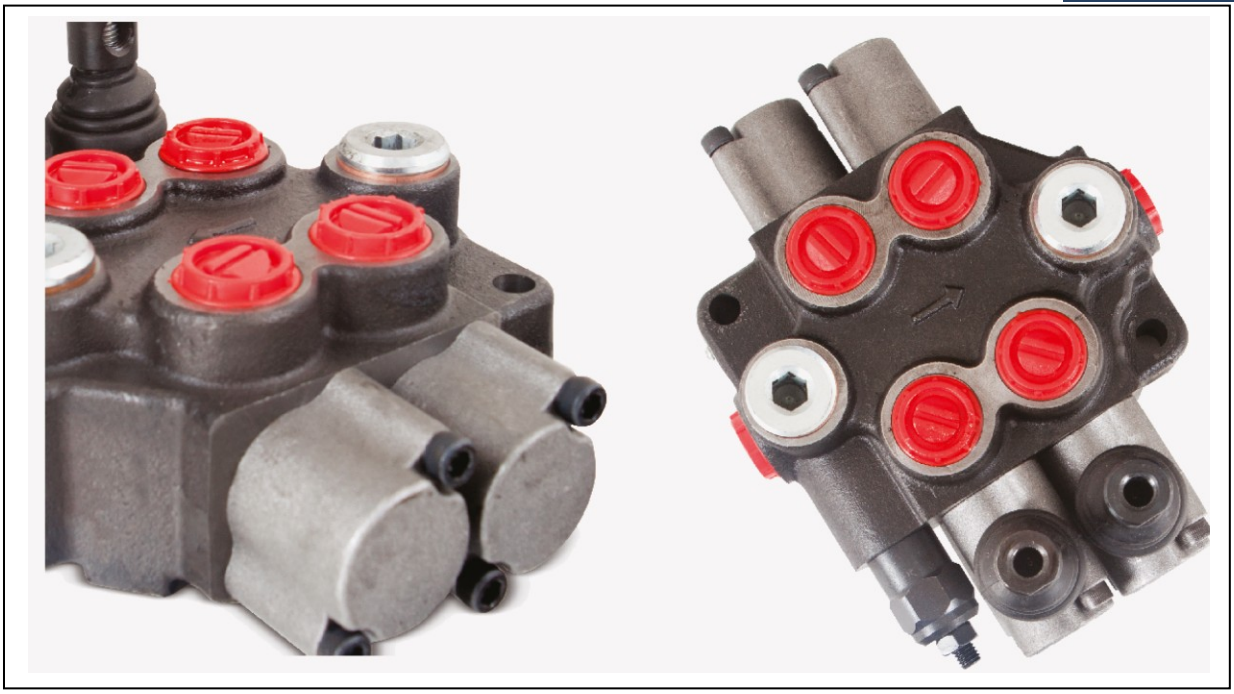
ORVAL HYDRAULIC

MONOBLOCK DIRECTIONAL CONTROL VALVES

ORV-M45

DETAILED TECHNICAL CATALOGUE



Contents

Additional Informations

Note: This catalog shows the product in the most standard configurations. For Other Configurations, more detailed information or special request, Please contact Customer Service Dpt.

Warning! :All specifications of this catalog refer to the standard product at this date (01/2011) . ORVAL, oriented to a continuous improvement, reserves the right to discontinue, modify or revise the specifications, without notice.

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

Working Conditions

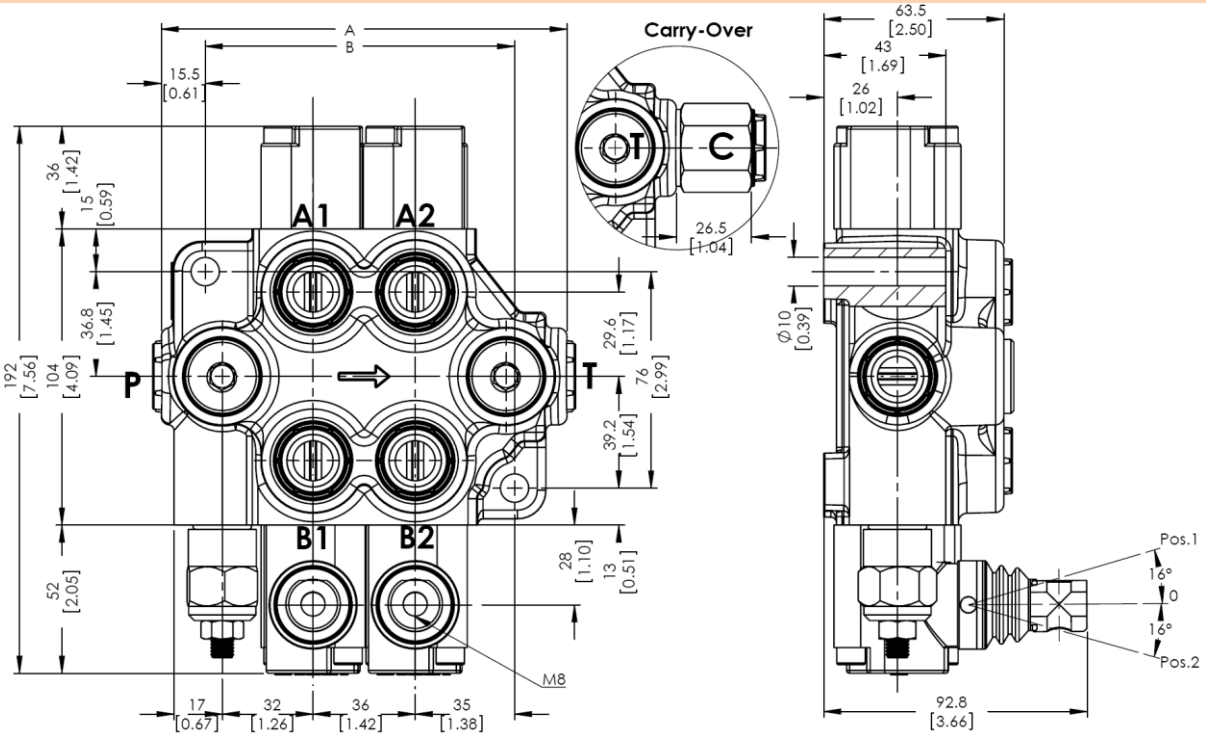
Nominal Flow Rating / Displacement	45 l/min	12 U.S.G.P.M
Maximum Working Pressure (Series Circuit)	315 Bar	4600 PSI
Max. Back Pressure	25 Bar	360 PSI
Oil Temperature with NBR Seals	-20 to 80 C˚	-4 to 176 F ˚
with FPM (Viton) Seals	-20 to 100 C˚	-4 to 212 F ˚
Oil Viskosity – Operating Range	From 10 to 75 mm2/s	From 10 to 75 cSt
Minumum / Maximum	10 / 400 mm2/s	10 / 400 cSt
Oil Filtration	≤30 µ	
Ambiant Temperature Range	-35 to 60 C˚	-31 to 140 F ˚
Number Of Spools	1 to 6	
Internal Leakage (at 100 bar (1450 PSI), 40C˚ (110 F˚), 46 cSt – A(B)—T)	3 cm3/min	0,18 in3/min
Max. Level Of Contamination	19/16 - ISO 4406	

Not: This catalogue shows technical specifications measured with mineral oil of 46 mm2/s-46 cSt viscosity at 40 C˚ temparture.

Features

- Simple, compact and heavy duty designed monoblock valves from 1 to 6 sections for open and closed center hydraulic systems.
- Optionaly Carry-Over port only tandem circuit.
- Fitted with a main pressure relief valve.
- Interchangeable spool diametre is 16 mm – 0,63 in.
- Available manual, pneumatic, hydraulic and electro-pneumatic spool control kits.

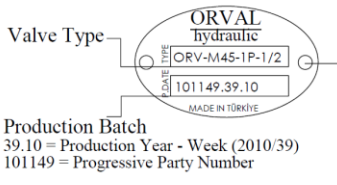
Dimensional Data

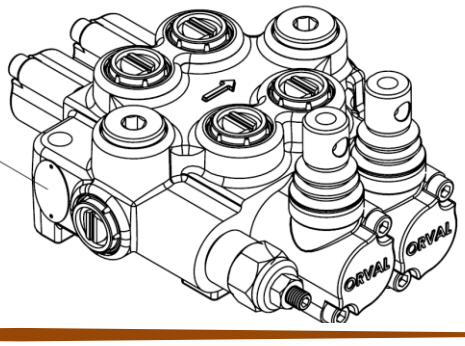


TYPE	A		B		Weight	
	mm	in	mm	in	Kg	lb
ORV-M45-1P	103	4,06	73	2,87	3.18	7,01
ORV-M45-2P	139	5,47	109	4,29	4.84	10,67
ORV-M45-3P	175	6,89	145	5,71	6.50	14,33
ORV-M45-4P	211	8,31	181	7,13	8.16	17,99
ORV-M45-5P	247	9,72	217	8,54	9.82	21,65
ORV-M45-6P	283	11,14	253	9,96	11.48	25,31

