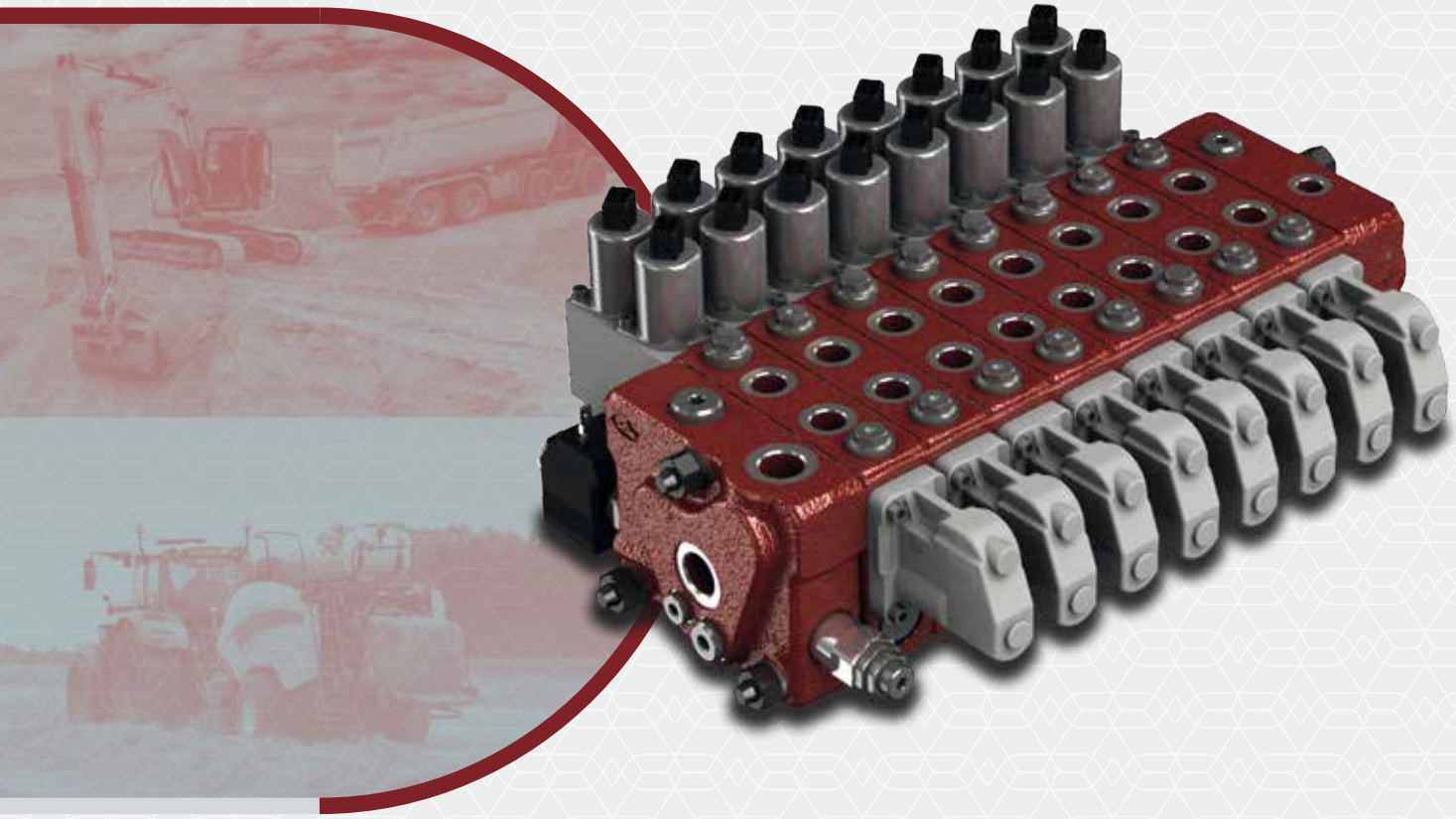
walvoil

MOTION BY PEOPLE

DPX Series

Full Flow Sharing Sectional Valve





DIRECTIONAL VALVES

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.

1st edition February 2026

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The DPX series

The DPX Series is a family of open/closed center post-pressure compensated sectional valves designed specifically for Mobile Applications. The DPX series provides exceptional controllability, efficiency and flexibility for applications requiring up to 160 l/min *(42 US gpm)* flow rates. The DPX Series is available in three different sizes: DPX050, DPX100 and DPX160, also available in High Pressure configuration.



DPX050



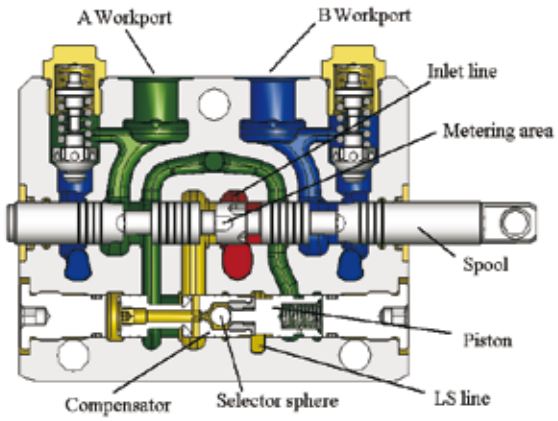
DPX100



DPX160

The Flow Sharing technology

The DPX Series control valves adds the benefit of Flow Sharing technology to the standard Load Sensing valve. The DPX 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.



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

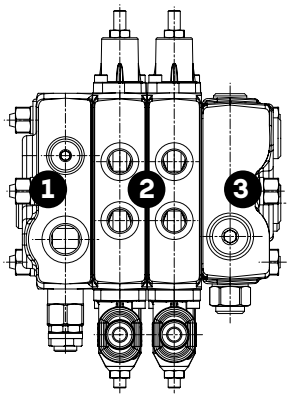
- Energy saving on closed center system, is produced only required flow and pressure by the actuators.
- The flow sharing technology permits multiple movements even with flow saturation.
- Flow passage design allows high P and T flow rate in a standard valve dimension.
- Inlet section with unidirectional restrictor option suitable for dumping the pressure peaks from the LS line to the compensator and vice versa.
- High Pressure version (HP) stackable with standard one.
- 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.

Guide to configuration

Configuration with mechanical, hydraulic or electric controls

This configuration needs standard inlet sections, working sections without pilot lines and standard outlet sections.



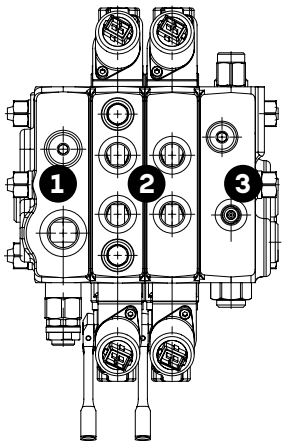
DPX050
1: AM or AN inlet sections
2: P or Q working sections
3: RP or RQ working sections with outlet

DPX100
1: AM or AN inlet sections
2: P or Q working sections
3: RF outlet sections

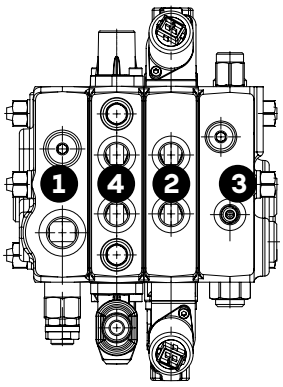
DPX160
1: AM or AN inlet sections
2: P or Q working sections
3: RC outlet sections

Configuration with only electrohydraulic or mixed controls

Electrohydraulic configuration (pic. 1) needs standard inlet sections, working and outlet sections with pilot lines.
In a valve configurated with electrohydraulic mixed sections (two-sides and one side type controls), the two-side control section have to be positioned after (on the right) one-side control section, close to the outlet one.
In a mixed control configuration valve (pic. 2) electrohydraulic control sections have to be positioned after (on the right) manual/hydraulic/electric control sections, close to the outlet section.
In case of need to include manual/hydraulic/electric control sections between 2 electro-hydraulic control sections, or between one of these and outlet section, it is necessary to require specific working sections kits able to cross pilot line.



(pic. 1)



(pic. 2)

DPX050
1: AM or AN inlet sections
2: PZ, QZ, PE or QE working sections
3: RPZ, RQZ, RPE or RQE working sections with outlet
4: P or Q working sections

DPX100
1: AM or AN inlet sections
2: PE, QE, PZ or QZ working sections
3: RDN or RDR outlet sections
4: P or Q working sections

DPX160
1: AM or AN inlet sections
2: PE or QE working sections
3: RCR or RCN outlet sections
4: P or Q working sections

Working conditions

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

		DPX050	DPX100 Std.	DPX100 HP	DPX100 HF	DPX160 Std.	DPX160 HP
Nominal flow rating	inlet port with compensator, with 14 bar - *200 psi* stand-by (margin pressure)	80 l/min *21 US gpm*	120 l/min *32 US gpm*	120 l/min *32 US gpm*	>120 l/min *>32 US gpm*	230 l/min *61 US gpm*	
	working ports, with 14 bar - *200 psi* stand-by (margin pressure)	50 l/min *13 US gpm*	90 l/min *24 US gpm*	90 l/min *24 US gpm*	120 l/min *32 US gpm*	160 l/min *42 US gpm*	
Max. pressure	**P** inlet port	300 bar *4350 psi*	300 bar *4350 psi*	380 bar[1] *5550 psi*[1]	380 bar[1] *5550 psi*[1]	300 bar	380 bar [3]
	A and **B** working ports	350 bar *5100 psi*	300 bar *4350 psi*	420 bar[1] *6000 psi*[1]	420 bar[1] *6000 psi*[1]	300 bar	420 bar [3]
Back pressure (max.) on outlet **T** port	with mechanical devices	10 bar - *145 psi*					
	with hydraulic/pneumatic devices	30 bar - *435 psi*					
	with electric/electrohydraulic devices	see related pages					
Standard internal leakage A(B)⇒T	**On std.working section**						
	Δp=100 bar - *1450 psi*	max. 6.5 cm³/min *max. 0.40 in³/min*	max. 9 cm³/min *max. 0.55 in³/min*			max. 12 cm³/min *max. 0.73 in³/min*	
	with port valves, Δp=100 bar - *1450 psi*	max. 11.5 cm³/min *max. 0.70 in³/min*	max. 14 cm³/min *max. 0.85 in³/min*			max. 17 cm³/min *max. 1.04 in³/min*	
	On Low Leak section						
	Δp=180 bar	max. 3 cm³/min *max. 0.18 in³/min*	max. 3 cm³/min *max. 0.18 in³/min*	-	-	-	
	with port valves, Δp=180 bar - *2600 psi*	max. 4 cm³/min *max. 0.24 in³/min*	max. 4 cm³/min *max. 0.24 in³/min*	-	-	-	
Fluido		Mineral oil					
Fluid temperature range	standard configuration	from -20°C to 100°C - *from -4°F to 212°F*					
Viscosity	operating range	from 15 to 75 mm²/s - *from 15 to 75 cSt*					
	min.	12 mm²/s - *12 cSt*					
	max.	400 mm²/s - *400 cSt*					
Contamination level	max	19/18/15 - ISO 4406 - *NAS 1638 class 9*					
Environmental temperature for working conditions	with mechanical devices	from -40°C to 60°C - *from -40°F to 140°F*					
	with hydraulic/pneumatic devices	from -30°C to 60°C - *from -22°F to 140°F*					
	with electric/electrohydraulic devices	from -20°C to 50°C - *from -4°F to 122°F*					

NOTES: (1) According to NFPA T 2.6.1., fatigue rating verified for 1 million cycles on 6 sample valves with test Pressure = 1.23 x Max. pressure indicated - (2) According to NFPA T 2.6.1., fatigue rating verified for 1 million cycles on 5 sample valves with test Pressure = 1.16 x Max. pressure indicated - (3) Fatigue rating verified for 1 million cycles on 6 sample valves with Test Pressure = 1.10 x Max. pressure indicated

Standard threads

REFERENCE STANDARD		BSP	UN-UNF	METRIC[4]	METRIC ISO[4]	NPTF
THREAD ACCORDING TO		ISO 228/1 BS 2779	ISO 263 ANSI B1.1 unified	ISO 262	ISO 262	ANSI B1.20.3
CAVITY DIMENSION ACCORDING TO	ISO	1179	11926	9974-1	6149	
	SAE		J1926		J2244	J476a
	DIN	3852-2 shape X or Y		3852-1 shape X or Y		

NOTE [4]: Metric threading is available on request

PORTS	DPX050		DPX100		DPX160	
THREADING	BSP	UN-UNF	BSP	UN-UNF	BSP	UN-UNF
P inlet	G 1/2	3/4-16 (SAE 8)	G 1/2 - G 3/4[5]	7/8-14 (SAE10) 1 1/16-12 (SAE12)[5]	G 3/4	1 1/16-12 (SAE12)
A and **B** ports	G 3/8	9/16-18 (SAE 6)	G 3/8 G 1/2[5] - G 3/4[6]	3/4-16 (SAE8) 1 1/16-12 (SAE12)[6]	G 3/4	1 1/16-12 (SAE12)
T outlet	G 1/2	3/4-16 (SAE 8)	G 1/2 - G 3/4[5]	7/8-14 (SAE10) 1 1/16-12 (SAE12)[5]	G 1	1 5/16-12 (SAE16)
V pilot	G 1/4	7/16-20 (SAE 4)	G 1/4	9/16-18 (SAE6)	G 1/4	9/16-18 (SAE6)
L drain	G 1/4	9/16-18 (SAE 6)	G 1/4	9/16-18 (SAE6)	G 1/4	9/16-18 (SAE6)
Hydraulic control ports	G 1/4	7/16-20 (SAE 4)	G 1/4	7/16-20 (SAE 4)	G 1/4	9/16-18 (SAE 6)
Pneumatic control ports			NPTF 1/8-27	NPTF 1/8-27		

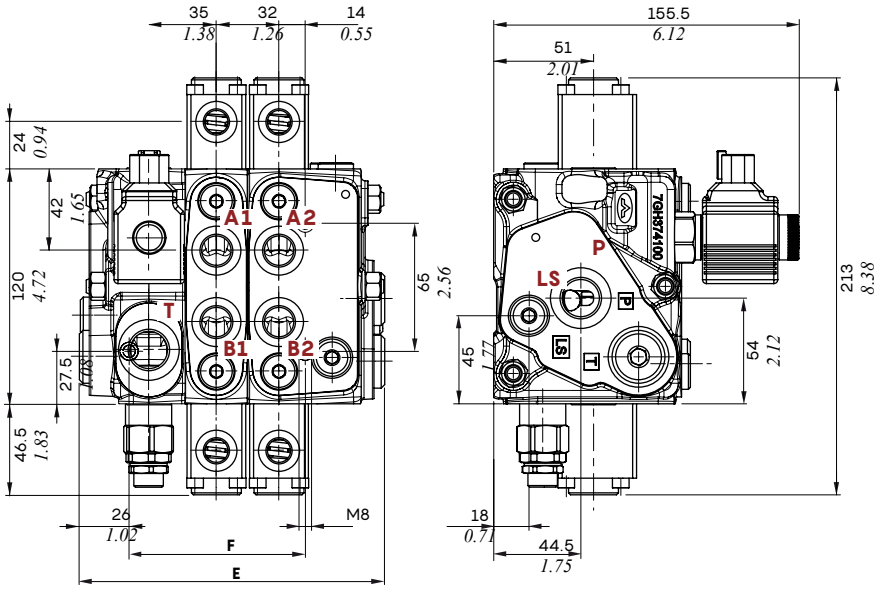
NOTE:
[5] - Optional threading / [6] - only for High Flow sections

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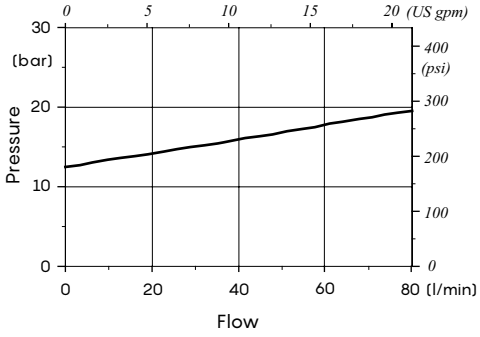
• **DPX050 Low leak**
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Dimensional data and performance

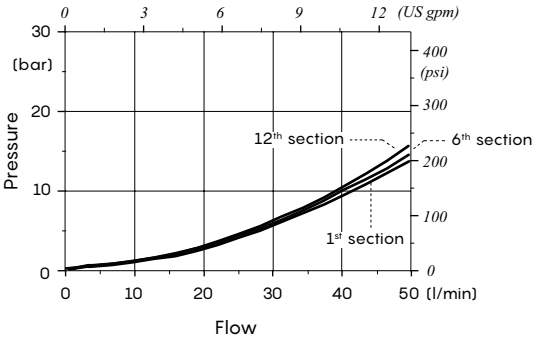


Type	E		F	
	mm	*in*	mm	*in*
DPX050/1	119	*4.69*	57.5	*2.26*
DPX050/2	151	*5.95*	89.5	*3.52*
DPX050/3	183	*7.20*	121.5	*4.78*
DPX050/4	215	*8.46*	153.5	*6.04*
DPX050/5	247	*9.72*	185.5	*7.30*
DPX050/6	279	*10.98*	217.5	*8.56*
DPX050/7	311	*12.24*	249.5	*9.82*
DPX050/8	343	*13.50*	281.5	*11.08*
DPX050/9	375	*14.76*	313.5	*12.34*
DPX050/10	407	*16.02*	345.5	*13.60*
DPX050/11	439	*17.28*	377.5	*14.86*
DPX050/12	471	*18.54*	409.5	*16.12*

P⇒T Pressure drop inlet compensator (margin pressure)

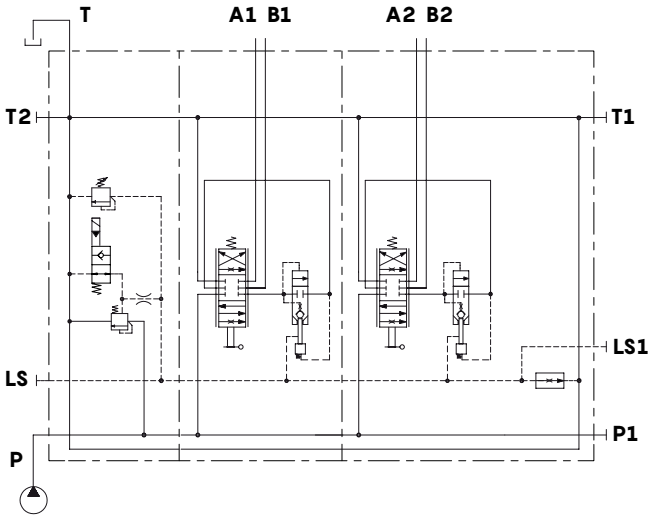


A(B)⇒T pressure drop (standard spool @ max.stroke)

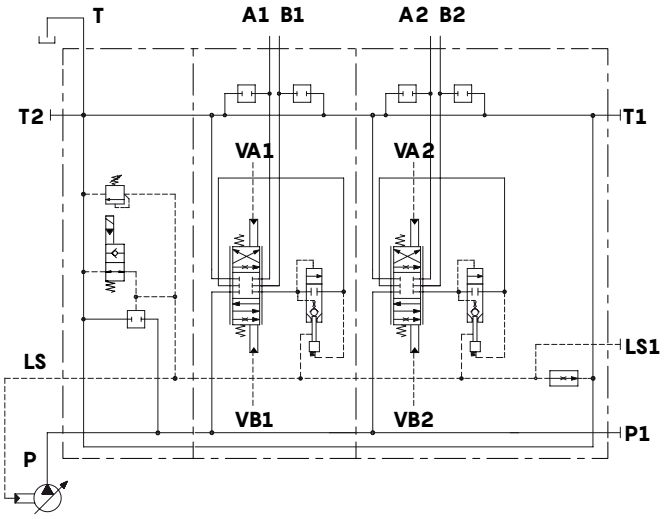


Hydraulic cuircuit

Configuration example with mechanical and hydraulic controls

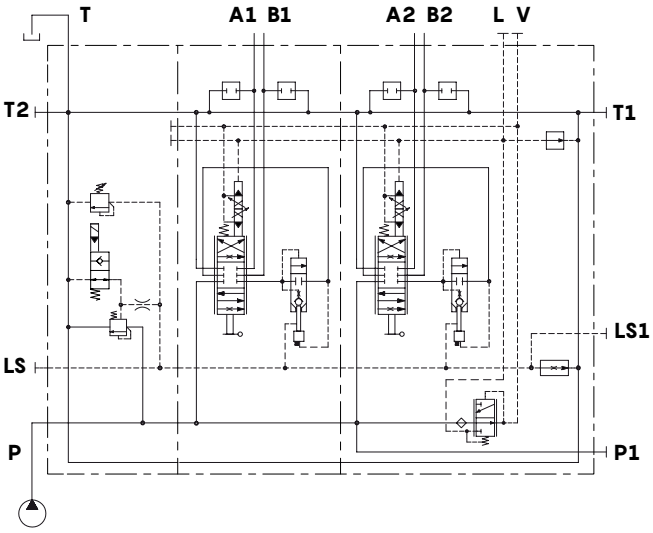


Open center circuit and lever control, with unloader valve, without port valve arrangement

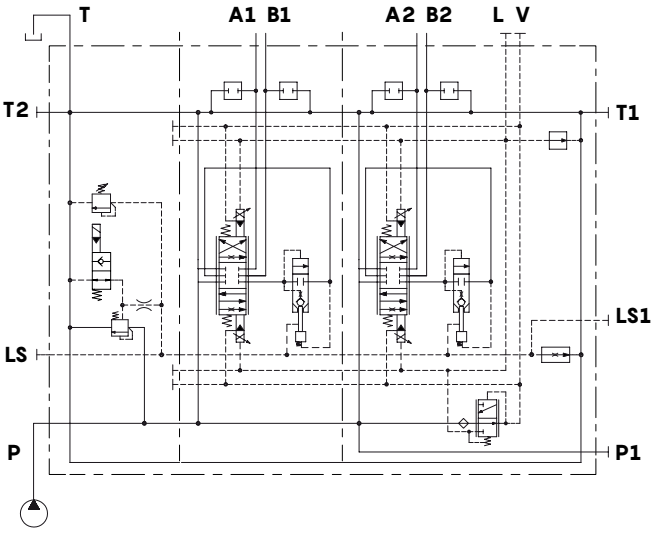


Closed center circuit and proportional hydraulic control, with unloader valve and port valve arrangement

Configuration example with electrohydraulic controls



Open center circuit and one-side proportional electrohydraulic control with lever, unloader valve, port valve arrangement and pressure reducing valve, internal pilot and drain



Open center circuit and two-side proportional electrohydraulic control, with unloader valve and port valve arrangement and pressure reducing valve, internal pilot and drain

Guide to configuration

Pressure peak reduction

Pressure peaks may occur in a port during normal machine operation, causing signal L.S. swings. If those pressure swings reach the inlet section or the pump compensators, they could cause an harsh and not confortable regulation, especially if they occur with high frequency.
The DPX Series directional valves, open and closed center ones, are available with inlet sections equipped with devices for L.S. signal peak reduction.

