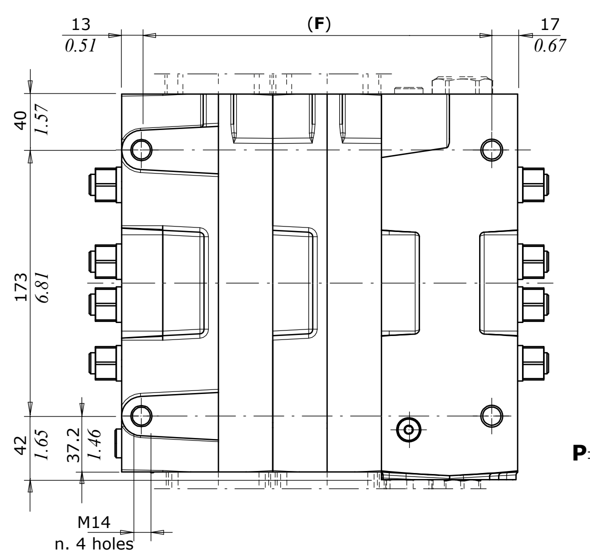
Content

- **EX72**

Dimensional data

Hydraulic control configuration example

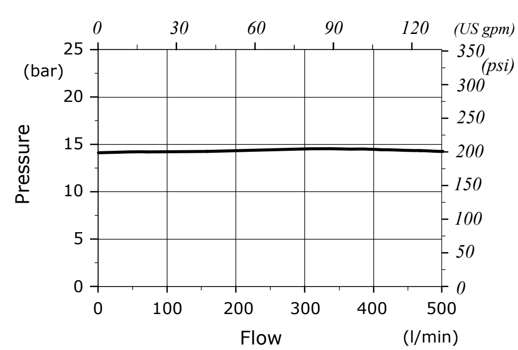




Type	E mm - *in*	F mm - *in*
EX72/1	225 - *8.85*	160 - *6.3*
EX72/2	297 - *11.7*	232 - *9.13*
EX72/3	369 - *14.52*	304 - *11.96*
EX72/4	441 - *17.36*	376 - *14.8*

Type	E mm - *in*	F mm - *in*
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*

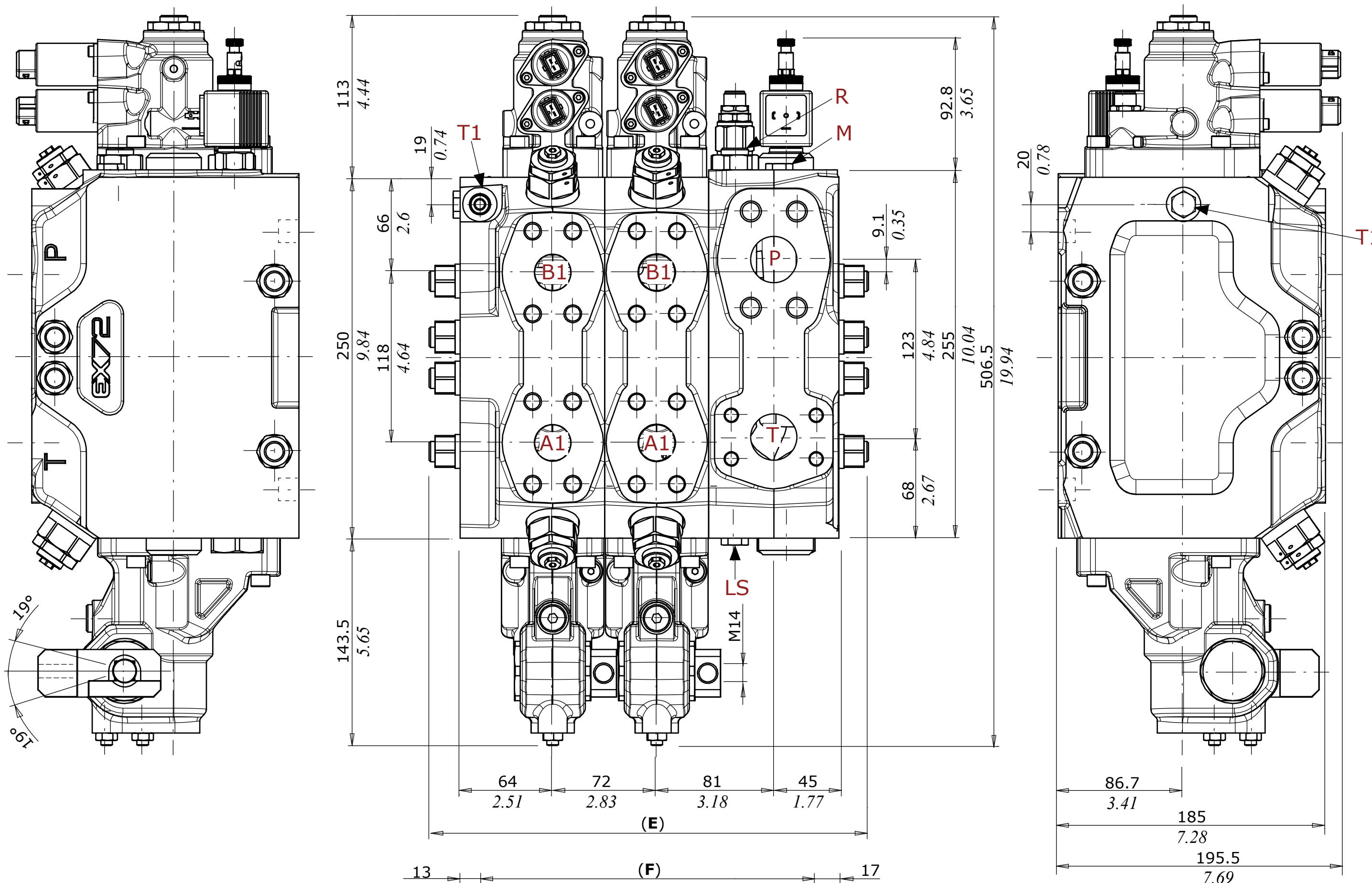
P⇒T Pressure drop inlet compensator (margin pressure)

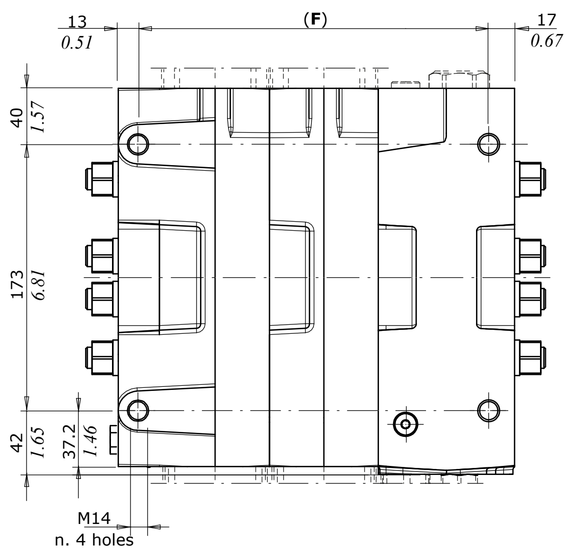


NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Dimensional data

Two-side electrohydraulic control configuration example

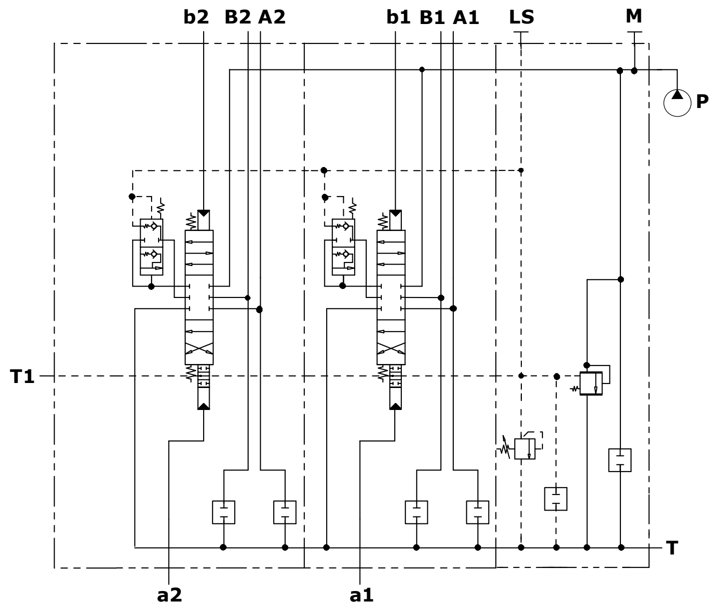




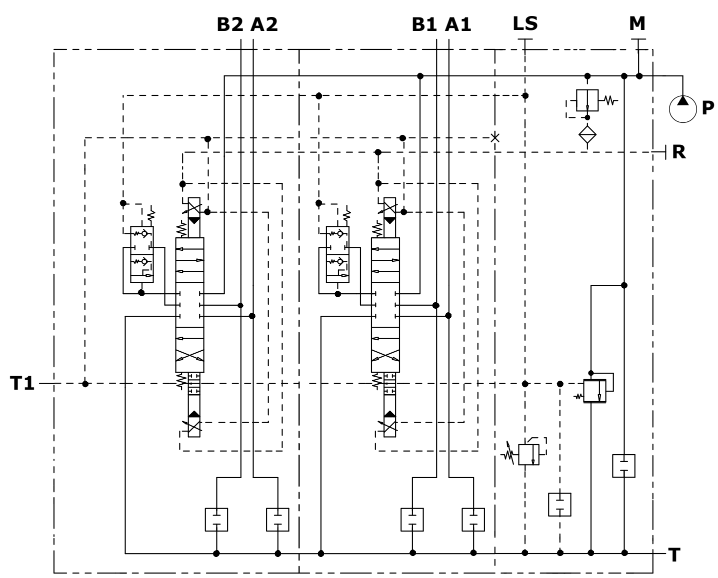
Type	E mm - *in*	F mm - *in*
EX72/1	225 - *8.85*	160 - *6.3*
EX72/2	297 - *11.7*	232 - *9.13*
EX72/3	369 - *14.52*	304 - *11.96*
EX72/4	441 - *17.36*	376 - *14.8*
EX72/5	513 - *20.2*	448 - *17.63*
EX72/6	585 - *23*	520 - *20.47*
EX72/7	657 - *25.86*	592 - *23.3*
EX72/8	729 - *28.7*	664 - *26.14*

NOTE: Drawings and dimensions are referred to a **UN-UNF** threading configuration

Hydraulic circuits



Right Inlet valve with hydraulic controls configuration (Fixed displacement pump):
EX72/2/MR-V1A(200)-V4B-V10C-KV-S38/
W001C(250\250)-HP05A-RC1-S36.05PA\05PB/
W001C(250\250)-HP05A-RCK1A-S36.05PA\05PB



Right Inlet valve with two-side electrohydraulic controls configuration (Fixed displacement pump):
EX72/2/MR-V1A(200)-V4B-V10C-KVR-S38/
W001C(250\250)-HP07-FP04-B12AJ-RC1-S36.05PA\05PB/
W001C(250\250)-HP07-FP04-B12AJ-RCK1A-S36.05PA\05PB

Complete section ordering codes

Hydraulic control valve configuration example - Right inlet

Working sections | Right Inlet

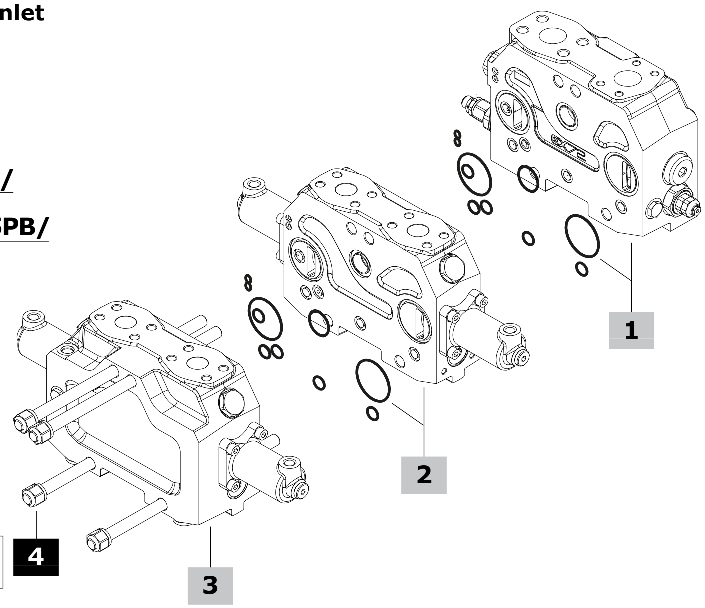
1 **EX72/2/MR-V1A(200)-V4B-V10C-KVS38/**