Standard Threads

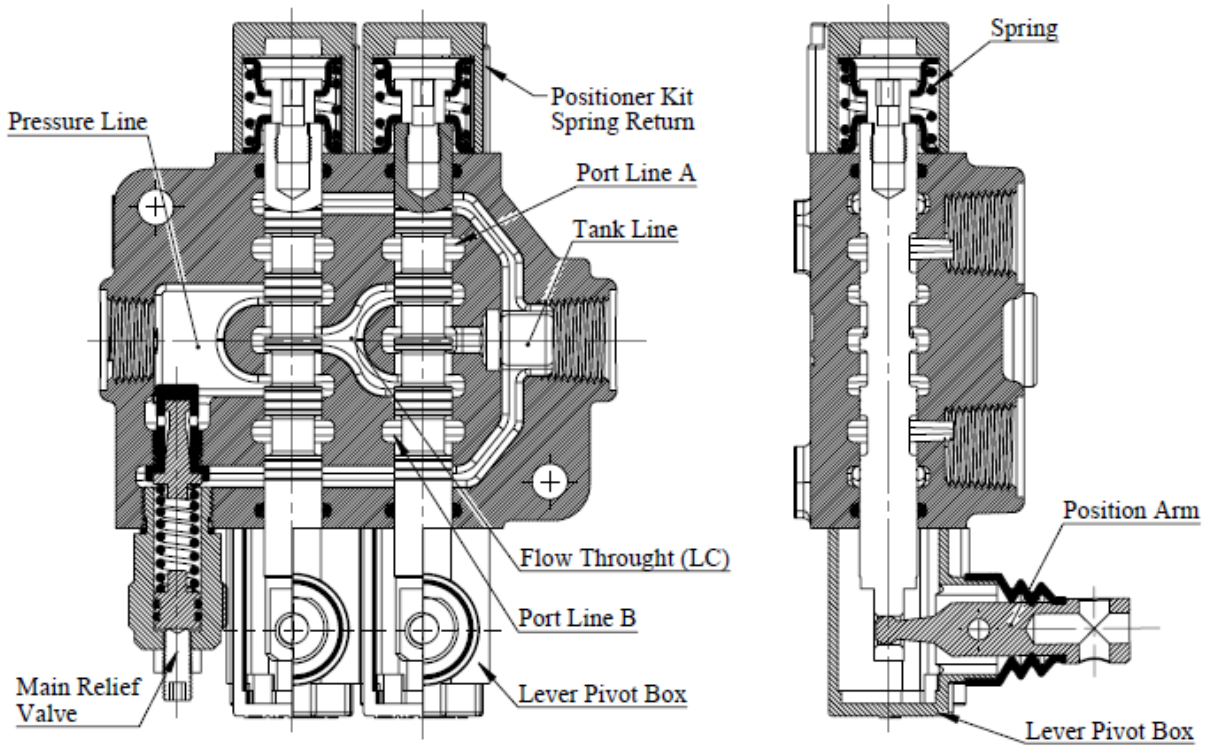
PORT	BSP (Iso 228)		UN-UNF (Iso 11926-1)	Metric (Iso 262)
	3/8" Series	½"Series		
P Inlet	G 3/8	G 1/2	3/4-16 UNF	M18x1.5
A-B Ports	G 3/8	G 1/2	9/16-18 UNF	M18x1.5
T Outlet	G 1/2	G 1/2	3/4-16 UNF	M18x1.5
Pneumatic	G 1/4	G 1/4	NPTF 1/8 - 27	NPTF 1/8 - 27
Carry-Over	G 1/2	G 1/2	3/4-16 UNF	G 1/2

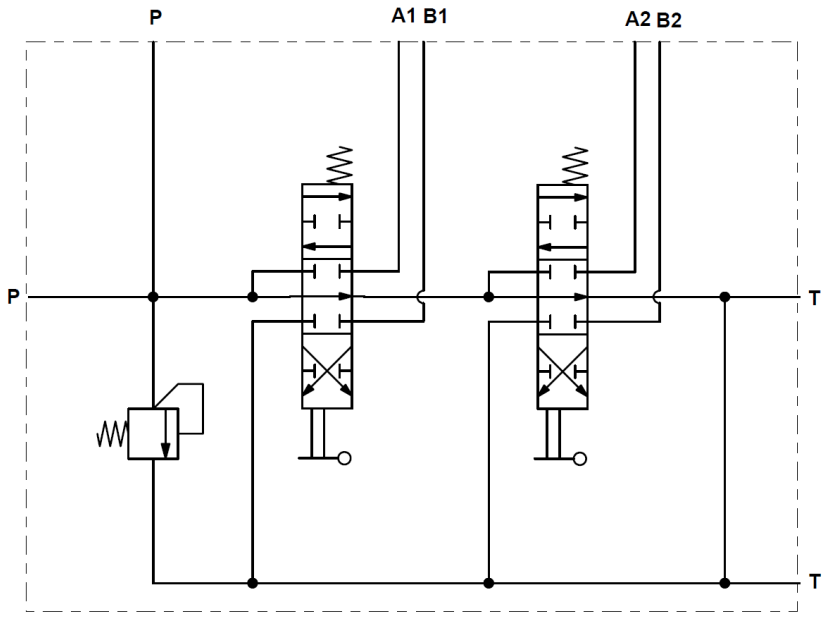




Hydraulic Circuit

Standard Configurations With Side Inlet And Outlet Ports - LH

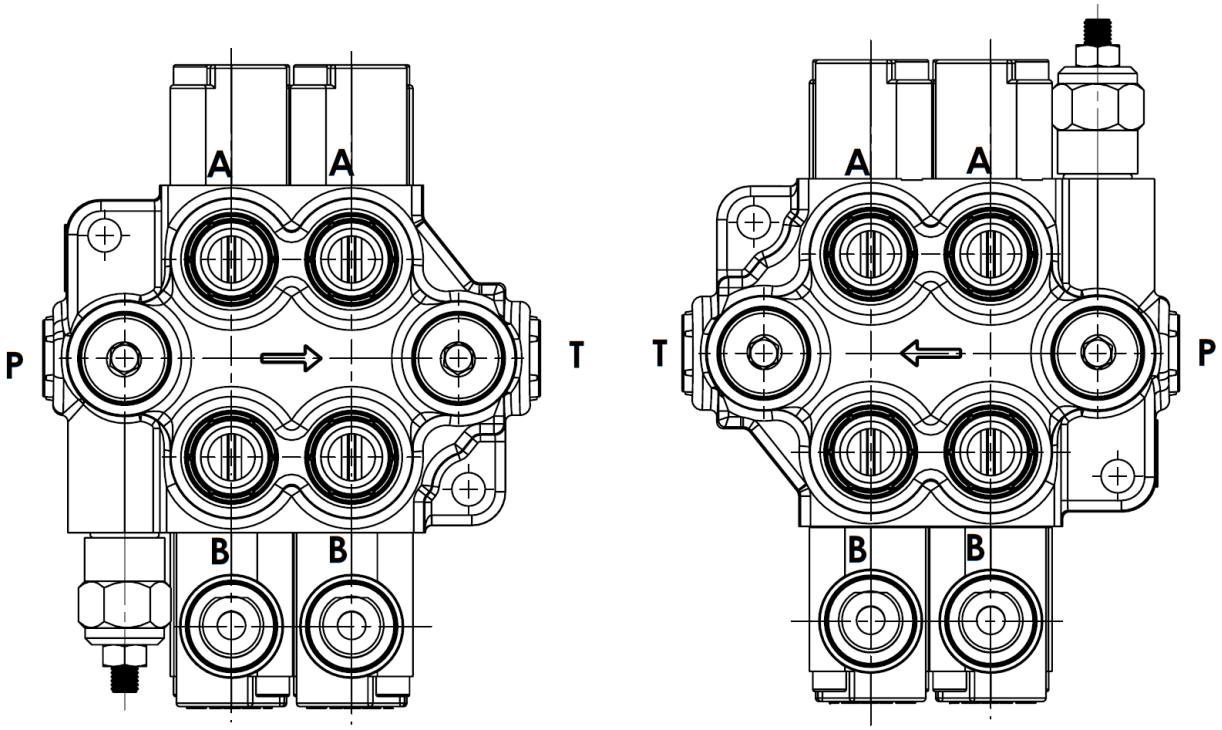


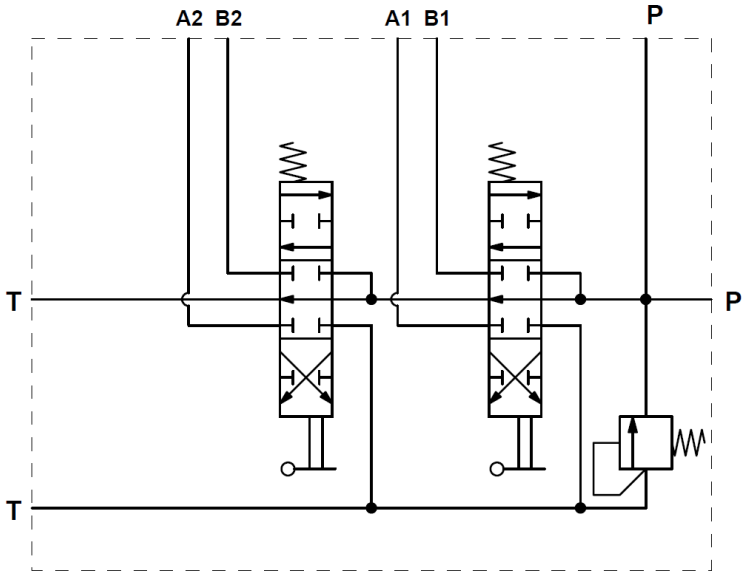


Code:ORV M45-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/PA1/SGT

Standard Configurations With Side Inlet And Outlet Ports - RH (Right Inlet)

A simmetrical body allows the reverse assembly of spool and this with connected control kit **(RH** Configuration).