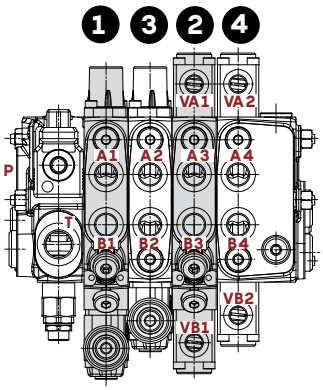
Standard configuration
Bidirectional restrictor on L.S. signal; it dampens the pressure peaks from L.S. line to inlet section compensator and vice versa.
SU option
Unidirectional restrictor on L.S. signal; it dampens the pressure peaks from L.S. line (and then from users) to inlet section compensator. It's recommended for applications that need soft start.
SO options
Unidirectional restrictor on L.S. signal; it dampens the pressure peaks from inlet section compensator to L.S. line. It's recommended for swings reduction occurred during normal operation.

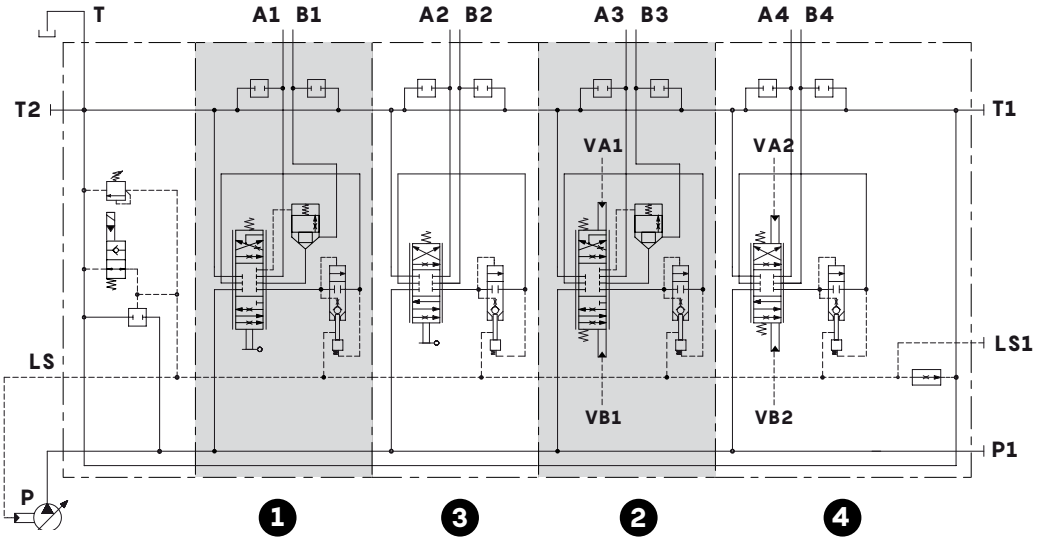
Directional valve with Low Leak working sections

The DPX050 directional valve can be configured with working sections fitted with a Low Leak valve, and it can be used in all applications that require reduced leakage, such as: Tractors, Boom Mowers, Backhoe Loaders, Graders, Mini-excavator, Compact Wheel Loaders, Fork Lifts.
The working sections have the following features:
- Dedicated cast iron body to integrate hydraulic pilot Low Leak valves
- Port valves arrangement
- Capability to integrate the floating circuit with hydraulic release of the Low Leak valve
- They are configurable with standard cointrols: mechanical, proportional hydraulic and electrohydraulic
- Dedicated spools to Low Leak function.
- Compatible with inlet and outlet sections in the catalogue.

Valve with mechanical or hydraulic controls

The Low Leak working sections can be assembledin any point of the valve between the inlet section and the working and outlet section.





1: Low Leak working section with mechanical control
2: Low Leak working section with hydraulic control
3: Standard working section with mechanical control
4: Standard working section with hydraulic control

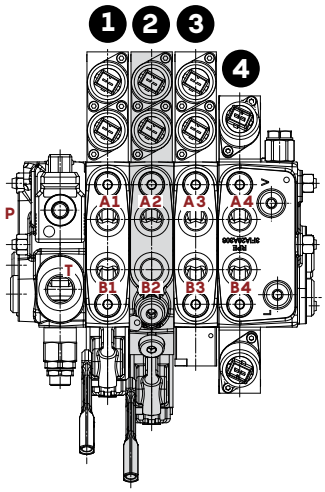
Directional valve with Low Leak working sections

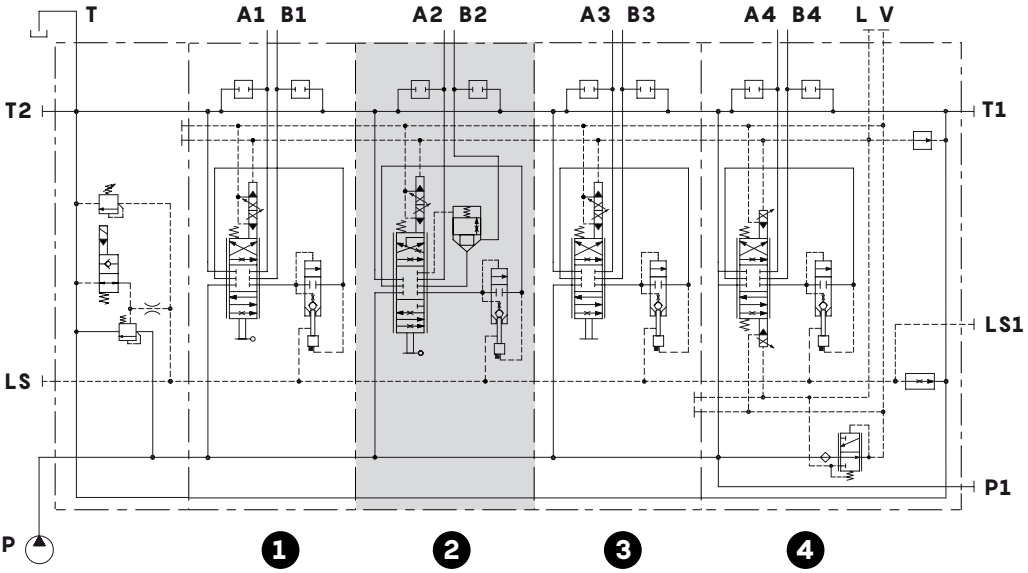
Valve with electrohydraulic controls

The Low Leak working sections can only be fitted with one side electrohydraulic controls, and it can be assembled in any point of the valve between the inlet section and the working and outlet section..

Standard sections sections can be fitted indifferently with one-side or two-side controls, considering that the sections with two-side control must be assembled last.

Any standard section with one side electrohydraulic control assembled downstream of the Low Leak section must be without lever control.





1: Standard working section with one side electrohydraulic control
2: Low Leak working section with one side electrohydraulic control
3: Standard working section with one side electrohydraulic control (without lever control on B side)
4: Standard working and outlet section with two side electrohydraulic control

Complete section ordering codes

A **Mechanical or hydraulic controls configuration:**

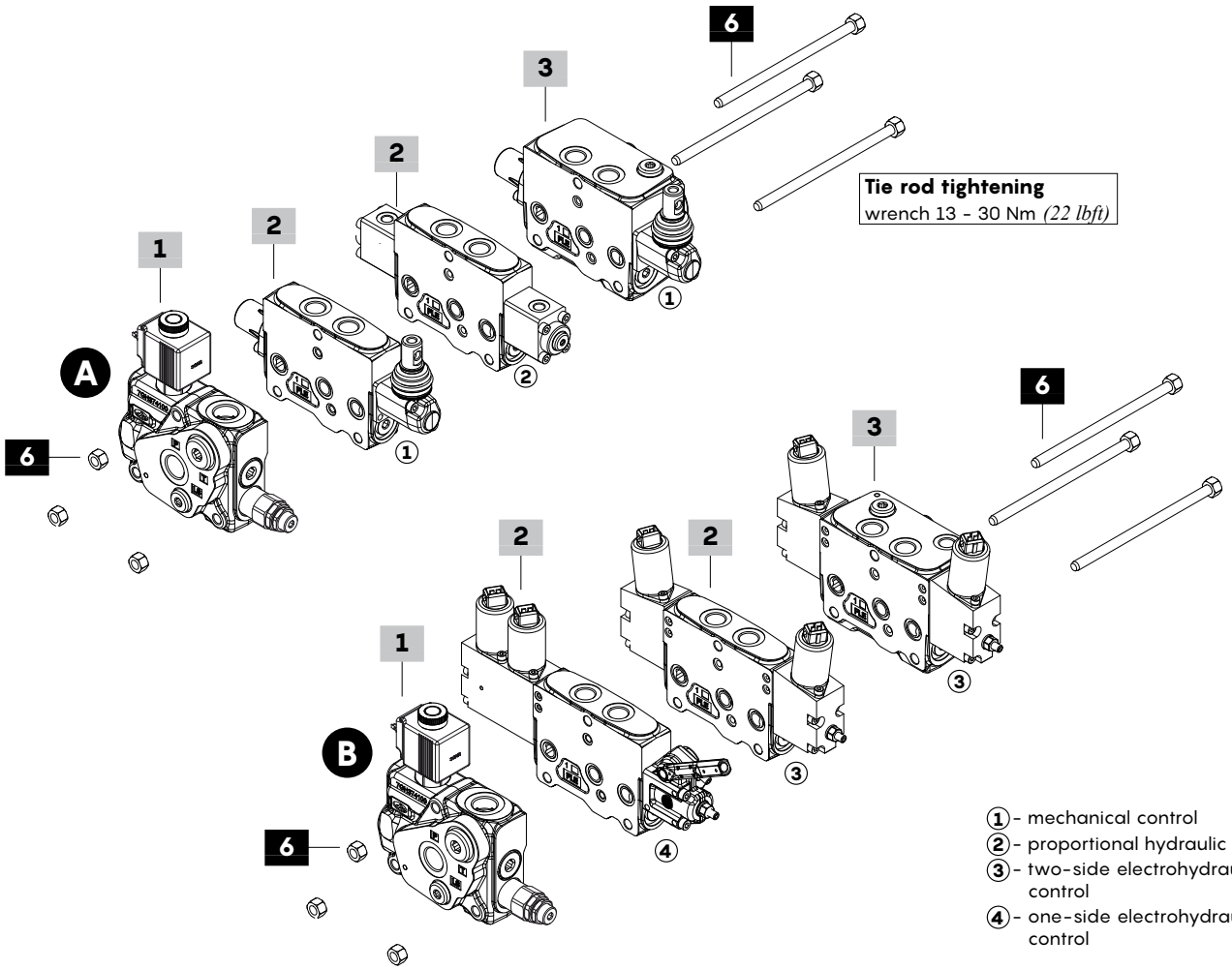
DPX050/3/AM2(TGW3-175\ELN)/Q-104(40\40)-8L/Q-I104(40\40)-8IM/RQ-104(40\40)-8L-.....-12VDC

No. of working sections: 1 | 2 | 2 | 3 | 4 | 5

B **Electrohydraulic controls configuration:**

DPX050/3/AM2(TGW3-175\ELN)/QZ-I104(40\40)-8EZ3LQF3/QE-I104(40\40)-8EB3F3/RQ-1I04(40\40)-8EB3F3-.....-12VDC

1 | 2 | 2 | 3 | 4 | 5



Complete section ordering codes

1 Complete inlet section *

Open Center circuit
TYPE: **DPX050/AM2(TGW3-175\ELN)-12VDC**
CODE: 660203001S
DESCRIPTION: With compensator, pressure relief valve and unloader valve, with P-T-T2-LS ports (T2-LS plugged)
TYPE: **DPX050/AM2(SO(FC0.5)\TGW4-250\ELT)-12VDC**
CODE: 660203017S
DESCRIPTION: As previous one with non-return flow limiter from inlet section to working section and by-pass valve
TYPE: **DPX050/AM2(SU\TGW3-175\LT)**
CODE: 660203036S
DESCRIPTION: With non-return flow limiter from working section to inlet section and by-pass valve, unloader valve arrangement plugged
Closed Center circuit
TYPE: **DPX050/AN2(TGW3-175\ELN)-12VDC**
CODE: 660203004S
DESCRIPTION: Without compensator, with pressure relief valve and unloader valve, with P-T-T2-LS ports (T2 plugged)
TYPE: **DPX050/AN2(SO\TGW4-250\LT)**
CODE: 660203003S
DESCRIPTION: As previous one with non-return flow limiter from inlet section to working section and by-pass valve, unloader valve arrangement plugged
TYPE: **DPX050/AN2(SU/TGW3-175/ELN)-12VDC**
CODE: 660203005S
DESCRIPTION: With non-return flow limiter from working section to inlet section and by-pass valve

2 Complete working section *

Mechanical control
TYPE: **DPX050/Q-104(40\40)-8L**
CODE: 660151001S
DESCRIPTION: Lever control without port valve arrangement
TYPE: **DPX050/P-104(40\40)-8L.U3T**
CODE: 660101004S
DESCRIPTION: As previous one with port valve arrangement
Proportional hydraulic control
TYPE: **DPX050/Q-I104(40\40)-8IM**
CODE: 660151002S
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/P-I104(40\40)-8IM.U3T**
CODE: 660101005S
DESCRIPTION: With port valve arrangement
Two-side proportional electrohydraulic control
TYPE: **DPX050/QE-I104(40\40)-8EB3F3-12VDC**
CODE: 660101008S
DESCRIPTION: With spool stroke limiter, without port valve arrangement
TYPE: **DPX050/PE-I104(40\40)-8EB3F3.U3T-12VDC**
CODE: 660101009S
DESCRIPTION: As previous one with port valve arrangement
One-side proportional electrohydraulic control
TYPE: **DPX050/QZ-I104(40/40)-8EZ3LQF3-12VDC**
CODE: 660101006S
DESCRIPTION: With lever and spool stroke limiter, without port valve arrangement
TYPE: **DPX050/PZ-I104(40\40)-8EZ3LQF3.U3T-12VDC**
CODE: 660101007S
DESCRIPTION: As previous one with port valve arrangement

3 Complete working section with outlet *

Mechanical control
TYPE: **DPX050/RQ-104(40\40)-8L**
CODE: 660303001S
DESCRIPTION: Lever control, with bleed valve and P1-T1-LS1 side ports (plugged), without port valves arrangement
TYPE: **DPX050/RP-104(40\40)-8L.U3T**
CODE: 660303003S
DESCRIPTION: As previous one with port valve arrangement
Proportional hydraulic control
TYPE: **DPX050/RQ-I104(40\40)-8IM**
CODE: 660303011S
DESCRIPTION: With bleed valve and P1-T1-LS1 side ports (plugged), without port valve arrangement
TYPE: **DPX050/RP-I104(40\40)-8IM.U3T**
CODE: 660303012S
DESCRIPTION: As previous one with port valve arrangement
Two-side proportional electrohydraulic control
TYPE: **DPX050/RQE-I104(40\40)-8EB3F3-12VDC**
CODE: 660303005S
DESCRIPTION: With spool stroke limiter, bleed valve, pressure reducing valve and P1-T1-LS1 side ports (plugged), V pilot and L drain ports plugged, without port valve arrangement
TYPE: **DPX050/RPER-I104(40\40)-8EB3F3.U3T-12VDC**
CODE: 660303006S
DESCRIPTION: As previous one with port valve arrangement
One-side proportional electrohydraulic control
TYPE: **DPX050/RQZ-I104(40\40)-8EZ3LQF3-12VDC**
CODE: 660303002S
DESCRIPTION: With lever and spool stroke limiter, bleed valve, pressure reducing valve and P1-T1-LS1 side ports (plugged), V pilot and L drain ports plugged, without port valve arrangement
TYPE: **DPX050/RPZ-I104(40\40)-8EZ3LQF3.U3T-12VDC**
CODE: 660303004S
DESCRIPTION: As previous one with port valves arrangement

4 Valve threading

Only specify if it is different from **BSP** standard (see page 7).

5 Voltage

Specify the voltage of electric devices.

6 Assembling kit

CODE	DESCRIPTION	CODE	DESCRIPTION
5TIR108125	For 1 section valve	5TIR108320	For 7 sections valve
5TIR108157	For 2 sections valve	5TIR108349	For 8 sections valve
5TIR108192	For 3 sections valve	5TIR108381	For 9 sections valve
5TIR108222	For 4 sections valve	5TIR108413	For 10 sections valve
5TIR108253	For 5 sections valve	5TIR108446	For 11 sections valve
5TIR108285	For 6 sections valve	5TIR108477	For 12 sections valve

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

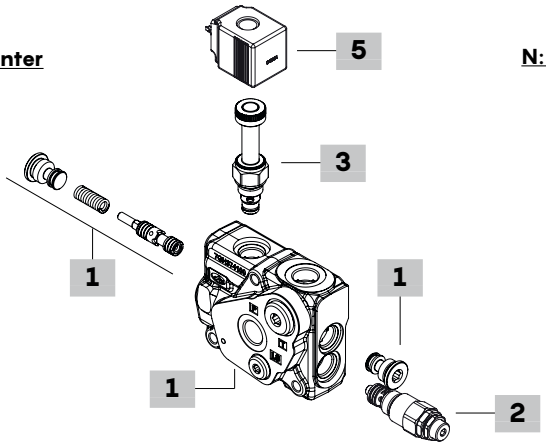
Inlet section part ordering codes

Valve setting (bar)

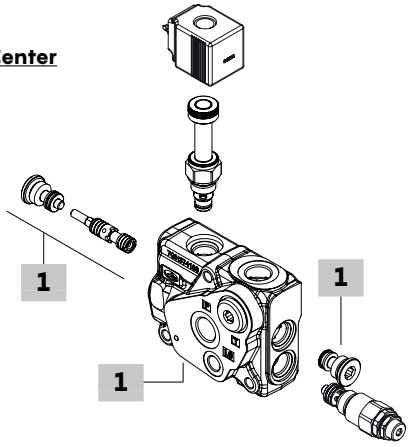
DPX050 / A M2 (TGW3 - 175 \ ELN) - .... - 12VDC

1 **2** **3** **4** **5**

M: Open Center



N: Closed Center



1 Inlet section kit * page 17

Open Center circuit

TYPE: **DPX050/AM2/EL** CODE: 5FIA150340S
DESCRIPTION: With P-T-T2-LS ports (T2-LS plugged) arranged for unloader valve

TYPE: **DPX050/AM2(SU)/EL** CODE: 5FIA150330S
DESCRIPTION: As previous one with non return flow limiter from working section to inlet section and by-pass valve

TYPE: **DPX050/AM2(SO)/EL** CODE:5FIA150331S
DESCRIPTION: As AM2 type with non return flow limiter from inlet section to working section and by-pass valve

Closed Center circuit

TYPE: **DPX050/AN2/EL** CODE: 5FIA150341S
DESCRIPTION: With P-T-T2-LS ports, arranged for unloader valve (T2 plugged)

TYPE: **DPX050/AN2(SU)/EL** CODE: 5FIA150332S
DESCRIPTION: As previous one with non return flow limiter from working section to inlet section and by-pass valve

TYPE: **DPX050/AN2(SO)/EL** CODE: 5FIA150333S
DESCRIPTION: As AN2 type with non return flow limiter from inlet section to working section and by-pass valve

2 Main pressure relief valve page 19

Valves standard setting is referred to 5 l/min *(1.3 US gpm)* flow.

