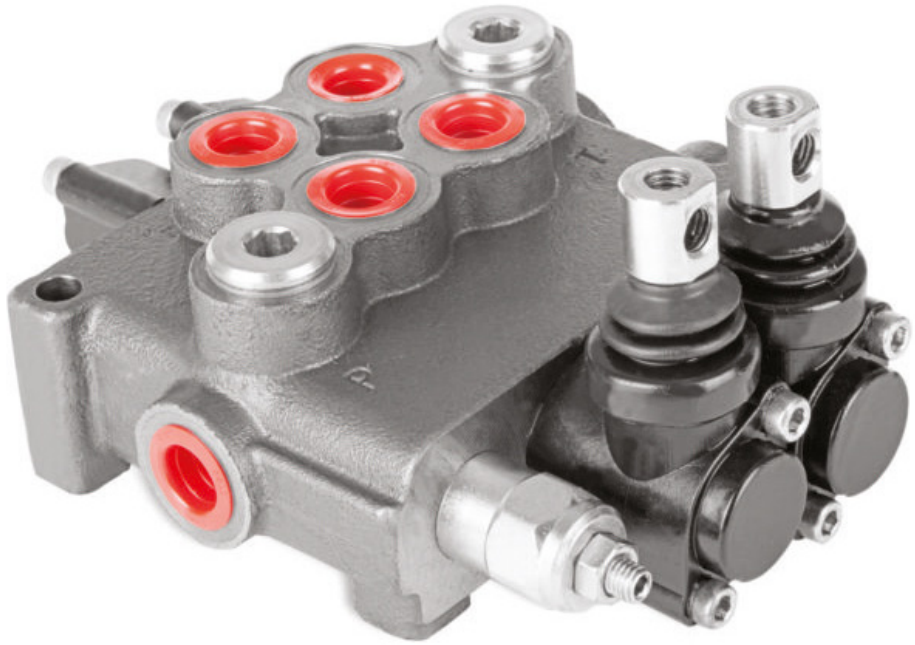
ORVAL HYDRAULIC

MONOBLOCK DIRECTIONAL CONTROL VALVES

ORV-MS45





CONTENTS

Working Conditions	41
Dimensional Data	42
Hydraulic Circuit	43
Performance Data And Curve	44
Inlet Relief Options	45
Ordering Codes	46
Spool Options	48
Spool Positioners – Side of Return	50
Spool Positioners – Side of Lever Control	54
Spool Positioners – Side of Lever Control	55
Spool Positioners – Side of Lever Control	56
Spool Positioners – Side of Lever Control	57
Complete Control – On / Off Solenoid Control	58
Outlet Port Options	59
Outlet Port Options	60
Installation and Maintenance	61
Technical Data	62

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 (01/2020). 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.

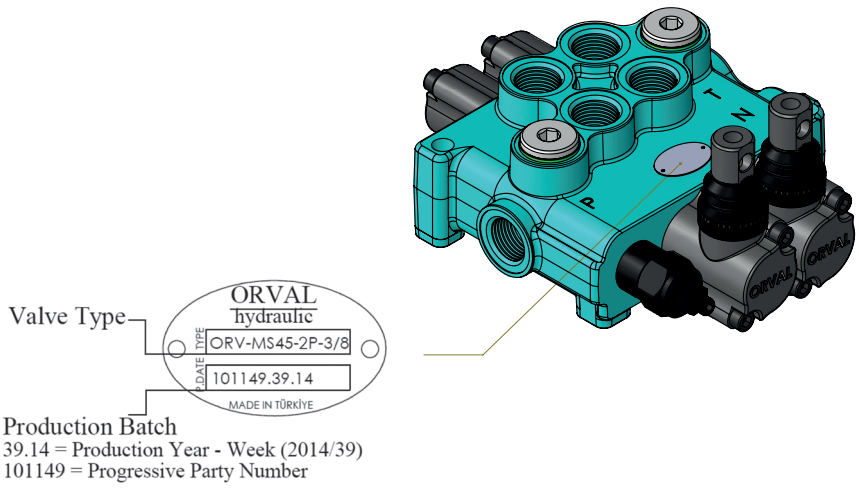
WORKING CONDITIONS

Nominal Flow Rating / Displacement	45 l/min	12 U.S.G.P.M
Maximum Working Pressure (Parallel Circuit)	315 Bar	4600 PSI
(Series Circuit)	250 Bar	3600 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 Viscosity – 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 7	
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	

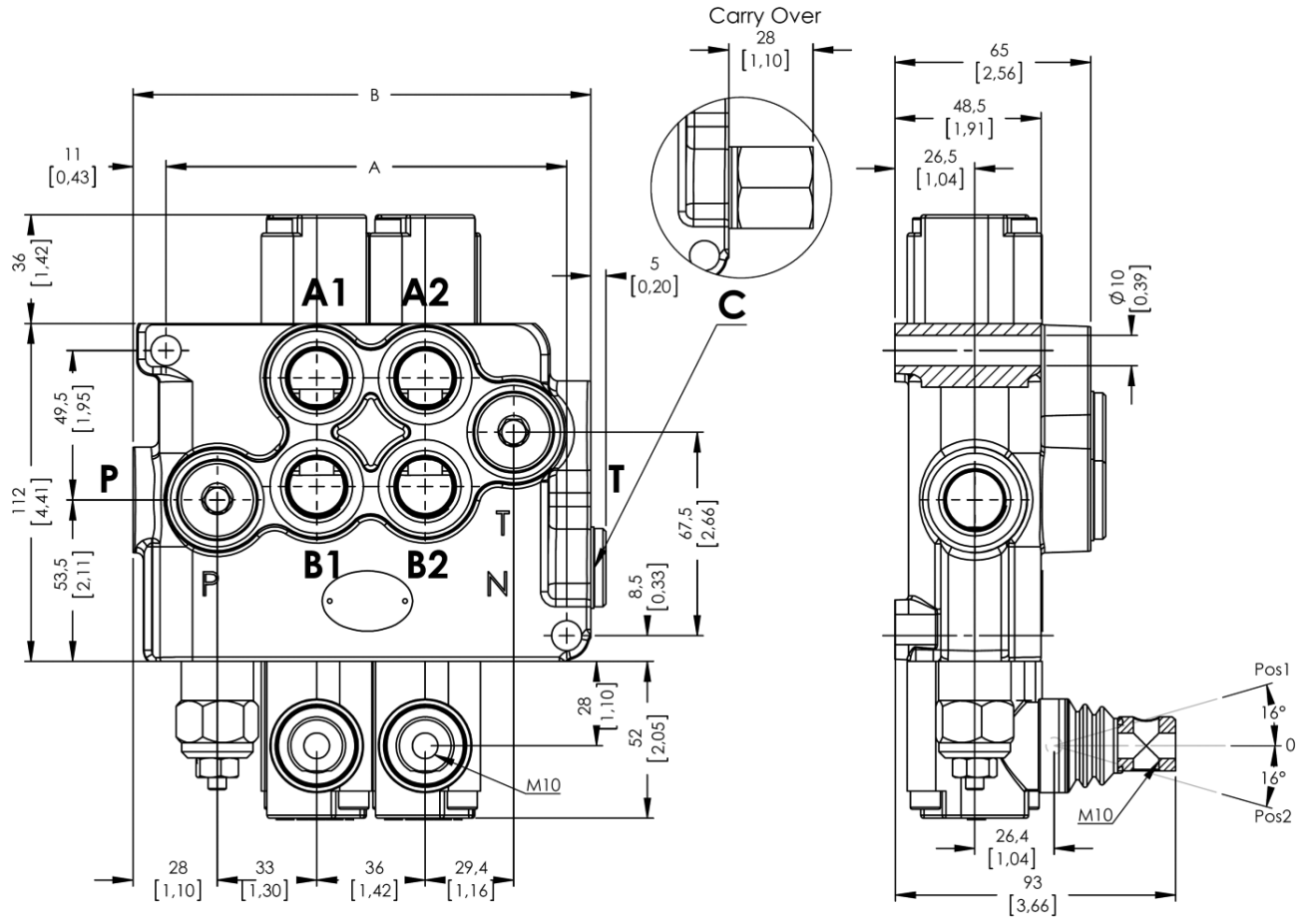
Not: This catalogue shows technical specifications measured with mineral oil of 46 mm2/s-46 cSt viscosity at 40 C° temparture.

Features

• Simple, compact and heavy duty designed monoblock valves from 1 to 7 sections for open and closed center hydraulic systems.
• Fitted with a main pressure relief valve and a load check valve.
• Optionaly Carry-Over port only parallel circuit.
• Interchangeable spool diameter is 16 mm – 0,63 in.
• Available manual, pneumatic, hydraulic and electro-pneumatic spool control kits.