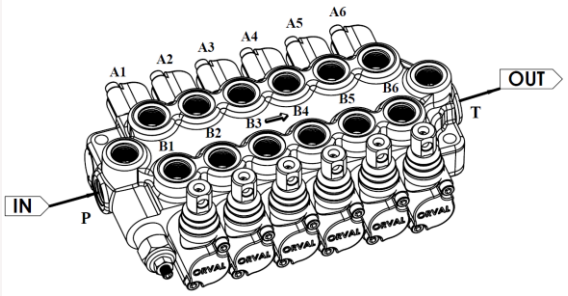


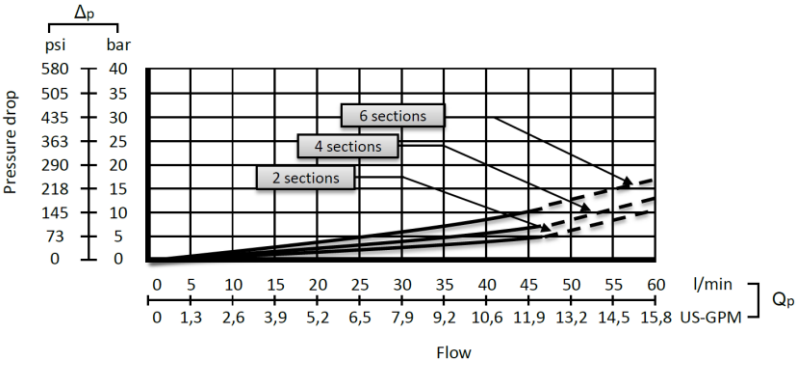


Code:ORV M45-2P / SMR2-120 / (RH) 1A-SR-STL/1A-SR-STL/PA1/SGT

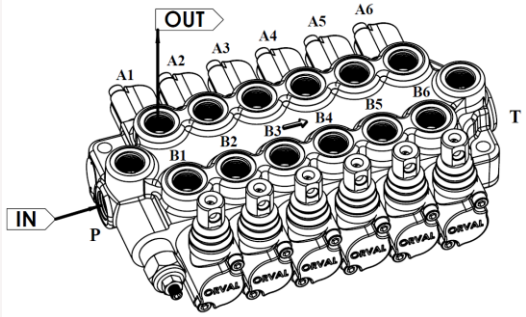
Performance Data And Curve

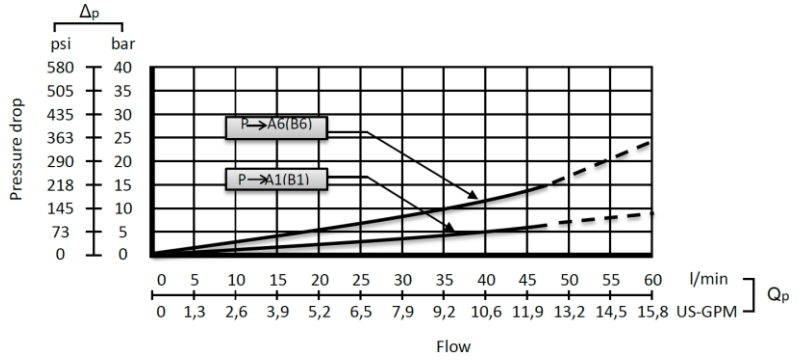
Open Center - Pressure Drop (P-T)



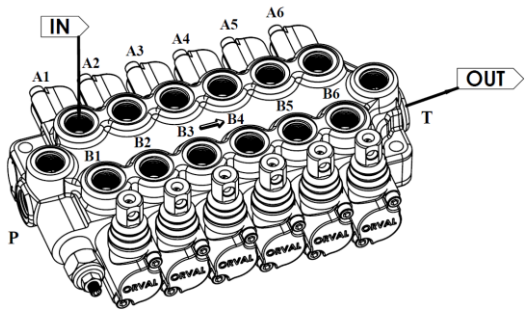


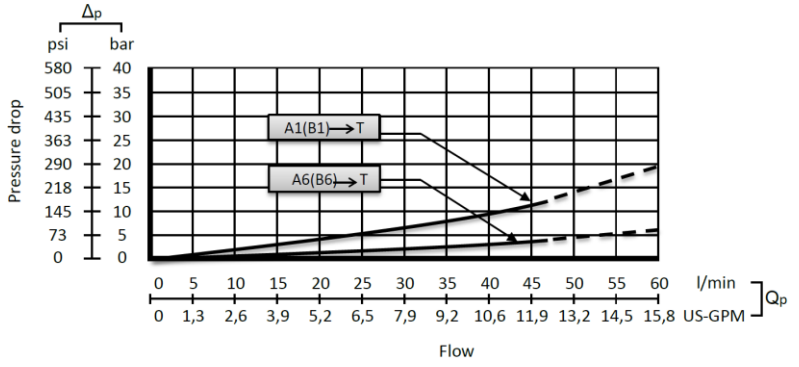
Inlet to Work Port - Pressure Drop (P-A/B)





Work Port to Outlet - Pressure Drop (A/B-T)





Note: Measured and chart value with spool type 1A.

Inlet Relief Options

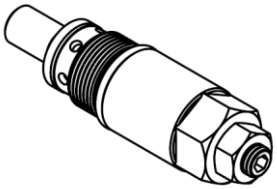
Direct Pressure Relief Valve

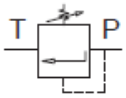
Code:

SMR2 – 120

→ Pressure Setting Bar in (Standard 120 bar)

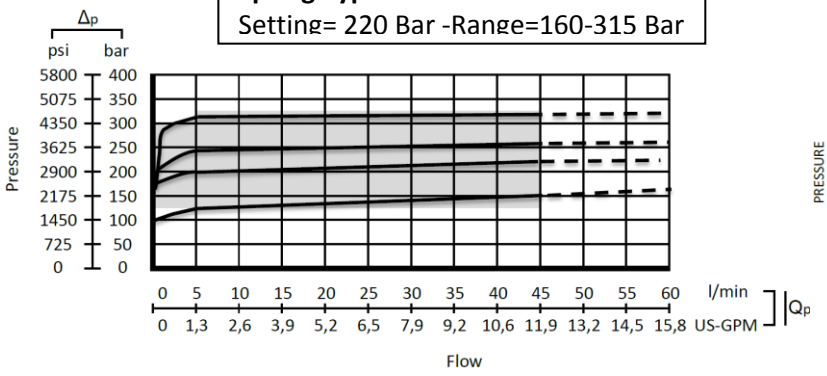
→ Standard Main Relief Spring Type -2

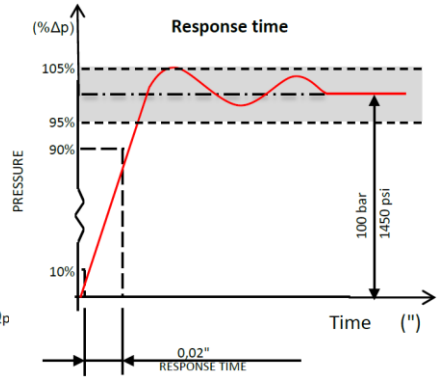




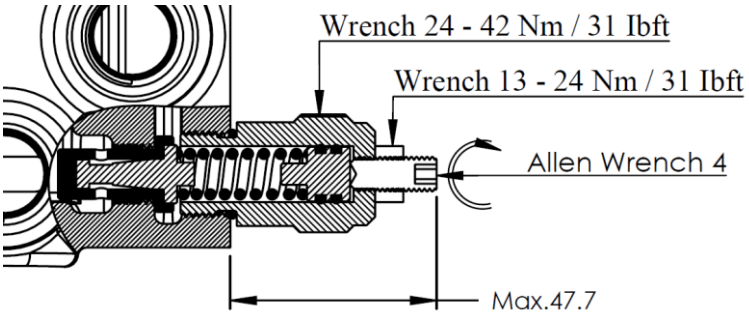
Performance Data:

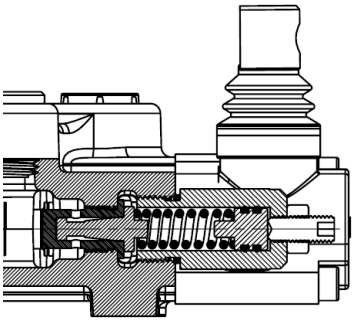
Spring Type Number : 3
Setting= 220 Bar -Range=160-315 Bar



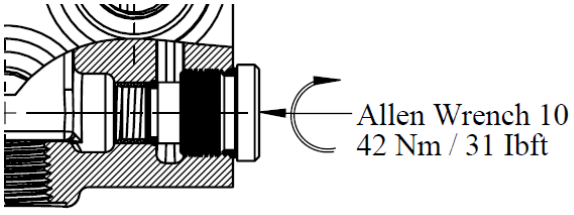


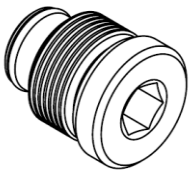
Adjustment Type on Valve:

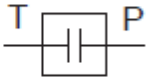




Relief Blanking Plug - WM

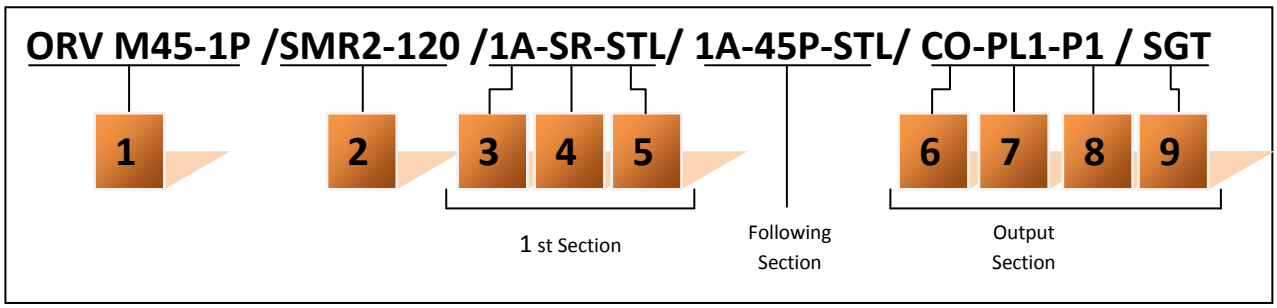


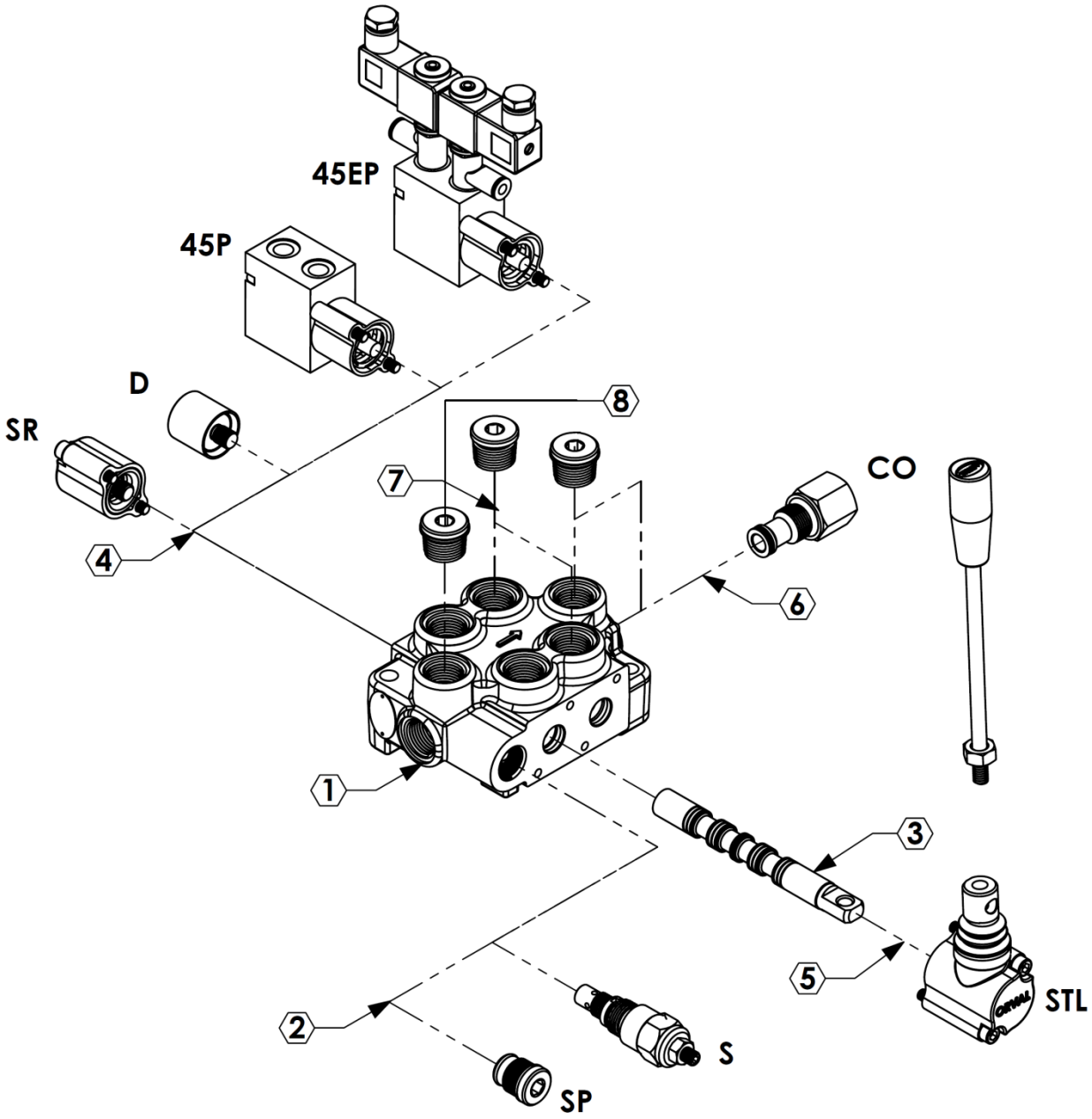




Ordering Codes

Order example





Ordering Codes

1-Valve Type and Body

M45 =Valve Type - (M) - Monoblok
(45) - Max. Flow Rate

1P =Body for 1 Section - (1BM145100)
2P =Body for 2 Sections - (1BM245100)
3P =Body for 3 Sections - (1BM345100)
4P =Body for 4 Sections - (1BM445100)
5P =Body for 5 Sections - (1BM545100)
6P =Body for 6 Sections - (1BM645100)

2-Pressure Relief Options

SMR = Standard direct pressure relief valve
SMR1-080 – (2SMR145080)–Range 0-80 bar
Setting 80 bar
SMR2-120 – (2SMR245120)–Range 60-200 bar
Setting 120 bar
SMR3-220 – (2SMR345220)–Range 160-315 bar
Setting 220 bar
SP =Standard relief plug – (2SP045100)

3-Spool Options

1A -(3SM145110) – 3 Positions ,Double acting
2A -(3SM145120) – 3 Positions ,Double acting
A to tank B Blocked
3A -(3SM145130) – 3 Positions ,Double acting
B to tank A blocked
4A -(3SM145140) – 3 Positions ,Double acting
A and B tank
5A -(3SM145150) – 3 Positions ,Single acting on
A (A to tank)
6A -(3SM145160) – 3 Positions ,Single acting on
B (B to tank)

4- Spool Positioners

SR=Spring Return in neutral position –
(4SR045100)
D =Detent in position 1, neutral and 2 -
(4D045100)
45P=ON/OFF Pneumatic – (445P045100)
45EP=12 VDC ON/OFF electro-pneumatic –
(445EP045112)
24 VDC ON/OFF electro-pneumatic –
(445EP045124)

5-Lever Options

STL=Standard Lever –(5STL045100)

6- Output Options

PA1(T) =G1/2" Top output plug-
(6PL1040112)
PA1(S) =G1/2" Side output plug-
(6PL1040112)
CO =G1/2" Carry–Over Connector –
(6CO045100)

7-Ports Plug Options "If Required"

PL1(5A) =Plug for single action spool for 5A
G1/2 –(6PL1040112)
PL1(6A) =Plug for single action spool for 6A
G1/2 –(6PL1040112)
PL2(5A)=Plug for single action spool for 5A
G3/8- (7PL2045138)
PL2(6A)=Plug for single action spool for 6A
G3/8- (7PL2045138)
*Page 13 for detail spool options.

8- Ports Input Plug Options

PI1(T) = G1/2 Top input – (6PL1040112)
PI1(S) = G1/2 Side input – (6PL1040112)
PI2(T) = G3/8 Top input – (7PL2045138)
PI2(S) = G3/8 Side input – (7PL2045138)

9- Ports Thread Options

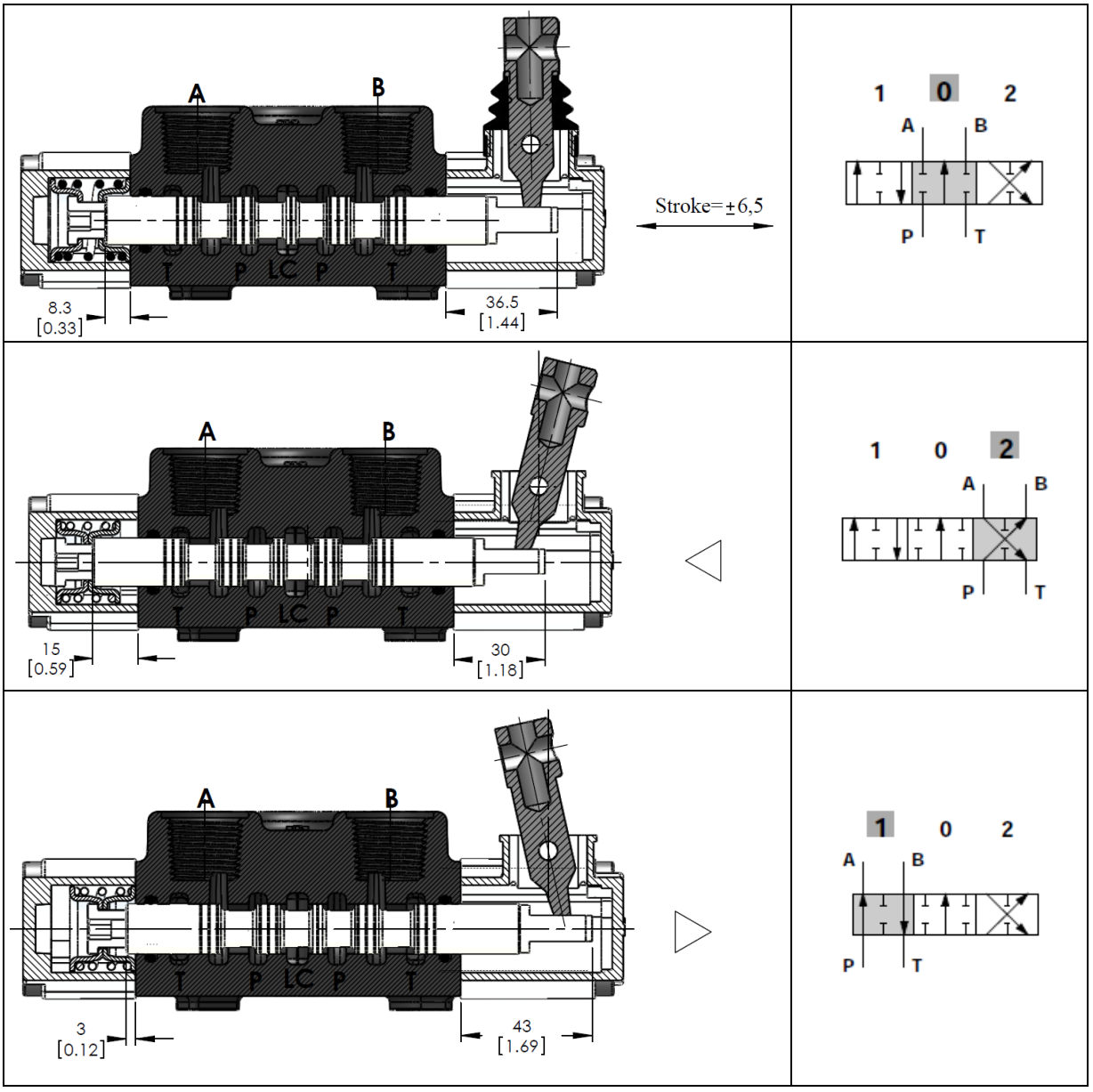
SGT1 =1/2" Series Port Options - (9P045112)
SGT2 =3/8" Series Port Options - (9P045138)
UNF =UNF Series Port Options - (9U045138)
M =Metric Series Port Options -
(9M045138)
*Page 4 for detail port information.