TYPE	CODE	DESCRIPTION
(TGW2-80)	0MC09002000	Range 10-120 bar *(145-1750 psi)* std setting 80 bar *(1160 psi)*
(TGW3-175)	0MC09002001	Range 40-220 bar *(580-3200 psi)* std setting 175 bar *(2550 psi)*
(TGW4-250)	0MC09002002	Range 200-350 bar *(2900-5100 psi)* std setting 250 bar *(3600 psi)*
SV	XTAP524340D	Relief valve blanking plug

3 Solenoid operated unloading valve page 19

TYPE	CODE	DESCRIPTION
ELN	0EF08002000	Without emergency override
ELV	0EF08002003	With screw type emergency override
ELP	0EF08002002	With push-button emergency override
ELT	0EF08002004	With "twist & push" emergency override
LT	XTAP510320	Unloading valve blanking plug

4 Section threading

Only specify if it is different from **BSP** standard (see page 7).

5 Coil

TYPE	CODE	DESCRIPTION
12VDC	4SLE001200A	12VDC coil type **BER**, ISO4400 connector

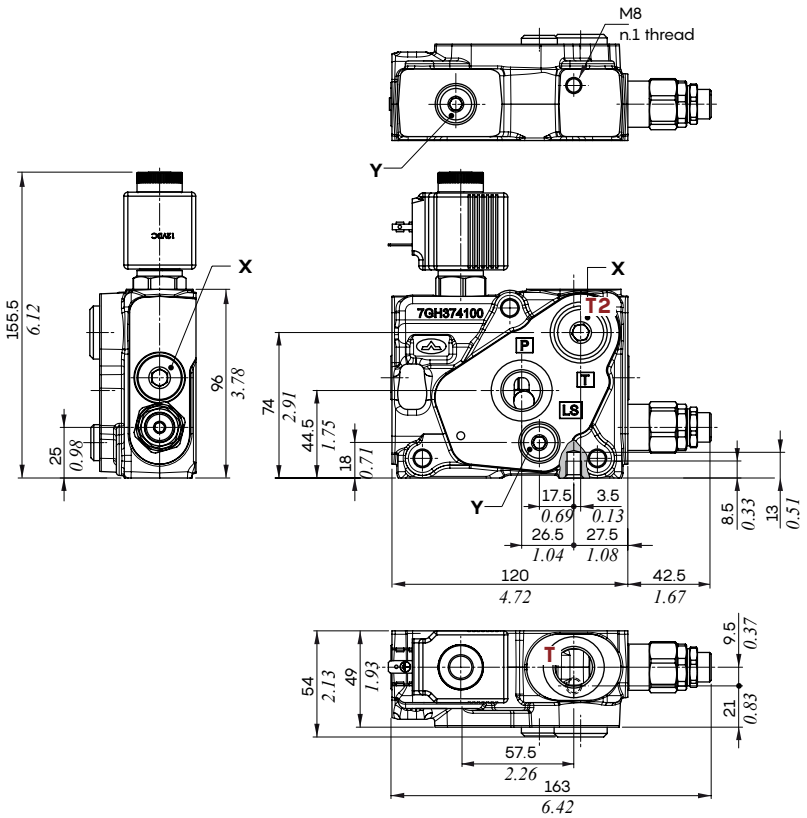
For complete available coil list see page 160.

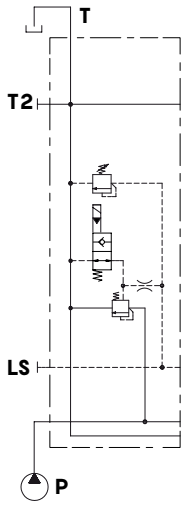
NOTE (*): Codes are referred to **BSP** thread.

Dimensions and hydraulic circuit

Example of M type Open Center section

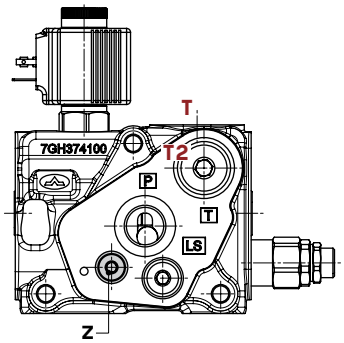
Type AM2



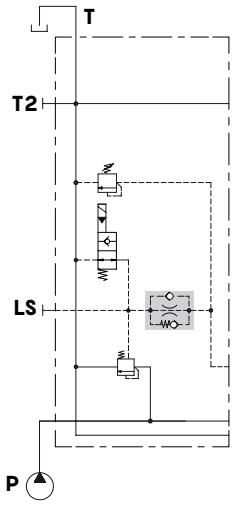


Wrenches and tightening torques
X = allen wrench 8 - 24 Nm *(17.7 lbft)*
Y = allen wrench 6 - 24 Nm *(17.7 lbft)*
Z = allen wrench 4 - 9.8 Nm *(7.2 lbft)*
NOTE: for valves wrench and torque see related pages

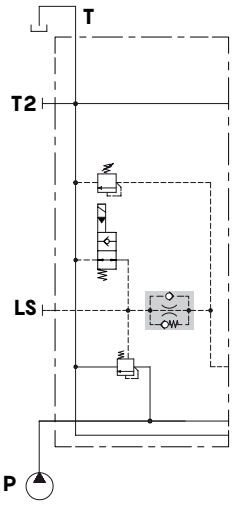
Type AM2(SO) or AM2(SU)



Type AM2(SU)



Type AM2(SO)

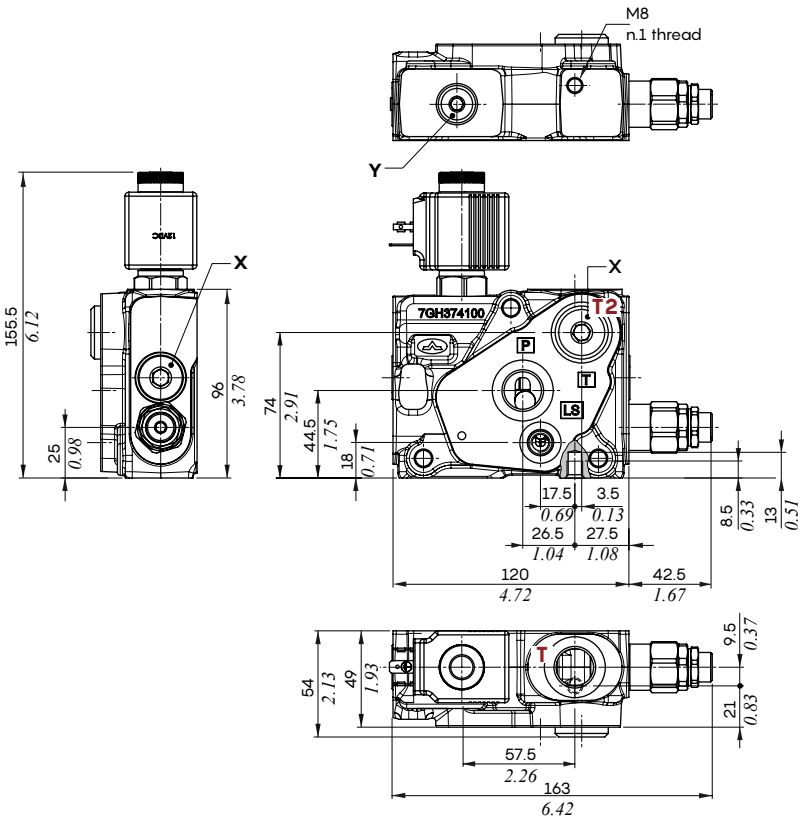


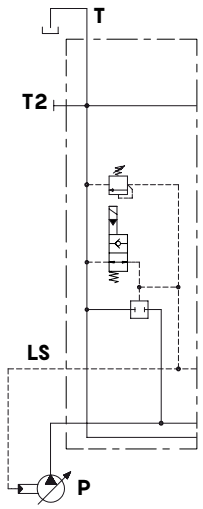
Inlet section

Dimensions and hydraulic circuit

Example of N type Closed Center section

Type AN2

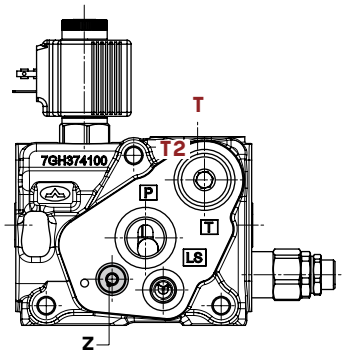




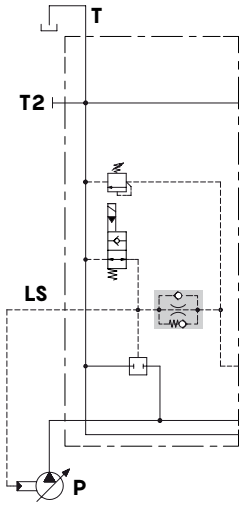
Wrenches and tightening torques

X = allen wrench 8 - 24 Nm *(17.7 lbft)*
Y = allen wrench 6 - 24 Nm *(17.7 lbft)*
Z = allen wrench 4 - 9.8 Nm *(7.2 lbft)*
NOTE: for valves wrench and torque see related pages

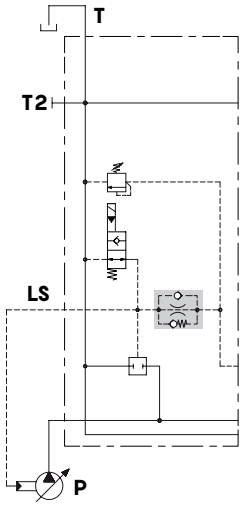
Type AN2(SO) or AN2(SU)



Type AN2(SU)

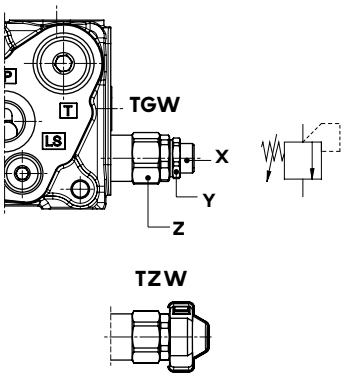


Type AN2(SO)

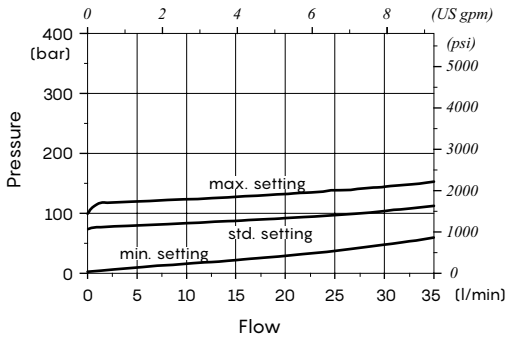


Main pressure relief valve

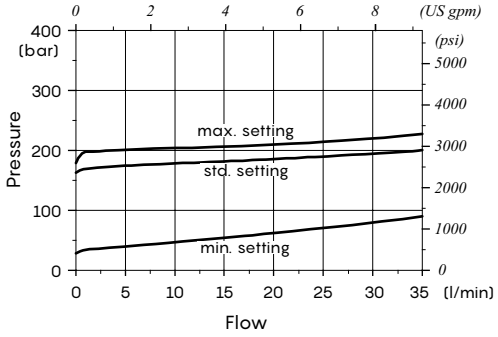
Setting types



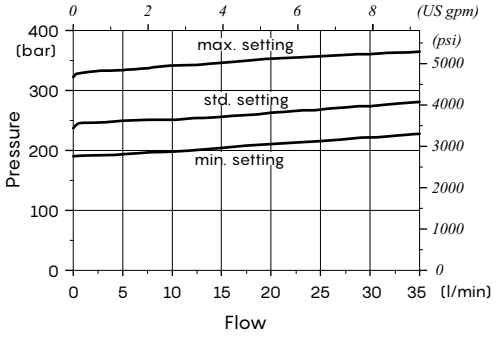
Setting range: type TGW2



Setting range: type TGW3



Setting range: type TGW4

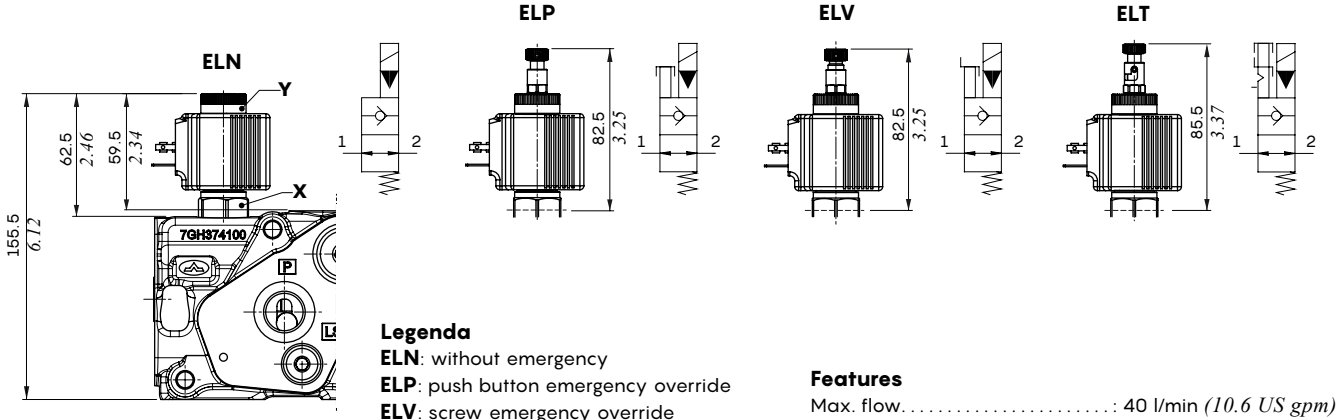


Legenda
TGW: free setting
TZW: valve set and locked
(cap code 4COP126301, n.2 pcs)
RAL3003 pigmented

Wrenches and tightening torques
X = allen wrench 5
Y = wrench 19 - 20 Nm *(14.7 lbft)*
Z = wrench 24 - 42 Nm *(31 lbft)*

Solenoid operated unloading valve

Manual emergency types



Legenda
ELN: without emergency
ELP: push button emergency override
ELV: screw emergency override
ELT: "push&twist" emergency override

Wrenches and tightening torques
X = wrench 24 - 30 Nm *(22 lbft)*
Y = manual tightening

Features
Max. flow. . . . . : 40 l/min *(10.6 US gpm)*
Max. pressure . . . . . : 380 bar *(5500 psi)*
Internal leakage . . . . . : 0.25 cm³/min @ 210 bar
(0.015 in³/min @ 3050 psi)

For coil features and options see **BER** type coil at page 160.

Working and outlet section part ordering codes (mechanical and hydraulic)

A Mechanical control configuration (section):

Flow on A/B ports (l/min) — Valve setting (bar): A port, B port

DPX050 / P - 104(40\40) - 8 L . U1(100) U2(120) - ....

1 3 4 5 7 8

B Prop. hydraulic control configuration (section):

DPX050 / Q - I104(40\40) - 8IM - ....

1 3 6 8

C Mechanical control configuration (outlet section):

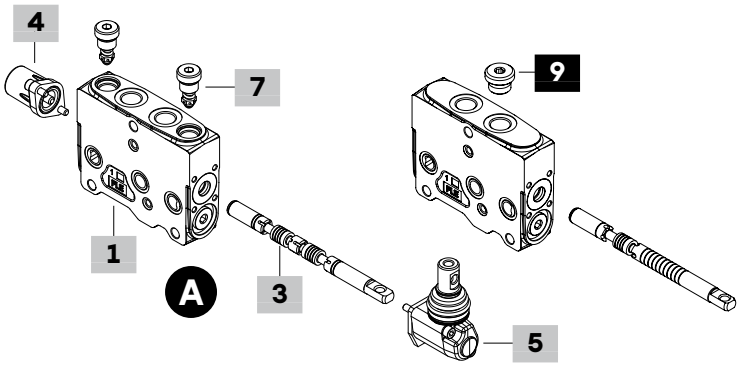
DPX050 / RP - 104(40\40) - 8 L . U3T- ....

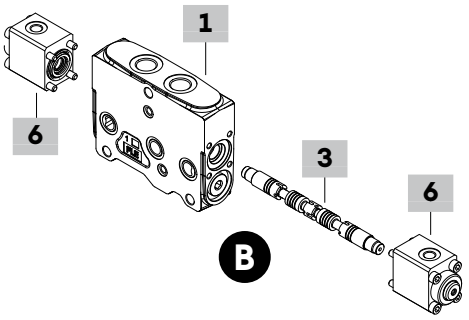
2 3 4 5 7 8

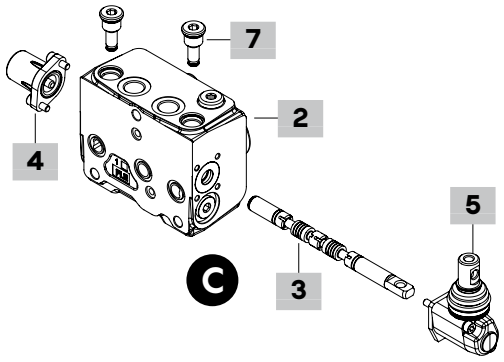
D Prop. hydraulic control configuration (outlet section):

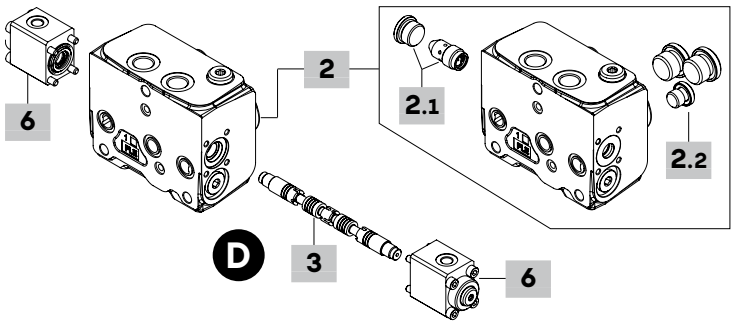
DPX050 / RQ - I104(40\40) - 8IM (VBT) - F1- ....