DIMENSIONAL DATA



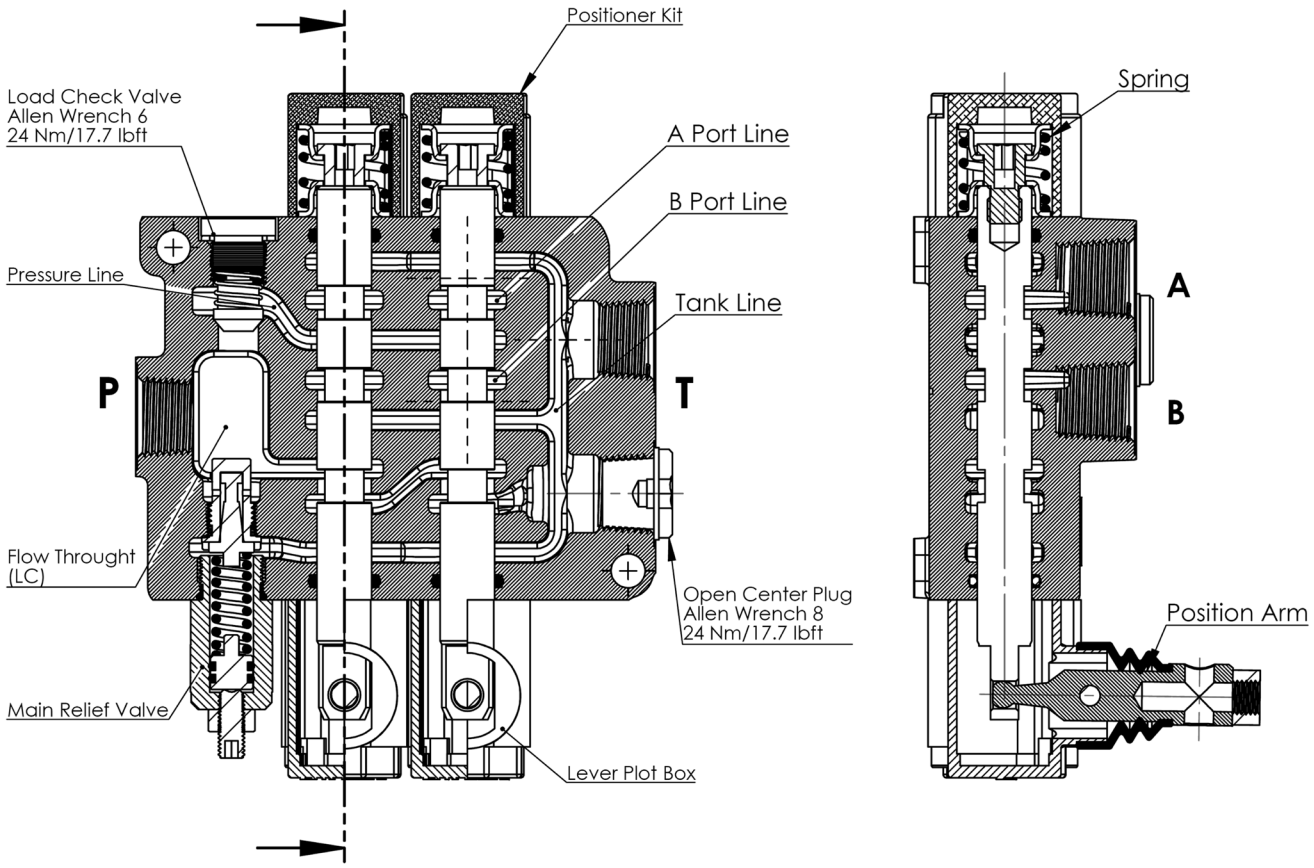
TYPE	A		B		Weight	
	mm	in	mm	in	Kg	lb
ORV-MS45-1P	97	4,25	116	4,56	4,00	8,18
ORV-MS45-2P	133	5,23	152	5,98	6,00	13,23
ORV-MS45-3P	169	6,65	188	7,40	7,40	16,31
ORV-MS45-4P	205	8,07	224	8,82	9,00	19,84
ORV-MS45-5P	241	9,49	260	10,23	10,60	23,37
ORV-MS45-6P	277	10,90	296	11,65	12,30	27,12
ORV-MS45-7P	313	12,32	332	13,07	14,00	30,86