HandLever

L =Standard HandLever (L=120mmxM8) -
(7L040100)

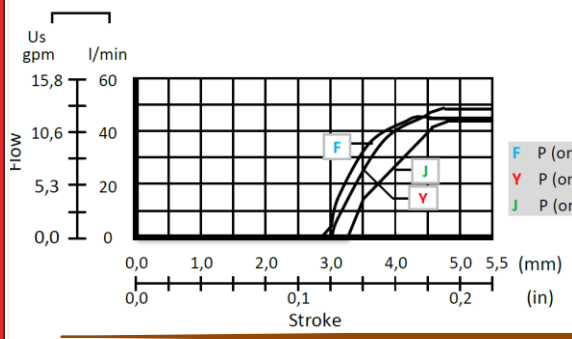
Spool Options

Spool Type - 1A



Performance Curve And Data:

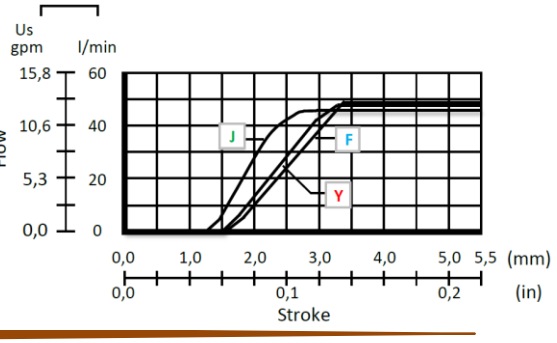
Spool metering P⟶A



Qin = 45 l/min

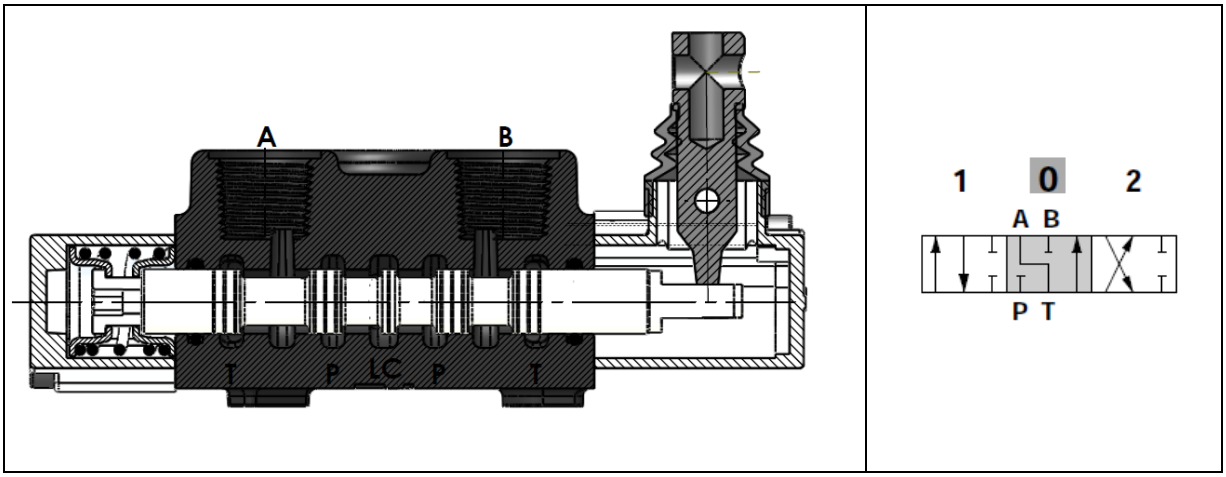
F P (on ports) = 63bar / 900 psi
Y P (on ports) = 100bar / 1450 psi
J P (on ports) = 250bar / 3600 psi