2 3 6 2.1 2.2 8









1 Working section kit * page 24

For mechanical control

TYPE: **DPX050/Q-FPM** CODE: 5EL10A3010V
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/P-FPM** CODE: 5EL10A3000V
DESCRIPTION: With port valve arrangement

For proportional hydraulic control

TYPE: **DPX050/Q-IM-FPM** CODE: 5EL10A3010AV
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/P-IM-FPM** CODE: 5EL10A3000AV
DESCRIPTION: With port valve arrangement

2 Working section kit with outlet * page 25

For mechanical control

TYPE: **DPX050/RQ** CODE: 5FIA20A310S
DESCRIPTION: With bleed valve, with P1-T1-LS1 plugged port, without port valve arrangement
TYPE: **DPX050/RP** CODE: 5FIA20A300S
DESCRIPTION: As previous one with port valve arrangement

For proportional hydraulic control

TYPE: **DPX050/RQ-IM** CODE: 5FIA20A310AS
DESCRIPTION: With bleed valve, with P1-T1-LS1 plugged port, without port valve arrangement
TYPE: **DPX050/RP-IM** CODE: 5FIA20A300AS
DESCRIPTION: As previous one with port valve arrangement

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

Working and outlet section part ordering codes (mechanical and hydraulic)

2.1 Bleed valve page 26

TYPE	CODE	DESCRIPTION
(-)	X138850000	Bleed valve
(VBT)	4TAP416810	Valve blanking plug
Both options need cavity plug:		
	3XTAP822151	SAE8 plug, nr.1

2.2 Parts *

TYPE	CODE	DESCRIPTION
P1-T1-LS1 plugged ports		
-	3XTAP727180	G1/2 plug, nr.2
	3XTAP719150	G1/4 plug, nr.1
P1-T1 plugged ports, LS1 open		
F1	3XTAP727180	G1/2 plug, nr.2

3 Spool page 27

Flow is referred to 14 bar *(200 psi)* stand-by (margin pressure)

TYPE	CODE	DESCRIPTION
For mechanical control		
Double acting with A and B closed in neutral position, floating circuit with 13RZ type positioner (4 position)		
105(50)	3CUA110005	50 l/min *(13 US gpm)* flow
104(40)	3CUA110004	40 l/min *(10.5 US gpm)* flow
103(30)	3CUA110003	30 l/min *(7.9 US gpm)* flow
102(20)	3CUA110002	20 l/min *(5.3 US gpm)* flow
101(10)	3CUA110001	10 l/min *(2.6 US gpm)* flow
106(5)	3CUA110006	5 l/min *(1.3 US gpm)* flow
Double acting with A and B to tank in neutral position		
202(20)	3CUA123002	20 l/min *(5.3 US gpm)* flow
201(10)	3CUA123001	10 l/min *(2.6 US gpm)* flow
Double acting with A and B partially to tank in neutral position		
2H05(50)	3CUA124005	50 l/min *(13 US gpm)* flow
2H04(40)	3CUA124004	40 l/min *(10.5 US gpm)* flow
2H03(30)	3CUA124003	30 l/min *(7.9 US gpm)* flow
2H02(20)	3CUA124002	20 l/min *(5.3 US gpm)* flow
2H01(10)	3CUA124001	10 l/min *(2.6 US gpm)* flow
2H06(5)	3CUA124006	5 l/min *(1.3 US gpm)* flow
Single acting on A, B plugged: G3/8 plug is required		
305(50)	3CUA131005	50 l/min *(13 US gpm)* flow
302(20)	3CUA131002	20 l/min *(5.3 US gpm)* flow
For proportional hydraulic control		
Double acting with A and B closed in neutral position, floating circuit with 4 positions 13IMP type control		
I105(50)	3CUA310005	50 l/min *(13 US gpm)* flow
I104(40)	3CUA310004	40 l/min *(10.5 US gpm)* flow
I103(30)	3CUA310003	30 l/min *(7.9 US gpm)* flow
I102(20)	3CUA310002	20 l/min *(5.3 US gpm)* flow
I101(10)	3CUA310001	10 l/min *(2.6 US gpm)* flow
I106(5)	3CUA310006	5 l/min *(1.3 US gpm)* flow
Double acting with A and B to tank in neutral position		
I204(40)	3CUA325004	40 l/min *(10.5 US gpm)* flow
I203(30)	3CUA325003	30 l/min *(7.9 US gpm)* flow
I202(20)	3CUA325002	20 l/min *(5.3 US gpm)* flow
I201(10)	3CUA325001	10 l/min *(2.6 US gpm)* flow
I206(5)	3CUA325006	5 l/min *(1.3 US gpm)* flow
Double acting with A and B partially to tank in neutral position		
I2H05(50)	3CUA324005	50 l/min *(13 US gpm)* flow
I2H04(40)	3CUA324004	40 l/min *(10.5 US gpm)* flow
I2H08(30)	3CUA324008	30 l/min *(7.9 US gpm)* flow
I2H07(20)	3CUA324007	20 l/min *(5.3 US gpm)* flow
I2H01(10)	3CUA324001	10 l/min *(2.6 US gpm)* flow
I2H06(5)	3CUA324006	5 l/min *(1.3 US gpm)* flow
Single acting on A or B, other port plugged: G3/8 plug is required		
I305-I405(50)	3CUA331005	50 l/min *(13 US gpm)* flow
I302-I402(20)	3CUA331002	20 l/min *(5.3 US gpm)* flow

4 "A" side spool positioners page 29

TYPE	CODE	DESCRIPTION
7FT	5V0710A001	With friction and neutral position notch
8	5V08102000	3 pos. with spring return to neutral position
8F2	5V0810A001	Spool stroke limiter on B port
8D	5V08102200	External pin with M6 female thread
8D2	5V08102220	External pin with M8 male thread
9BZ	5V09202010	Detent in position 1
10BZ	5V10202010	Detent in position 2
11BZ	5V11202010	Detent in positions 1 and 2
12	5V12102000	2 positions, detent in pos. 1 and 2
For floating circuit (standard spool)		
13RZ	5V13306020	4 pos., detent in 4th position with spool in, spring return to neutral position

5 "B" side spool control kit page 31

TYPE	CODE	DESCRIPTION
L	5LEV10A000	Standard lever box
LF1	5LEV10A001	As L type, with spool stroke limiter on A port
SLP	5COP150000	Without lever with dust-proof plate
TQ	5TEL10A100	Flexible cable connection

6 Proportional hydraulic control * page 32

TYPE	CODE	DESCRIPTION
8IM	5IDR20A300AV	Range 8-27 bar *(116-392 psi)*
8IMX	5IDR20A301AV	Range 3.5-20 bar *(51-290 psi)*
8IMF3	5IDR20A302AV	Range 8-27 bar *(116-392 psi)*, with spool stroke limiter on A and B ports
8IMXF3	5IDR20A303AV	Range 3.5-20 bar *(51-290 psi)*, with spool stroke limiter on A and B ports
For floating circuit (standard spool)		
13IMP	5IDR20A310AV	Range 4-16.5-28 bar *(58-239-406 psi)*

7 Port valves page 40

TYPE	CODE	DESCRIPTION
UT	XTAP518370V	Valve blanking plug
C	5KIT411000	Anticavitation valve

Fixed setting antishock and anticavitation valves: setting is referred to 10 l/min *(2.6 US gpm)*

TYPE: **U 100** (100 = setting (bar)) CODE: 5KIT308 100 (100 = setting (bar))

SETTING:

40 bar *(580 psi)*	50 bar *(725 psi)*	63 bar *(870 psi)*
80 bar *(1150 psi)*	100 bar *(1450 psi)*	120 bar *(1750 psi)*
130 bar *(1900 psi)*	140 bar *(2050 psi)*	150 bar *(2150 psi)*
165 bar *(2400 psi)*	175 bar *(2550 psi)*	185 bar *(2700 psi)*
200 bar *(2900 psi)*	210 bar *(3050 psi)*	220 bar *(3200 psi)*
235 bar *(3400 psi)*	250 bar *(3600 psi)*	270 bar *(3900 psi)*
300 bar *(4350 psi)*	340 bar *(4950 psi)*	

8 Section threading

Only specify if it is different from **BSP** standard (see page 7).

9 Plug for single acting spool *

CODE	DESCRIPTION
3XTAP722160	G3/8 plug

NOTE (*): Codes are referred to **BSP** thread.
NOTE (-): "Type" omitted in section description

Working and outlet section part ordering codes (electrohydraulic)

A One-side electrohydraulic control configuration (section):

flow on A/B ports (l/min) — Valve setting (bar): A port, B port

DPX050 / PZ - I104(40\40) - 8EZ3 LQF3 . U1(100) U2(120) - .... - 12VDC

1 3 4 5 7 8 4

B Two-side electrohydraulic control configuration (section):

DPX050 / QE - I104(40\40) - 8EB3F3 - .... - 12VDC

1 3 6 8 6

C One-side electrohydraulic control configuration (outlet section):

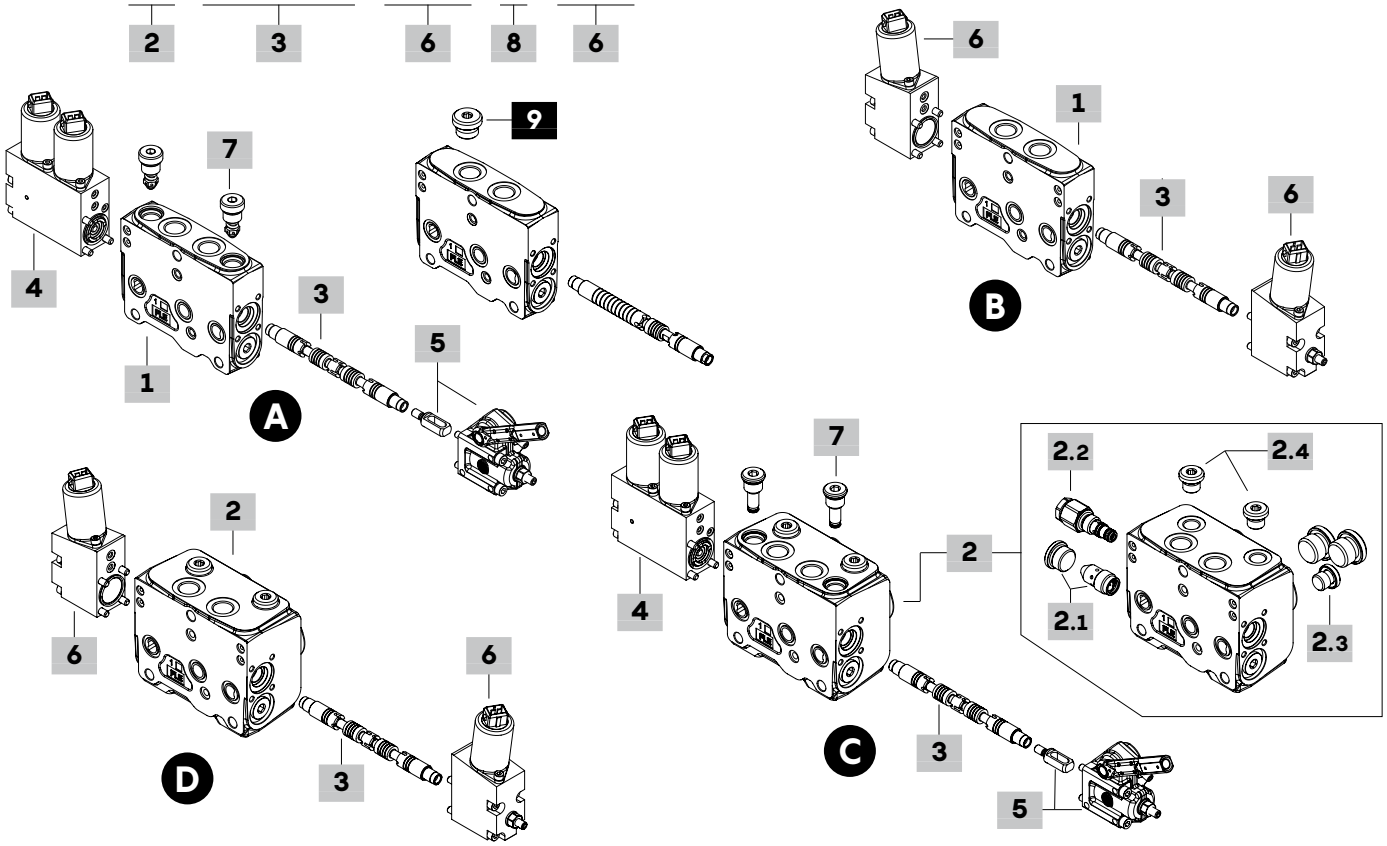
DPX050 / RQZ - I104(40\40) - 8EZ3 LQF3 . U3T - (VBT \ RT) - F1 - NOTAP(VL) - .... - 12VDC

2 3 4 5 7 2.1 2.2 2.3 2.4 8 4

D Two-side electrohydraulic control configuration (outlet section):

DPX050 / RQE - I104(40\40) - 8EB3F3 - .... - 12VDC

2 3 6 8 6



1 Working section kit *	page 24

For two-side electrohydraulic control

TYPE: **DPX050/QE-FPM** CODE: 5EL10A3012V
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/PE-FPM** CODE: 5EL10A3002V
DESCRIPTION: With port valve arrangement

1 Working section kit *	page 24

For one-side electrohydraulic control

TYPE: **DPX050/QZ-FPM** CODE: 5EL10A3210V
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/PZ-FPM** CODE: 5EL10A3200V
DESCRIPTION: With port valve arrangement

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

Working and outlet section part ordering codes (electrohydraulic)

2 Working section kit with outlet * page 25

For two-side electrohydraulic control
TYPE: **DPX050/RQE** CODE: 5FIA20A313S
DESCRIPTION: With bleed valve, with P1-T1-LS1 plugged port, without port valve arrangement
TYPE: **DPX050/RPE** CODE: 5FIA20A301S
DESCRIPTION: As previous one with port valve arrangement
For one-side electrohydraulic control
TYPE: **DPX050/RQZ** CODE: 5FIA20A326S
DESCRIPTION: With bleed valve, with P1-T1-LS1 plugged port, without port valve arrangement
TYPE: **DPX050/RPZ** CODE: 5FIA20A325S
DESCRIPTION: As previous one with port valve arrangement

2.1 Bleed valve page 26

TYPE	CODE	DESCRIPTION
(-)	X138850000	Bleed valve
(VBT)	4TAP416810	Valve blanking plug
Both options need cavity plug:		
	3XTAP822151	SAE8 plug, nr.1

2.2 Pressure reducing valve page 26

Codes are regerred to parts with **FPM** seals.

TYPE	CODE	DESCRIPTION
(-)	X219740035V	Pressure reducing valve, 30-45 bar *(435-650 psi)*
(RT)	XTAP418350V	Valve blanking plug

2.3 Parts *

TYPE	CODE	DESCRIPTION
P1-T1-LS1 plugged ports		
-	3XTAP727180	G1/2 plug, nr.2
	3XTAP719150	G1/4 plug, nr.1
P1-T1 plugged ports, LS1 open		
F1	3XTAP727180	G1/2 plug, nr.2

2.4 Pilot and drain *

TYPE	CODE	DESCRIPTION
(-)	3XTAP719150	G1/4 plug, nr.2 for internal pilot and drain
NOTAP(VL)	4TAP310007	M10x1 DIN906 plug, for external drain

3 Spool page 27

Flow is referred to 14 bar *(200 psi)* stand-by (margin pressure)

TYPE	CODE	DESCRIPTION
Double acting with A and B closed in neutral position, floating circuit with 4 positions controls (13.. type)		
I105(50)	3CUA310005	50 l/min *(13 US gpm)* flow
I104(40)	3CUA310004	40 l/min *(10.5 US gpm)* flow
I103(30)	3CUA310003	30 l/min *(7.9 US gpm)* flow
I102(20)	3CUA310002	20 l/min *(5.3 US gpm)* flow
I101(10)	3CUA310001	10 l/min *(2.6 US gpm)* flow
I106(5)	3CUA310006	5 l/min *(1.3 US gpm)* flow
Double acting with A and B to tank in neutral position		
I204(40)	3CUA325004	40 l/min *(10.5 US gpm)* flow
I203(30)	3CUA325003	30 l/min *(7.9 US gpm)* flow
I202(20)	3CUA325002	20 l/min *(5.3 US gpm)* flow
I201(10)	3CUA325001	10 l/min *(2.6 US gpm)* flow
I206(5)	3CUA325006	5 l/min *(1.3 US gpm)* flow
Double acting with A and B partially to tank in neutral position		
I2H05(50)	3CUA324005	50 l/min *(13 US gpm)* flow
I2H04(40)	3CUA324004	40 l/min *(10.5 US gpm)* flow
I2H08(30)	3CUA324008	30 l/min *(7.9 US gpm)* flow
I2H07(20)	3CUA324007	20 l/min *(5.3 US gpm)* flow
I2H01(10)	3CUA324001	10 l/min *(2.6 US gpm)* flow
I2H06(5)	3CUA324006	5 l/min *(1.3 US gpm)* flow
Single acting on A or B, other port plugged: G3/8 plug is required		
I305-I405(50)	3CUA331005	50 l/min *(13 US gpm)* flow
I302-I402(20)	3CUA331002	20 l/min *(5.3 US gpm)* flow

4 One-side electrohydr.control; "A" side page 38

These controls must be coupled with "B" side options

TYPE	CODE	DESCRIPTION
8EZ3-12VDC	5V0810A780V	AMP connector
8EZ3-24VDC	5V0810A785V	As previous one
8EZ3F2-12VDC	5V0810A781V	AMP conn., spool stroke limiter
8EZ3F2-24VDC	5V0810A782V	As previous one
8EZ34-12VDC	5V0810A786V	Deutsch connector
8EZ34-24VDC	5V0810A787V	As previous one
8EZ34F2-12VDC	5V0810A783V	Deutsch conn.,spool stroke limiter
8EZ34F2-24VDC	5V0810A784V	As previous one
For floating circuit (standard spool)		
13EZ3P-12VDC	5V1310A788V	With Step, with AMP connector
13EZ3P-24VDC	5V1310A790V	As previous one
13EZ34P-12VDC	5V1310A789V	With Step, with Deutsch conn.
13EZ34P-24VDC	5V1310A791V	As previous one
With spool position sensor		
8EZ3SPSD-12VDC	5V0810A790V	AMP connector and digital sensor
8EZ3SPSD-24VDC	5V0810A791V	As previous one

5 One-side electrohydr.option; "B" side page 39

These options must be coupled with "A" side controls

TYPE	CODE	DESCRIPTION
LQ	5LEV10A005V	Lever control
LQ180	5LEV10A006V	As previous one, turned of 180°
LQF3	5LEV10A004V	As LQ, spool stroke limiter on A, B ports
LQF3180	5LEV10A003V	As previous one, turned of 180°
SLC	5COP150010V	Endcap
SLCF1	5COP150011V	Endcap with spool stroke limiter

6 Two-side electrohydraulic control page 37

TYPE	CODE	DESCRIPTION
8EB3-12VDC	5IDR90A200V	AMP connector
8EB3-24VDC	5IDR90A201V	As previous one
8EB34-12VDC	5IDR90A202V	Deutsch connector
8EB34-24VDC	5IDR90A203V	As previous one
8EB3F3-12VDC	5IDR90A204V	AMP connector, spool stroke limiter on A and B ports
8EB3F3-24VDC	5IDR90A205V	As previous one
8EB34F3-12VDC	5IDR90A206V	Deutsch onnector, spool stroke limiter on A and B ports
8EB34F3-24VDC	5IDR90A207V	As previous one
For floating circuit (standard spool)		
13EB3P-12VDC	5IDR91A208V	With Step, AMP connector
13EB3P-24VDC	5IDR91A209V	As previous one
13EB34P-12VDC	5IDR91A210V	With Step, Deutsch connector
13EB34P-24VDC	5IDR91A211V	As previous one

7 Port valves page 40

TYPE	CODE	DESCRIPTION
U040	5KIT308040	Setting: 40 bar *(580 psi)*

For complete list see previous pages.

8 Section threading

Only specify if it is different from **BSP** standard (see page 7).

9 Plug for single acting spool *

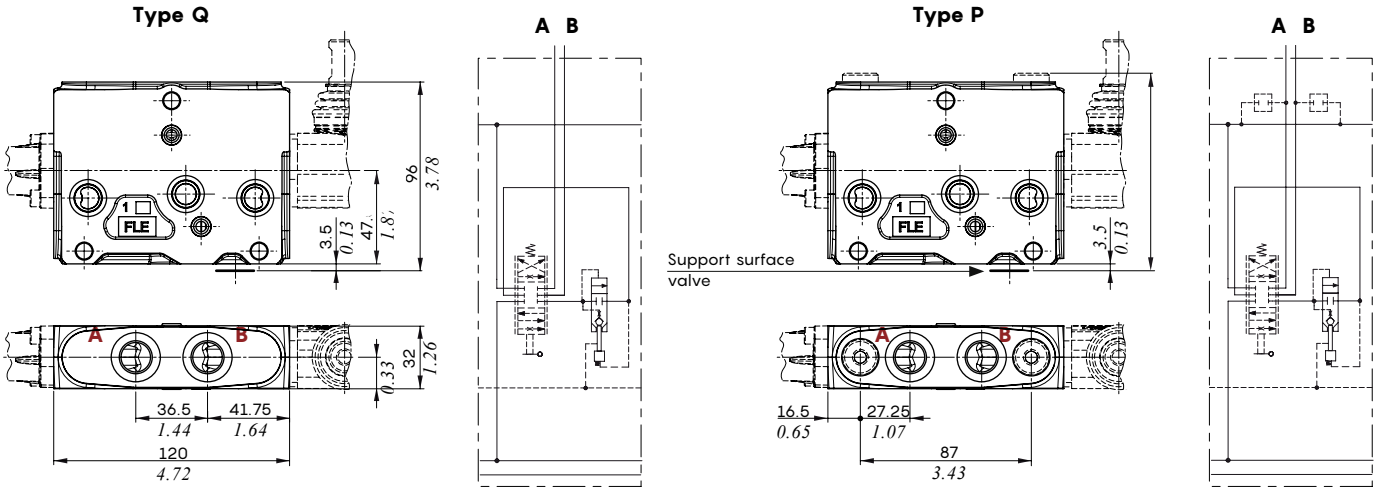
CODE	DESCRIPTION
3XTAP722160	G3/8 plug

NOTE (*): Codes are referred to **BSP** thread.
NOTE (-): "Type" omitted in section description