2 **W001C(250/250)-HP05A-RC1S36.05PA\05PB/**

3 **W001C(250/250)-HP05A-RCK1AS36.05PA\05PB/**

P006/2 N10

Painted with RAL 9005 black primer



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

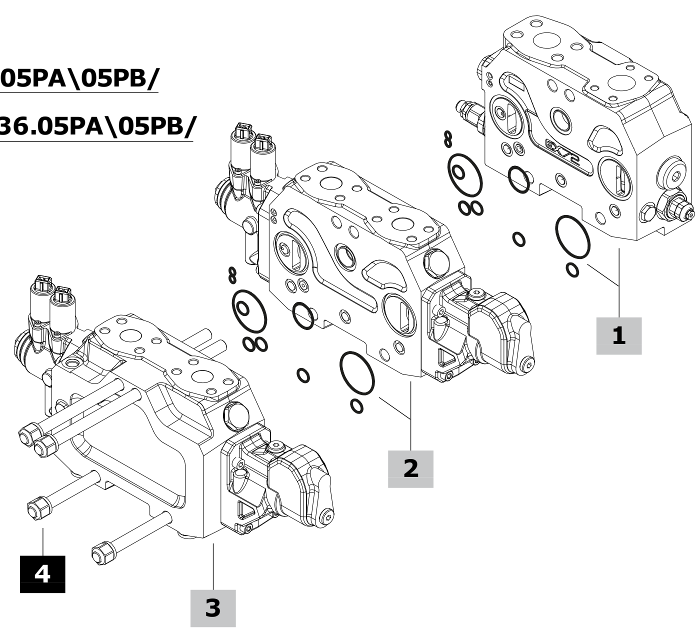
Two-side electrohydraulic control valve configuration example - Right inlet

1 **EX72/2/MR-V1A(200)-V4B-V10C-KVS38/**

2 **W001C(250/250)-HP07-FP04-B12AJ-RC1S36.05PA\05PB/**

3 **W001C(250/250)-HP07-FP04-B12AJ-RCK1AS36.05PA\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-S38**
CODE: SHE720014
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-S38**
CODE: SHE720015
DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C
TYPE: **MR/V1A(200)-V4B-V10C-KVR-S38**
CODE: SHE720016
DESCRIPTION: As previous one with pressure reducing valve
TYPE: **MR/V1A(200)-V4B-V10C-KVE-S38**
CODE: SHE720017
DESCRIPTION: As previous one for external pressure reducing valve
For Closed Center circuit (JV)
TYPE: **MR/V1A(200)-V4B-V10C-JV-S38**
CODE: SHE720018
DESCRIPTION: With LS pressure relief valve and valve blanking plugs on positions B and C
TYPE: **MR/V1A(200)-V4B-V10C-JVR-S38**
CODE: SHE720019
DESCRIPTION: As previous one with pressure reducing valve
TYPE: **MR/V1A(200)-V4B-V10C-JVE-S38**
CODE: SHE720020
DESCRIPTION: As previous one for external pressure reducing valve
TYPE: **MR/V1A(200)-V4B-V11C(C12AJ)-JVR-S38**
CODE: SHE720021
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-S36-05PA-05PB**
CODE: SHL720018
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-S36-04PA(150)-04PB(150)**
CODE: SHL720019
DESCRIPTION: As previous one with pilot combined valves
With proportional electrohydraulic controls
TYPE: **SD/W001C(250\250)-HP04-FP04-B12AJ-RC1-S36-05PA-05PB**
CODE: SHL720020
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-S36-04PA(150)-04PB(150)**
CODE: SHL720021
DESCRIPTION: As previous one with pilot combined valves
TYPE: **SD/W001C(250\250)-HP07-FP04-B12AJ-RC1-S36-05PA-05PB**
CODE: SHL720022
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-S36-04PA(150)-04PB(150)**
CODE: SHL720023
DESCRIPTION: As previous one with pilot combined valves

3 Integrated end sections*

With proportional hydraulic controls
TYPE: **SD/W001C(250\250)-HP05A-RCK1A-S36-05PA-05PB**
CODE: SHU720003
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-S36-05PA-05PB**
CODE: SHL720004
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 **UNC** thread

Part ordering codes

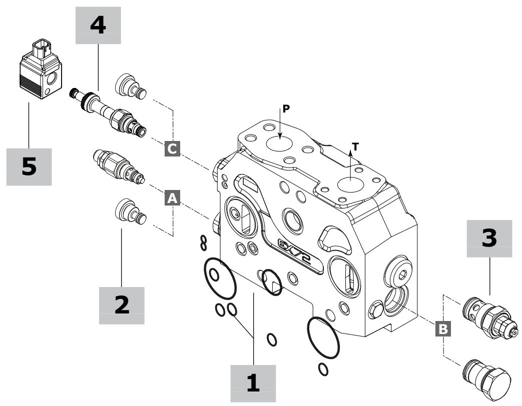
Valve positions

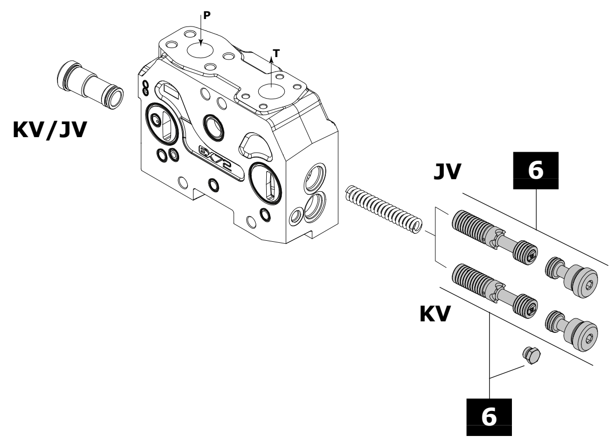
EX72 / MR - V1 A (200) - V4 B - V11 C - C12AJ - KV-S37

Right Inlet — **2** — pressure relief valve setting (bar) — **3** — **4** — **5** — **1**

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 S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500002
DESCRIPTION: For fixed displacement pumps, internal LS, without pressure reducing valve

TYPE: **KVR S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500012
DESCRIPTION: For fixed displacement pumps, internal LS, with pressure reducing valve

TYPE: **KVE S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500042
DESCRIPTION: For fixed displacement pumps, internal LS, for external pressure reducing valve

For Closed Center circuit (JV)

TYPE: **JV S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500004
DESCRIPTION: For variable displacement pumps, internal LS, without pressure reducing valve

TYPE: **JVR S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500014
DESCRIPTION: For variable displacement pumps, internal LS, with pressure reducing valve

TYPE: **JVE S38 -** P and T ports SAEJ518 type 2 flange connection
CODE: 029500044
DESCRIPTION: For variable displacement pumps, internal LS, for external pressure reducing valve

NOTE: for seal kit codes, see page 140

2 Valves on position A page 119

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 119

TYPE	CODE	DESCRIPTION
V3B		Full Flow direct relief valve
	915079501	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 Trasformation kit page 120

TYPE	CODE	DESCRIPTION
KV kit	320095011(1)	Trasformation kit, from JV (closed center) to KV (open center)
JV kit	320095003	Trasformation kit, from KV (open center) to JV (closed center)

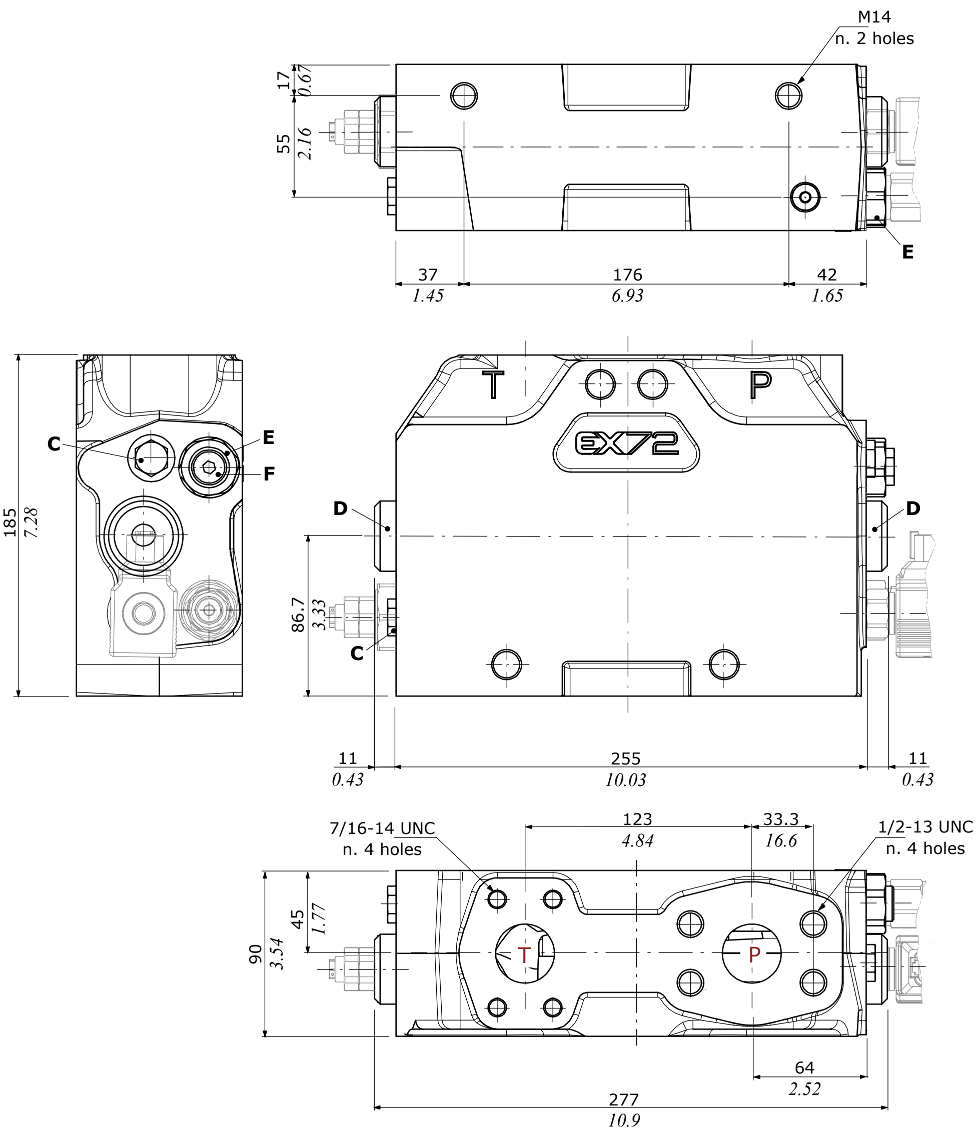
NOTE (*): Codes are referred to **UNC** thread
(1): Codes are referred to **UN-UNF** thread

Dimensional data and hydraulic circuits

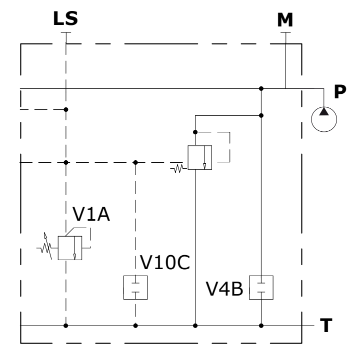
Drawing is referred to KV section; dimensions are the same for JV section

Wrenches and tightening torques
C = wrench 17 - 45 Nm *(33.2 lbft)*
D = allen wrench 10 - 80 Nm *(59 lbft)*
E = wrench 30 - 65 Nm *(48 lbft)*
F = allen wrench 6 - 30 Nm *(22 lbft)*

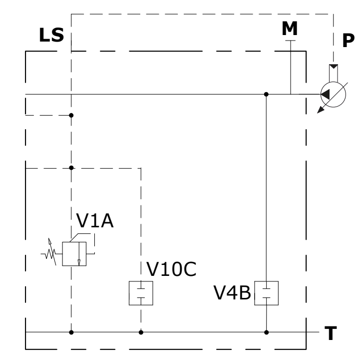
NOTE: for valves wrench and torque, see related pages



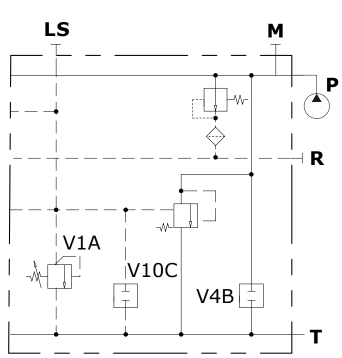
KV Open Center (example)



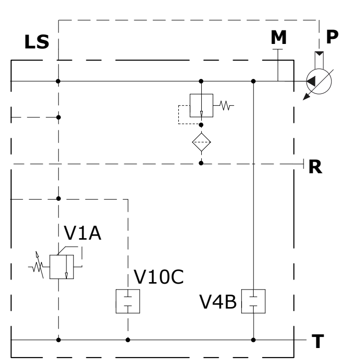
JV Closed Center (example)



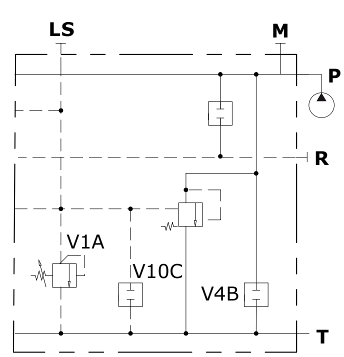
KVR Open Center
with pressure reducing valve
(example)



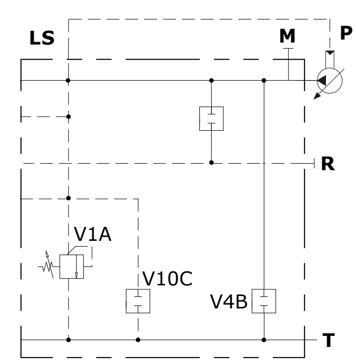
JVR Closed Center
with pressure reducing valve
(example)



KVE Open Center
for external pressure
reducing valve (example)



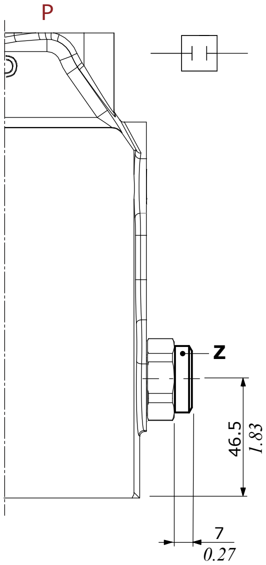
JVE Closed Center
for external pressure
reducing valve (example)