Spool metering A⟶T

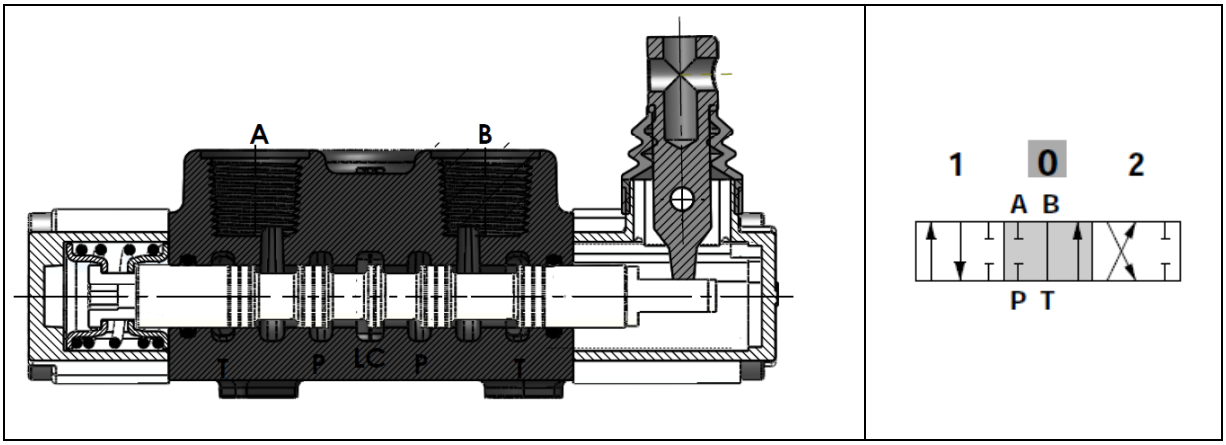


Spool Options

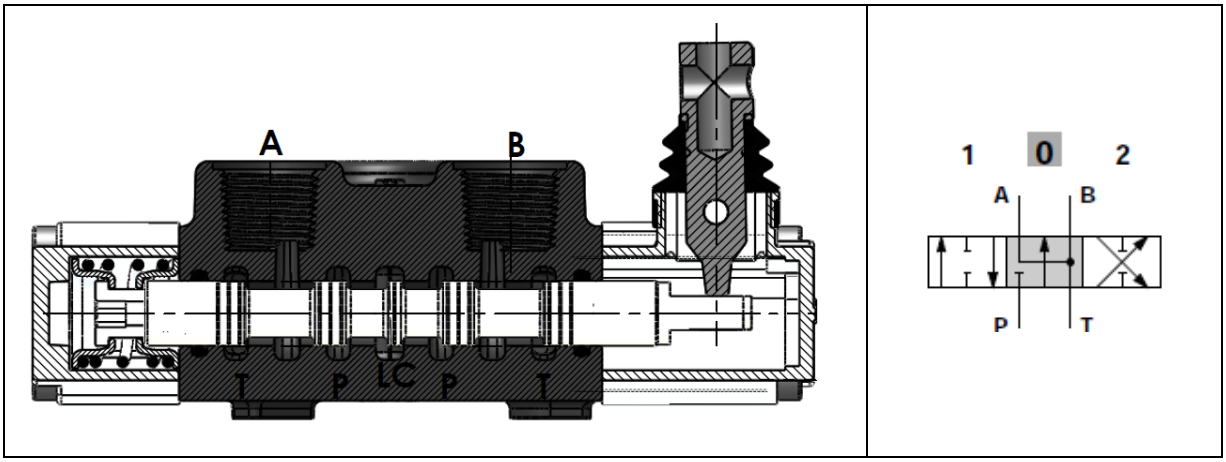
Spool Type - 2A



Spool Type - 3A

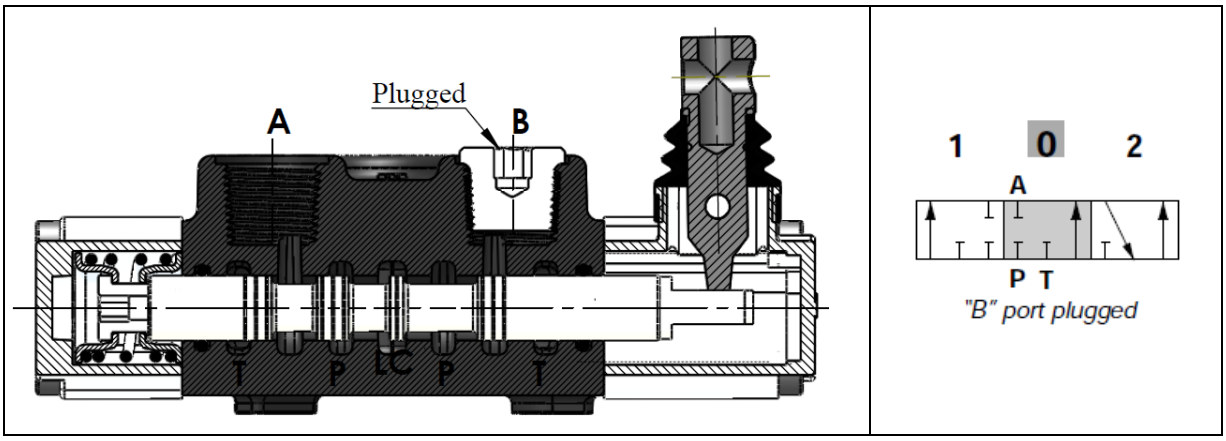


Spool Type - 4A

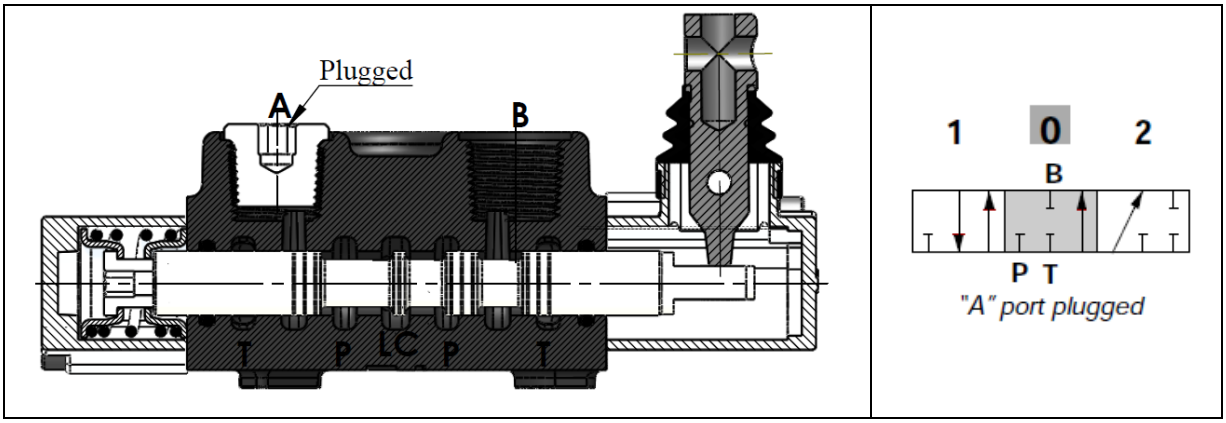


Spool Options

Spool Type - 5A

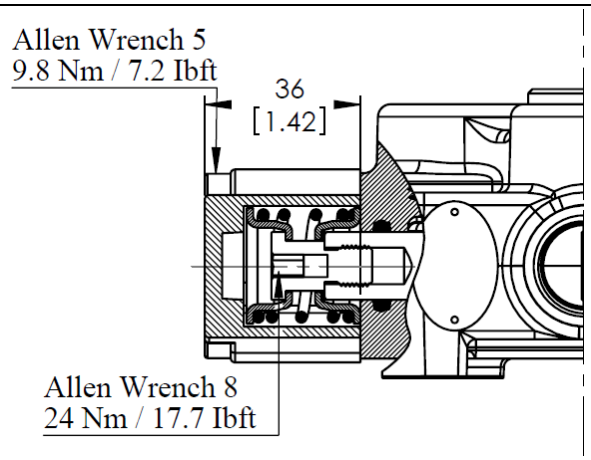
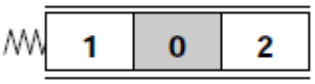


Spool Type - 6A

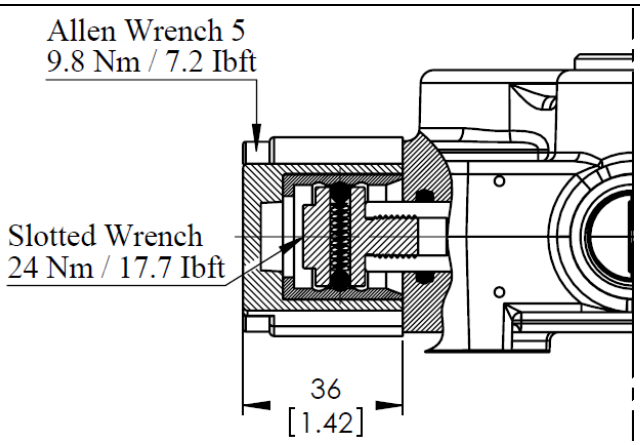
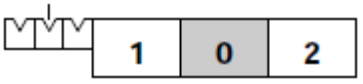


Spool Positioners – Side of Return

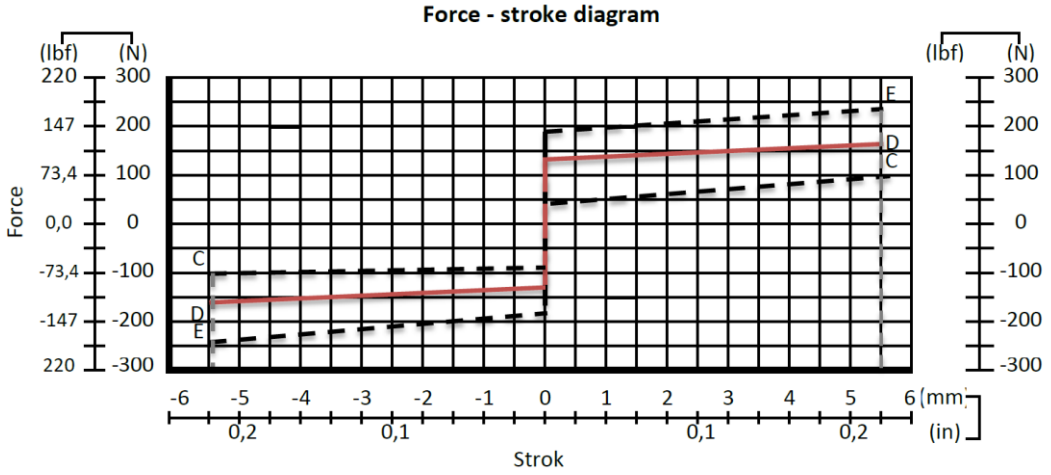
With Spring Return in Neutral Position

Kit No: **SR**	
Sectional Appearance	Diagram
	

With Detent

Kit No: **D**	
Sectional Appearance	Diagram
	

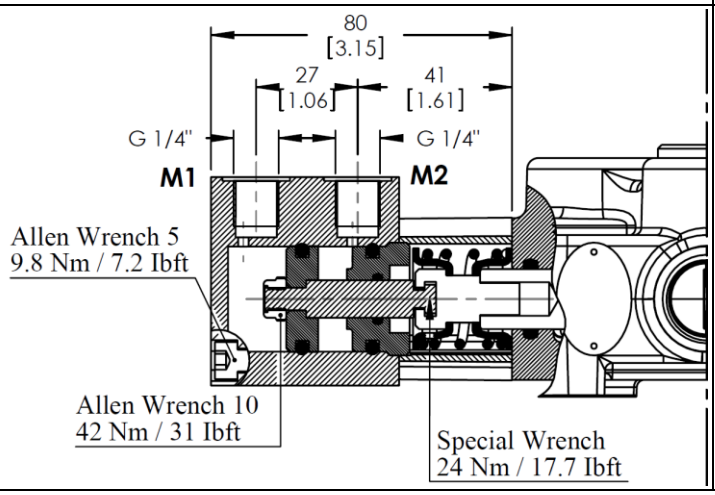
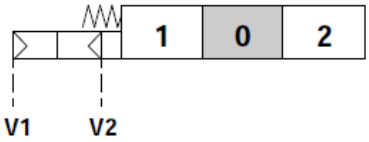
Force - stroke diagram