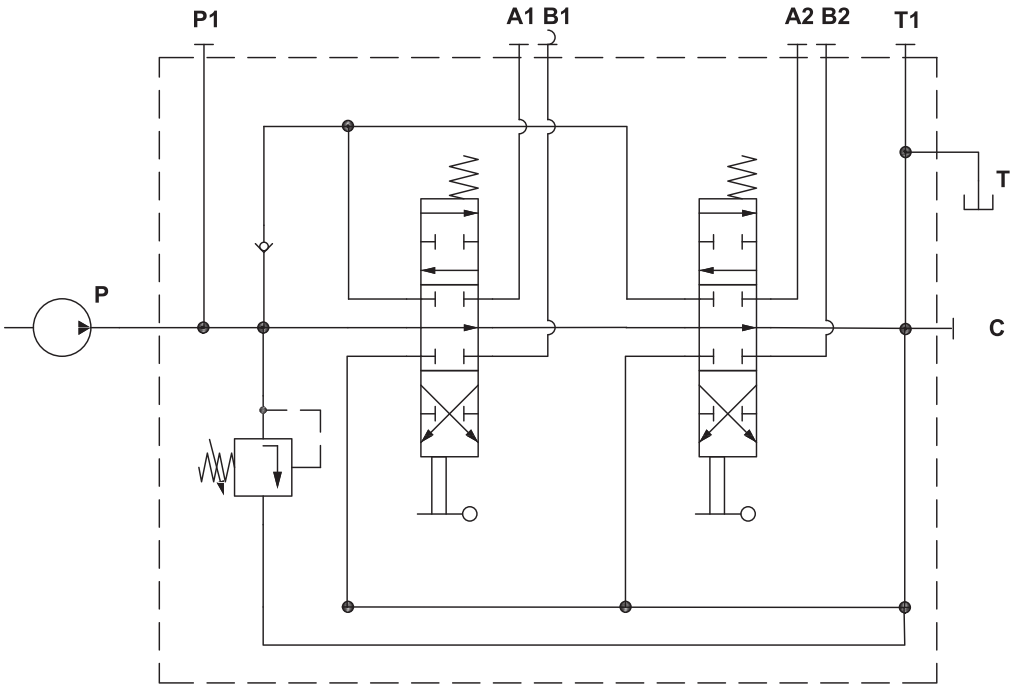
STANDARD THREADS

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

Parallel - Standard Configurations With Side Inlet And Outlet Open Center

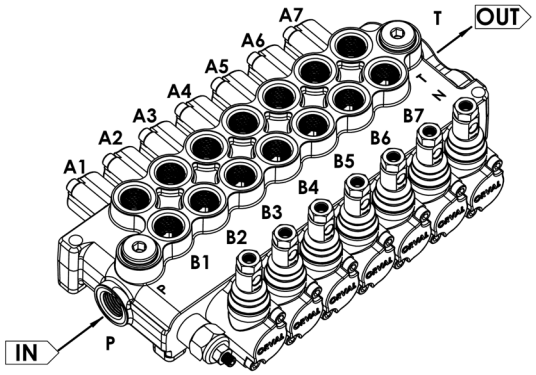


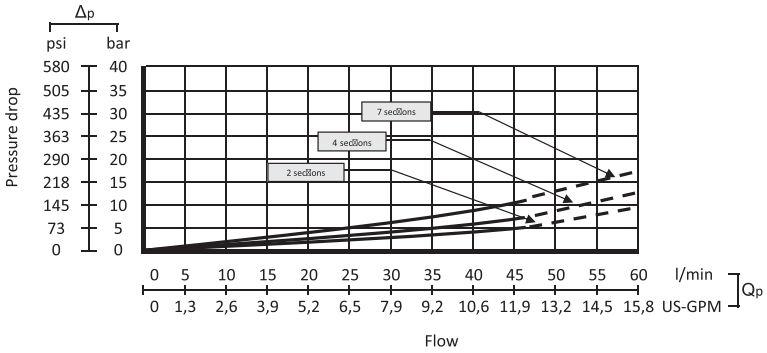


Code: ORV MS45-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/PA1/SGT

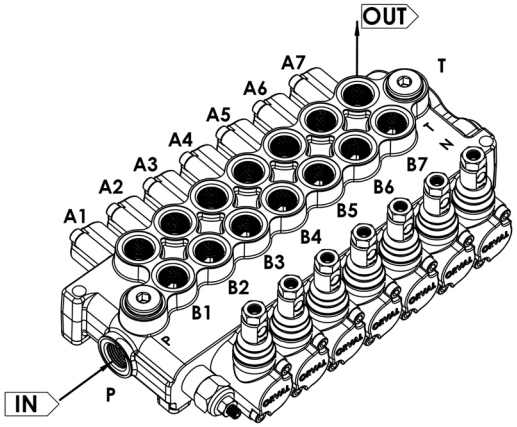
PERFORMANCE DATA AND CURVE

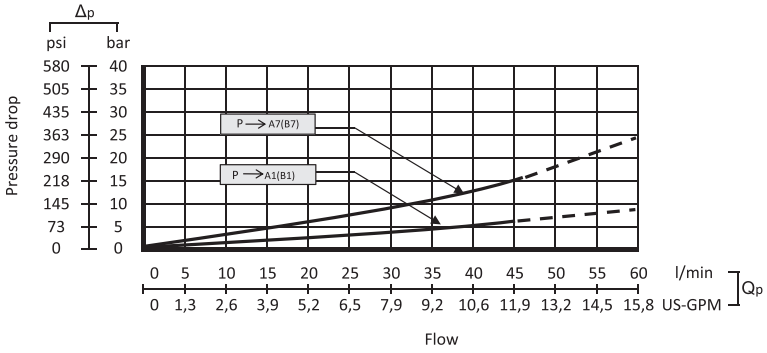
Open Center - Pressure Drop (P-T)



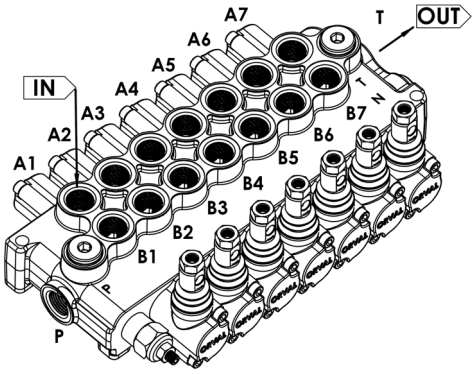


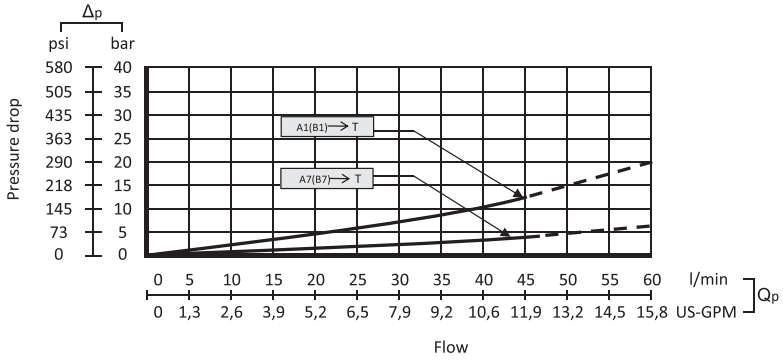
Inlet to Work Port - Pressure Drop (P-A/B)





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





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

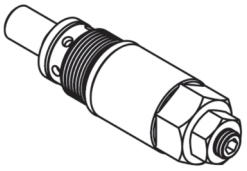
INLET RELIEF OPTIONS

Direct Pressure Relief Valve

Code:

SMR2 – 120

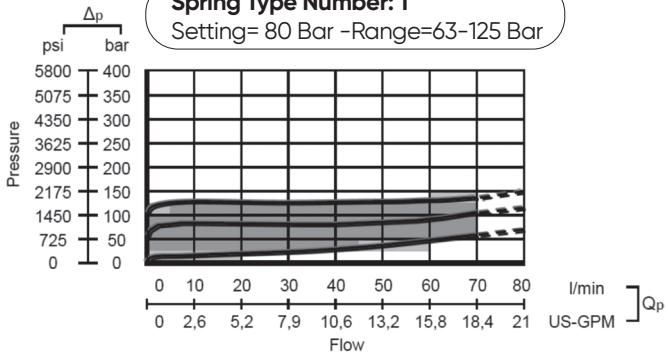
- **Pressure Setting Bar in (Standard 120 bar)**
- **Standard Main Relief Spring Type -2**



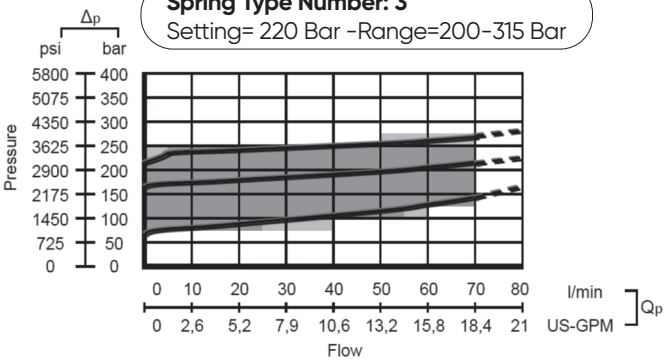


Performance Data

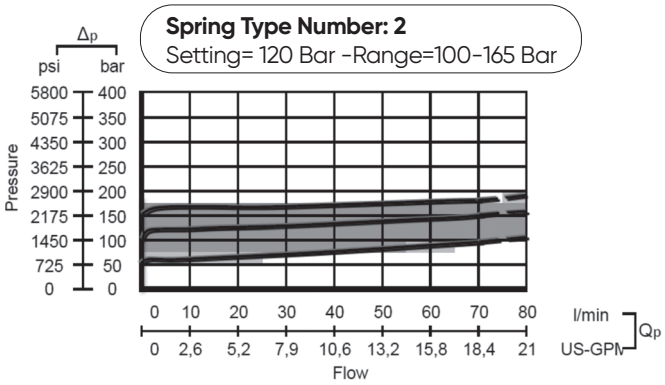
Spring Type Number: 1
Setting= 80 Bar -Range=63-125 Bar