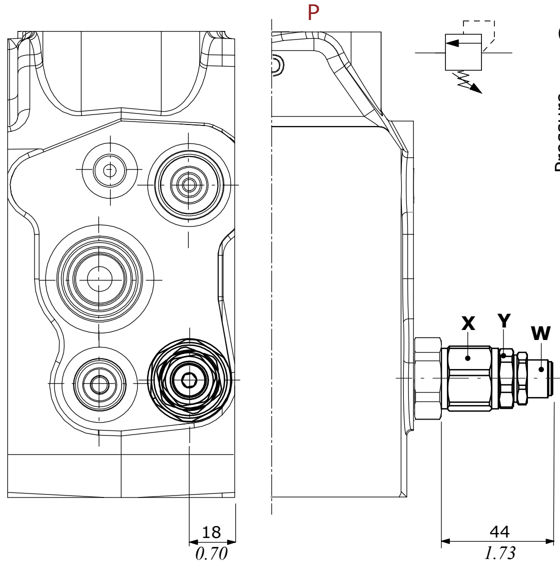
Inlet valves

Valves on position A

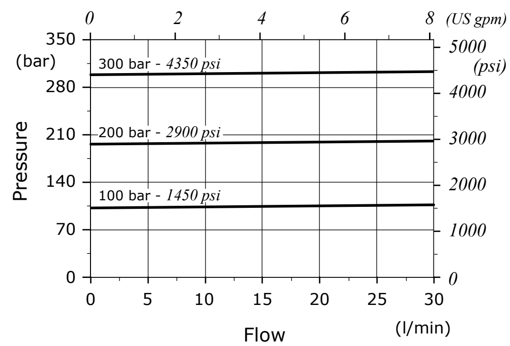
V2A type
Valve blanking plug



V1A type
LS pressure relief valve



LS relief valve characteristics

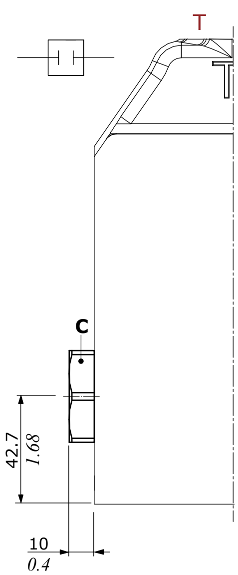


Wrenches and tightening torque

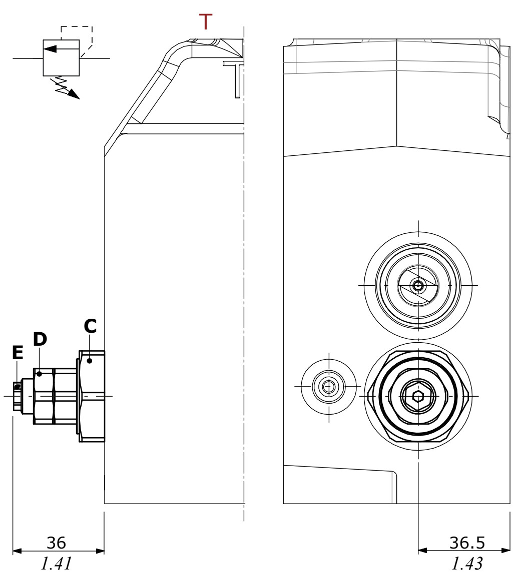
X = wrench 24 - 45 Nm *(33 lbft)*
Y = wrench 19 - 30 Nm *(22 lbft)*
W = allen wrench 5
Z = allen wrench 8 - 30 Nm *(22 lbft)*

Valves on position B

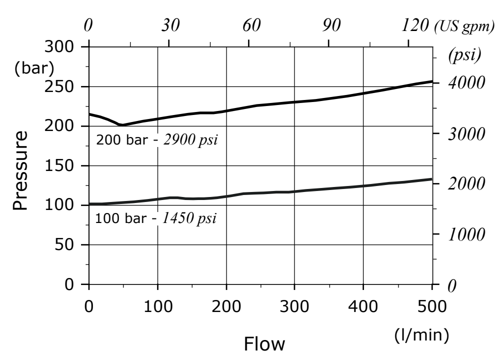
V4B type
Valve blanking plug



V3B type
Full Flow direct relief valve



Full Flow relief valve characteristics



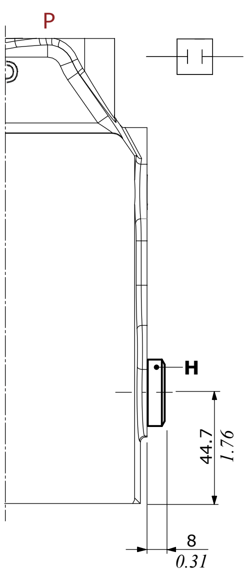
Wrenches and tightening torque

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

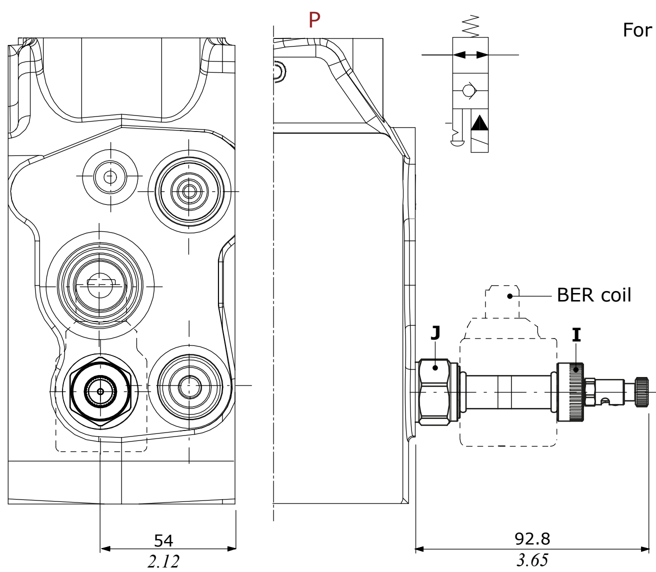
Inlet valves

Valves on position C

V10C type
Valve blanking plug



V11C type
LS electric unloading valve
(without coil)



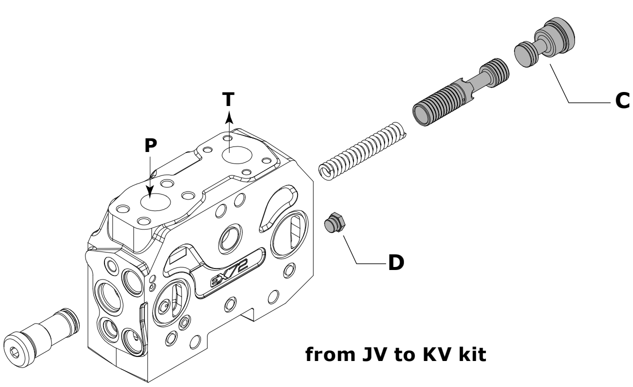
Wrenches and tightening torques
H = allen wrench 8 - 30 Nm *(22 lbft)*
J = wrench 24 - 30 Nm *(22 lbft)*
I = manual tightening

For **BER** type coils see page 136

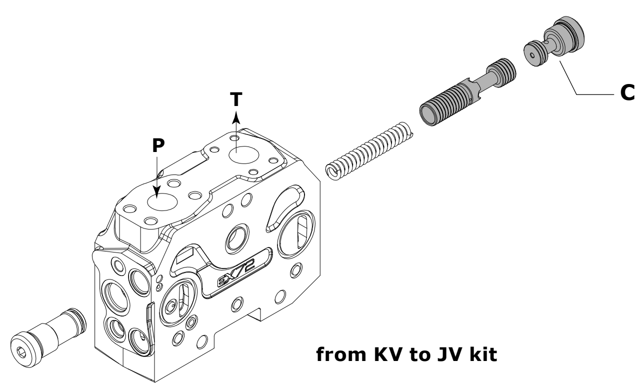
NOTES:
Valve types V1A and V3B require factory setting (example: V1A - 150)
Valve combination V1A - V3B requires double setting (example: 200*240); the minimun difference between settings is 40 bar - *580 psi*
Valve type V11C requires coil kit type (example: C12AJ)

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 320095011, from JV to KV kit
code 320095003, from KV to JV kit



from JV to KV kit



from KV to JV kit

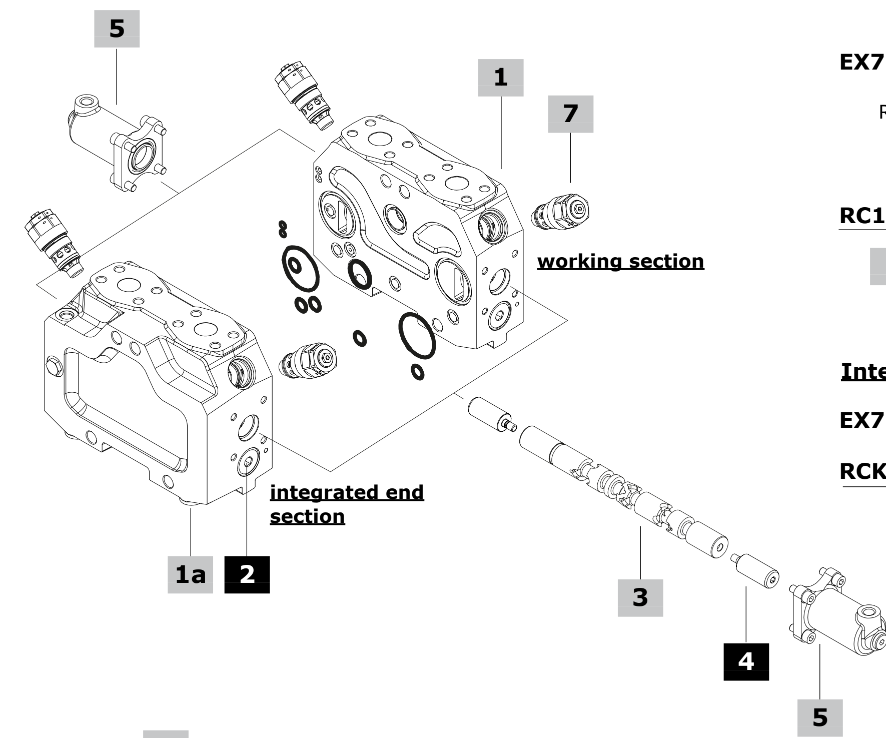
Wrenches and tightening torques
C = allen wrench 8 - 80 Nm *(59 lbft)*
D = wrench 17 - 45 Nm *(33.2 lbft)*

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 properely 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-S36 . 04-PA(150)\04-PB(150)

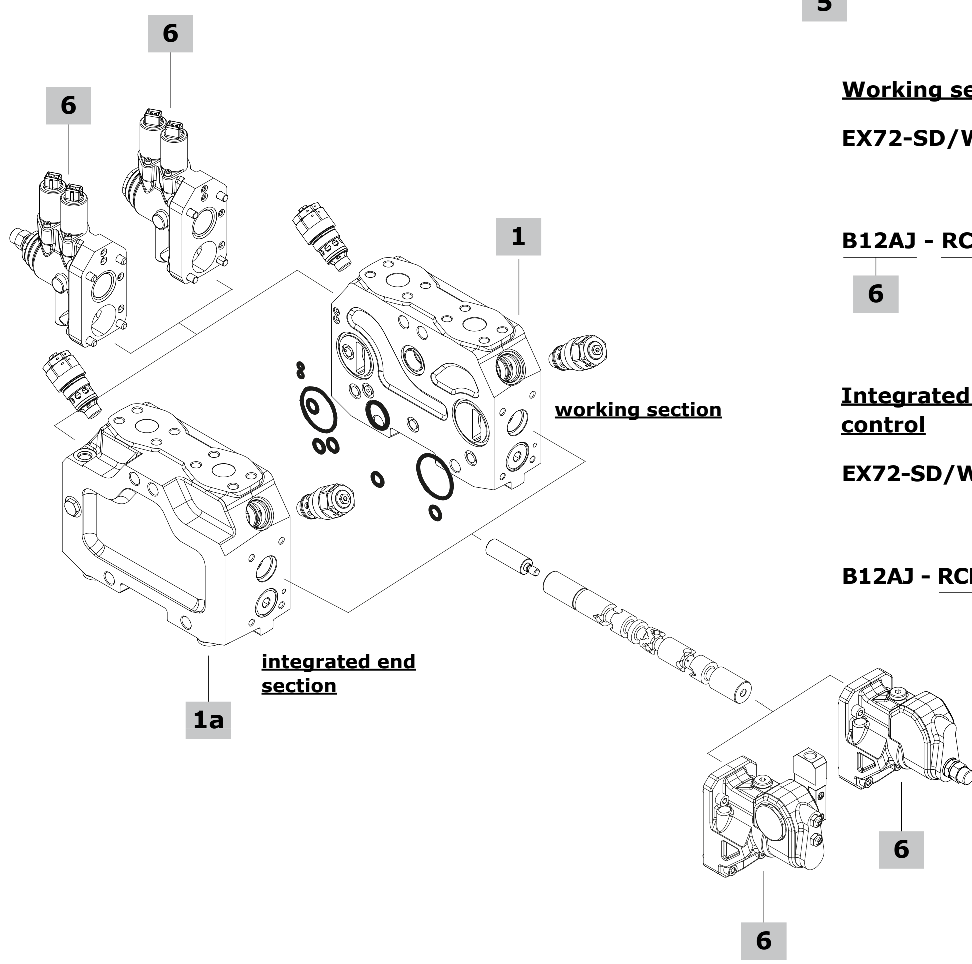
1 7

Integrated end section with hydraulic control

EX72-SD/W001C(250\250) - HP05A -

RCK1A-S36 . 04-PA(150)\04-PB(150)