Spool Positioners – Side of Return

ON/OFF Pneumatic Control

Kit No: **45P**

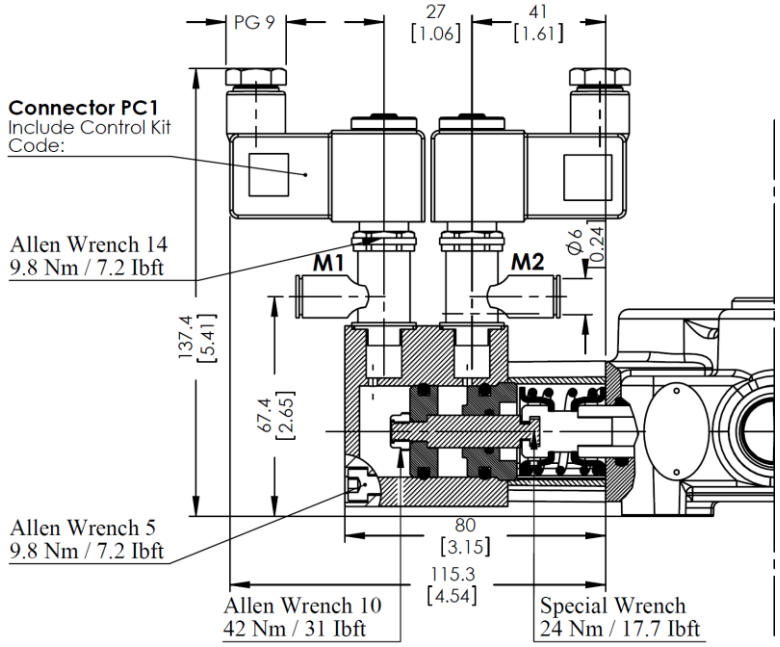
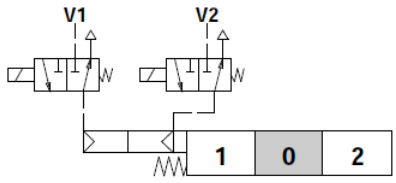
Sectional Appearance	Diagram
	

Operatig Features

Pilot Pressure .....: 6 Bar (Max. 10) / 87 Psi (Max. 145)

ON/OFF Electro-Pneumatic Control

Kit No: **45EP**

Sectional Appearance	Diagram
	

Operatig Features

Pilot Pressure .....: 6 Bar (Max. 10) / 87 Psi (Max. 145)

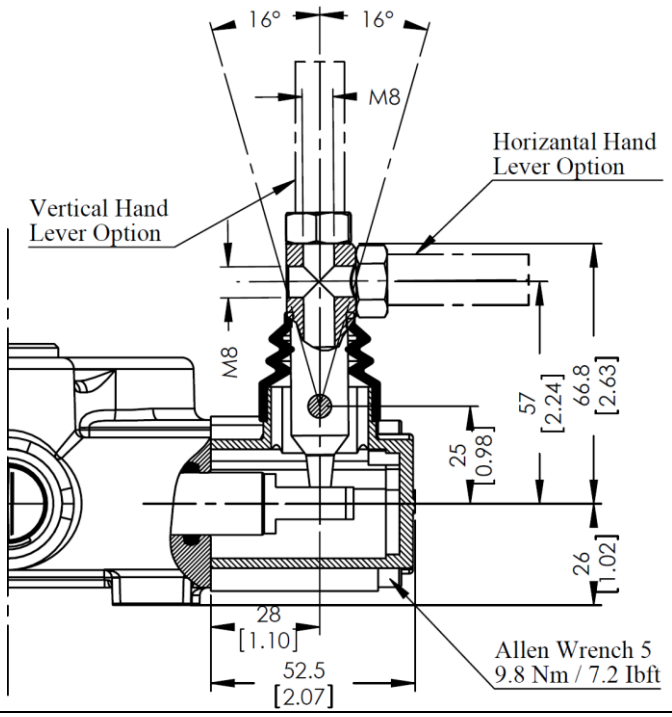
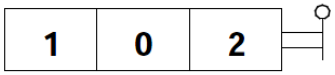
Selonoid Operating Features

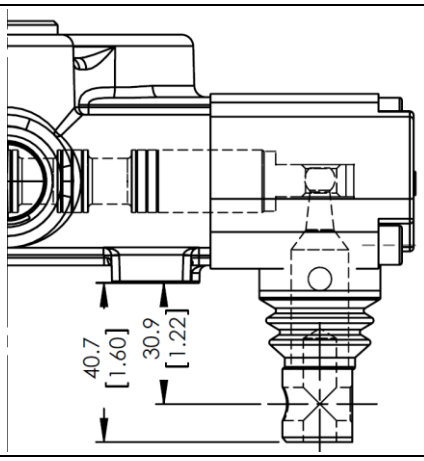
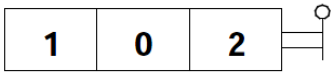
Nominal Voltage.....: 12VDC / 24 VDC

Power Rating.....: 6 W

Spool Positioners – Side of Lever Control

Lever Controls

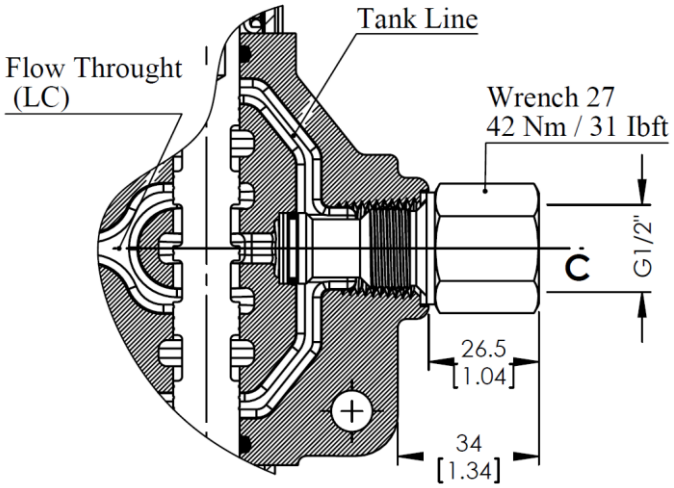
Kit No: **STL - L0**	
Sectional Appearance	Diagram
	

Kit No: **STL - L180**	
Sectional Appearance	Diagram
	
Note: Aluminium with protection arm lever pivot box, it can be rotated 180°.	

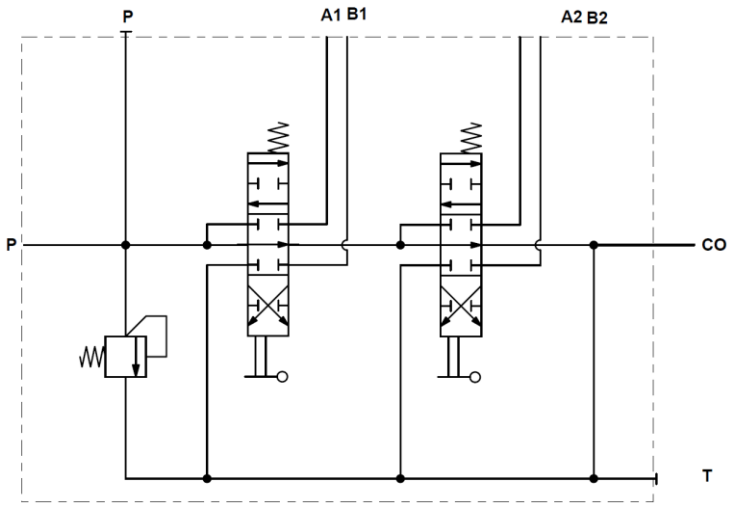
Outlet Port Options

Carry - Over Connection

Kit No: **CO**

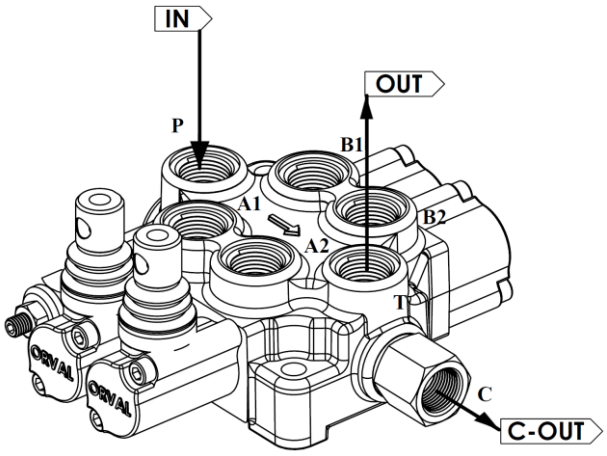


Sectional Appearance



Hydraulic Circuit

Code:ORV M45-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/CO-PA1/SGT



Direction of Port Connectted

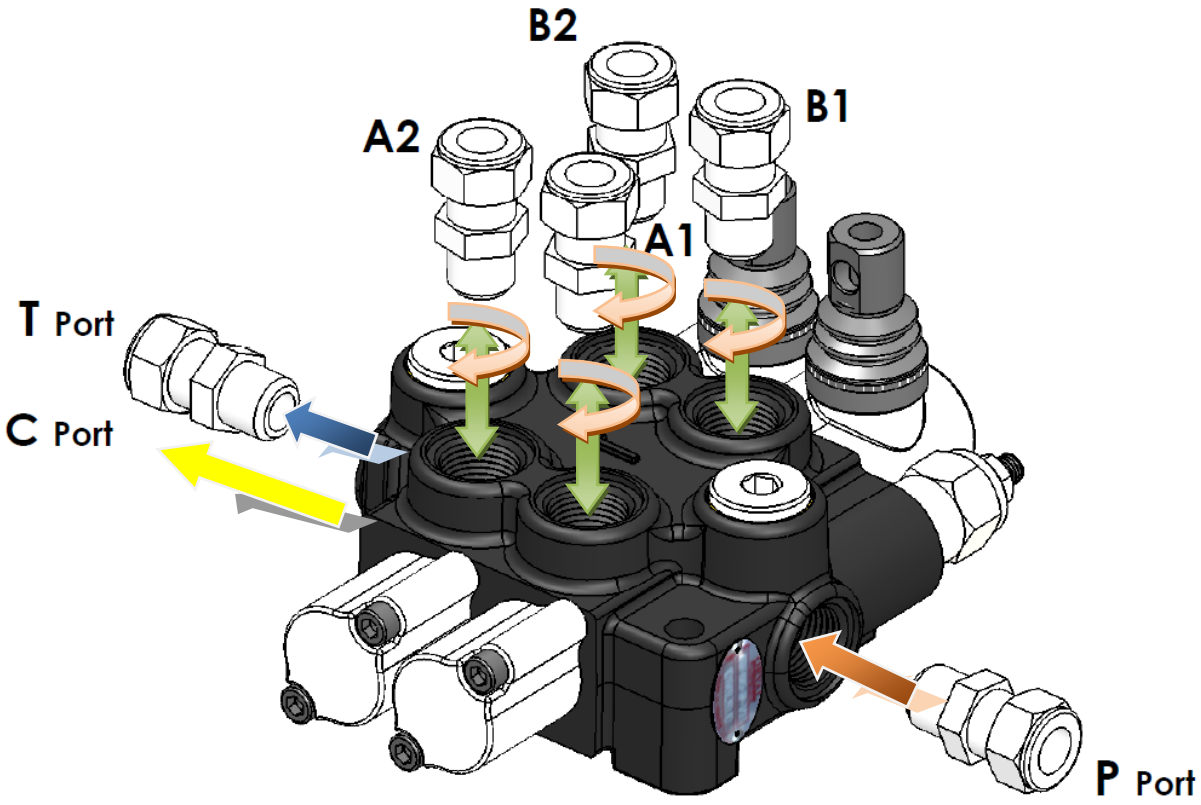
SGT : See page 5 for Standard center.