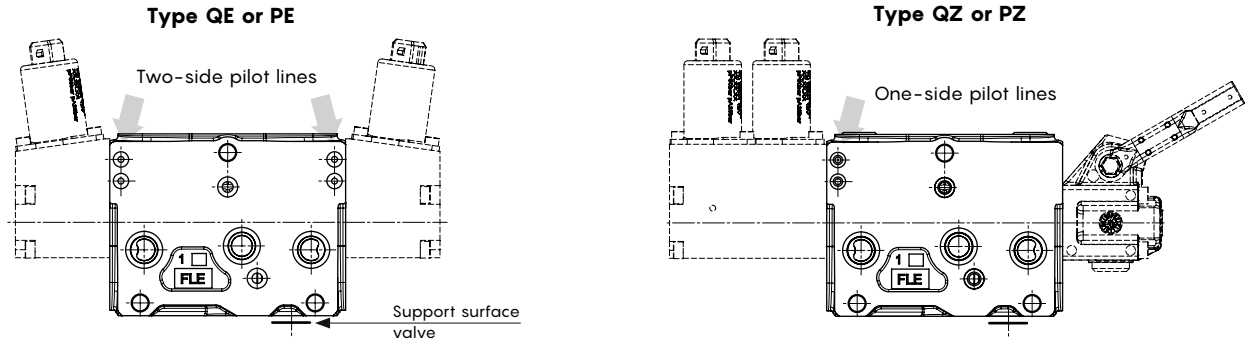
Working and outlet section

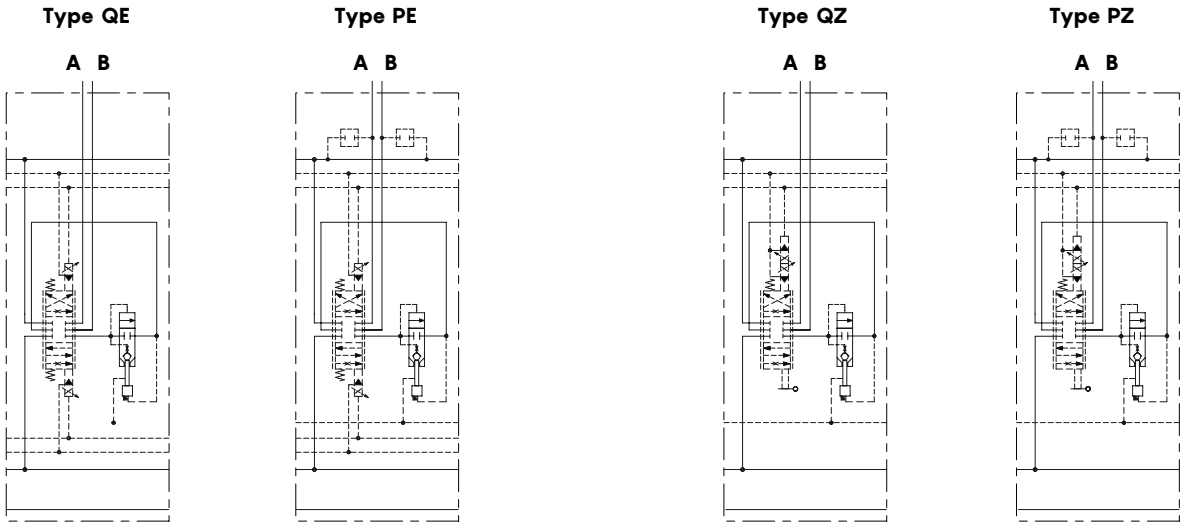
Dimensions and hydraulic circuit

Section for mechanical and hydraulic controls



Section for electrohydraulic controls

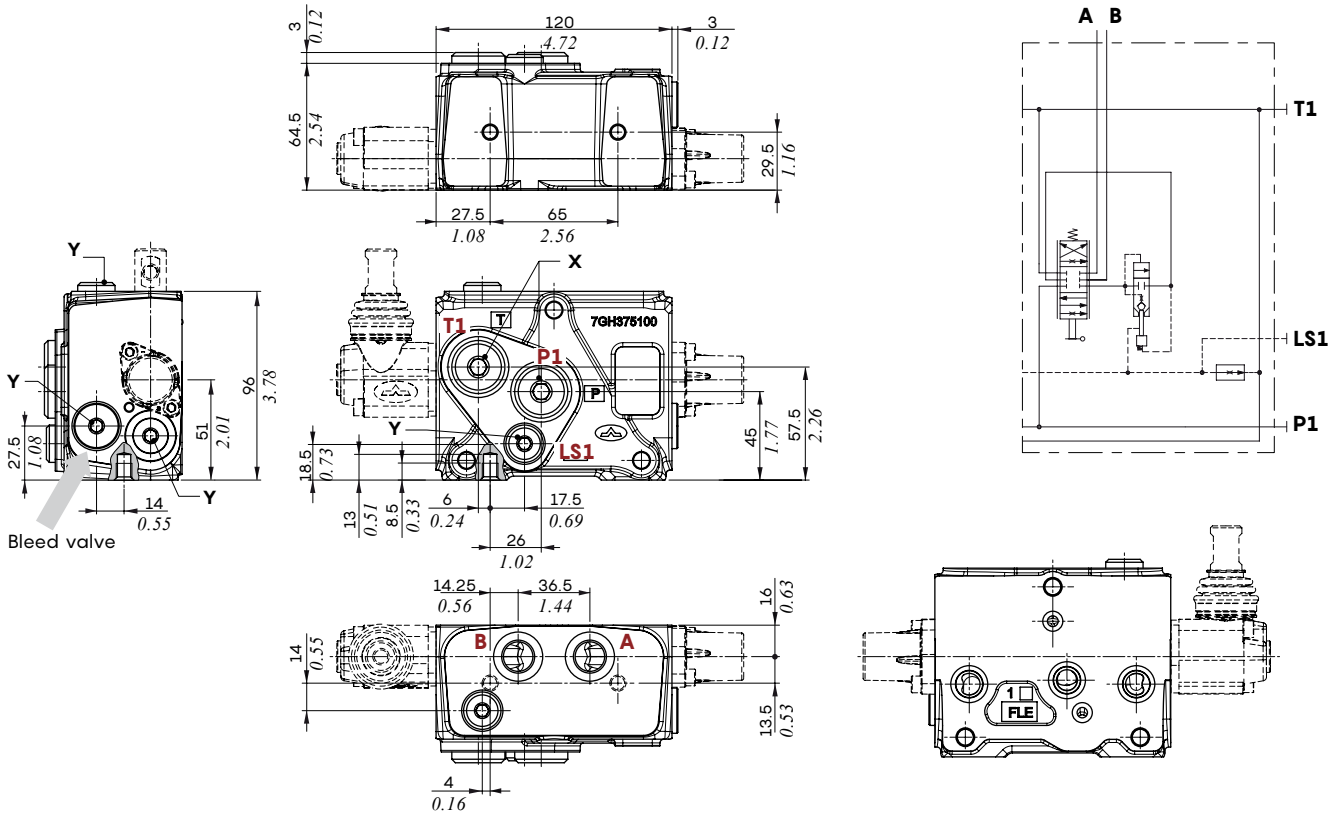




Dimensions and hydraulic circuit

Section with outlet for mechanical and hydraulic controls

Type RQ

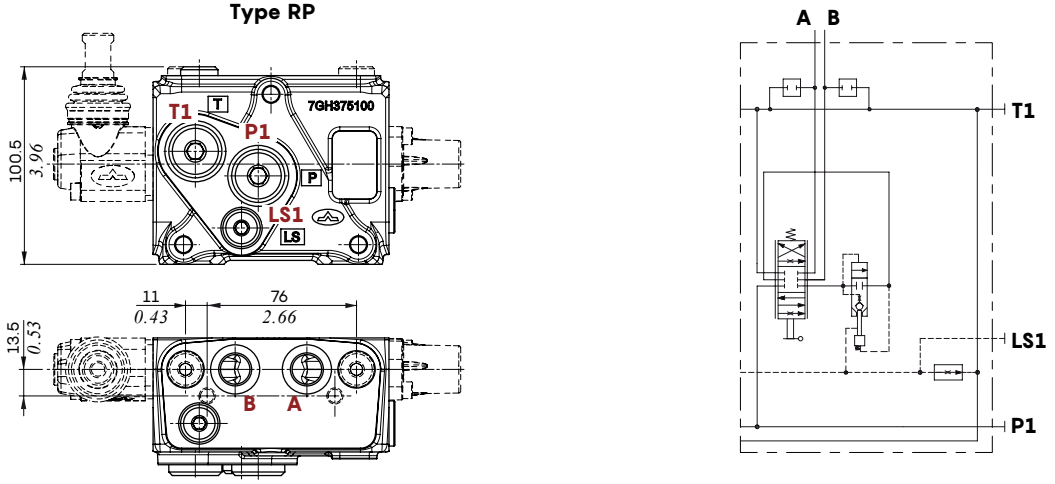


Wrenches and tightening torques

X = allen wrench 8 - 24 Nm *(17.7 lbft)*

Y = allen wrench 6 - 24 Nm *(17.7 lbft)*

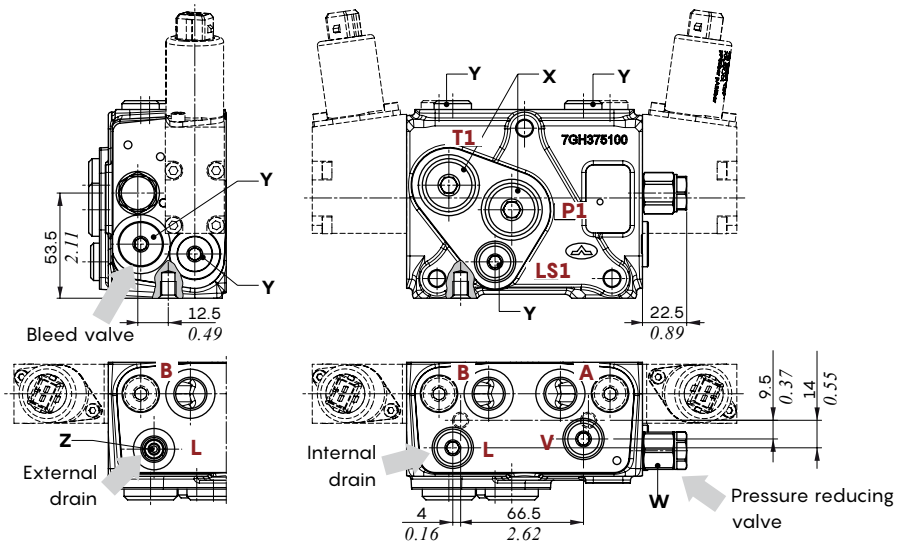
Type RP



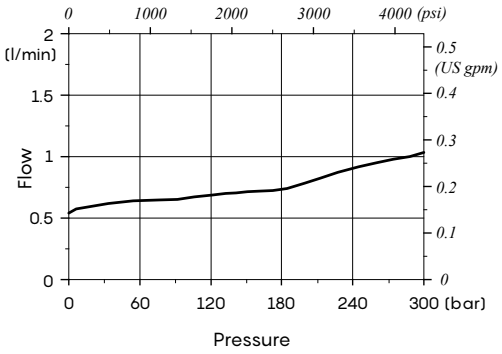
Working and outlet section

Dimensions and hydraulic circuit

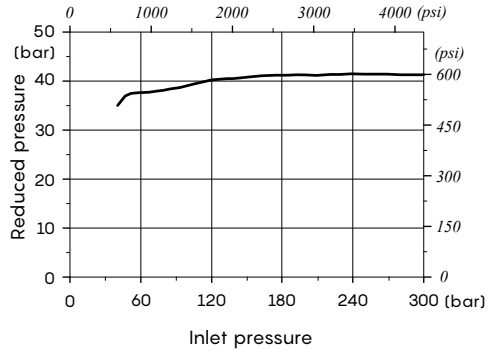
Section with outlet for electrohydraulic controls



Bleed valve diagram
Flow vs. Pressure



Pressure reducing valve diagram
Reduced pressure vs. Inlet pressure

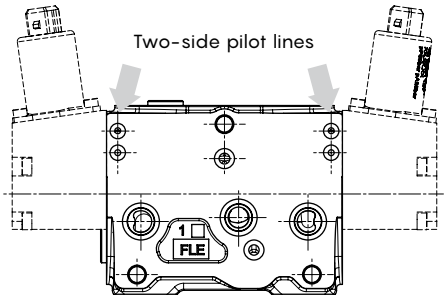


Wrenches and tightening torques
X = allen wrench 8 - 24 Nm *(17.7 lbft)*
Y = allen wrench 6 - 24 Nm *(17.7 lbft)*
Z = allen wrench 5 - 9.8 Nm *(7.2 lbft)*
W = wrench 19 - 24 Nm *(17.7 lbft)*

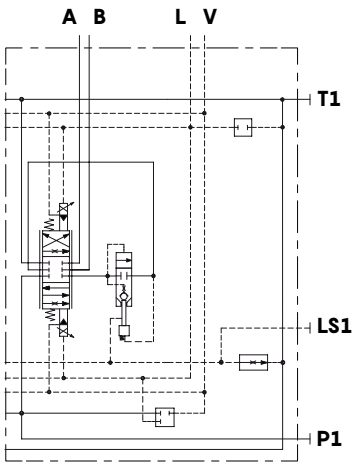
Bleed valve features
Max. inlet pressure . . . : 300 bar *(4350 psi)*
Max. back pressure. . . : 25 bar *(363 psi)*

Pressure reducing valve features
Max. inlet pressure . . . : 380 bar *(5500 psi)*
Reduced pressure . . . . : 30-45 bar *(435-650 psi)*
Max. back pressure. . . : 25 bar *(363 psi)*

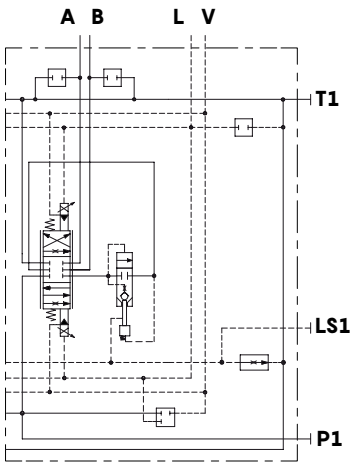
Type RQE or RPE



Type RQE
(**RT** configuration; without pressure reducing valve, seat plugged)

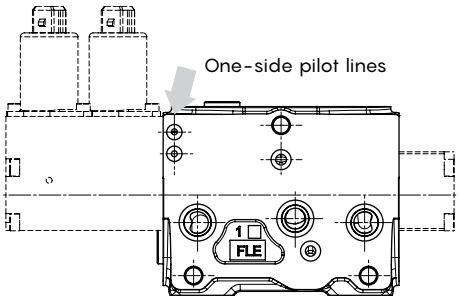


Type RPE
(**RT** configuration; without pressure reducing valve, seat plugged)

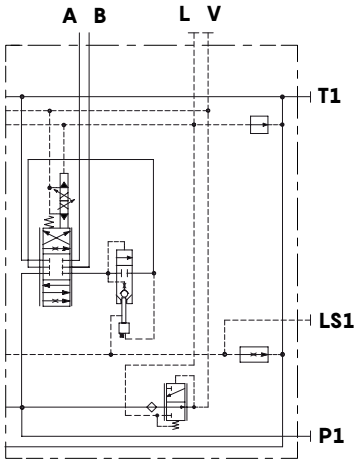


Dimensions and hydraulic circuit

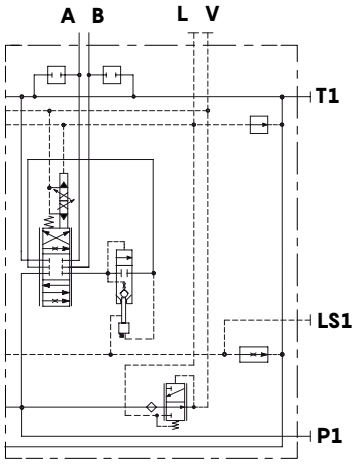
Type RQZ or RPZ



Type RQZ
(With pressure reducing valve)

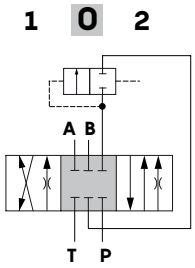


Type RPZ
(With pressure reducing valve)



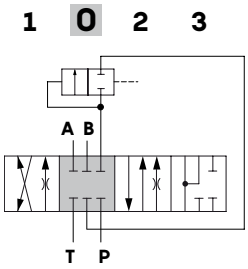
Spool

Type 1 (1../I1..)
A, B closed in neutral position
with 3 position control



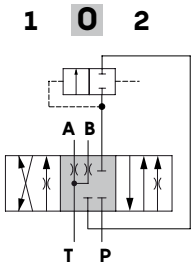
Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*

Type 1 (1../I1..)
A, B closed in neutral position
with 4 position control



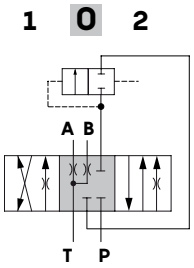
Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*
position 3: - 10 mm *(- 0.39 in)*

Type 2(2../I2..)
A, B to tank
in neutral position



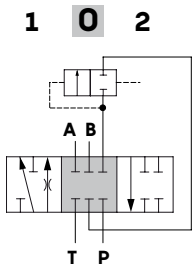
Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*

Type 2H(2H../I2H..)
A, B partially to tank
in neutral position



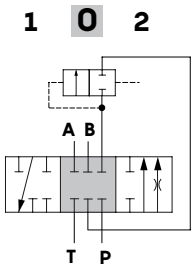
Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*

Type 3 (3../I3..)
Single acting on A

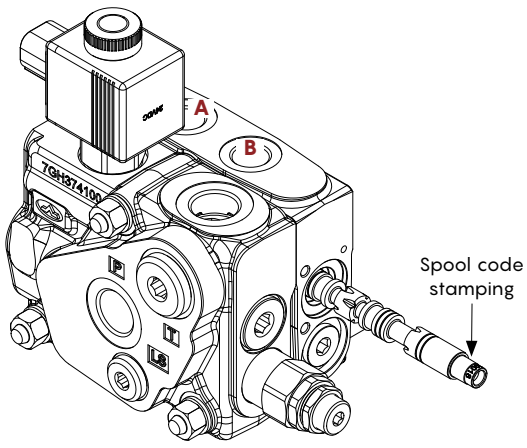


Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*

Type 4 (4../I4..)
Single acting on B



Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*



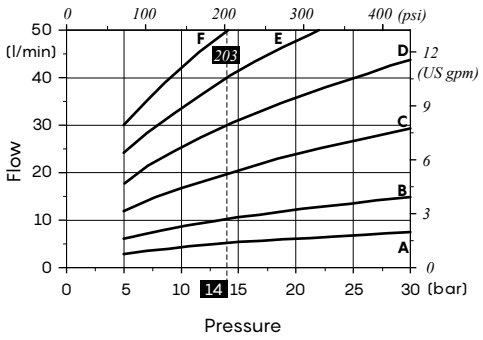
In case of spool replacement the code stamping must be oriented toward B port.

Working and outlet section

Spool

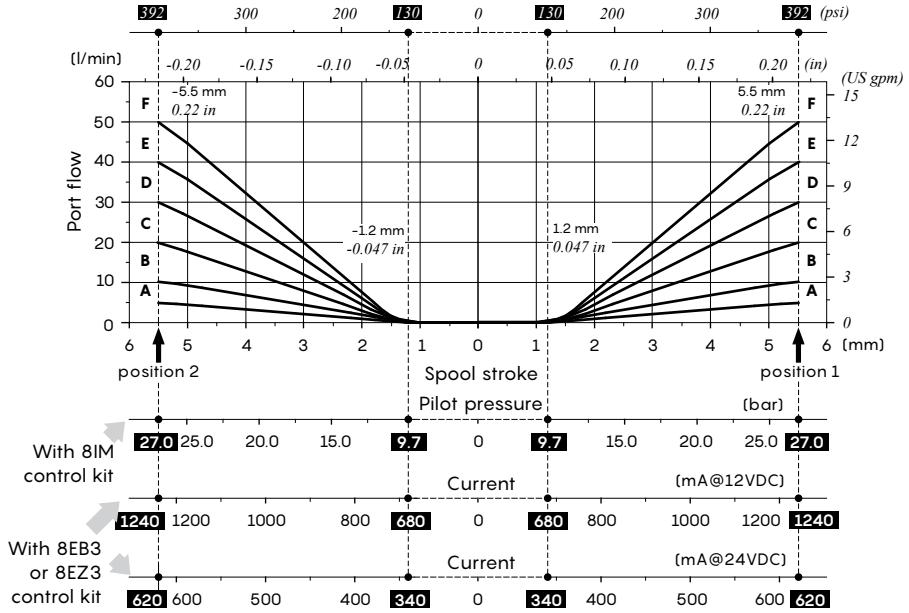
Following curves are detected with standard spools, connecting P⇒A⇒B⇒T and P⇒B⇒A⇒T ports without flow multiplication.
Customized spools with backpressure or flow multiplication may require different force, pressure and pilot current for operation.