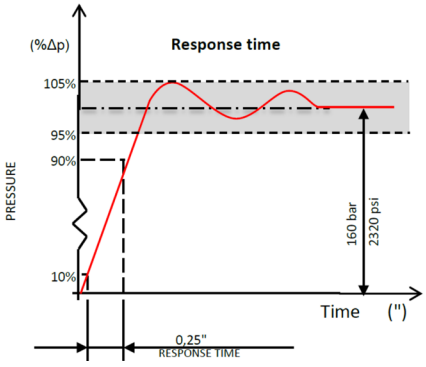


Spring Type Number: 3
Setting= 220 Bar -Range=200-315 Bar

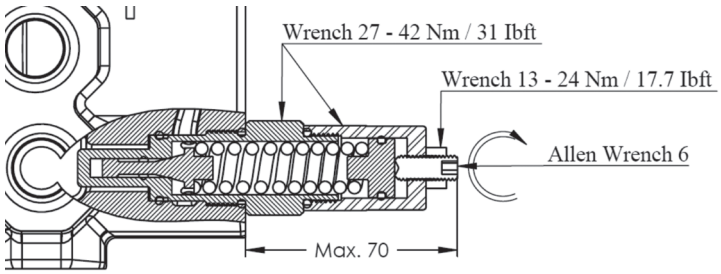


Spring Type Number: 2
Setting= 120 Bar -Range=100-165 Bar

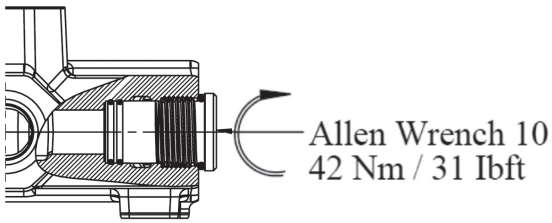


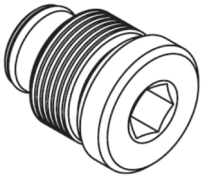


Adjustment Type on Valve



Relief Blanking Plug - WM







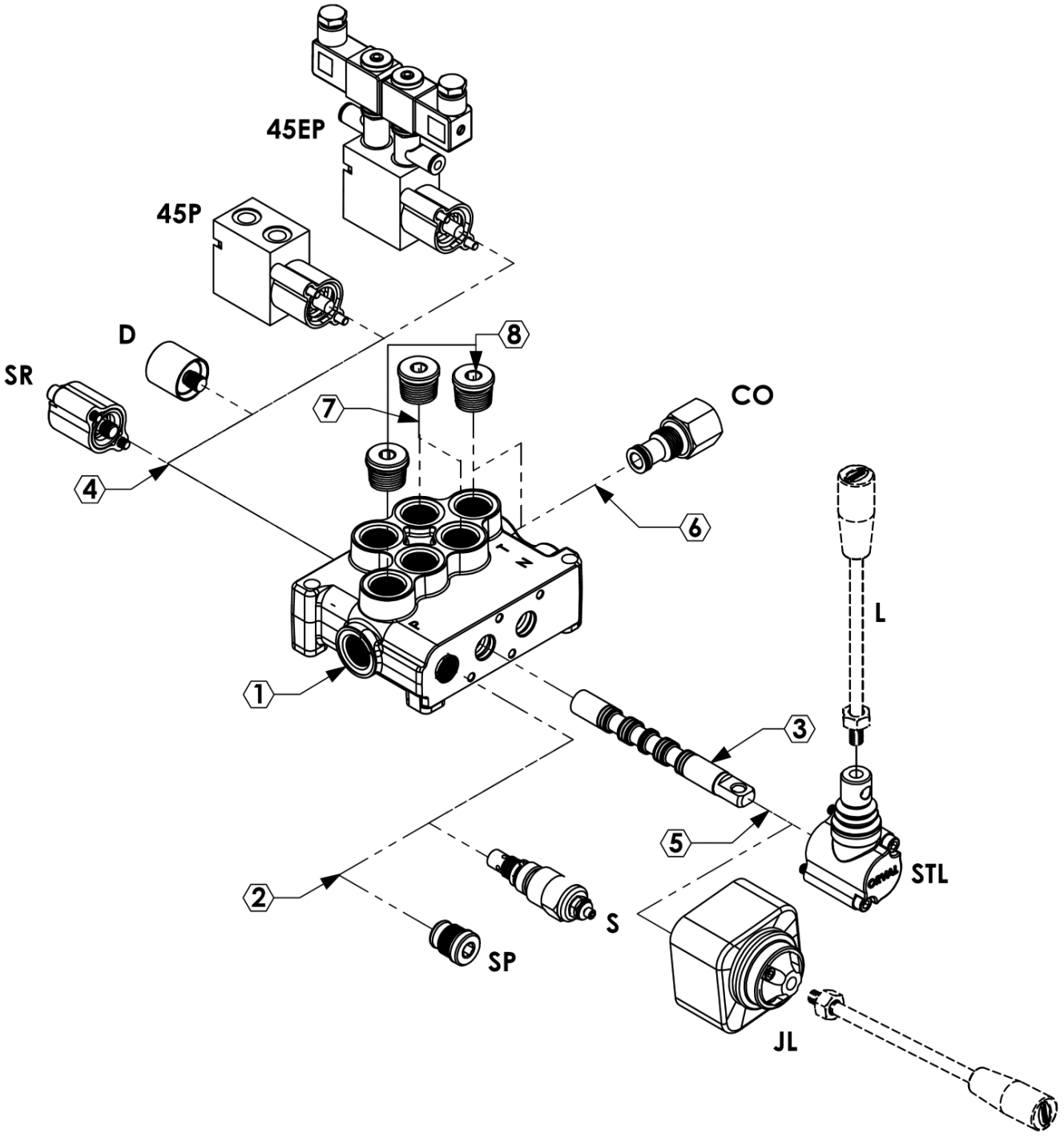
ORDERING CODES

Order Example

ORV MS45-2P (1) / SMR2-120 (2) / 1A-SR-STL (3 4 5) / 1A-45P-STL (Following Section) / CO - PL1 - P1 (6 7 8) / SGT (9)

(3 4 5) 1 st Section

(6 7 8 9) Output Section



ORDERING CODES

1- Valve Type and Body

MS45 =Valve Type - (MS) - Monoblok
(45) - Max. Flow Rate

1P = Body for 1 Section - (1BMS145100)
2P = Body for 2 Sections - (1BMS245100)
3P = Body for 3 Sections - (1BMS345100)
4P = Body for 4 Sections - (1BMS445100)
5P = Body for 5 Sections - (1BMS545100)
6P = Body for 6 Sections - (1BMS645100)

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 - (3SMS145110) – 3 Positions, Double acting
2A -(3SMS145120) – 3 Positions, Double acting
A to tank B Blocked
3A -(3SMS145130) – 3 Positions, Double acting
B to tank A blocked
4A -(3SMS145140) – 3 Positions, Double acting
A and B tank
5A -(3SMS145150) – 3 Positions, Single acting on
A (A to tank)
6A -(3SMS145160) – 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 /24 VDC ON/OFF electro-pneumatic –
(445EP045112)
45EH = 12 VDC/24 VDC ON/OFF electro-hydraulic
(3645EH100112)

5- Lever Options

STL = Standard lever –(5STL045100)
JL = Joystick lever for two sections operation
- (5JL 080100)

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)

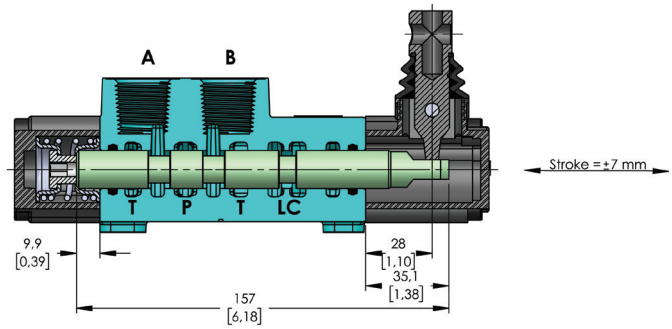
*Page 4 for detail port information.

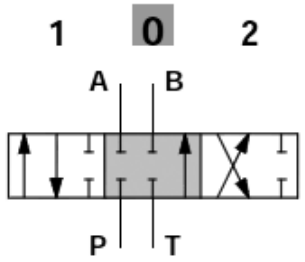
HandLever

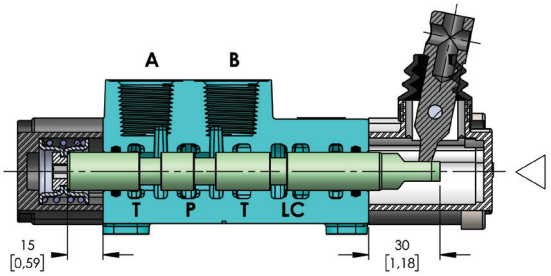
L = Standard HandLever (L=120mmxM10) - (7L040100)
HL = Remote Cable Kit – (80HL80100)

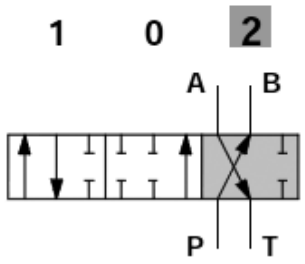
SPOOL OPTIONS

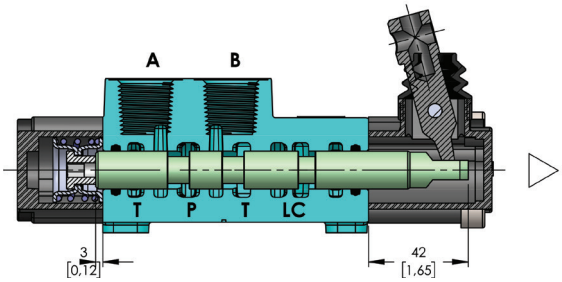
Spool Type - 1A

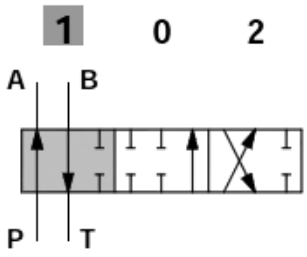




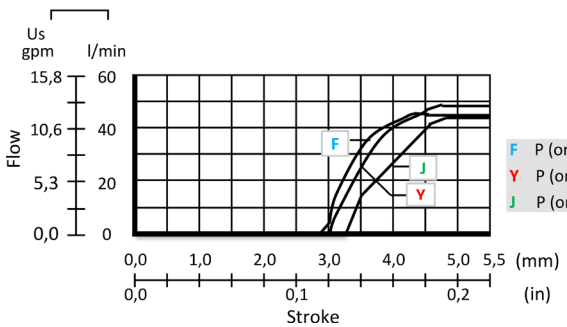






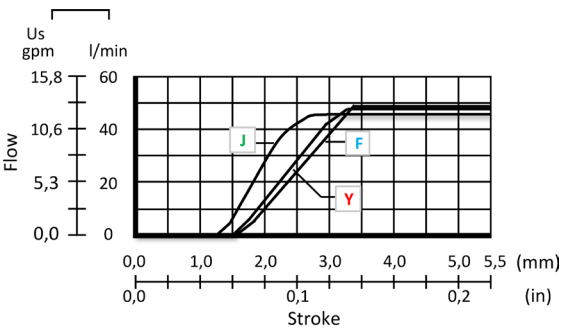


Performance Curve And Data



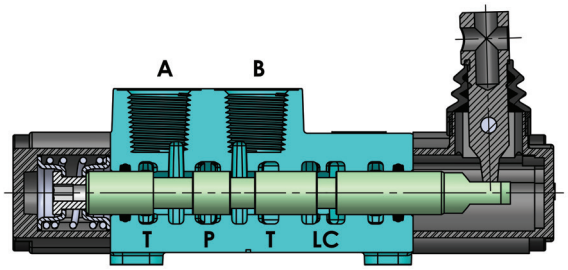
Qin = 45 l/min

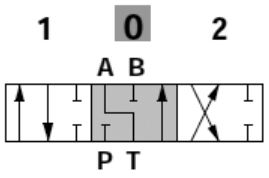
F P (on ports) = 63bar / 900 psi
Y P (on ports) = 100bar / 1450 psi
J P (on ports) = 250bar / 3600 psi