Installation and Maintenance

The ORV M45 valve is assembled and tested as per the technical specification of this catalog.

Before the final installation on your equipment, follow the below recommendation:

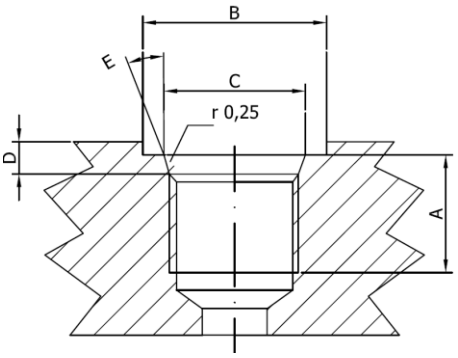
- The valve can be assembled in any position, in order to prevent body deformation and spool sticking mount the product on a flat surface;
- In order to prevent the possibility of water entering the lever box and spool control kit, do not use high pressure wash down directly on the valve;
- Prior to painting, ensure plastic port plugs are tightly in place.



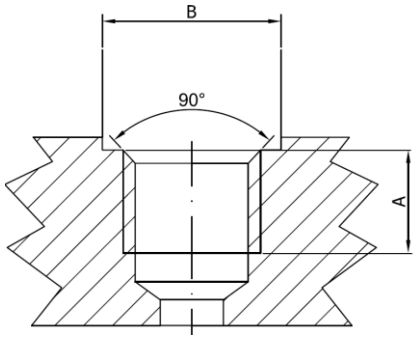
Threads Type (Nm / lbft)	P Port	A and B Port	T Port
BSP (ISO 228/1)	G 3/8	G 3/8	G 1/2
With O--Ring seal	35 / *25.8*	35 / *25.8*	50 / *36.9*
With copper washer	40 / *29.5*	40 / *29.5*	60 / *44.3*
With steel and rubber washer	30 / *22.1*	30 / *22.1*	60 / *44.3*
BSP (ISO 228/1)	G 1/2	G 1/2	G 1/2
With O--Ring seal	50 / *36.9*	50 / *36.9*	50 / *36.9*
With copper washer	60 / *44.3*	60 / *44.3*	60 / *44.3*
With steel and rubber washer	60 / *44.3*	60 / *44.3*	60 / *44.3*
UN--UNF (ISO 11926--1)	3/4--16 UNF--2B	9/16--18 UNF--2B	3/4--16 UNF--2B
With O--Ring seal	50 / *36.9*	30 / *22.1*	50 / *36.9*
METRIC (ISO 262)	M18 x 1.5	M18 x 1.5	M18 x 1.5
With O--Ring seal	35 / *25.8*	35 / *25.8*	35 / *25.8*
With copper washer	40 / *29.5*	40 / *29.5*	40 / *29.5*
With steel and rubber washer	40 / *29.5*	40 / *29.5*	40 / *29.5*

Technical Data

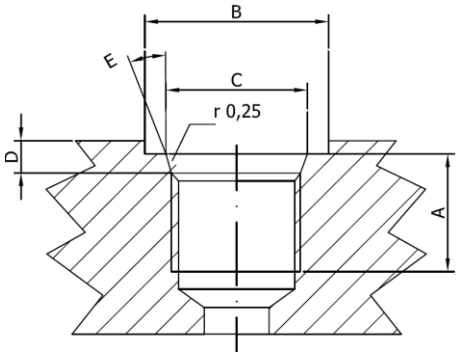
Ports Dimensional Data



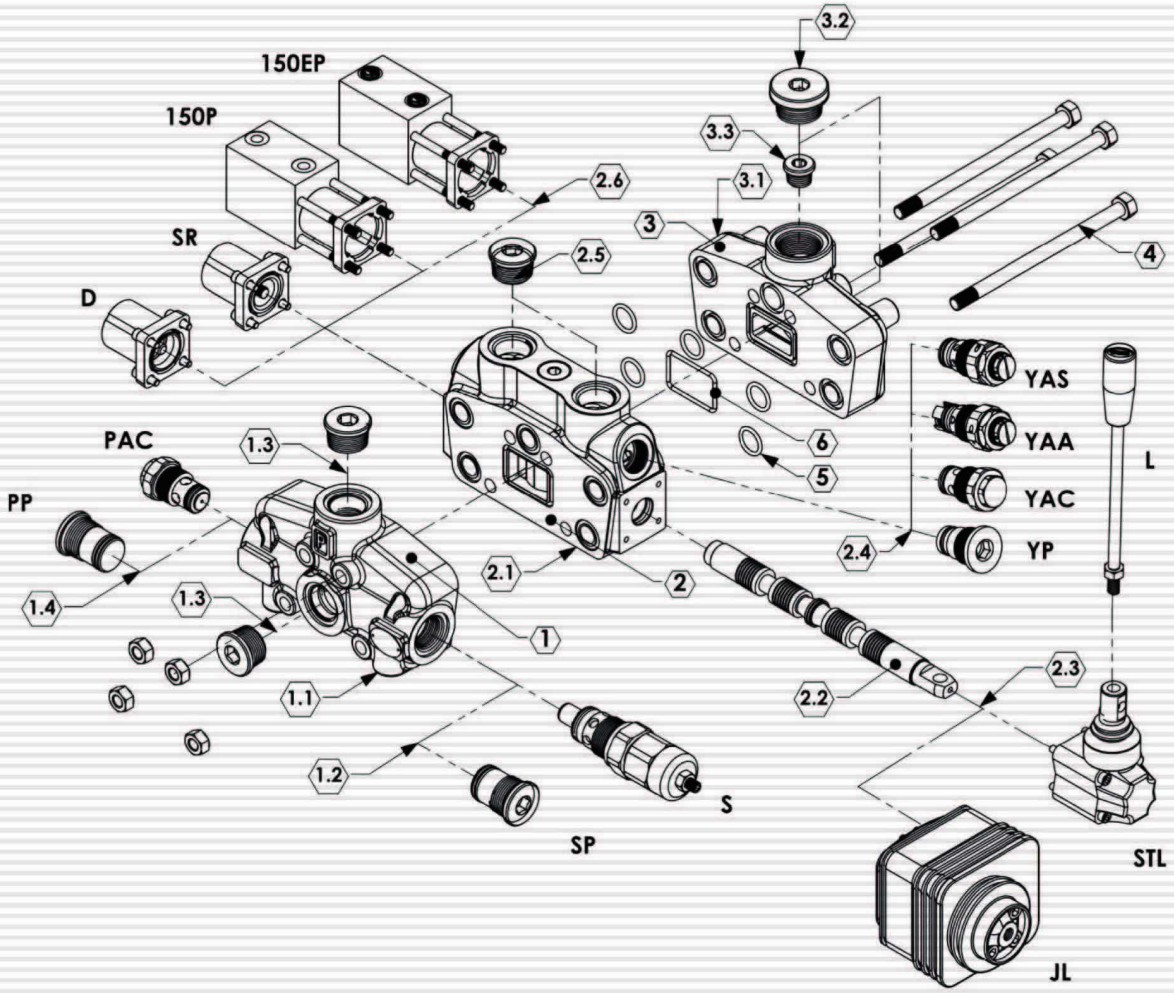
SAE UN-UNF (ISO 725)						
Dimensions		9/16-18 UNF SAE6		3/4-16 UNF SAE8		7/8-14 UNF SAE10	
mm	in						
A		13	0,51	15	0,59	17	0,67
B		25	0,83	30	1,18	34	1,34
C		13,6	0,61	20,6	0,81	23,9	0,94
D		2,5	0,10	2,5	0,10	2,5	0,10
E		15˚		15˚		15˚	



BSP (ISO 228)						
Dimensions		G1/4		G3/8		G1/2	
mm	in						
A		14	0,55	14	0,55	16	0,63
B		19	0,75	23	0,91	27	1,06



METRIC (ISO 262)					
Dimensions		M18x1,5 ISO 262		M22x1,5 ISO 262	
mm	in				
A		14	0,55	16	0,63
B		27,5	1,08	31,5	1,24



ORVAL HYDRAULIC