Spool flow vs. Stand-by pressure (margin pressure)

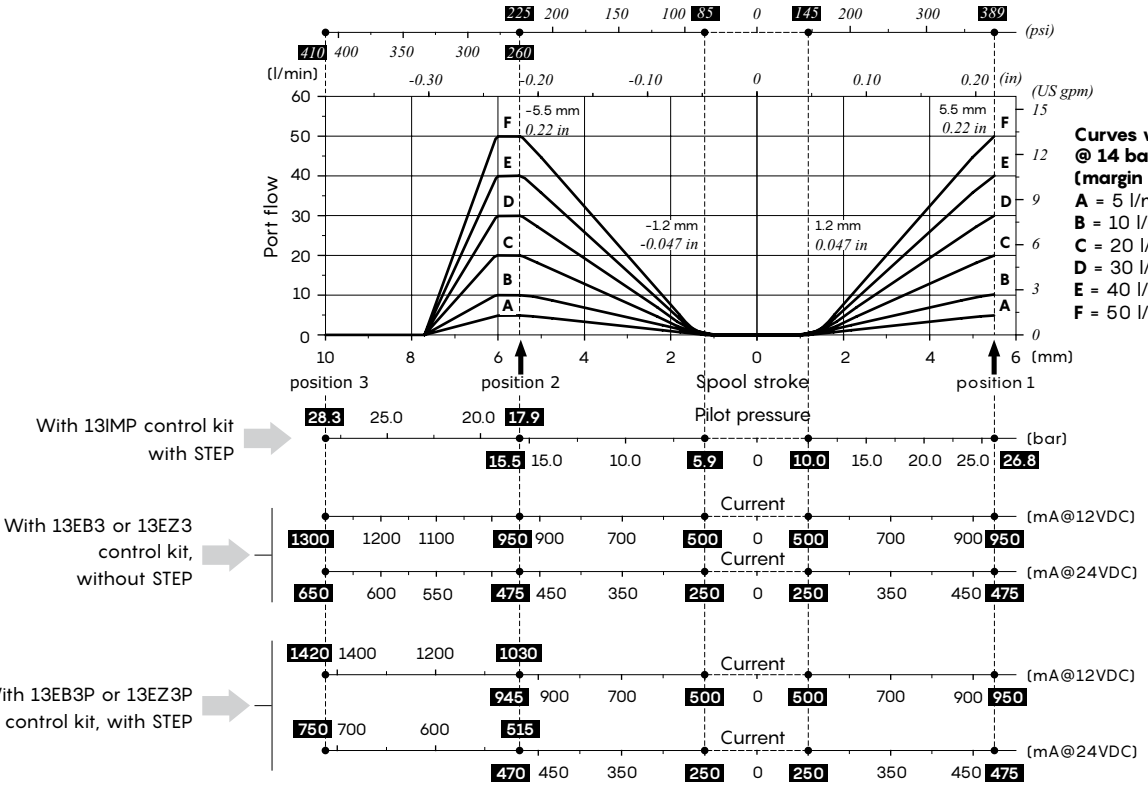


Curves with spool nominal flow @ 14 bar *(200 psi)* **stand-by (margin pressure)**
A = 5 l/min *(1.3 US gpm)* ± 10%
B = 10 l/min *(2.6 US gpm)* ± 10%
C = 20 l/min *(5.3 US gpm)* ± 10%
D = 30 l/min *(7.9 US gpm)* ± 10%
E = 40 l/min *(10.6 US gpm)* ± 10%
F = 50 l/min *(12.2 US gpm)* ± 10%

3 positions spools metering curve
Qin = 50 l/min *(13.2 US gpm)* - Open center circuit



Floating spool metering curve
Qin = 50 l/min *(13.2 US gpm)* - Open center circuit



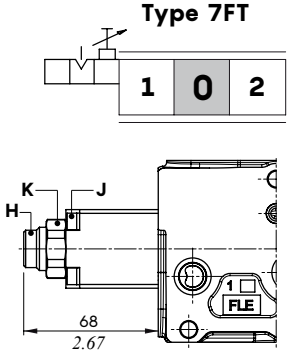
Curves with spool nominal flow @ 14 bar *(200 psi)* **stand-by (margin pressure)**
A = 5 l/min *(1.3 US gpm)*
B = 10 l/min *(2.6 US gpm)*
C = 20 l/min *(5.3 US gpm)*
D = 30 l/min *(7.9 US gpm)*
E = 40 l/min *(10.6 US gpm)*
F = 50 l/min *(12.2 US gpm)*

Working and outlet section

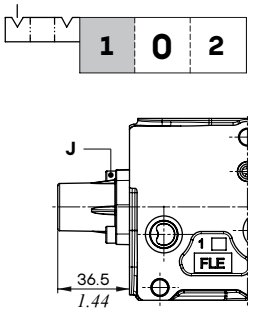
"A" side spool positioners

With friction and neutral position notch — **2 positions, with detent in position 1 and 2**

Type 7FT



Type 12

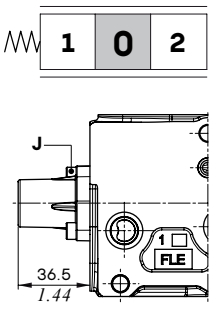


Release force 230 N ± 10 N
(51.7 lbf ± 2.2 lbf)

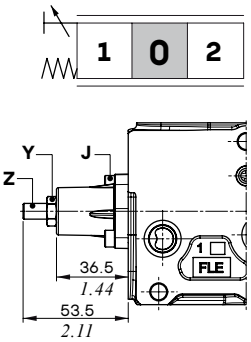
Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
H = allen wrench 4
K = wrench 28 - manual tightening

With spring return to neutral position

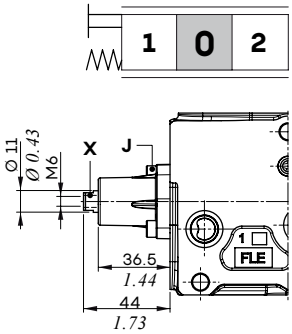
Type 8



Type 8F2
Spool stroke limiter on B port

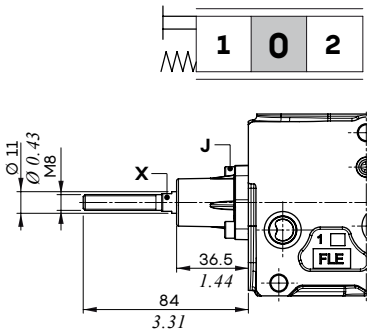


Type 8D
External pin with M6 female thread

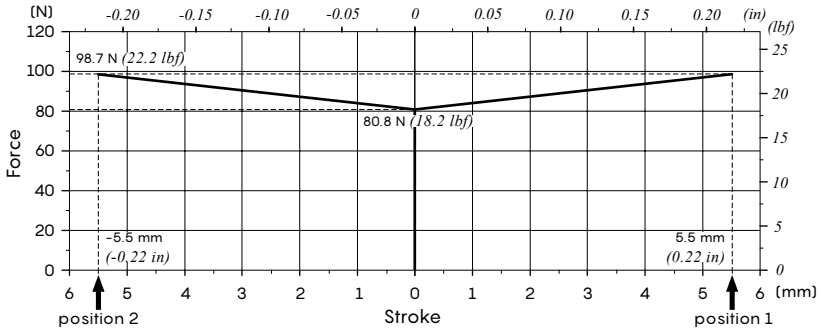


Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
X = wrench 9
Y = wrench 13 - 24 Nm *(17.7 lbft)*
Z = allen wrench 4

Type 8D2
External pin with M8 male thread



Force vs. Stroke diagram

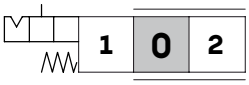


Working and outlet section

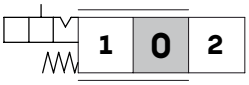
"A" side spool positioners

With detent and spring return to neutral position

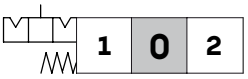
Type 9BZ
Detent in position 1
(see A curve)

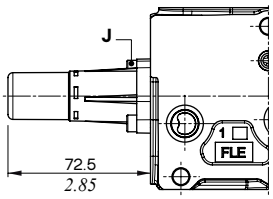


Type 10BZ
Detent in position 2
(see B curve)

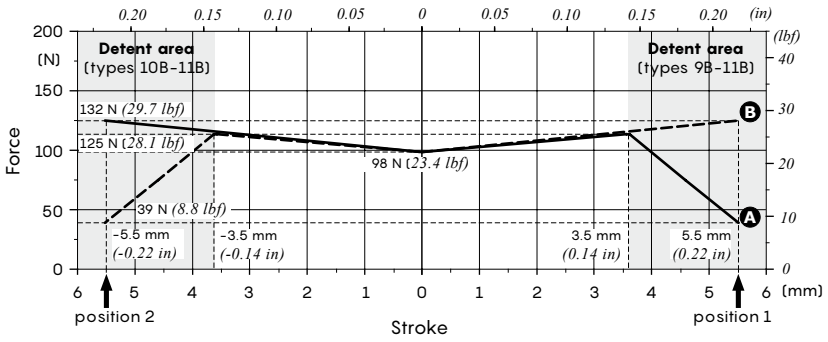


Type 11BZ
Detent in positions 1
(A curve) and 2 (B curve)





Force vs. Stroke diagram

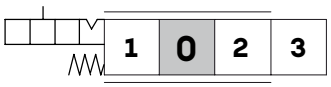


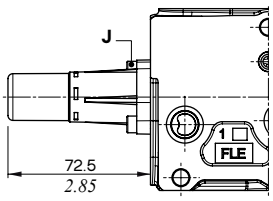
Release force 230 N ± 10% *(51.7 lbf ± 10%)*

Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*

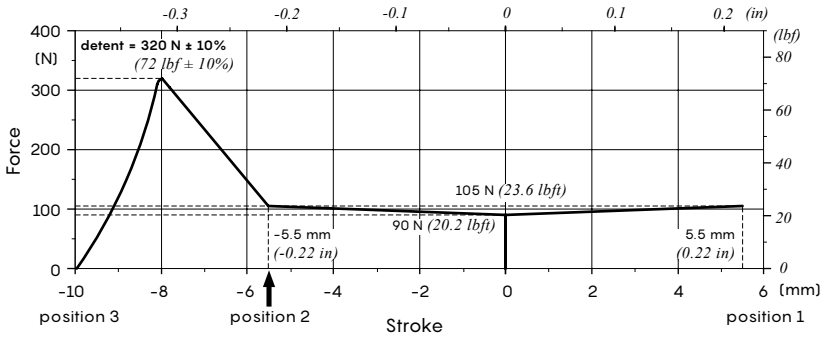
With detent and spring return to neutral position, for floating circuit

Type 13RZ





Force vs. Stroke diagram



Release force from pos.3: 315 N ± 10% *(71 lbf ± 10%)*

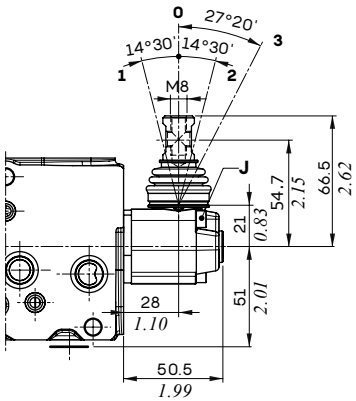
Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*

"B" side spool control kit

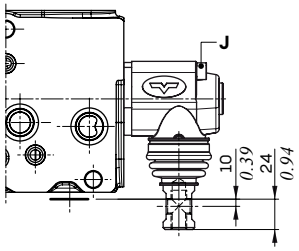
Lever box

Type L

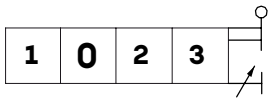


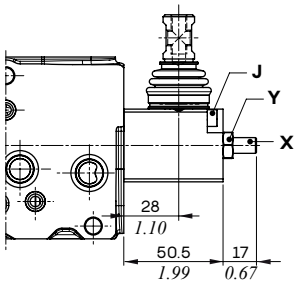


L180 configuration



Type LF1
Spool stroke limiter on A port

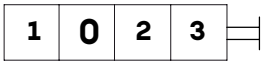


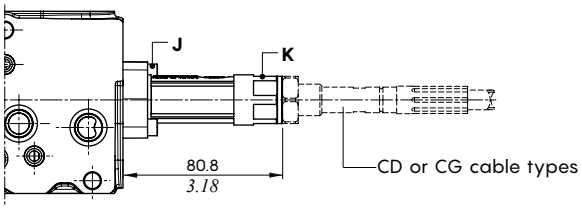


Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
X = allen wrench 4
Y = wrench 13 - 24 Nm *(17.7 lbft)*

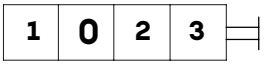
Without lever box

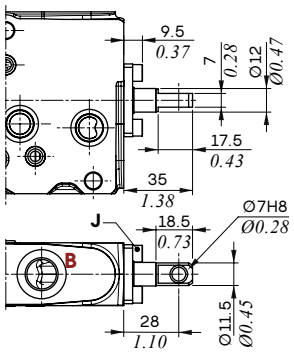
Type TQ
Flexible cable connection





Type SLP
Dust-proof plate



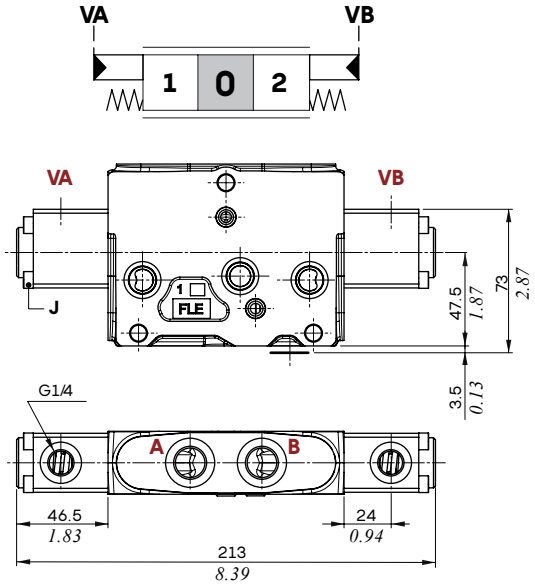


Wrenches and tightening torques
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
K = wrench 24 *(17.7 lbft)*

Working and outlet section

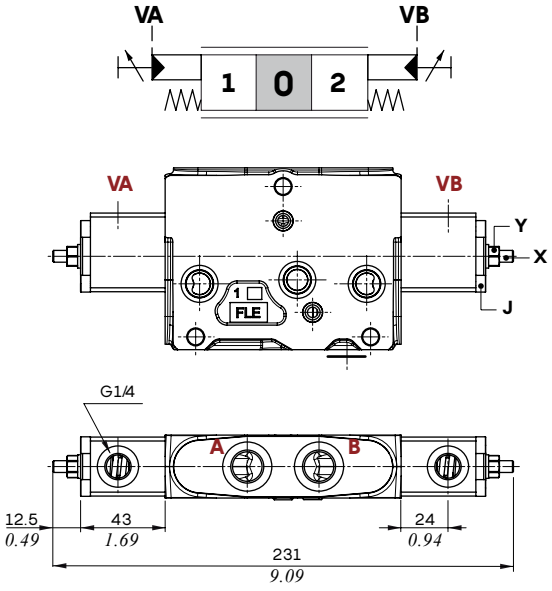
Proportional hydraulic control

Types 8IM - 8IMX



Types 8IMF3 - 8IMXF3

With spool stroke limiter on A and B ports



Features (all types)

Max. pressure . . . . . : 70 bar *(1010 psi)*

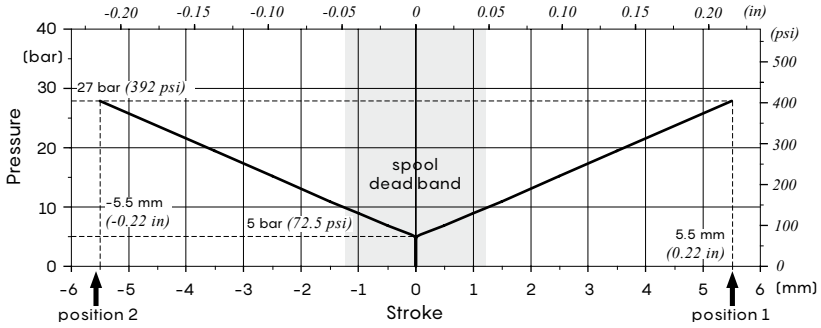
Wrenches and tightening torques

J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*

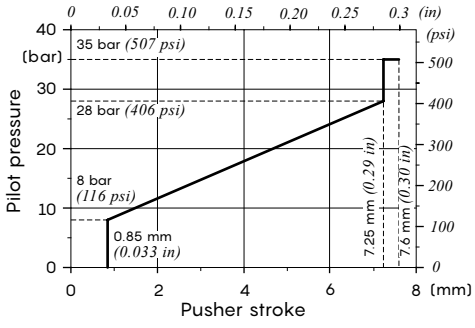
X = allen wrench 3

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

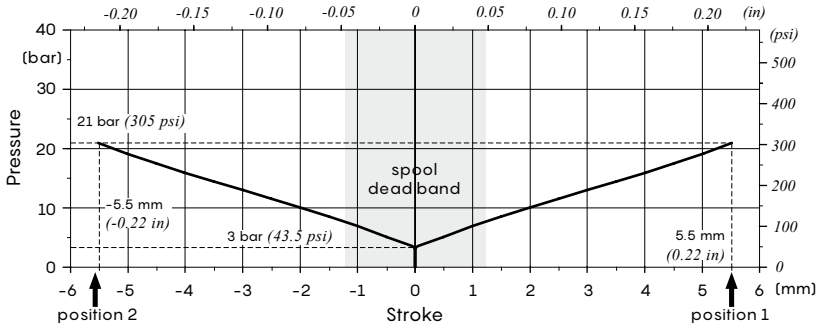
Types 8IM-8IMF3: Stroke vs. Pressure diagram



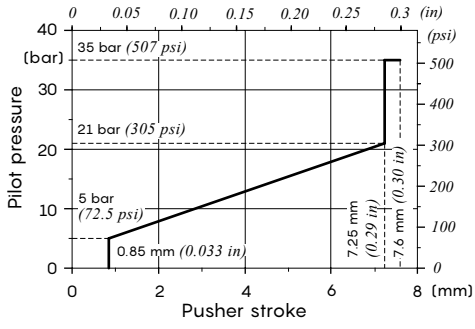
Suggested pressure control curve: type 089



Types 8IMX-8IMXF3: Stroke vs. Pressure diagram



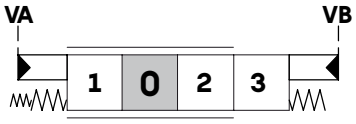
Suggested pressure control curve: type 028

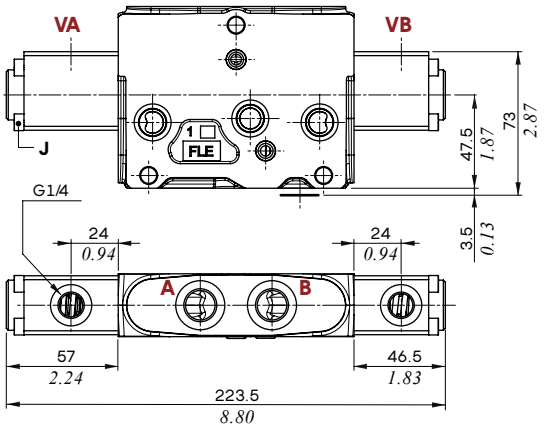


Proportional hydraulic control

Type 13IMP

For floating circuit





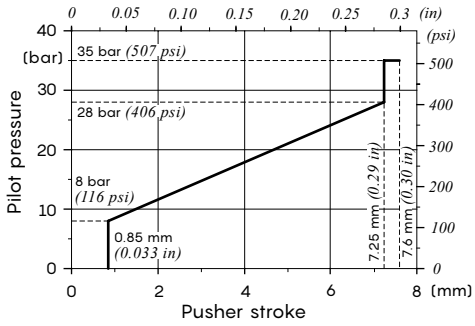
Wrenches and tightening torques

J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*

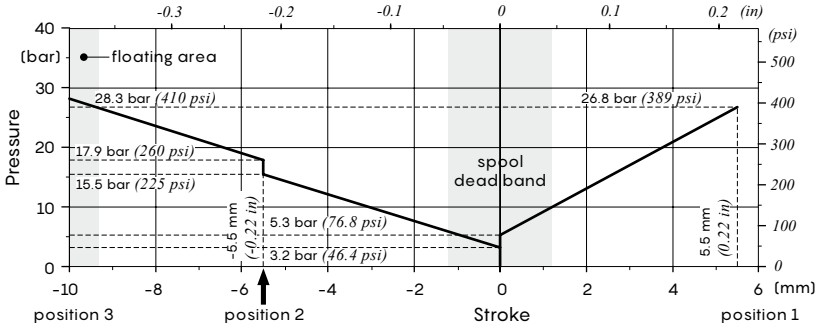
Features

Max. pressure . . . . . : 70 bar *(1010 psi)*

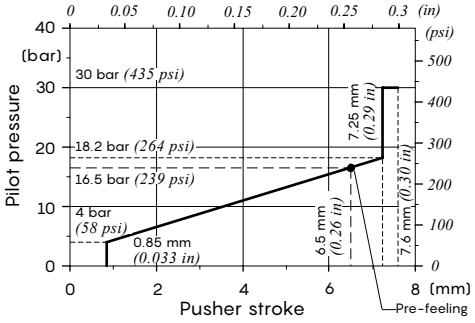
Suggested pressure control curve on VA port: type 089



Stroke vs. Pressure diagram



Suggested pressure control curve on VB port: type 086



Working and outlet section

Electrohydraulic control performace data

Following specifications are measured with:
- mineral oil of 46 mm²/s - *46 cSt* viscosity at 40°C - *104°F* temperature,
- standard spools, connecting P⇒A⇒B⇒T ports without flow multiplication,
- 12 VDC and 24 VDC nominal voltage with ± 10% tolerance.

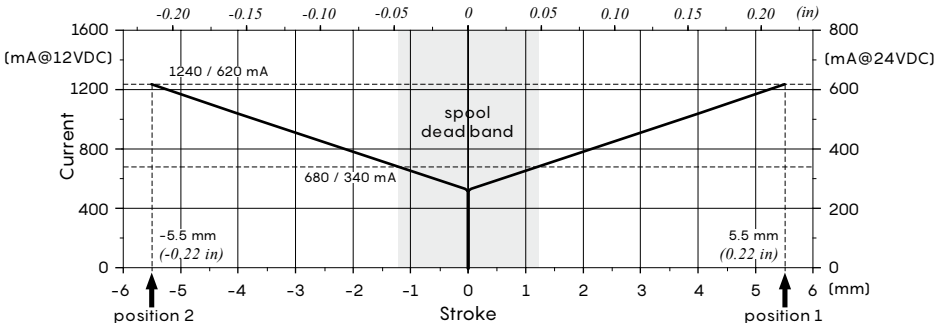
Following electrohydraulic controls need CED400W electronic unit; for information please contact Sales Department.