1a



Working section with electrohydraulic control

EX72-SD/W001C(250\250) - HP04L - FP04

6 6

B12AJ - RC1-S36 . 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-S36 . 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 S36	039500002	SAEJ518 type 2 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCS1 S36	039500022	SAEJ518 type 2 flange connection ports
For electrohydraulic controls		
Standard section, with port valves arrangement:		
RC1 S36	039500102	SAEJ518 type 2 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCS1 S36	039500122	SAEJ518 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 S36	039500202	SAE6 upper T1 drain, SAEJ518 type 2 flange connection ports
RCK1C S36	039500204	SAE6 side T1 drain,SAEJ518 type 2 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCSK1A S36	039500302	SAE6 upper T1 drain, SAEJ518 type 2 flange connection ports
RCSK1C S36	039500304	SAE6 side T1 drain, SAEJ518 type 2 flange connection ports
For electrohydraulic controls		
Standard section, with port valves arrangement:		
RCK1A S36	039500222	SAE6 upper T1 drain, SAEJ518 type 2 flange connection ports
RCK1C S36	039500224	SAE6 side T1 drain, SAEJ518 type 2 flange connection ports
Section with additional port for remoted LS relief valve, with port valves arrangement:		
RCSK1A S36	039500332	SAE6 upper T1 drain, SAEJ518 type 2 flange connection ports
RCSK1C S36	039500334	SAE6 side T1 drain, SAEJ518 type 2 flange connection ports
Standard section with P1 port and port valves arrangement:		
RCP1A S36	039500402	SAE6 upper T1 drain, A, B and side P1 SAEJ518 type 2 flange connection ports
RCP1C S36	039500404	SAE6 side T1 drain, A, B and side P1 SAEJ518 type 2 flange connection ports
Section with P1 port and additional port for remoted LS relief valve, with port valves arrangement:		
RCSP1A S36	039500412	SAE6 upper T1 drain, A, B and side P1 SAEJ518 type 2 flange connection ports
RCSP1C S36	039500414	SAE6 side T1 drain, A, B and side P1 SAEJ518 type 2 flange connection ports

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 129

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 133

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

TYPE	CODE	DESCRIPTION
HP05A	320595103	With SAE6 upper ports
HP05C	320595109	With SAE6 side ports
HP05L	320595115	With SAE6 upper ports and stroke limiter

6 Two-side electrohydraulic controls page 130

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 **UNC** 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)**

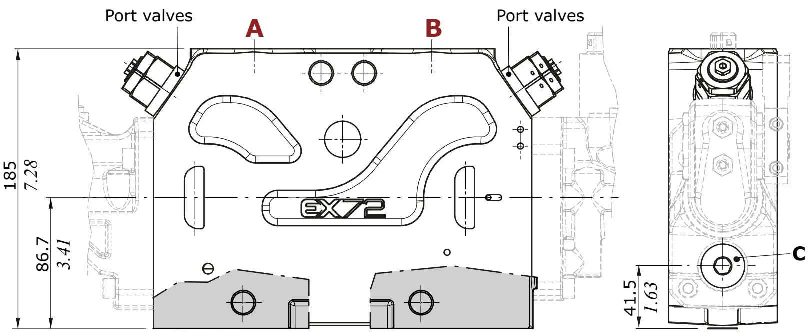
└setting (bar) @ min. flow - 5 l/min *(1.3 US gpm)*

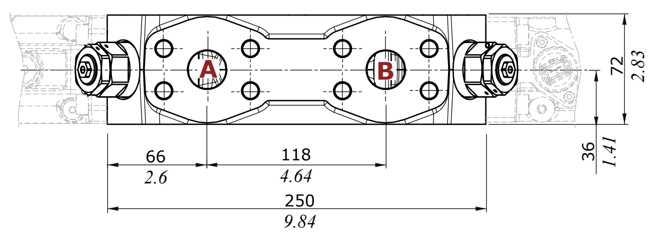
TYPE	CODE	DESCRIPTION
01 PA/PB	915068804	setting @ full flow from 60 to 100 bar *(from 870 to 1450 psi),* setting @ min. flow from 10-A to 60-A bar *(from 145-A to 870-A psi)*
	915068805	setting @ full flow from 101 to 160 bar *(from 1460 to 2300 psi),* setting @ min. flow from 61-A to 130-A bar *(from 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

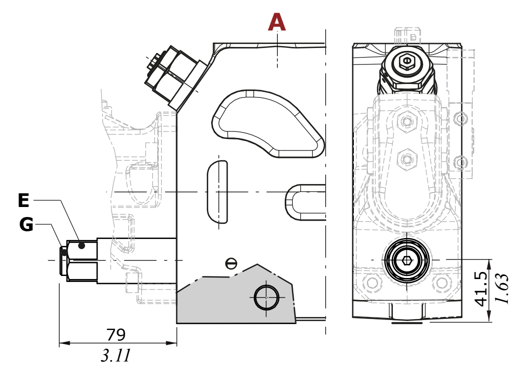
Working sections

RC1 type
Standard section with port valves arrangement

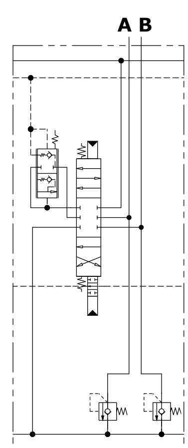




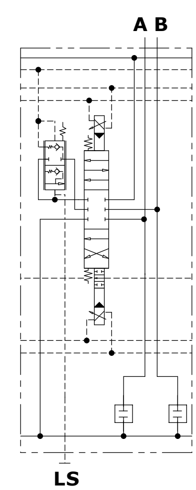
RCS1 type
Section with additional G1/4 port for remoted LS relief valve, and port valves arrangement



RC1
Hydraulic control with port valves arrangement



RCS1
Electrohydraulic control with port valves arrangement and additional G1/4 port for remoted LS relief valve

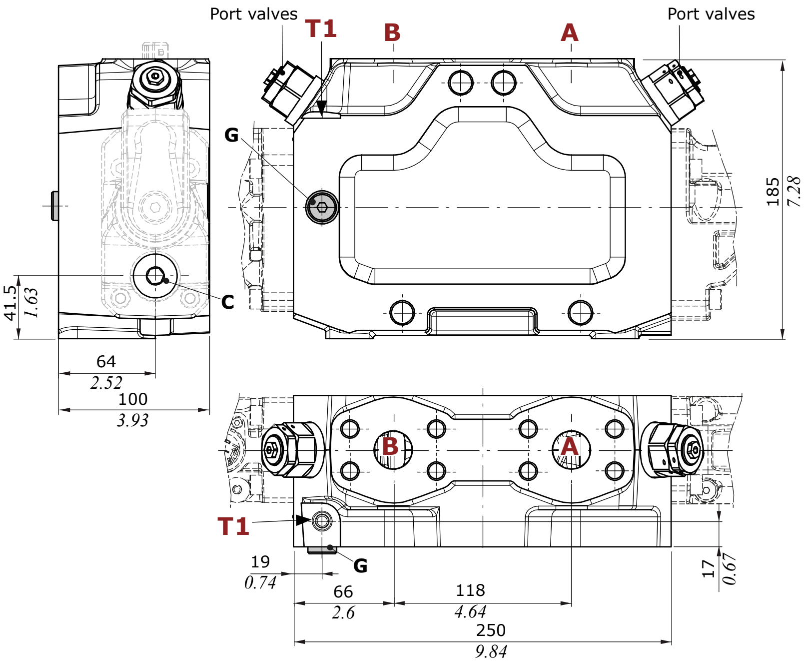


Wrenches and tightening torques
C = allen wrench 10 - 80 Nm *(59 lbft)*
E = wrench 27 - 55 Nm *(40.5 lbft)*
G = allen wrench 6 - 30 Nm *(22 lbft)*

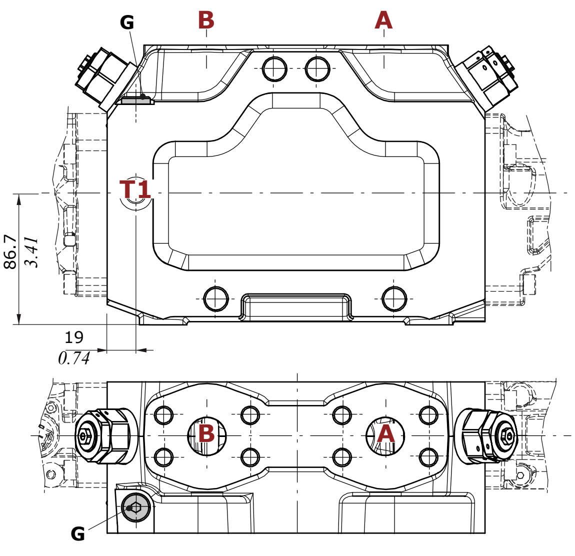
Dimensional data

Integrated end sections

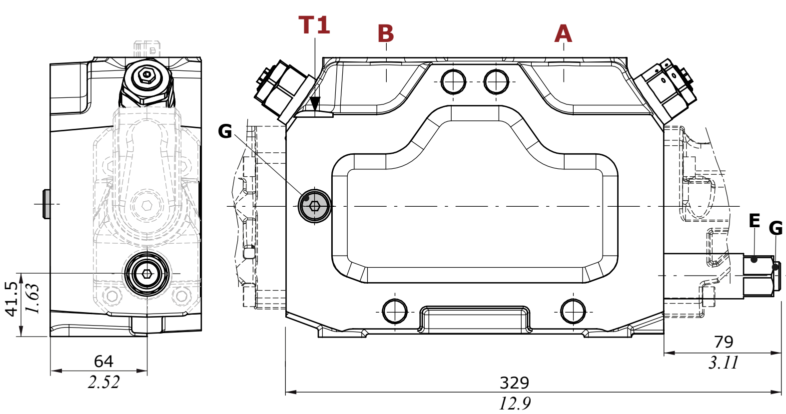
RCK1A Type
Standard section with upper T1 drain and port valves arrangement



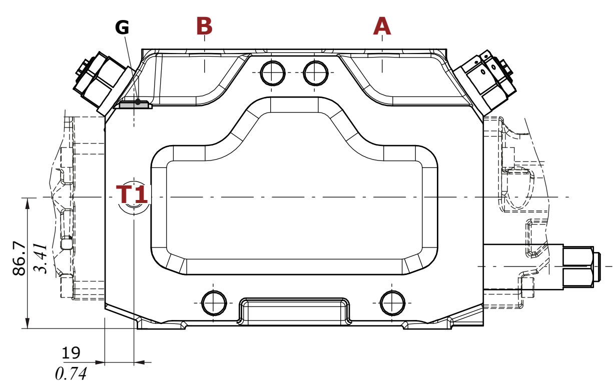
RCK1C Type
Standard section with side T1 drain and port valves arrangement



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

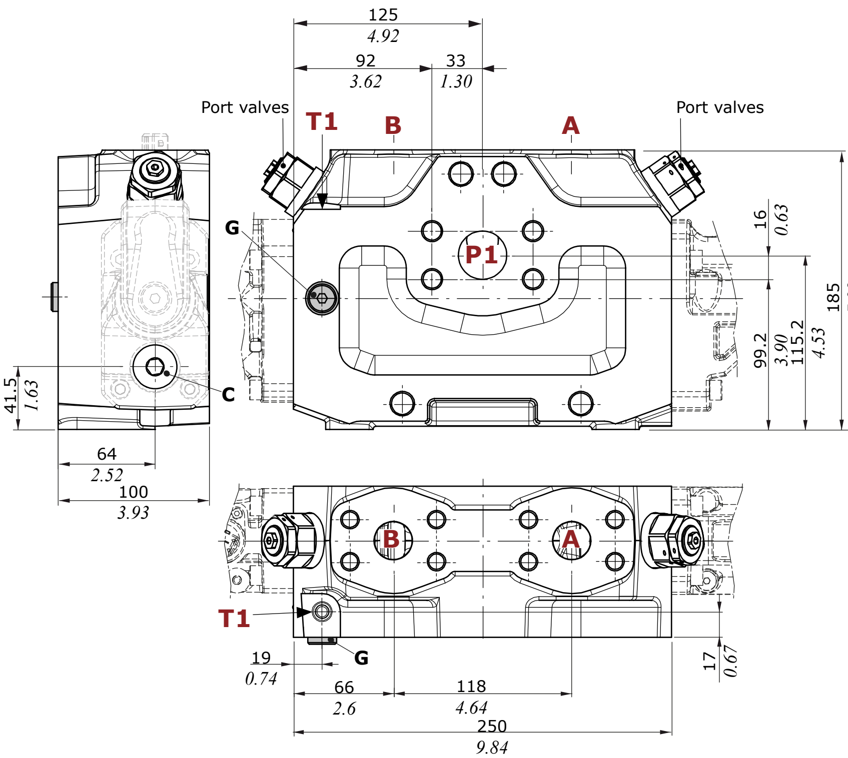


Wrenches and tightening torques
C = allen wrench 10 - 80 Nm *(59 lbft)*
E = wrench 27 - 55 Nm *(40.5 lbft)*
G = allen wrench 6 - 30 Nm *(22 lbft)*