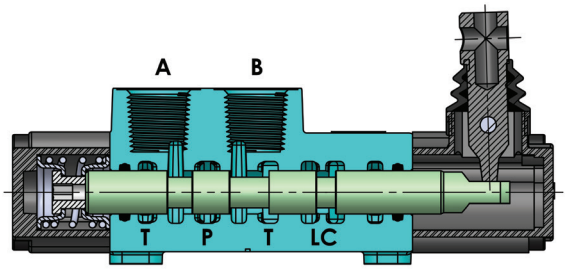
SPOOL OPTIONS

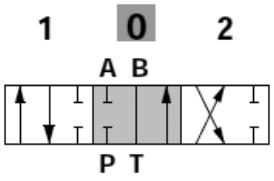
Spool Type - 2A



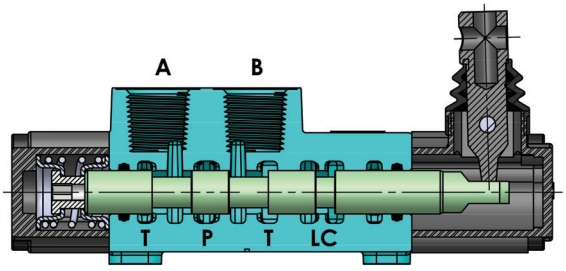


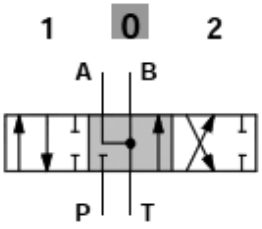
Spool Type - 3A



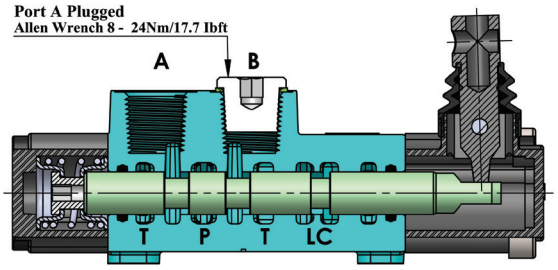


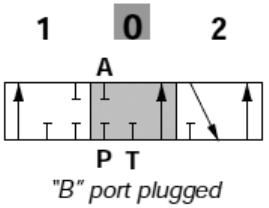
Spool Type - 4A





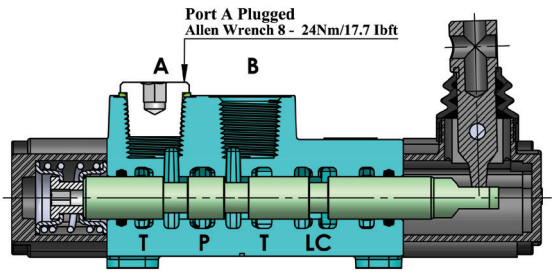
Spool Type - 5A

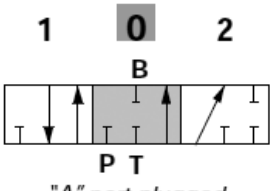




"B" port plugged

Spool Type - 6A





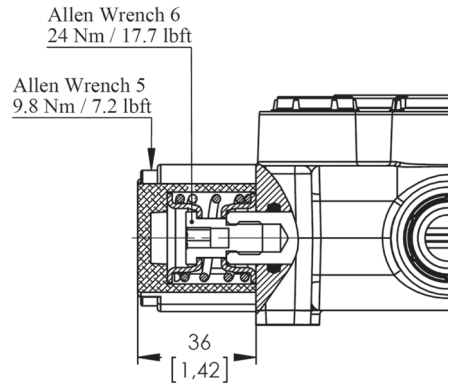
"A" port plugged

SPOOL POSITIONERS – SIDE OF RETURN

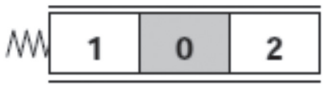
With Spring Return in Neutral Position

Kit No: **SR**

Sectional Appearance



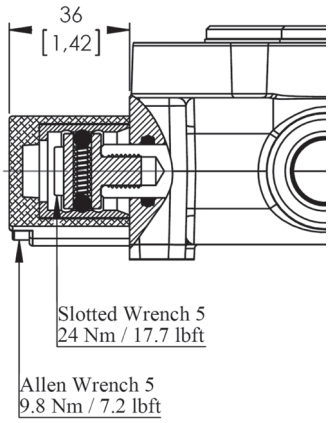
Diagram



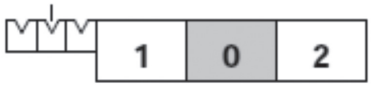
With Detent

Kit No: **D**

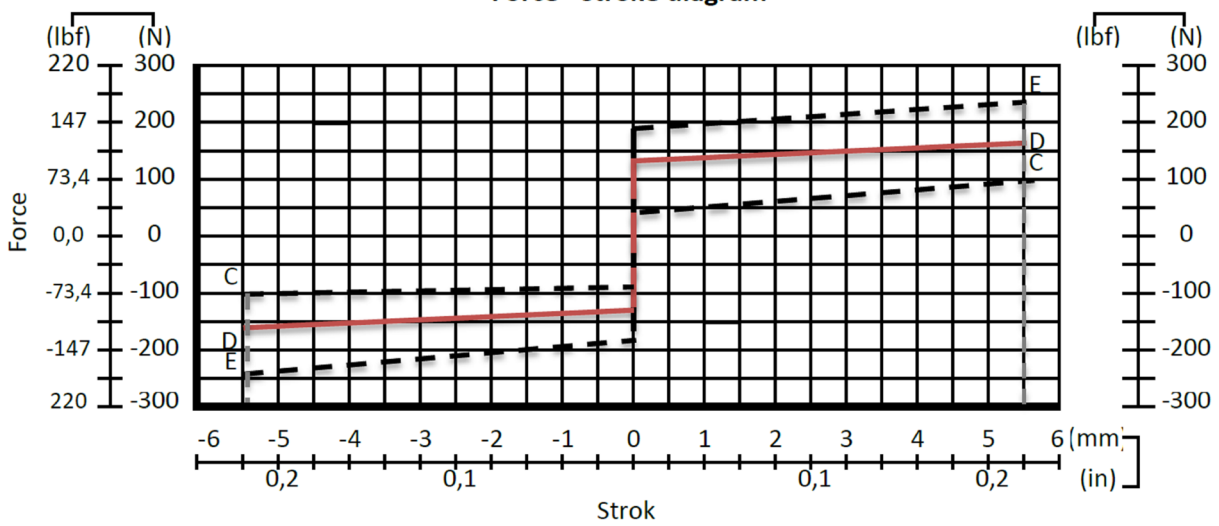
Sectional Appearance



Diagram



Force - stroke diagram

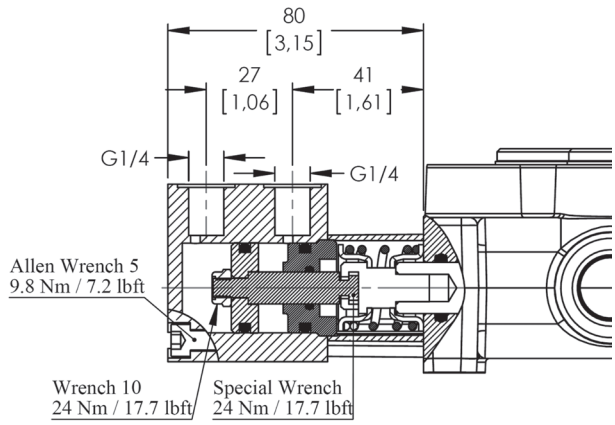


SPOOL POSITIONERS – SIDE OF RETURN

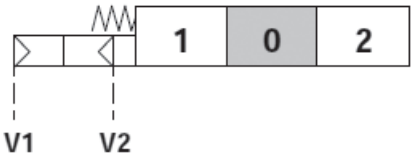
ON/OFF Pneumatic Control

Kit No: **45P**

Sectional Appearance



Diagram



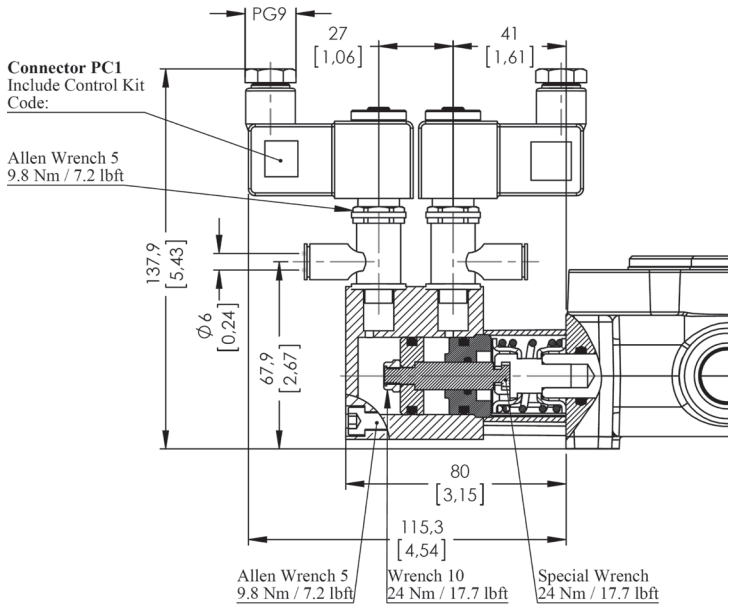
Operating Features

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

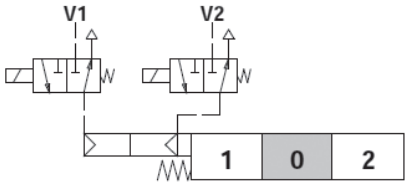
ON/OFF Electro-Pneumatic Control

Kit No: **45EP**

Sectional Appearance



Diagram



Operating Features

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

Selenoid Operating Features

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