Specifications		Spool control type			
		8EB3	13EB3P	8EZ3	13EZ3P
Electric specifications					
Coil impedance	12 VDC	4.72 Ω	4.72 Ω	4.72 Ω	4.72 Ω
	24 VDC	20.8 Ω	20.8 Ω	20.8 Ω	20.8 Ω
Max. operating current	12 VDC	1.5 A	1.5 A	1.5 A	1.5 A
	24 VDC	0.75 A	0.75 A	0.75 A	0.75 A
No load current consumption		0	0	0	0
				With lever box configured controls	
Hysteresis max. (1)	external drain	4%	4%	6%	6%
	internal drain	5%	5%	7%	7%
Time response	from 0 ⇒ 100% and from 100% ⇒ 0 of stroke	< 60 ms	< 85 ms	< 75 ms	< 85 ms
Min. flow control signal	12 VDC	680 mA	500 mA	680 mA	500 mA
	24 VDC	340 mA	250 mA	340 mA	250 mA
Max. flow control signal	12 VDC	1240 mA	P⇒A: 950 mA P⇒B: 945 mA 1030 mA	1240 mA	P⇒A: 950 mA P⇒B: 945 mA 1030 mA
	24 VDC	620 mA	P⇒A: 475 mA P⇒B: 470 mA 515 mA	620 mA	P⇒A: 475 mA P⇒B: 470 mA 515 mA
Float flow control signal	12 VDC		1420 mA		1420 mA
	24 VDC		710 mA		710 mA
Dither frequency	low frequency	150 Hz		150 Hz	
	high frequency	180 Hz - 200 mA		180 Hz - 200 mA	
Insertion		100%		100%	
Coil insulance		Class H (180°C - *356°F*)		Class H (180°C - *356°F*)	
Connector type		AMP JPT - Deutsch DT		AMP JPT - Deutsch DT	
Weather protection (connector)		IP65 (JPT type) - IP69K (DT type)		IP65 (JPT type) - IP69K (DT type)	
Hydraulic specifications					
Max. pressure		40 bar *(580 psi)*		50 bar *(725 psi)*	
Max. back pressure		10 bar *(145 psi)*		10 bar *(145 psi)*	

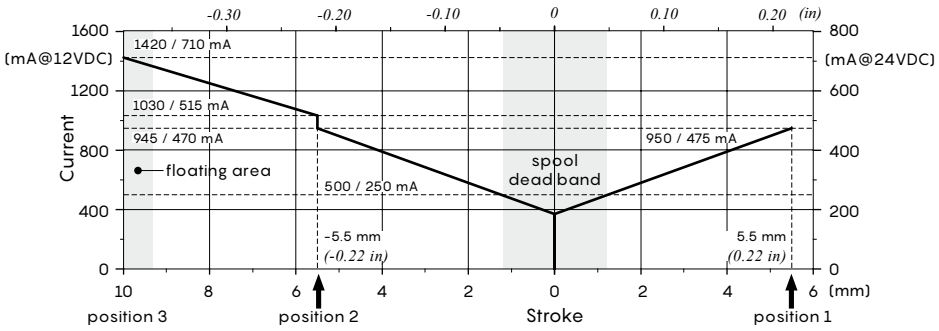
Note (1) hysteresis is indicated at nominal supply voltage and f = 0.008 Hz for one cycle (one cycle = neutral ⇒ full A ⇒ neutral ⇒ full B ⇒ neutral).
For the calculation rules see "Appendix A" on page 170.

Electrohydraulic control performace data

Types 8EB3-8EZ3: Stroke vs. Current diagram



Types 13EB3P-13EZ3P: Stroke vs. Current diagram



Working and outlet section

Electrohydraulic controls: spool position sensor

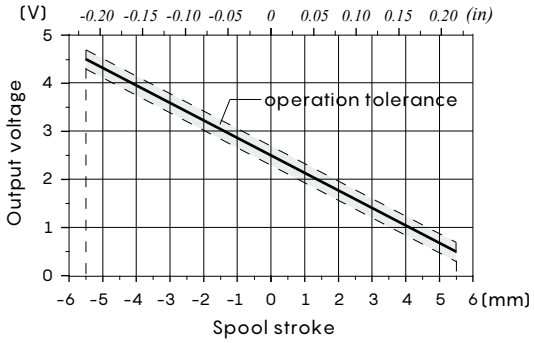
The sensor can be ordered exclusively through the EB and EZ type electrohydraulic controls; see page 23 for available control list.

SPSL sensor

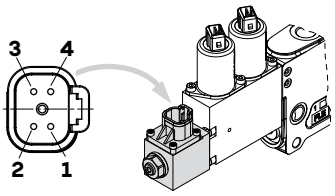
The SPSL position sensor converts the spool movements into a voltage linear signal.

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



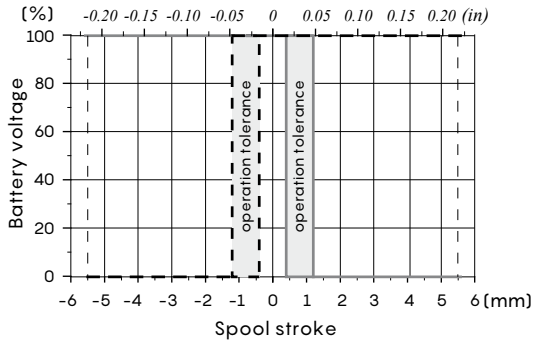
Deutsch DT06-4S mating connector, code 5CON140072

SPSD sensor

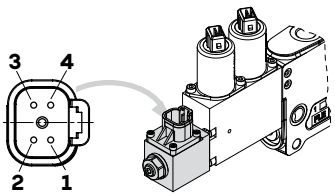
The SPSD position sensor converts the spool movements into an electric digital signal.

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

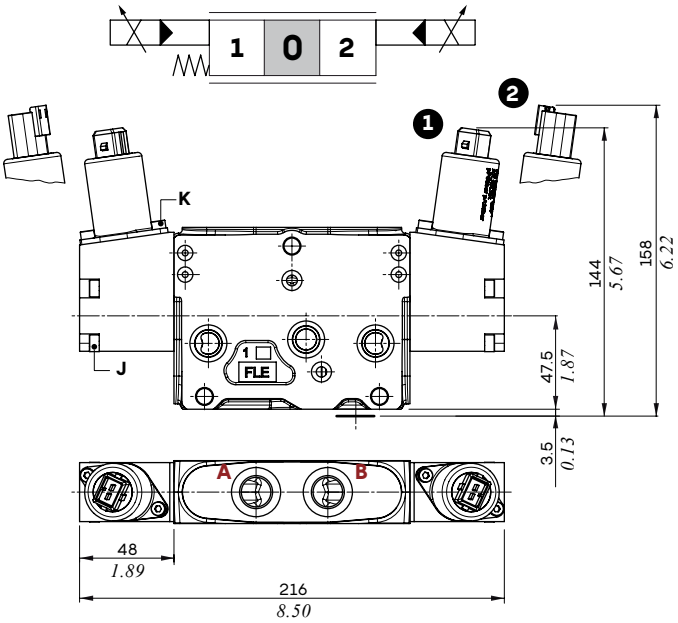
Two-side electrohydraulic control

Control types

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

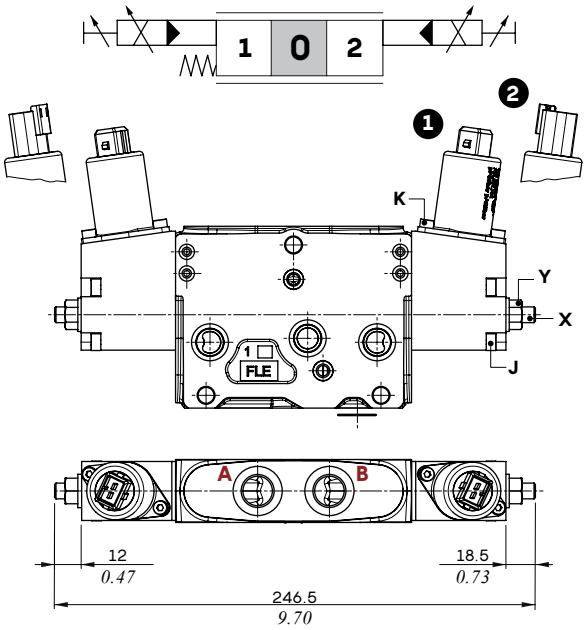
2: With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

Types 8EB3 - 8EB34



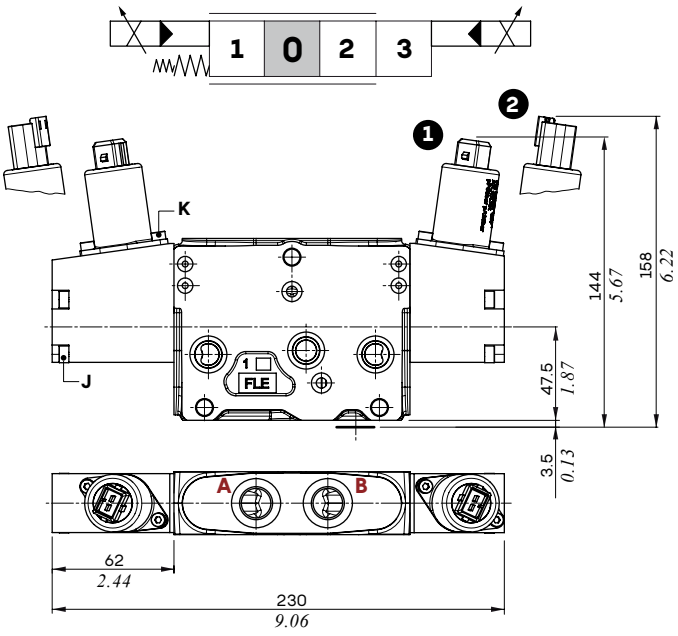
Types 8EB3F3 - 8EB34F3

With spool stroke limiter



Types 13EB3P - 13EB34P

For floating circuit



Wrenches and tightening torques

J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*

K = allen wrench 3 - 5 Nm *(3.7 lbft)*

X = allen wrench 4

Y = wrench 13 - 24 Nm *(17.7 lbft)*

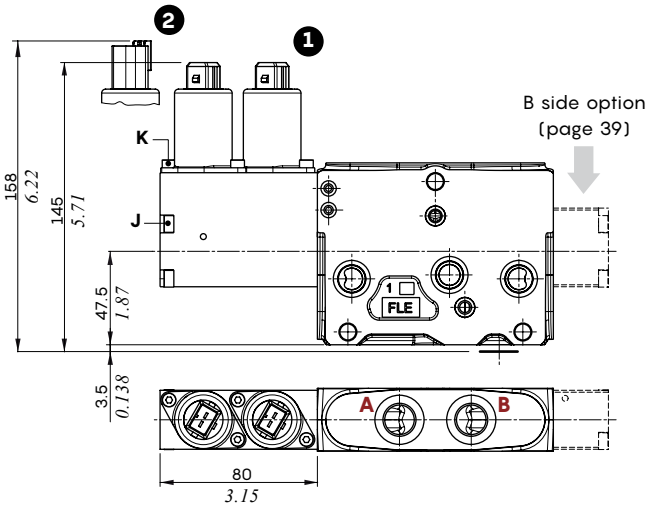
Working and outlet section

One-side electrohydraulic control: "A" side

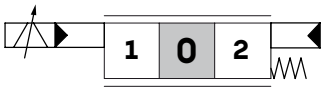
Control types

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

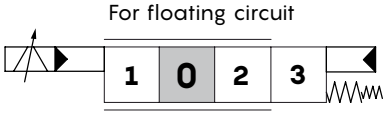
2 : With Deutsch DT04 connector - Deutsch DT06-2S mating connector code: 5CON140031

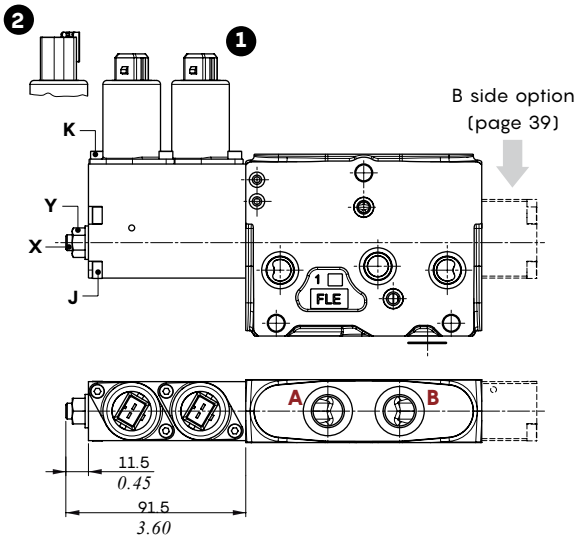


Types 8EZ3 - 8EZ34

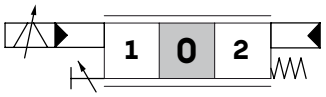


Types 13EZ3P - 13EZ34P
For floating circuit



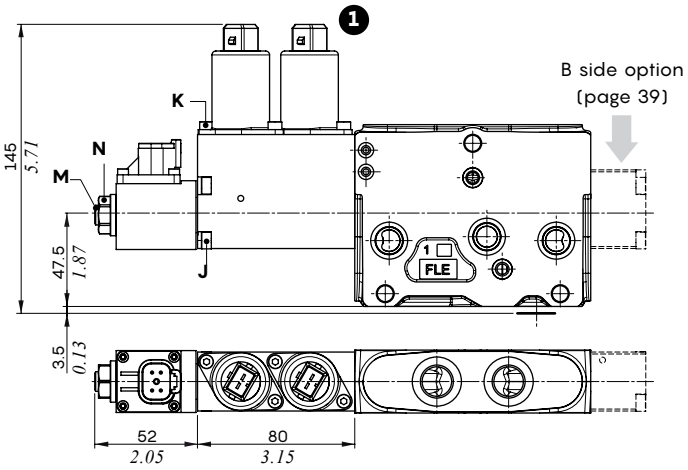


Types 8EZ3F2 - 8EZ34F2
With spool stroke limiter

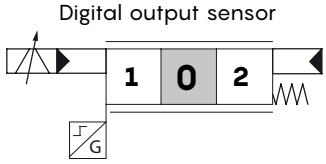


Wrenches and tightening torques

J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
K = allen wrench 3 - 5 Nm *(3.7 lbft)*
X = allen wrench 4
Y = wrench 13 - 24 Nm *(17.7 lbft)*
M = allen wrench 4 - 9.8 Nm *(7.2 lbft)*
N = wrench 17 - 9.8 Nm *(7.2 lbft)*



Type 8EZ3SPSD
Digital output sensor

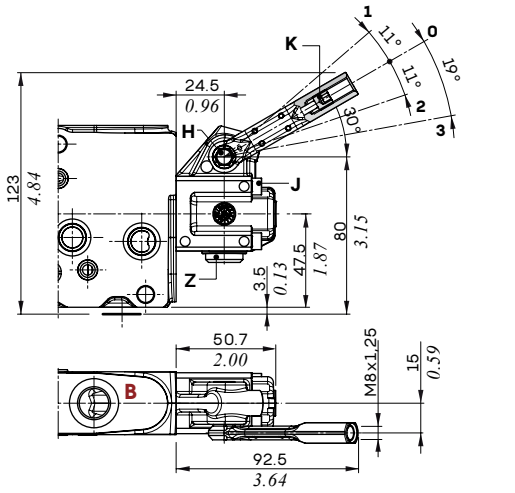


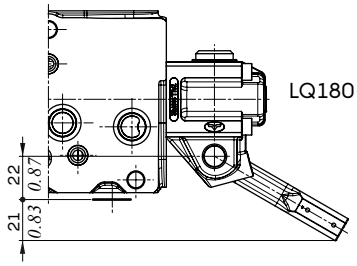
One-side electrohydraulic control: "B" side option

These options are available for one-side electyrohydraulic controls only.

Types LQ - LQ180

1	0	2	3



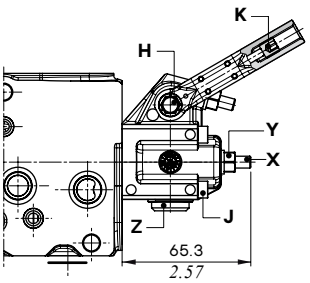


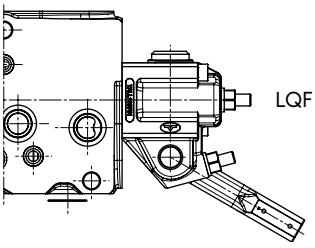
LQ180 configuration

Types LQF3 - LQF3180

With stroke limiters on A and B ports

1	0	2	3



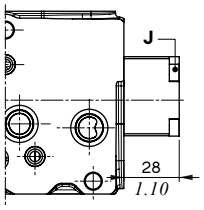


LQF3180 configuration

Type SLC

With endcap

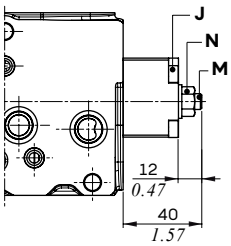
1	0	2	3



Type SLCF1

Spool stroke limiter on A port

1	0	2	3



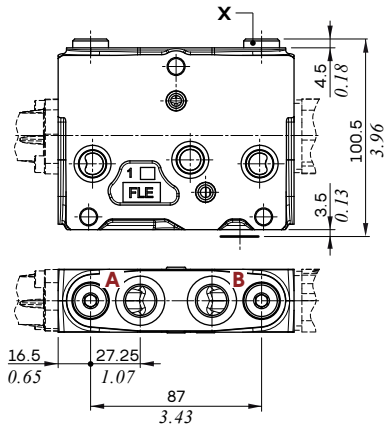
Wrenches andtightening torques

H = wrench 8
J = allen wrench 4 - 6.6 Nm *(4.9 lbft)*
M = allen wrench 4
N = wrench 13 - 24 Nm *(17.7 lbft)*
K = allen wrench 4 - 9.8 Nm *(7.2 lbft)*
X = allen wrench 3
Y = wrench 10 - 9.8 Nm *(7.2 lbft)*
Z = allen wrench 6 - 24 Nm *(17.7 lbft)*

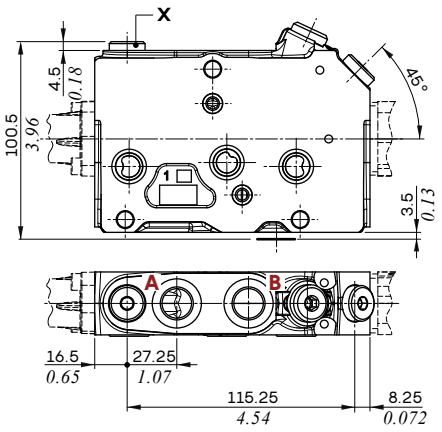
Working and outlet section

Port valves

On standard section



On Low Leak section



Type U valve: antishock valves with prefill



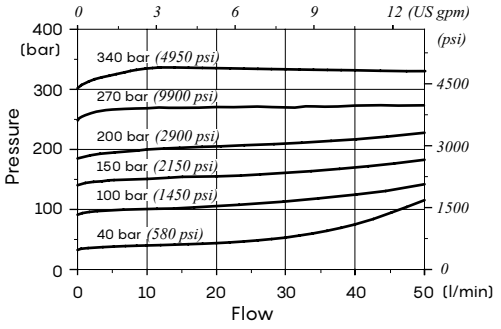
Type C valve: anticavitation



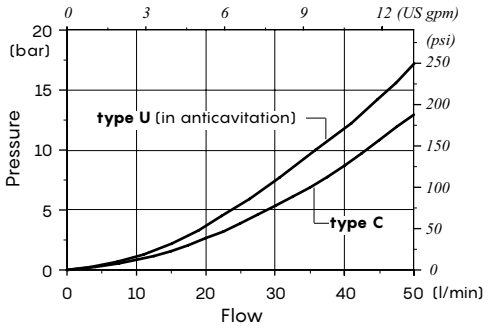
Wrenches and tightening torques

X = allen wrench 6 - 24 Nm *(17.7 lbft)*

Type U
Setting example
(10 l/min - *2.6 Us gpm*)



Types U and C: pressure drops



LL complete section ordering codes

A Mechanical and hydraulic controls configuration:

Nr. of working sections

DPX050/4/AM2(TGW3-175\ELN)/PLL-I104LL(40\40)-8IM.U3T/Q-104(40\40)-8IM/RQ-104(40\40)-8L-.....-12VDC

1 — 2A — 2B — 3 — 4 — 5

DPX050: For working conditions and guide to mixed (**Low Leak** and **Standard sections** both) configuration see pages 5, 6, 12, 13.