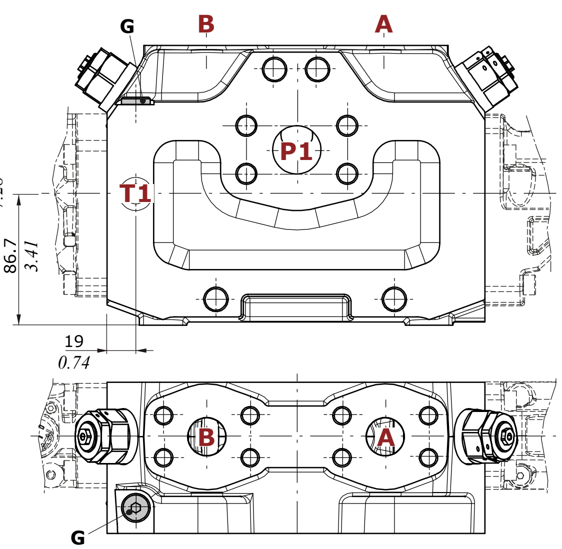
Dimensional data

Integrated end sections

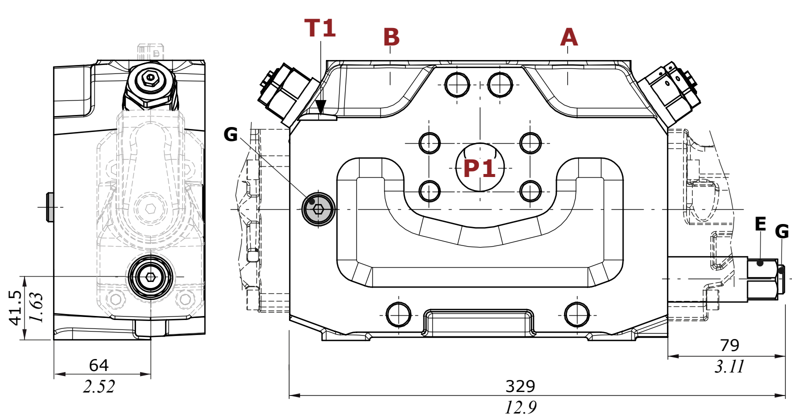
RCP1A type
Standard section with upper T1 drain,
side P1 inlet and port valves arrangement



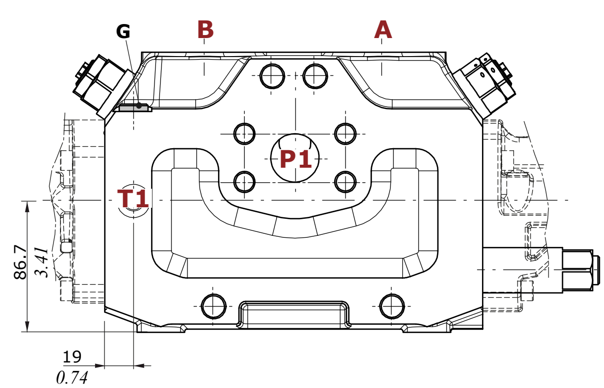
RCP1C type
Standard section with side T1 drain,
side P1 inlet and port valves arrangement



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

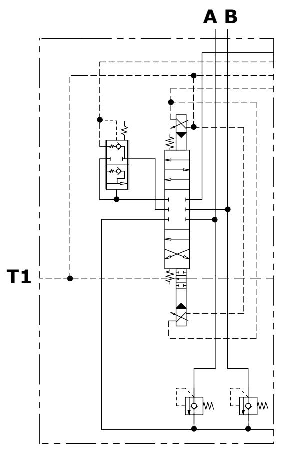


Wrenches and tightening torques
C = allen wrench 8 - 65 Nm *(48 lbft)*
F = wrench 24 - 55 Nm *(40.5 lbft)*
G = allen wrench 6 - 30 Nm *(22 lbft)*

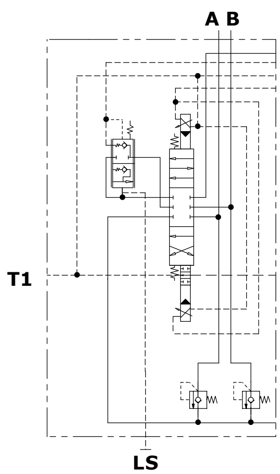
Hydraulic circuits

Integrated end sections

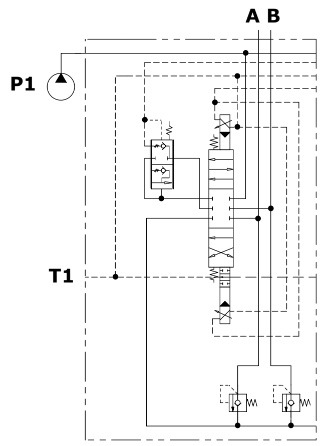
RCK1A - RCK1C
Electrohydraulic control with port valves



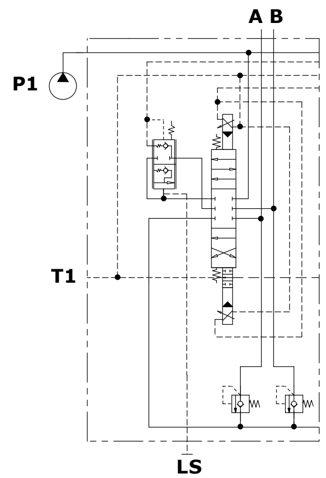
RCSK1A - RCSK1C
Electrohydraulic control with port valves and additional G1/4 port for remoted LS relief valve



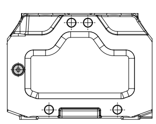
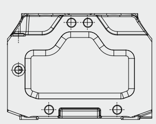
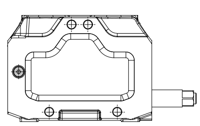
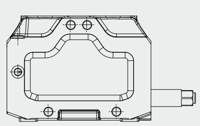
RCP1A - RCP1C
Electrohydraulic control with port valves

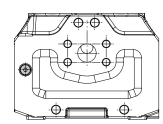
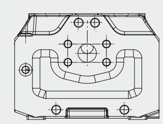
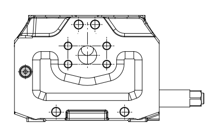
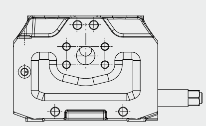


RCSP1A - RCSP1C
Electrohydraulic control with port valves and additional G1/4 port for remoted LS relief valve



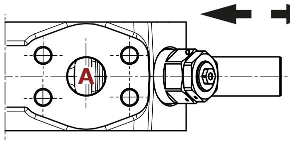
Port configurations

Types	T1 port (side)	T1 port (upper)	
RCK1A	plugged	open	
RCK1C	open	plugged	
RCSK1A	plugged	open	
RCSK1C	open	plugged	

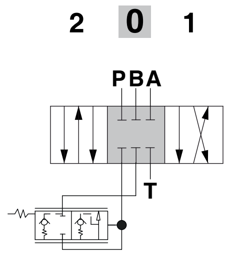
Types	T1 port (side)	T1 port (upper)	P1 port (side)	
RCP1A	plugged	open	open	
RCP1C	open	plugged	open	
RCSP1A	plugged	open	open	
RCSP1C	open	plugged	open	

Spools

Pos. 1 **Pos. 2**
P->A P->B

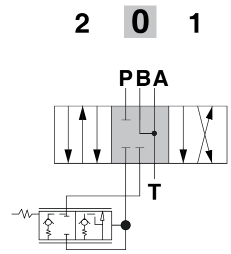


W001C type
A and B closed in
neutral position



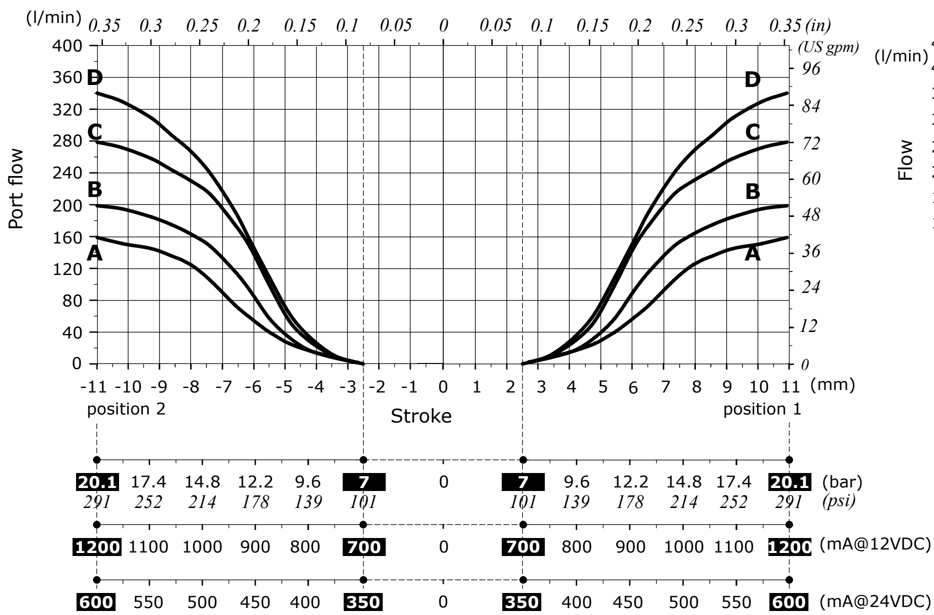
Spool stroke
Position 1: + 11 mm *(- 0.43 in)*
Position 2: - 11 mm *(+ 0.43 in)*

W002C type
A and B to tank
in neutral position

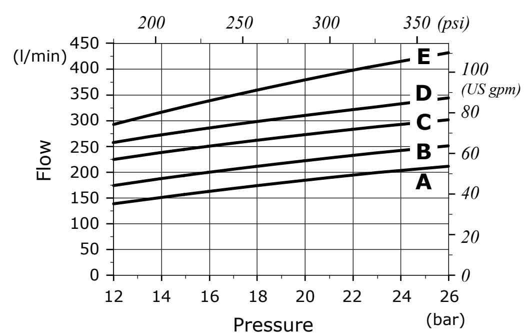


Spool stroke
Position 1: + 11 mm *(- 0.43 in)*
Position 2: - 11 mm *(+ 0.43 in)*

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)*

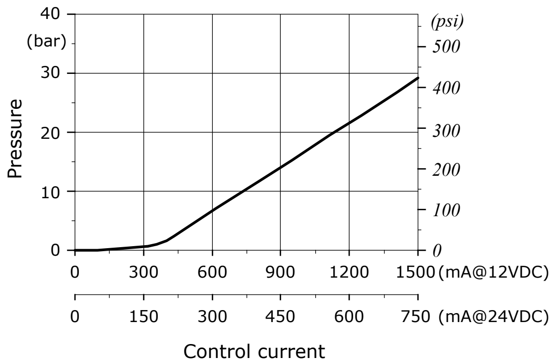
Proportional electrohydraulic control

Following specifications are measured with:
- mineral oil of 46 mm^2/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.

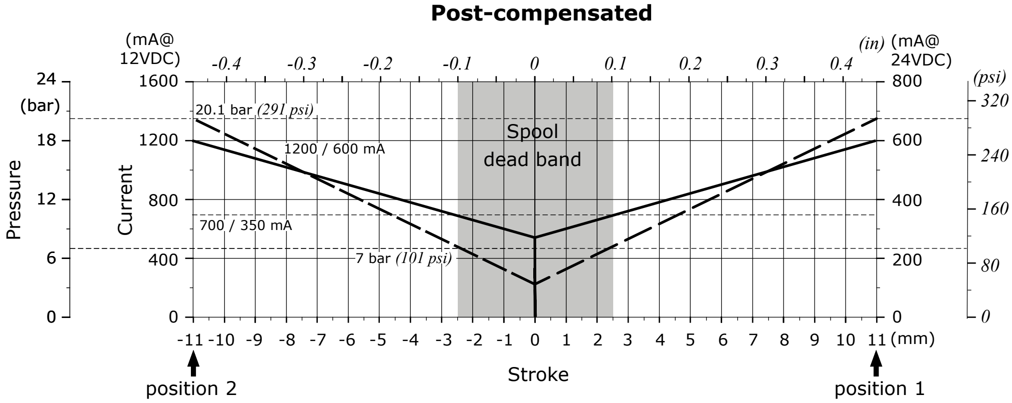
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department

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 insulance		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