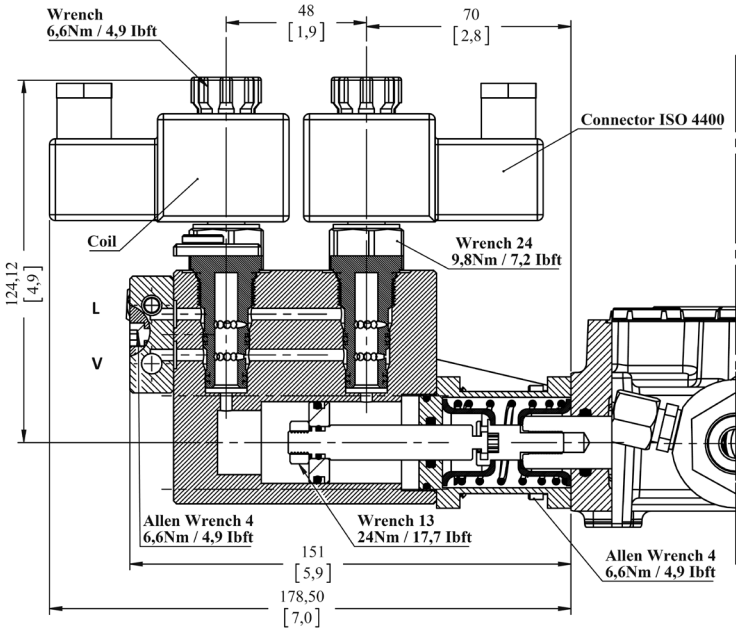
Power Rating.....: 6 W

SPOOL POSITIONERS – SIDE OF RETURN

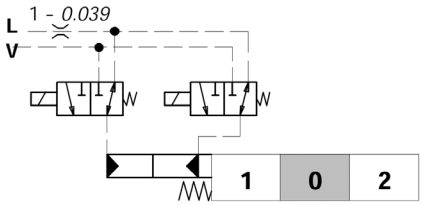
ON/OFF Electro - Hydraulic Control

Kit No: **45EH**

Sectional Appearance



Diagram



Operating Features

Pilot Pressure .....: 10 Bar / 145 Psi
: 50 Bar / 725 Psi
Max back pressure on drain L....:25 Bar / 360 Psi

Selenoid Operating Features

Coil Connection.....: ISO 4400
Nominal voltage.....: 12 VDC / 24 VDC
Power rating.....: 21 W
Duty cycle.....: %100
Protection type.....: IP 65
Nominal voltage tolerance.....: ±10
Max temperatures.....: 100 C°
Stroke.....: ±5,5 mm

ORDER CODE

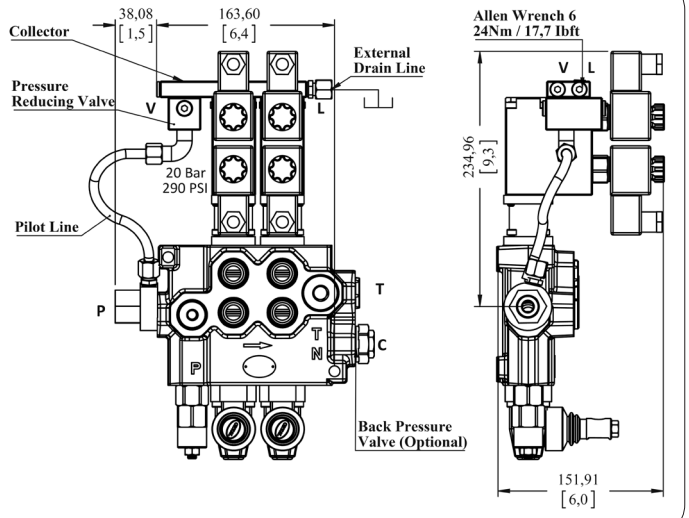
External Pilot Collector	Standard Pilot Collector
COL 11 - 10COL1001 – Kit For Section 1	COL 21 - 10COL2001 – Kit For Section 1
COL 12 - 10COL1001 – Kit For Section 2	COL 22 - 10COL2001 – Kit For Section 2
COL 13 - 10COL1001 – Kit For Section 3	COL 23 - 10COL2001 – Kit For Section 3
COL 14 - 10COL1001 – Kit For Section 4	COL 24 - 10COL2001 – Kit For Section 4
COL 15 - 10COL1001 – Kit For Section 5	COL 25 - 10COL2001 – Kit For Section 5
COL 16 - 10COL1001 – Kit For Section 6	COL 26 - 10COL2001 – Kit For Section 6
COL 17 - 10COL1001 – Kit For Section 7	COL 27 - 10COL2001 – Kit For Section 7
COL 18 - 10COL1001 – Kit For Section 8	COL 28 - 10COL2001 – Kit For Section 8

SPOOL POSITIONERS – SIDE OF RETURN

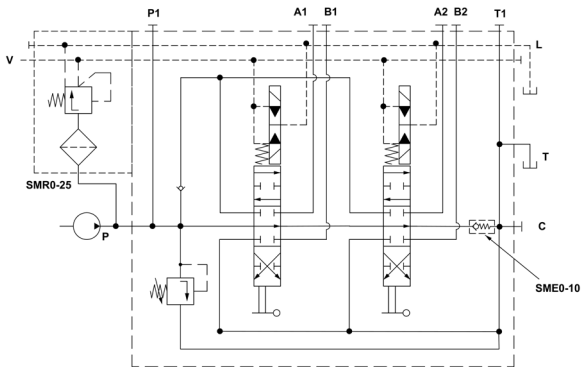
ON/OFF Electro - Hydraulic Control Connections