B Electrohydraulic controls configuration:

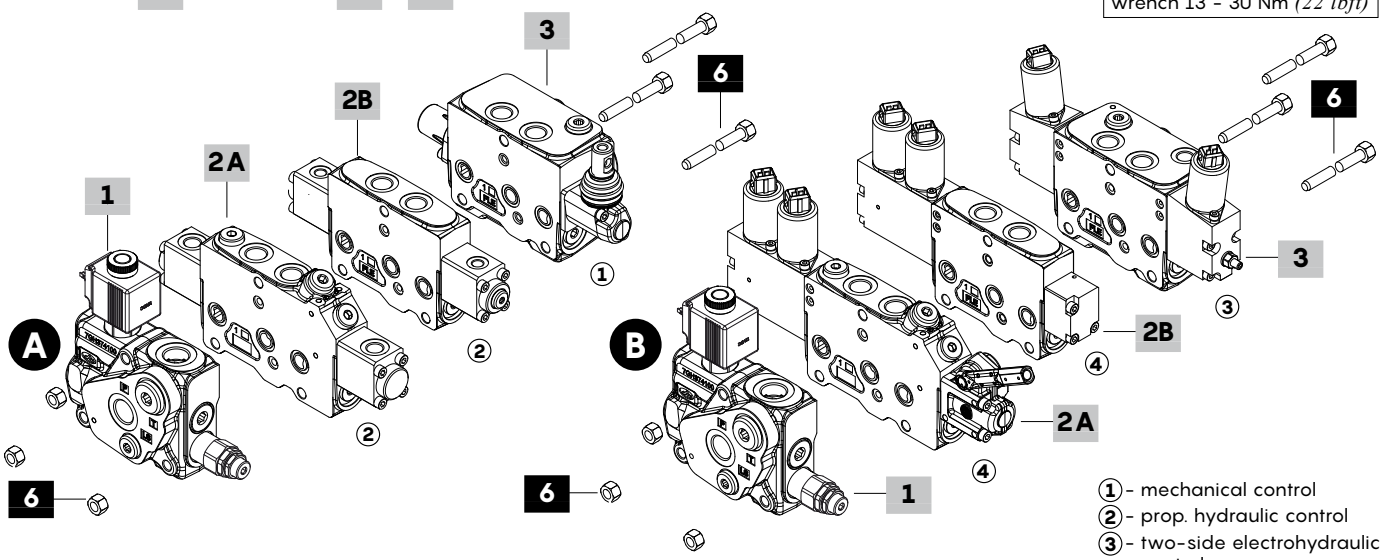
DPX050/4/AM2(TGW3-175\ELN)/PZLL-I104LL(40\40)-8EZ3LQ.U3T/QZ-I104(40\40)-8EZ3SLC/

1 — 2A — 2B

RQE-I104(40\40)-8EB3F3-.....-12VDC

3 — 4 — 5

Tie rod tightening
wrench 13 - 30 Nm *(22 lbft)*



① - mechanical control
② - prop. hydraulic control
③ - two-side electrohydraulic control
④ - one-side electrohydraulic control

1 Complete inlet section *

All inlet sections listed in the catalogue can be used; see page 15

2A Complete Low Leak working section *

Mechanical control
TYPE: **DPX050/QLL-104LL(40\40)-8L**
CODE: 660100001S
DESCRIPTION: Lever control without port valve arrangement
TYPE: **DPX050/PLL-104LL(40\40)-8L.U3T**
CODE: 660100002S
DESCRIPTION: As previous with port valve arrangement
Proportional hydraulic control
TYPE: **DPX050/QLL-I104LL(40\40)-8IM**
CODE: 660100003S
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/PLL-I104LL(40\40)-8IM.U3T**
CODE: 660100004S
DESCRIPTION: With port valve arrangement
One-side proportional electrohydraulic control
TYPE: **DPX050/QZLL-I104LL(40\40)-8EZ3LQF3-12VDC**
CODE: 660100005S
DESCRIPTION: With lever and spool stroke limiter, without port valve arrangement
TYPE: **DPX050/PZLL-I104(40\40)-8EZ3LQF3.U3T-12VDC**
CODE: 660100006S
DESCRIPTION: As previous one with port valve arrangement

2B Complete Standard working section *

All sections listed in the catalogue can be used (see page 15), considering the configuration rules indicated on pages 12, 13.

3 Complete working section with outlet *

All inlet sections listed in the catalogue can be used, considering the configuration rules indicated on pages 12, 13.

4 Valve threading

Only specify if it is different from **BSP** standard (see page 7).

5 Voltage

Specify the voltage of electric devices.

6 Assembling kit

Need standard tie rods; see page 15

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

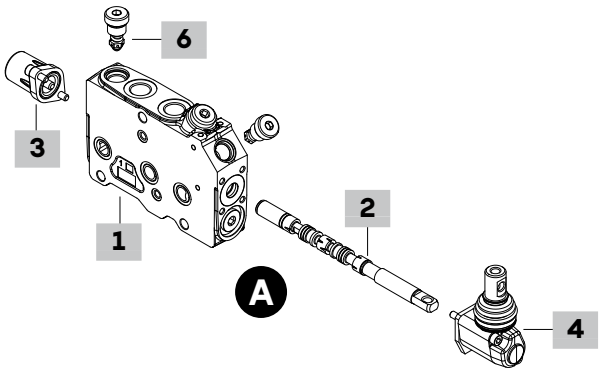
LL working section part ordering codes (mechanical and hydraulic)

A Mechanical control configuration:

Flow on A/B ports (l/min) — Valve setting (bar): A port, B port

DPX050 / PLL - 104LL(40\40) - 8 L . U1(100) U2(120) - ....

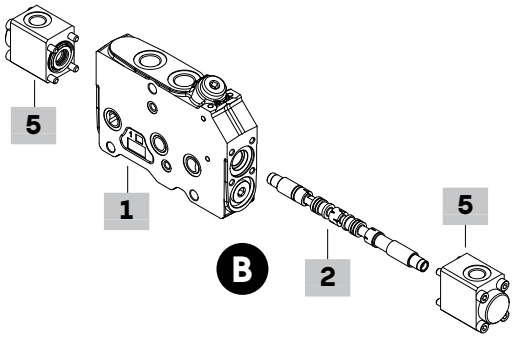
1 2 3 4 6 7



B Prop. hydraulic control configuration:

DPX050 / QLL - I104LL(40\40) - 8IM - ....

1 2 5 7



1 Low Leak working section kit * page 44

For mechanical control

TYPE: **DPX050/QLL-FPM** CODE: 5EL10A3021LV
DESCRIPTION: Without port valve arrangement
TYPE: **DPX050/PLL-FPM** CODE: 5EL10A3020LV
DESCRIPTION: With port valve arrangement

For proportional hydraulic control

TYPE: **DPX050/QLL-IM-FPM** CODE: 5EL10A3021ALV
DESCRIPTION: Without port valve arrangementrie
TYPE: **DPX050/PLL-IM-FPM** CODE: 5EL10A3004V
DESCRIPTION: With port valve arrangemente

2 Low Leak spool page 45

Flow is referred to 14 bar *(200 psi)* stand-by (margin pressure)

TYPE	CODE	DESCRIPTION
For mechanical control		
Double acting with A and B closed in neutral position, floating circuit with 13RZ type positioner (4 position)		
105LL(50)	3CUA110005L	50 l/min *(13 US gpm)* flow
104LL(40)	3CUA110004L	40 l/min *(10.5 US gpm)* flow
103LL(30)	3CUA110003L	30 l/min *(7.9 US gpm)* flow
102LL(20)	3CUA110002L	20 l/min *(5.3 US gpm)* flow
101LL(10)	3CUA110001L	10 l/min *(2.6 US gpm)* flow
106LL(5)	3CUA110006L	5 l/min *(1.3 US gpm)* flow
For proportional hydraulic control		
Double acting with A and B closed in neutral position, floating circuit with 4 positions 13IMP type control		
I105LL(50)	3CUA310005L	50 l/min *(13 US gpm)* flow
I104LL(40)	3CUA310004L	40 l/min *(10.5 US gpm)* flow
I103LL(30)	3CUA310003L	30 l/min *(7.9 US gpm)* flow
I102LL(20)	3CUA310002L	20 l/min *(5.3 US gpm)* flow
I101LL(10)	3CUA310001L	10 l/min *(2.6 US gpm)* flow
I106LL(5)	3CUA310006L	5 l/min *(1.3 US gpm)* flow

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

3 "A" side spool positioners page 29

Controls for LL sections are the same as for Standard Pressure sections

TYPE	CODE	DESCRIPTION
7FT	5V0710A001	With friction and neutral position notch
8	5V08102000	3 pos. with spring return to neutral position
8F2	5V0810A001	Spool stroke limiter on B port
8D	5V08102200	External pin with M6 female thread
8D2	5V08102220	External pin with M8 male thread
9BZ	5V09202010	Detent in position 1
10BZ	5V10202010	Detent in position 2
11BZ	5V11202010	Detent in positions 1 and 2
12	5V12102000	2 positions, detent in pos. 1 and 2
For floating circuit (standard spool)		
13RZ	5V13306020	4 pos., detent in 4th position with spool in, spring return to neutral position

4 "B" side spool control kit page 31

Controls for LL sections are the same as for Standard Pressure sections

TYPE	CODE	DESCRIPTION
L	5LEV10A000	Standard lever box
LF1	5LEV10A001	As L type, with spool stroke limiter on A port
SLP	5COP150000	Without lever with dust-proof plate
TQ	5TEL10A100	Flexible cable connection

5 Proportional hydraulic control * page 32

Controls for LL sections are the same as for Standard Pressure sections

TYPE	CODE	DESCRIPTION
8IM	5IDR20A300AV	Range 8-27 bar *(116-392 psi)*
8IMX	5IDR20A301AV	Range 3.5-20 bar *(51-290 psi)*
8IMF3	5IDR20A302AV	Range 8-27 bar *(116-392 psi)*, with spool stroke limiter on A and B ports
8IMXF3	5IDR20A303AV	Range 3.5-20 bar *(51-290 psi)*, with spool stroke limiter on A and B ports
For floating circuit (standard spool)		
13IMP	5IDR20A310AV	Range 4-16.5-28 bar *(58-239-406 psi)*

6 Port valves page 40

TYPE	CODE	DESCRIPTION
U040	5KIT308040	Setting: 40 bar *(580 psi)*

For complete list see page 21.

7 Section threading

Only specify if it is different from **BSP** standard (see page 7).

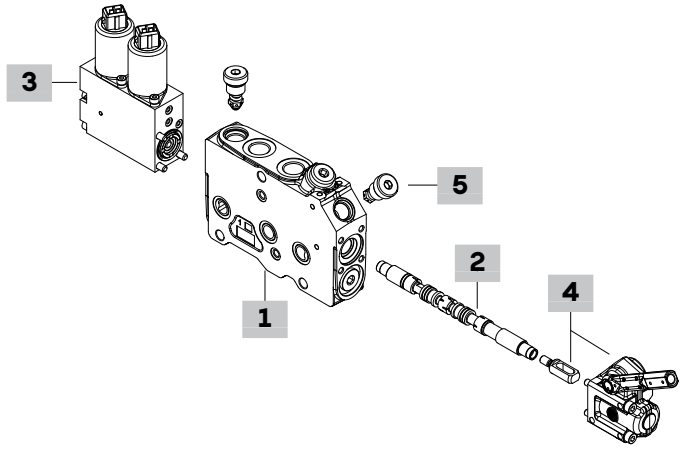
LL working section part ordering codes (electrohydraulic)

One-side electrohydraulic control configuration:

Flow on A/B ports (l/min) — Valve setting (bar): A port, B port

DPX050 / PZLL - I104LL(40\40) - 8EZ3 LQF3 . U1(100) U2(120) - .... - 12VDC

1 2 3 4 5 6 3



1 Low Leak working section kit * page 44

For one-side electrohydraulic control

TYPE: **DPX050/QZLL-FPM** CODE: 5EL10A3216V
DESCRIPITION: Without port valve arrangement
TYPE: **DPX050/PZLL-FPM** CODE: 5EL10A3006V
DESCRIPTION: With port valve arrangement

2 Low Leak spool page 45

Flow is referred to 14 bar *(200 psi)* stand-by (margin pressure)

TYPE	CODE	DESCRIPTION
Double acting with A and B closed in neutral position, floating circuit with 13EZ3 type positioner (4 position).		
I105LL(50)	3CUA310005L	50 l/min *(13 US gpm)* flow
I104LL(40)	3CUA310004L	40 l/min *(10.5 US gpm)* flow
I103LL(30)	3CUA310003L	30 l/min *(7.9 US gpm)* flow
I102LL(20)	3CUA310002L	20 l/min *(5.3 US gpm)* flow
I101LL(10)	3CUA310001L	10 l/min *(2.6 US gpm)* flow
I106LL(5)	3CUA310006L	5 l/min *(1.3 US gpm)* flow

5 Port valves page 40

TYPE	CODE	DESCRIPTION
U040	5KIT308040	Setting: 40 bar *(580 psi)*

For complete list see page 21.

6 Section threading

Only specify if it is different from **BSP** standard (see page 7).

3 One-side electrohydr.control; "A" side page 38

Controls for LL sections are the same as for Standard Pressure sections
These controls must be coupled with "B" side options

TYPE	CODE	DESCRIPTION
8EZ3-12VDC	5V0810A780V	AMP connector
8EZ3-24VDC	5V0810A785V	As previous one
8EZ3F2-12VDC	5V0810A781V	AMP connector, with spool stroke limiter
8EZ3F2-24VDC	5V0810A782V	As previous one
8EZ34-12VDC	5V0810A786V	Deutsch connector
8EZ34-24VDC	5V0810A787V	As previous one
8EZ34F2-12VDC	5V0810A783V	Deutsch connector, with spool stroke limiter
8EZ34F2-24VDC	5V0810A784V	As previous one
For floating circuit (standard spool)		
13EZ3P-12VDC	5V1310A788V	With Step, with AMP connector
13EZ3P-24VDC	5V1310A790V	As previous one
13EZ34P-12VDC	5V1310A789V	With Step, with Deutsch connector
13EZ34P-24VDC	5V1310A791V	As previous one
With spool position sensor		
8EZ3SPSD-12VDC	5V0810A790V	AMP connector and digital sensor
8EZ3SPSD-24VDC	5V0810A791V	As previous one

4 One-side electrohydr.option; "B" side page 39

Controls for LL sections are the same as for Standard Pressure sections
These options must be coupled with "A" side controls

TYPE	CODE	DESCRIPTION
LQ	5LEV10A005V	Lever control
LQ180	5LEV10A006V	As previous one, turned of 180°
LQF3	5LEV10A004V	As LQ, spool stroke limiter on A, B ports
LQF3180	5LEV10A003V	As previous one, turned of 180°
SLC	5COP150010V	Endcap
SLCF1	5COP150011V	Endcap with spool stroke limiter

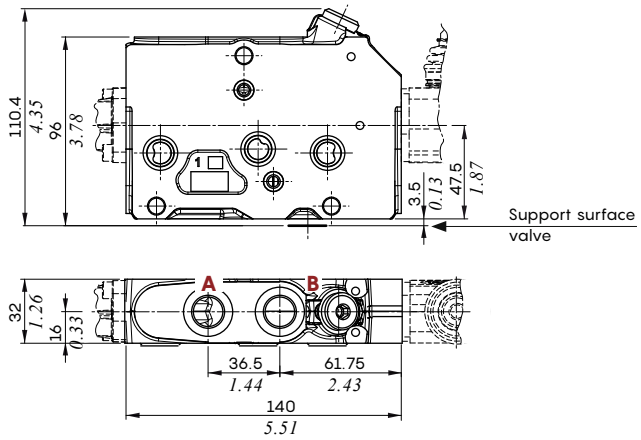
NOTE (*): Codes are referred to **BSP** thread.

LL working section

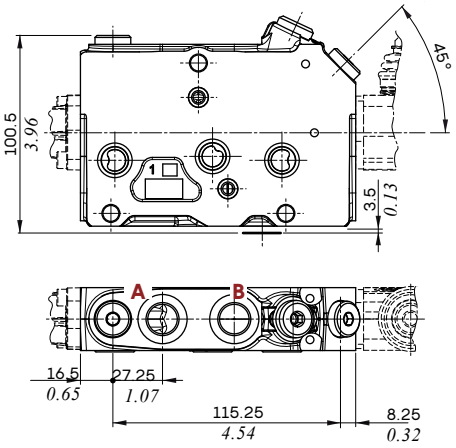
Dimensions and hydraulic circuit

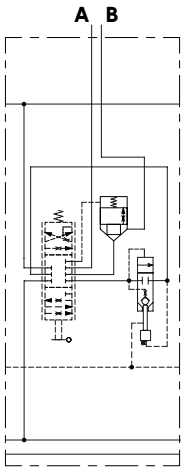
Section for mechanical and hydraulic controls

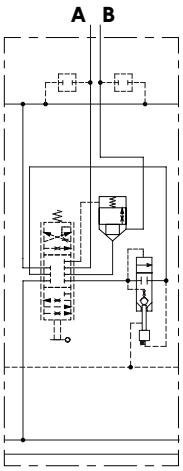
Type QLL



Type PLL

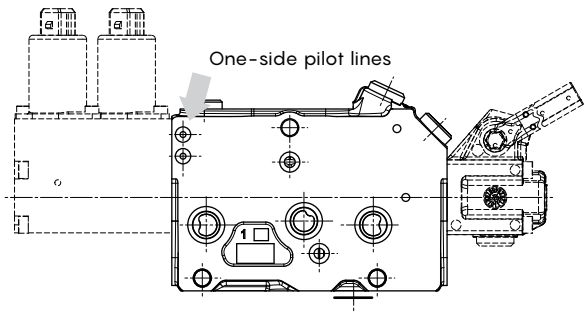




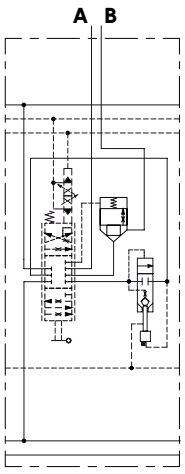


Section for electrohydraulic controls

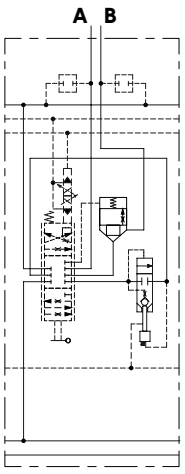
Type QZLL or PZLL



Type QZLL



Type PZLL

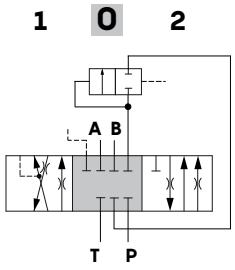


Spool

Low Leak spool metering curves are the same as the standard spools; see page 28

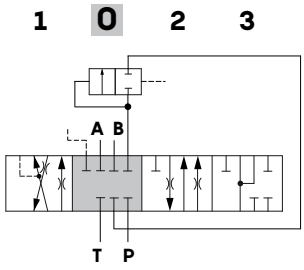
Type 1LL (1LL../1LL..)
A, B closed in neutral position

with 3 position control

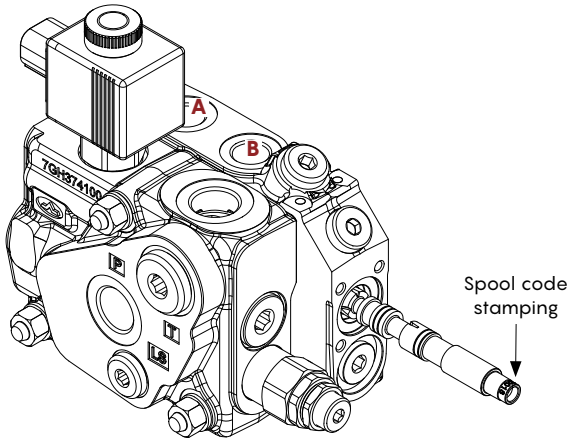


Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*

with 4 position control

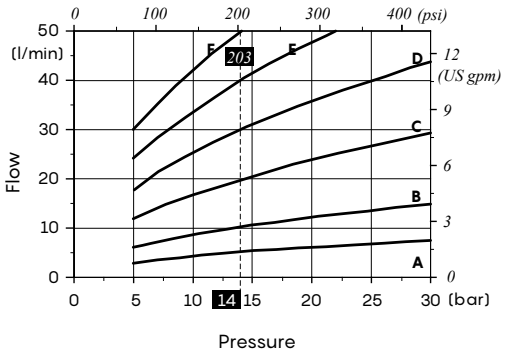


Stroke
position 1: + 5.5 mm *(+ 0.22 in)*
position 2: - 5.5 mm *(- 0.22 in)*
position 3: - 10 mm *(- 0.39 in)*



In case of spool replacement the code stamping must be oriented toward B port.

Spool flow vs. Stand-by pressure (margin pressure)



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

A = 5 l/min *(1.3 US gpm)*
B = 10 l/min *(2.6 US gpm)*
C = 20 l/min *(5.3 US gpm)*
D = 30 l/min *(7.9 US gpm)*
E = 40 l/min *(10.6 US gpm)*
F = 50 l/min *(12.2 US gpm)*