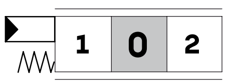
A and B side controls

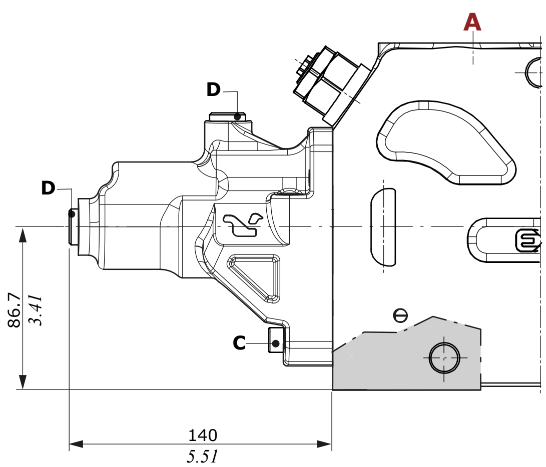
Two-side electrohydraulic controls

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

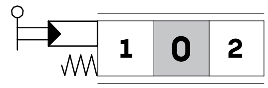
"A" side controls

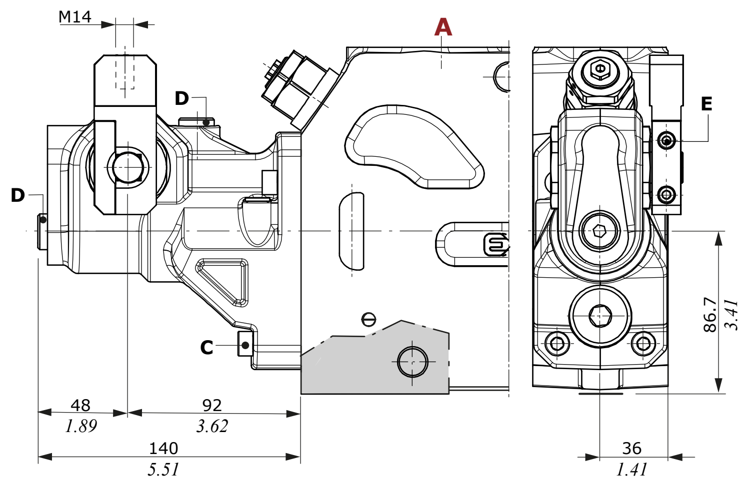
HP07 type
Without lever



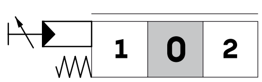


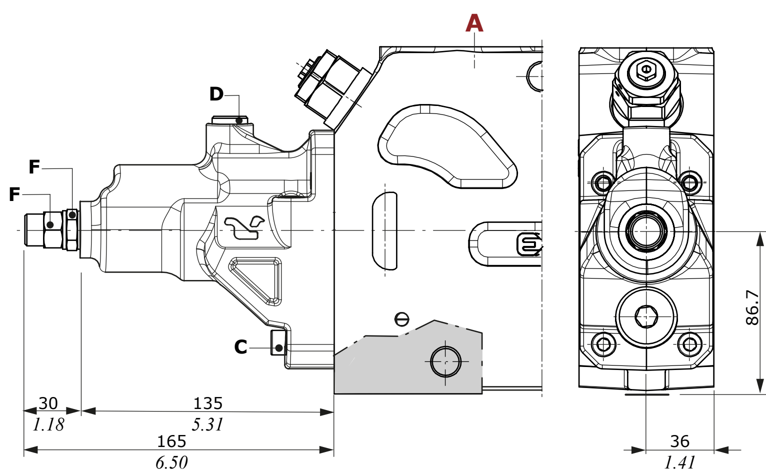
HP04 type
With lever





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)*

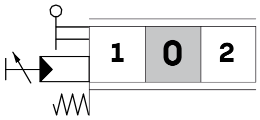
A and B side controls

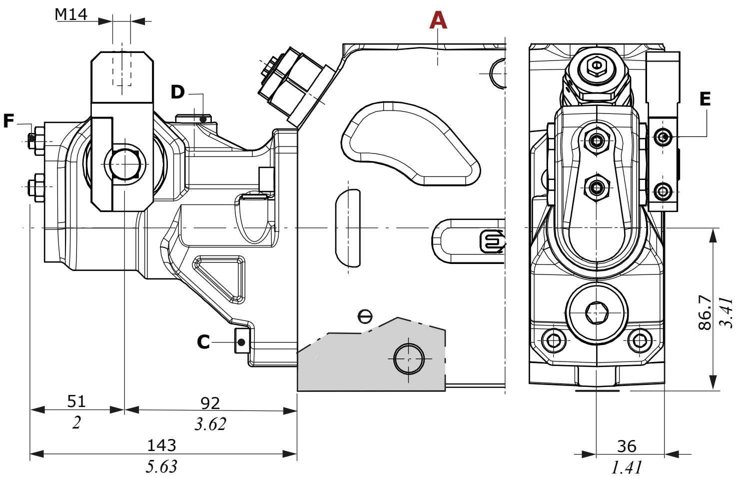
Two-side electrohydraulic controls

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





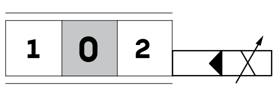
Wrenches and tightening torques
C = allen wrench 4 - 5/7 Nm *(3.7/5.2 lbft)*
D = allen wrench 6 - 30 Nm *(22 lbft)*
E = allen wrench 3 - 2 Nm *(1.5 lbft)*
F = allen wrench 3
G = wrench 19 - 15 Nm *(11 lbft)*

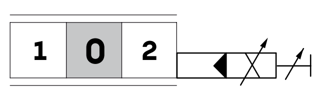
"B" side controls

Control Types

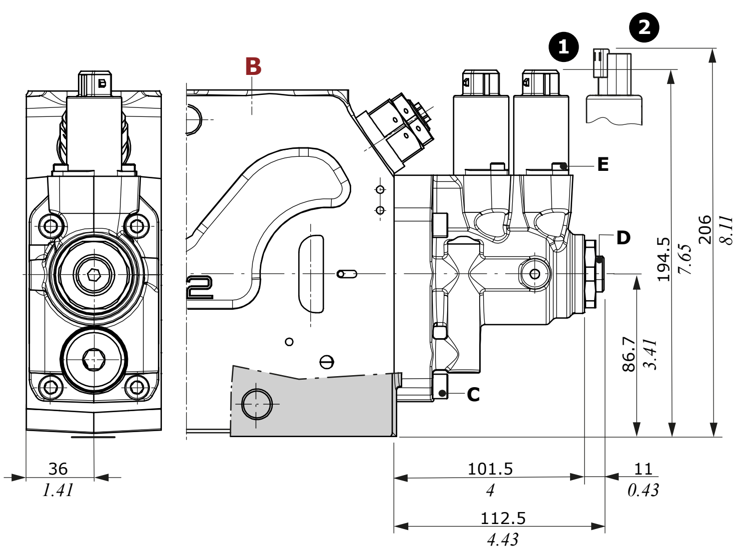
1 : With AMP JPT connector - AMP JPT mating connector, code: 5CON003
2 : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

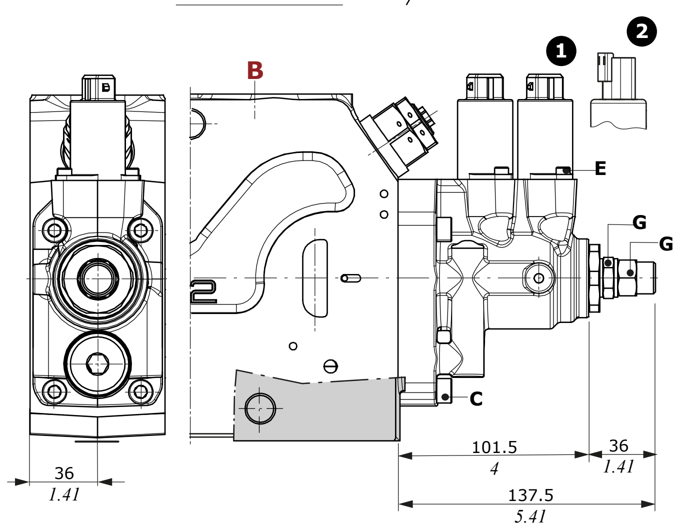
FP04 type
Electrohydraulic control





FP04L type
With stroke limiter





A and B side controls

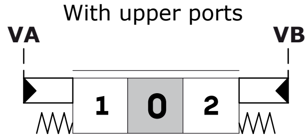
Hydraulic controls

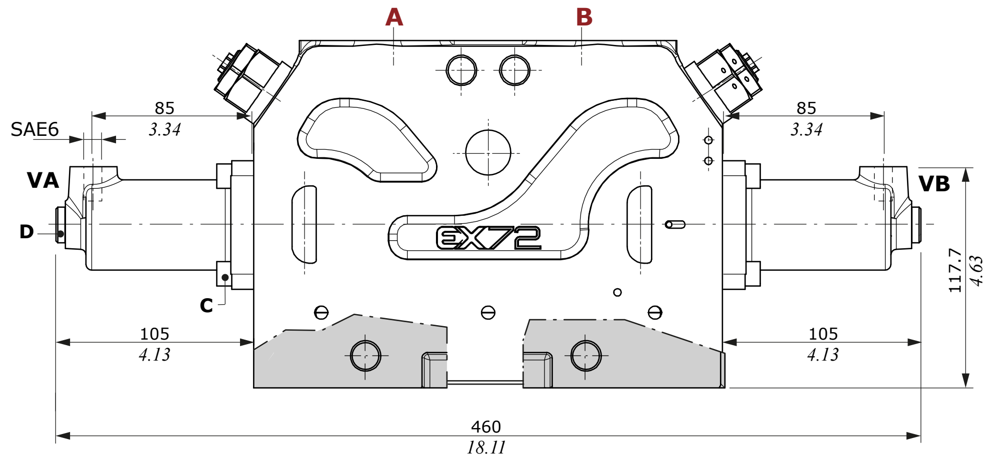
Integrated end sections are equipped with the same parts of work section, change only the body arrangement.

Proportional controls (A+B sides)

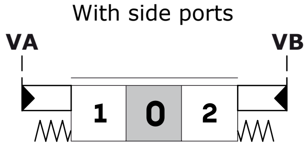
Controls are available with upper or side ports.

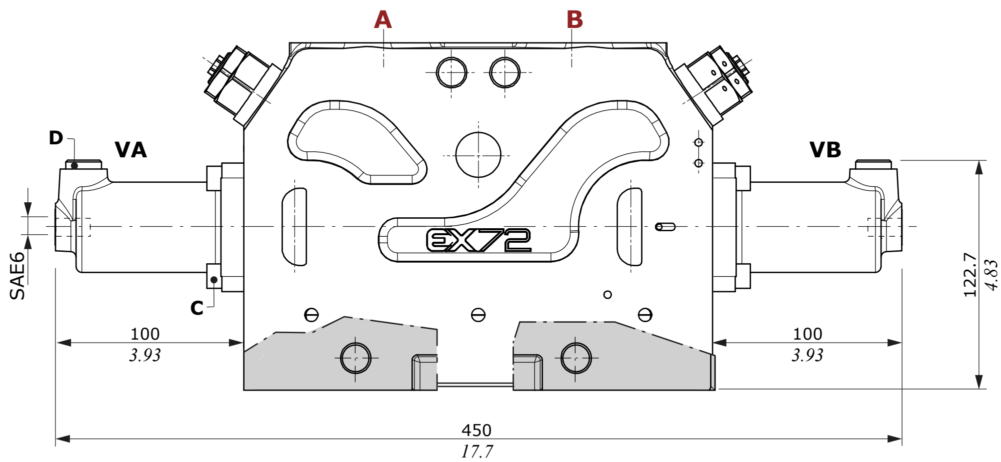
HP05A type
With upper ports



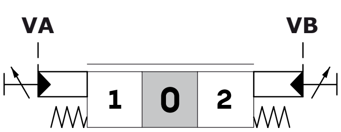


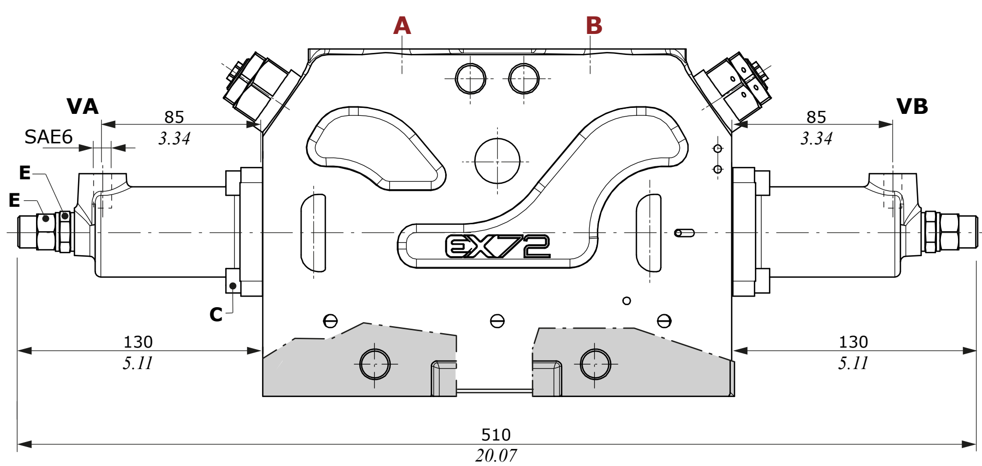
HP05C type
With side ports





HP05L type
With upper ports
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 = wrench 19 - 15 Nm *(11 lbft)*

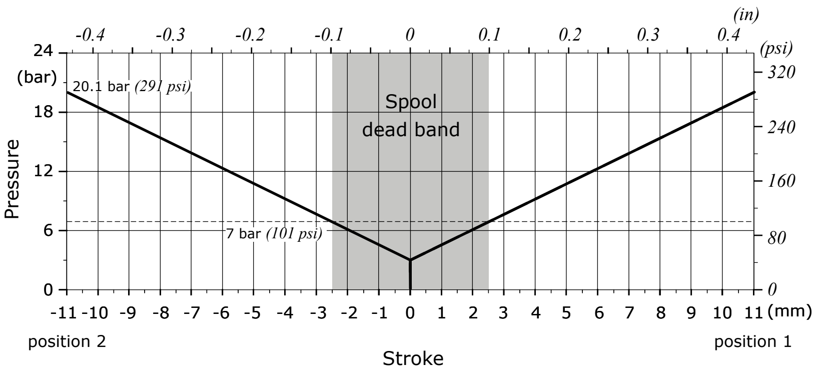
A and B side controls

Hydraulic controls

Proportional controls (A+B sides)