Connection Type 1: **Collector kit for external pilot and drain**

Sectional Appearance



Diagram



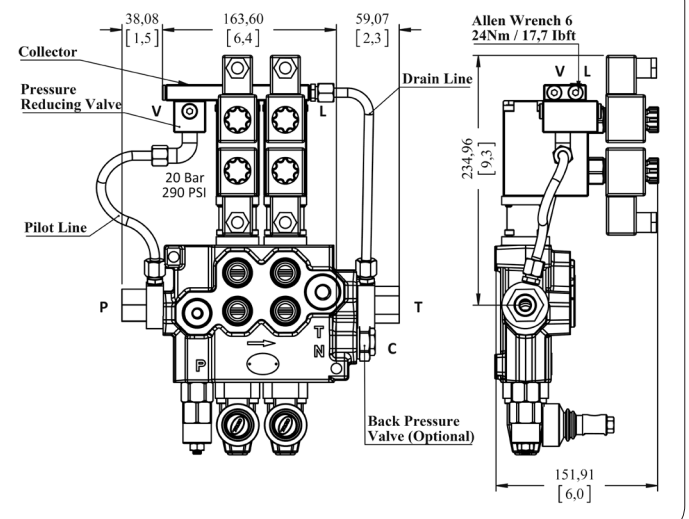
Operating Features

External Pressure Reducing Valve .....: 20 Bar / 290 Psi (For V line)

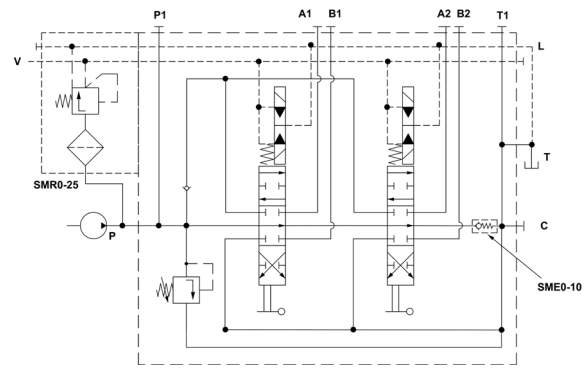
Code= ORV MS45-2P (SD(LA)-SMR2-125-PP)/P-1A-STL-45EH/ P-1A-STL-45EH (SMR0 -COL12-12V)/ SO-PT1 / SGT

Connection Type 2: **Collector kit with pilot and drain lines**

Sectional Appearance



Diagram



SMR 0-25 Valve Operating Features (Pressure reducing valve)

Outlet Pressure .....: 20 Bar / 290 Psi

Max. Flow.....: 8 l/min

Filtering .....:80 µ

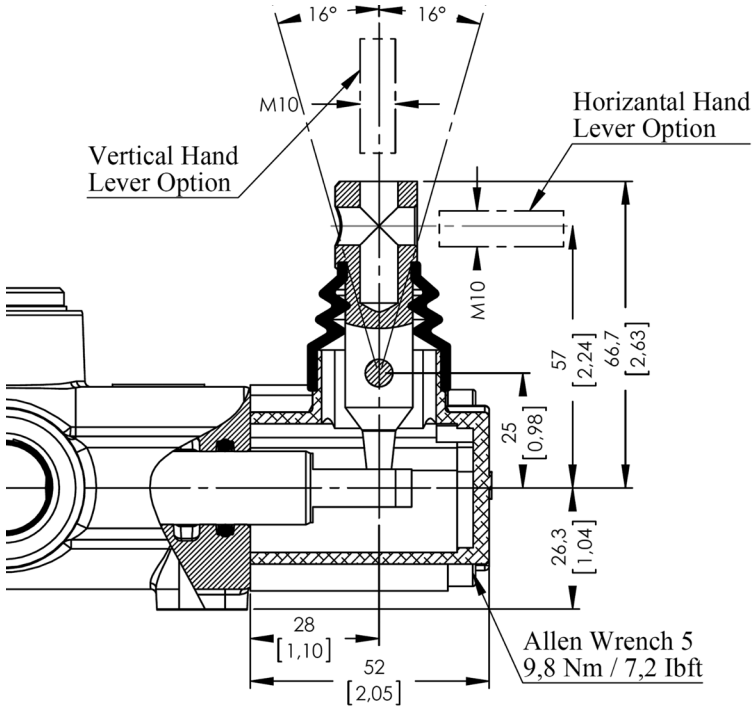
Code= ORV MS45-2P (SD(LA)-SMR2-125-PP)/P-1A-STL-45EH/ P-1A-STL-45EH (SMR0 –COL22-12V)/ SO-PT1 / SGT

SPOOL POSITIONERS – SIDE OF LEVER CONTROL

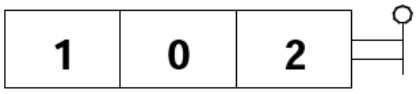
Lever Controls

Kit No: **STL - L0**

Sectional Appearance

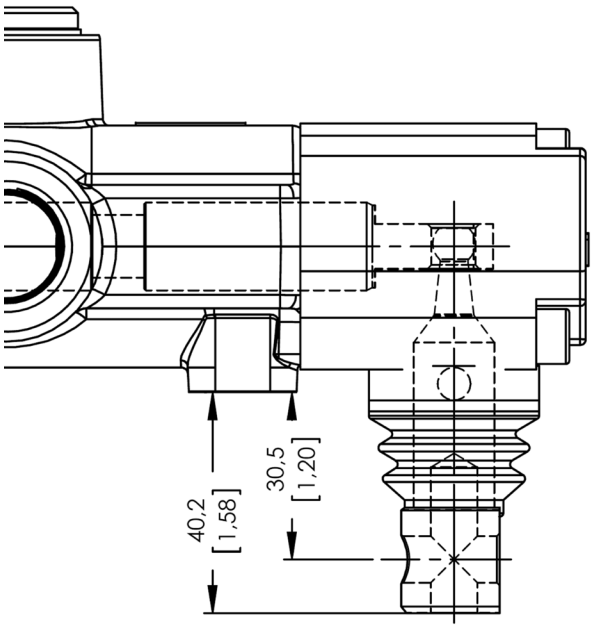


Diagram

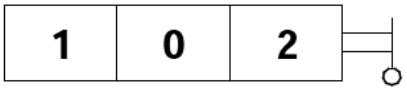


Kit No: **STL - L180**

Sectional Appearance



Diagram



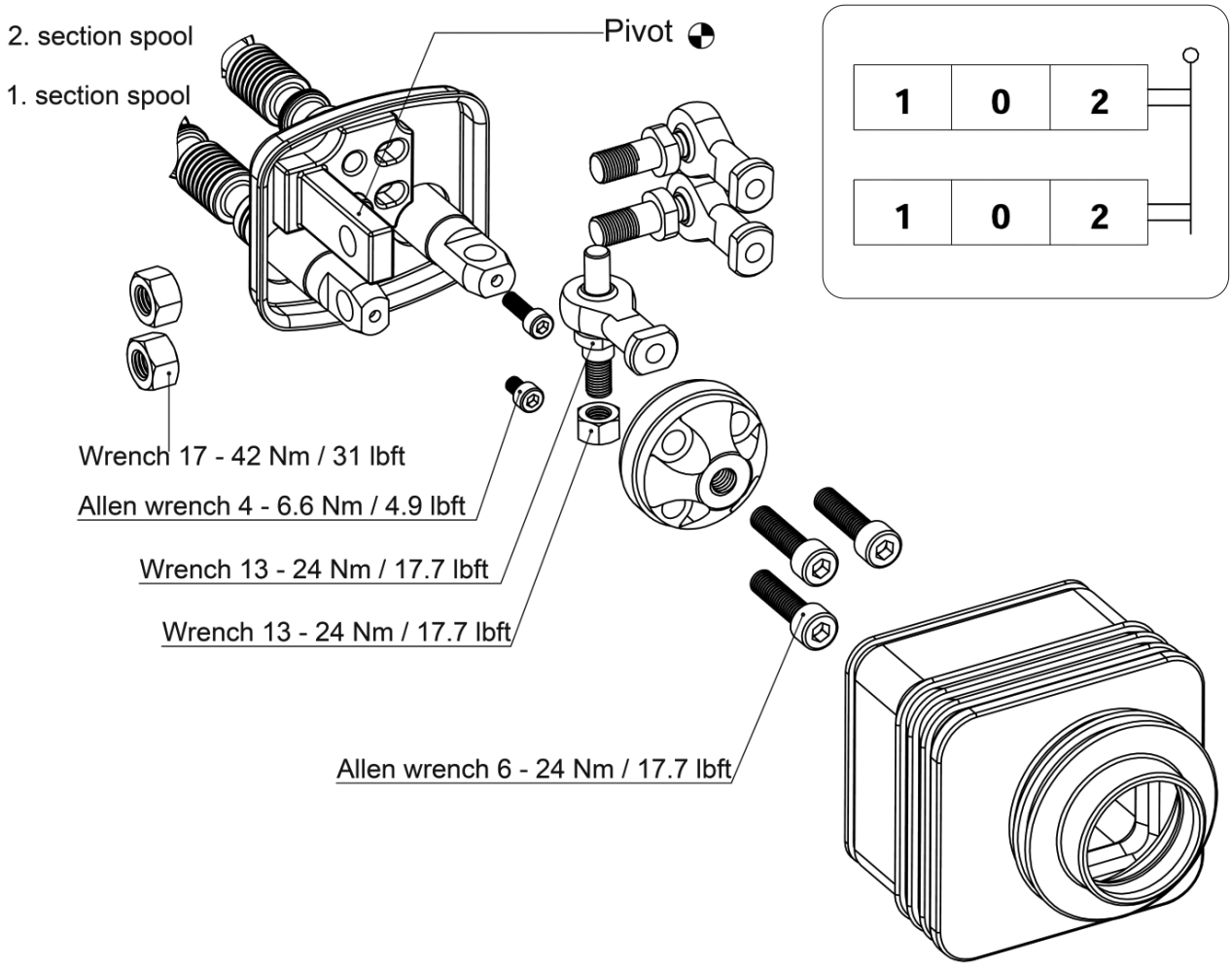
Note: Arm lever pivot box is aluminium cap protected. And it can be rotated 180º.