For control types, see previous page

Stroke vs. Pressure diagram



Compatibility table

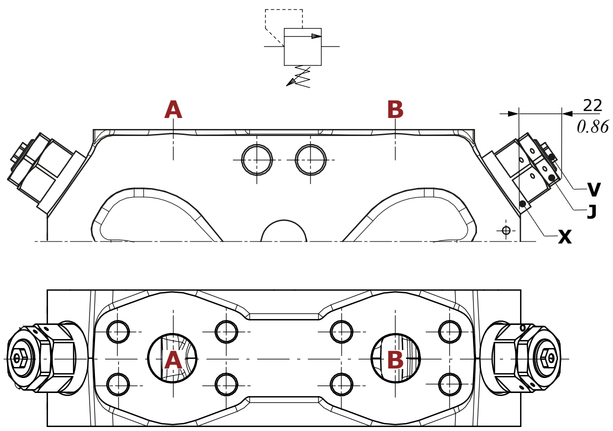
Combination controls and spool end kit		"A" side controls HP04	HP04L	HP07	HP07L	HP05
"B" side controls	FP04	422501250	422501250	422501250		
	FP04L				422501250	
	HP05					422501231

For spool end types, see page 138

Port valves

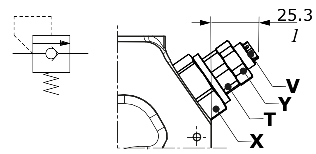
Always indicate setting value when using antishock valve or pilot combined valve:
Example: 01 PA (120) = setting at full flow / 01 PA (120-A) = setting at min. flow
Example: 04 PA (120) = setting at full flow / 04 PA (120-A) = setting at min. flow

01 PA/PB type
Antishock valve



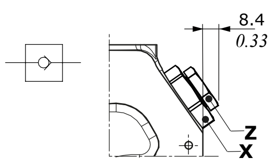
setting range (bar - *psi*)			
Type	pressure @ 450 l/min *(118.8 US gpm)*	Type	pressure @ 5 l/min *(1.3 US gpm)*
A	60/100 - *870/1450*	**A**	10-A/60-A - *145-A/870-A*
B	101/160 - *1460/2300*	**B**	61-A/130-A - *880-A/1890-A*
C	161/250 - *2330/3600*	**C**	131-A/250-A - *1900-A/3600-A*

04 PA/PB type
Pilot combined valve

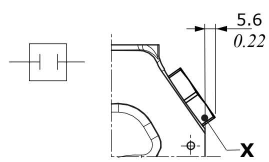


setting range (bar - *psi*)	
Type	pressure @ 450 l/min *(118.8 US gpm)*
A	50/390 - *725/5650*

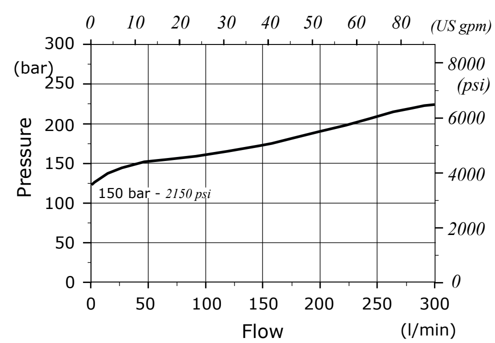
02 PA/PB type
Anticavitation valve



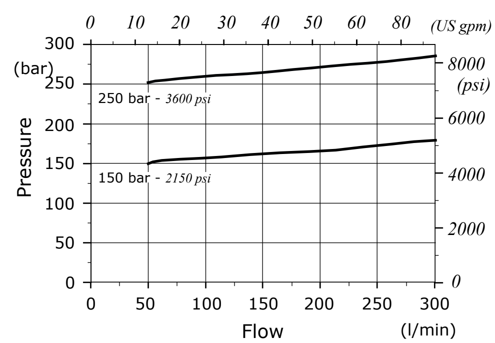
05 PA/PB type
Valve blanking plug



01 type
antishock valve
(50 l/min - *13.2 Us gpm*)



04 type
combined valve (antishock function)
(50 l/min - *13.2 Us gpm*)



Wrenches and tightening torques
X = wrench 32 - 80 Nm *(59 lbft)*
J = wrench 30 - 20 Nm *(14.7 lbft)*
V = wrench 10
Y = wrench 22 - 20 Nm *(14.7 lbft)*
T = wrench 22 - 80 Nm *(59 lbft)*
Z = wrench 22 - 25 Nm *(18.4 lbft)*

Content

• EX series

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

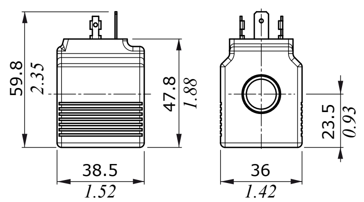
Voltage	ISO 4400 mating connector with rectifier
	BER type coil
24 VDC	4CN1010240
48 VDC	4CN1010480
110 VDC	4CN1011100
220 VDC	4CN1012200

Coils and connectors

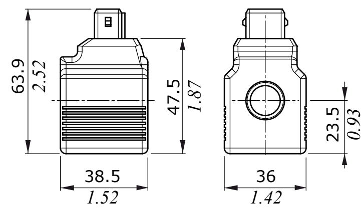
Dimensional data and features

BER type

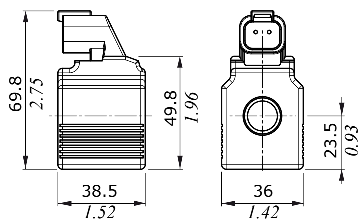
ISO4400 connector



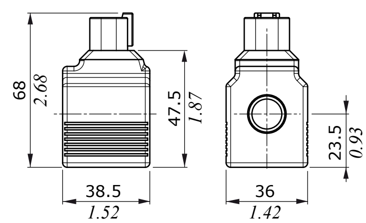
AMP JPT connector



DEUTSCH DT04 connector
(parallel type)



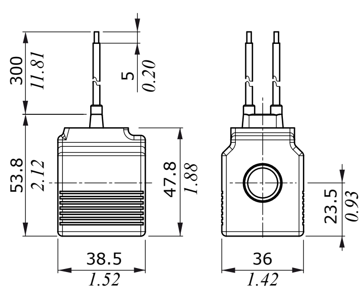
DEUTSCH DT04 connector
(perpendicular type)



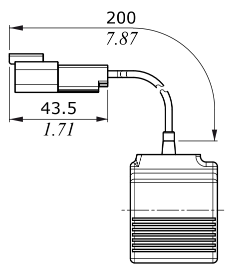
Features

Nominal voltage tolerance	: ±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 insulance	: Class H (180°C - *356 °F*)
Weather protection	: IP65 - ISO4400
	: IP69K - Deutsch DT
	: IP65 - AMP JPT
	: IP67 - Weatherpack
	: IP67 - Metri-pack
Insertion	: 100%

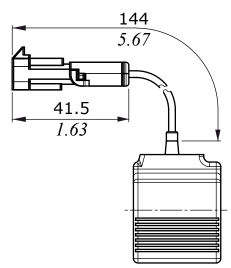
Flying leads



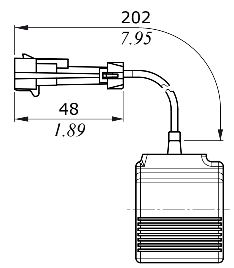
Flying leads with DEUTSCH DT04 connector



Flying leads with PACKARD WEATHER-PACK connector



Flying leads with PACKARD METRI-PACK connector

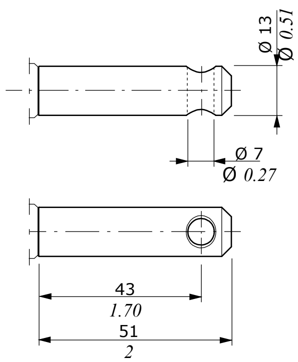


Spool end kit

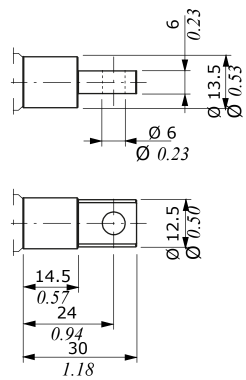
EX38

For post-compensated standard section (A side)

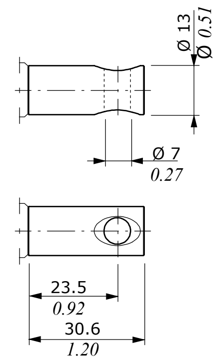
Only for mechanical controls



Only for without lever control

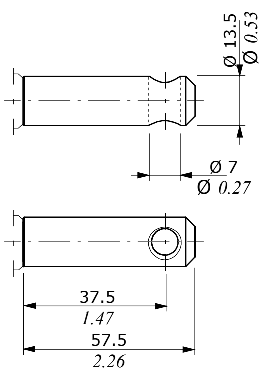


Only for hydraulic and electrohydraulic controls

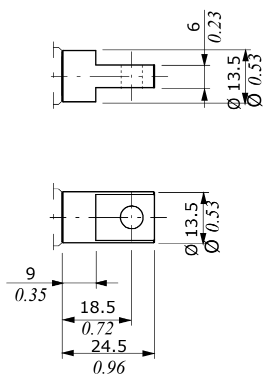


For post-compensated float section (A side)

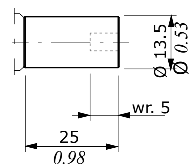
Only for mechanical controls



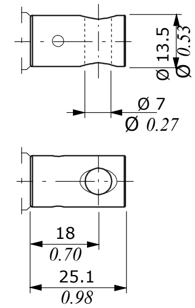
Only for without lever control



Only for HP07 control

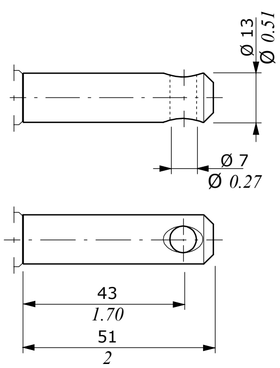


Only for HP04/HP04L controls

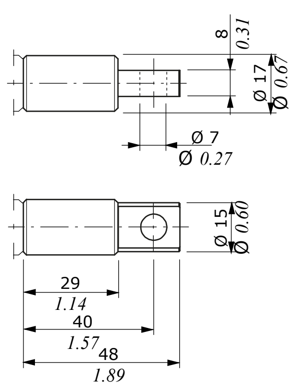


For pre-compensated section (A side)

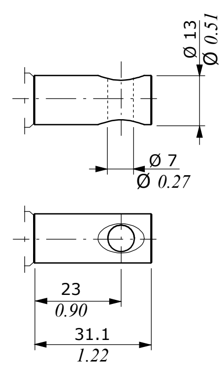
Only for mechanical controls



Only for without lever control



Only for hydraulic and electrohydraulic controls

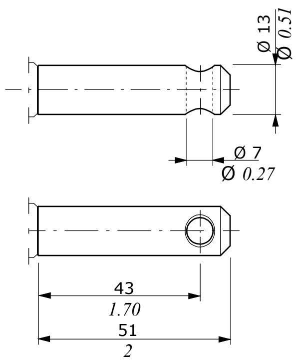


Spool end kit

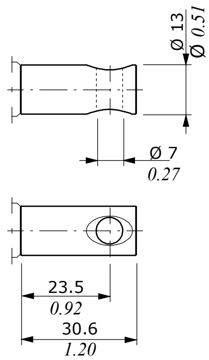
EX38-HF

For post-compensated standard section (A side)

Only for mechanical controls



Only for hydraulic and electrohydraulic controls

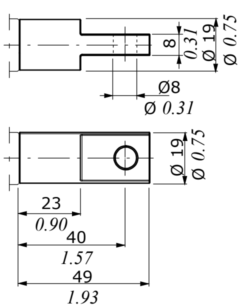


EX54

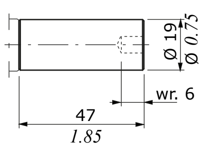
For post-compensated section

A side

Only for mechanical controls

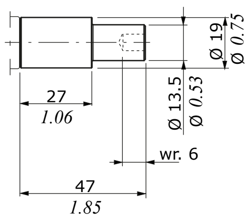


Only for hydraulic control

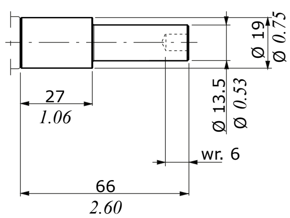


B side

Only for electrohydraulic control



Only for spool position sensor controls

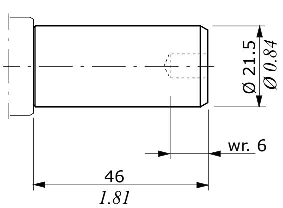


EX72

For post-compensated section

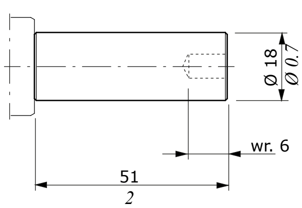
A + B sides

Only for hydraulic control



B side

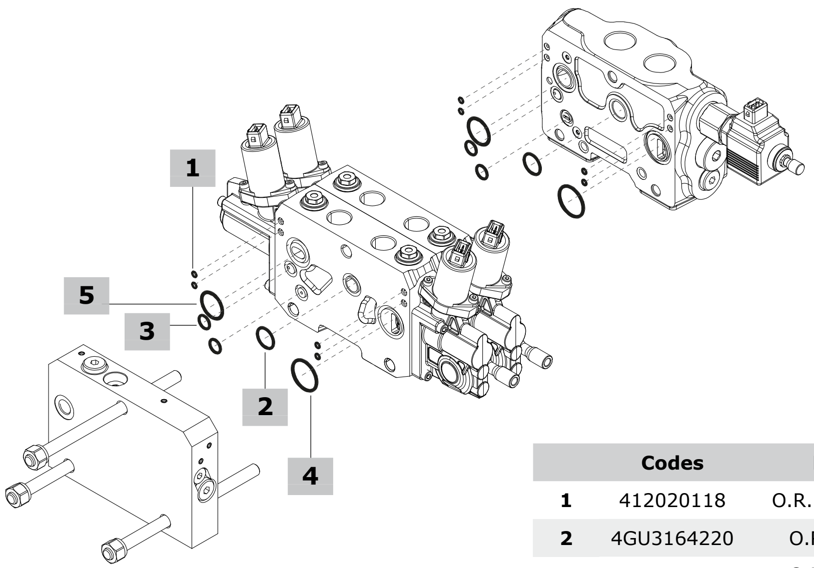
Only for electrohydraulic control



Seal kits

EX38

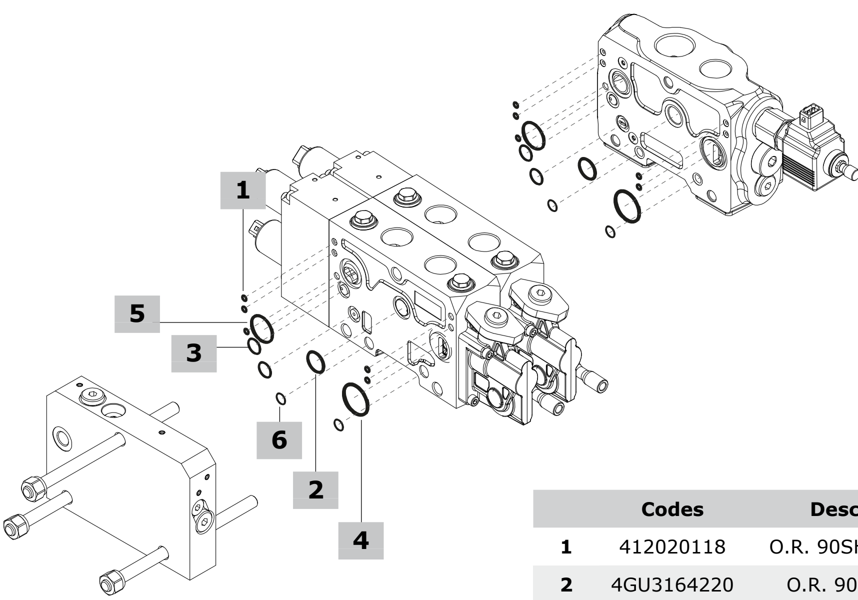
For inlet/working sections (post/pre-compensated)



	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)

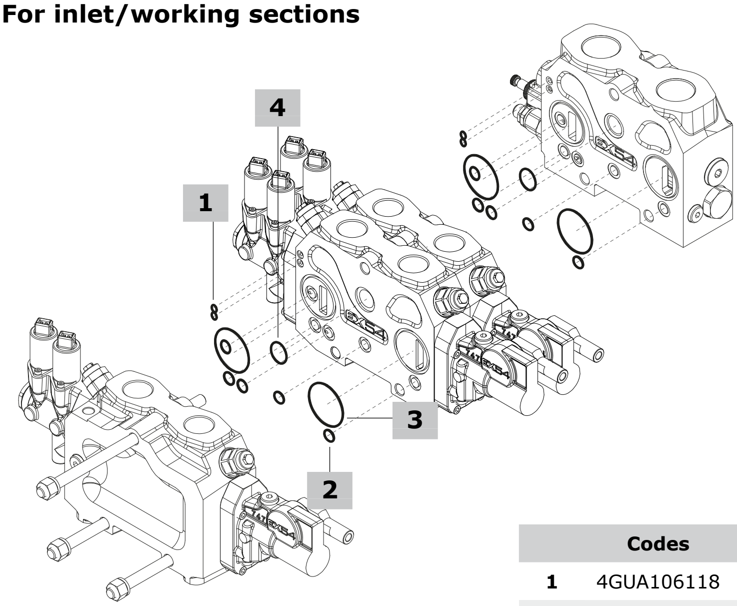


	Codes	Descriptions	Q.ty	Complete seal kit code
1	412020118	O.R. 90SH (n27or050)	5	350993003
2	4GU3164220	O.R. 90SH (3-908)	1	
3	412020303	O.R. 90SH (6-532)	2	
4	4GUA325126	O.R. 90SH (25.7x2.62)	1	
5	4GUA321926	O.R. 90SH (21.89x2.62)	1	
6	412010124	O.R. 70SH (2-11)	2	

Seal kits

EX54

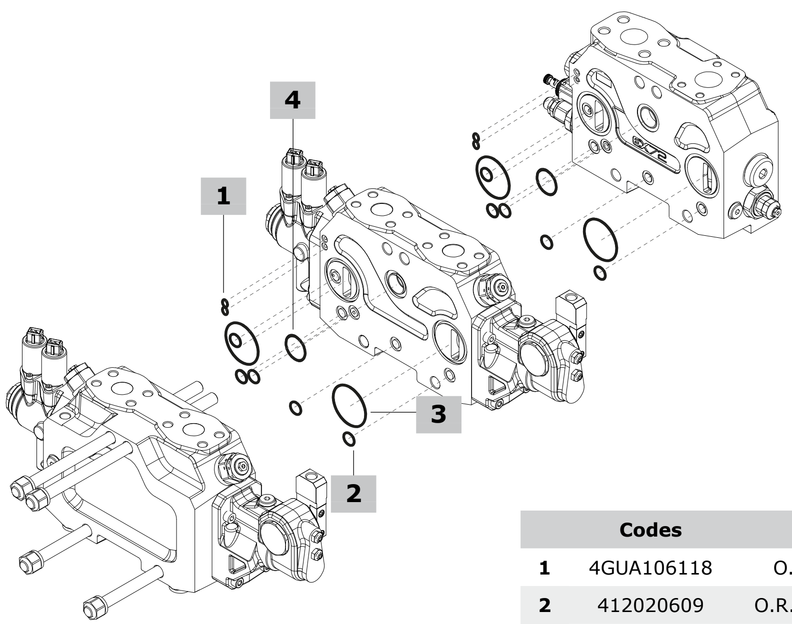
For inlet/working sections



	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

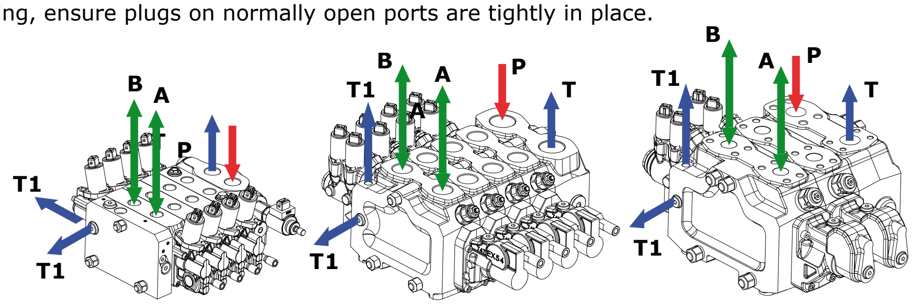


	Codes	Descriptions	Q.ty	Complete seal kit code
1	4GUA106118	O.R. 70SH 6.07x1.78	2	350995001
2	412020609	O.R. 90SH 13.11 (5-616)	5	
3	612020501	O.R. 90SH 50.39 (1BWG4)	2	
4	4GU3297350	O.R. 90SH 29.74x3.53	1	

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	G 1/4
	With O-Ring seal	90 *(66.3)*	60 *(44.2)*	90 *(66.3)*	30 *(22)*
	With copper washer	90 *(66.3)*	60 *(44.2)*	90 *(66.3)*	30 *(22)*
	With steel and rubber washer	90 *(66.3)*	60 *(44.2)*	90 *(66.3)*	30 *(22)*
	UN-UNF	1" 1/16-12 (SAE 12)	7/8-14 (SAE 10)	1" 1/16-12 (SAE 12)	9/16-18 (SAE 6)
	With O-Ring seal	90 *(66.3)*	90 *(66.3)*	90 *(66.3)*	30 *(22)*
EX38-HF	**BSP**	G 3/4	G 3/4	G 1"	G 1/4
	With O-Ring seal	90 *(66.3)*	90 *(66.3)*	100 *(73.7)*	30 *(22)*
	With copper washer	90 *(66.3)*	90 *(66.3)*	120 *(88.5)*	30 *(22)*
	With steel and rubber washer	90 *(66.3)*	90 *(66.3)*	120 *(88.5)*	30 *(22)*
	UN-UNF	1" 1/16-12 (SAE 12)	1" 1/16-12 (SAE 12)	1" 5/16-12 (SAE 16)	9/16-18 (SAE 6)
	With O-Ring seal	90 *(66.3)*	90 *(66.3)*	120 *(88.5)*	30 *(22)*
		P port	**A and B ports**	**T port**	**T1 port**
EX54	**BSP**	G 1" 1/4	G 1"	G 1" 1/4	G 1/4
	With O-Ring seal	120 *(88.5)*	120 *(88.5)*	120 *(88.5)*	30 *(22)*
	With copper washer	120 *(88.5)*	120 *(88.5)*	120 *(88.5)*	30 *(22)*
	With steel and rubber washer	120 *(88.5)*	120 *(88.5)*	120 *(88.5)*	30 *(22)*
	UN-UNF	1" 5/8-12 (SAE20)	1" 5/16-12 (SAE 16)	1" 5/8-12 (SAE 20)	9/16-18 (SAE 6)
	With O-Ring seal	120 *(88.5)*	120 *(88.5)*	120 *(88.5)*	30 *(22)*
	ISO 6162 type 1 **ISO 6162 type 2**	1" (M12) - type 2	3/4 (M10) - type 1	1" 1/4 (M10) - type 1	-
	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 **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)*	-
EX72	**BSP**	-	-	-	G 1/4
	With O-Ring seal	-	-	-	30 *(22)*
	With copper washer	-	-	-	30 *(22)*
	With steel and rubber washer	-	-	-	30 *(22)*
	UN-UNF	-	-	-	9/16-18 (SAE 6)
	With O-Ring seal	-	-	-	30 *(22)*
	ISO 6162 type 1 **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 **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

WALVOIL S.P.A.
DIREZIONE E COORDINAMENTO INTERPUMP GROUP S.P.A.
Sede principale, Filiali e Uffici di rappresentanza
Headquarters, Subsidiaries and Representative Offices

WALVOIL S.P.A. SEDE PRINCIPALE | HEADQUARTERS
Via Adige, 13/D . 42124 Reggio Emilia . Italy
TEL. +39 0522 932411
info@walvoil.com | www.walvoil.com

AUSTRALASIA | AUSTRALASIA

WALVOIL FLUID POWER AUSTRALASIA PTY LTD
6 Leonard Avenue . Toukley NSW 2263 . Sydney . Australia
TEL. +61 413 739 938
australasia@walvoil.com

BRASILE | BRAZIL

INTERPUMP HYDRAULICS BRASIL LTDA | WALVOIL DIVISION
Rua Gilberto de Zorzi, 525 . Bairro Forqueta 95115-730
Caxias do Sul (RS)
TEL. +55 54 3289 7000
infobrasil@walvoil.com

CANADA | CANADA

WALVOIL CANADA INC.
3100, Rue Jacob Jordan . Terrebonne . Qc J6X 4J6 . Canada
TEL. +1 450 477 1076 Ext:225
info@walvoilcanada.com | www.walvoilcanada.com

CINA | CHINA

WALVOIL FLUID POWER (DONGGUAN) CO. LTD
1st Floor, the Third Factory Area, Sijia, Shijie Town, Dongguan City
Guangdong province. China.
TEL. +86 769 81816189-8020
info@walvoil.com.cn | www.walvoil.com.cn

COREA DEL SUD | SOUTH KOREA

WALVOIL FLUID POWER KOREA LTD.
(17818)80-15, Oseongsandan 1Ro, Oseong-myun,
Pyeongtaek-si Gyeonggi-do
Republic of Korea 451-872
TEL. +82 31 682 6030
info@walvoil.co.kr | www.walvoil.co.kr

FRANCIA | FRANCE

WALVOIL FLUID POWER FRANCE
362 rue de La Jaunais . Vritz . 44540 Vallons-de-l'Erdre
TEL. +33 2 41 94 41 06
france@walvoil.com

INDIA | INDIA

WALVOIL FLUID POWER (INDIA) PVT. LTD.
No. 1, 2nd Cross, 2nd Main, KIADB Industrial Area, Attibele, Anekal Taluk
Bangalore - 562107 .
TEL. +91 80 0614 24000
info@walvoil.co.in | www.walvoil.co.in

MESSICO | MEXICO

WALVOIL FLUID POWER MEXICO S.A. DE C.V.
Julian Sepulveda Davila #109, Parque Industrial SG, cp. 66640, Apodaca
Nuevo León, Mexico

U.S.A. | U.S.A.

WALVOIL FLUID POWER CORP. | HEADQUARTERS
4111 North Garnett Tulsa, OK 74116, USA
TEL. +1 918 858 7100
info@walvoilusa.com | www.walvoilusa.com

WALVOIL FLUID POWER CORP
1109, Technology Drive . Red Wing . MN 55066 . U.S.A.
TEL. +1 651 212 6400
info@walvoilusa.com | www.walvoilusa.com

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