SPOOL POSITIONERS – SIDE OF LEVER CONTROL

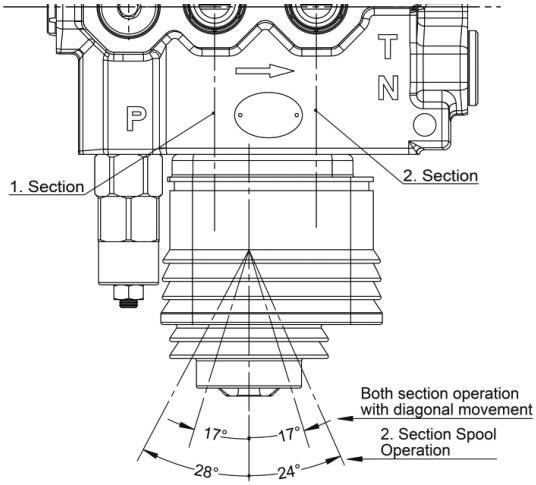
Lever Controls - Joystick

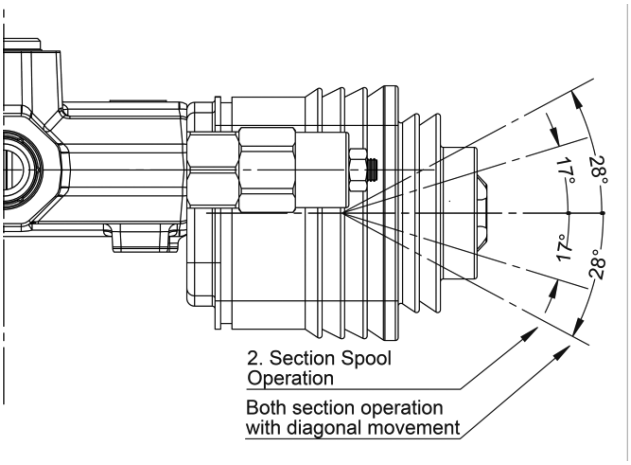
Kit No: **JL**

Exploded View | Diagram



Operation Angle:



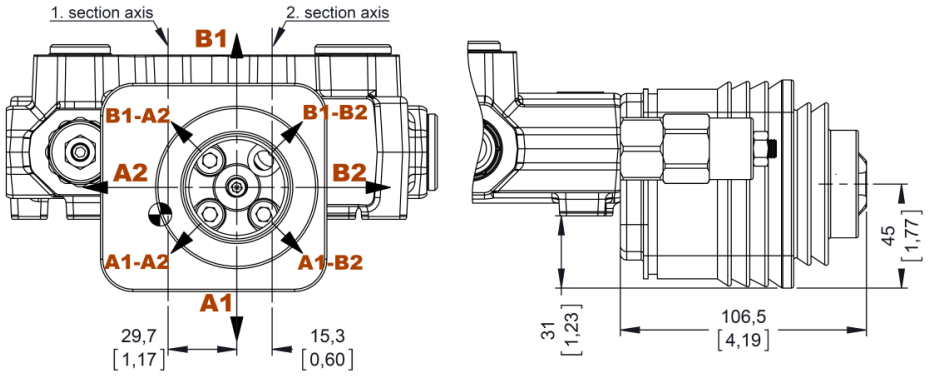


SPOOL POSITIONERS – SIDE OF LEVER CONTROL

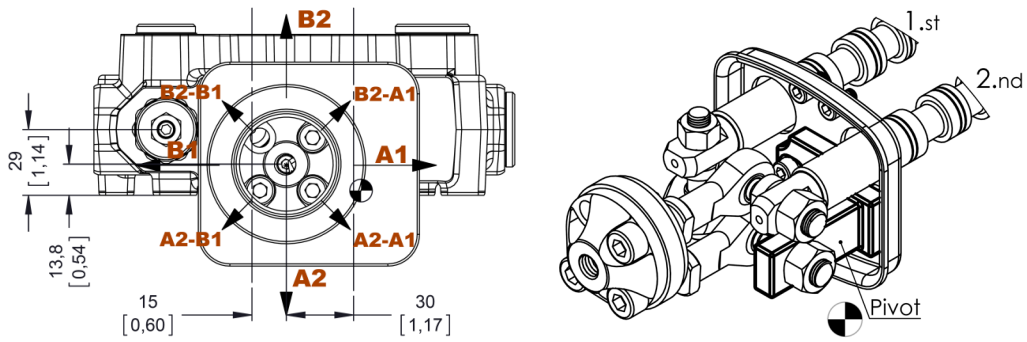
Lever Controls - Joystick

Dimensions and movement sceme

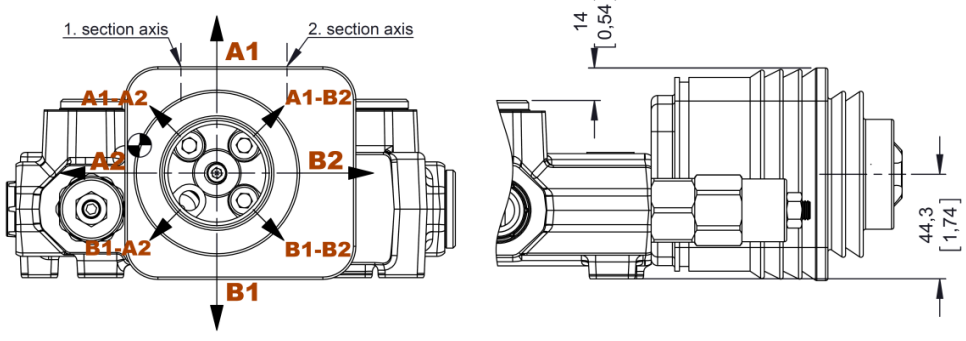
Type No: **JL1** — Pivot placed down on the Left



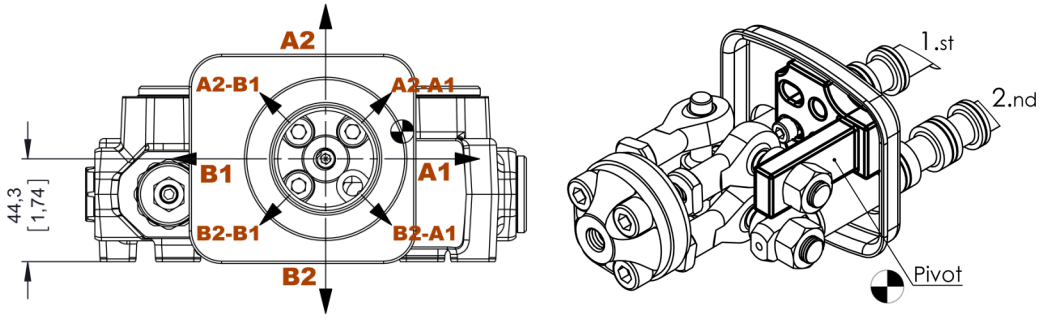
Type No: **JL2** — Pivot placed down on the right



Type No: **JL3** — Pivot placed above on the Left



Type No: **JL4** — Pivot placed above on the right



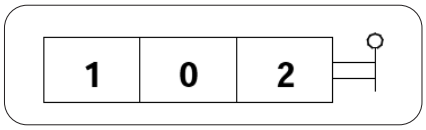
SPOOL POSITIONERS – SIDE OF LEVER CONTROL

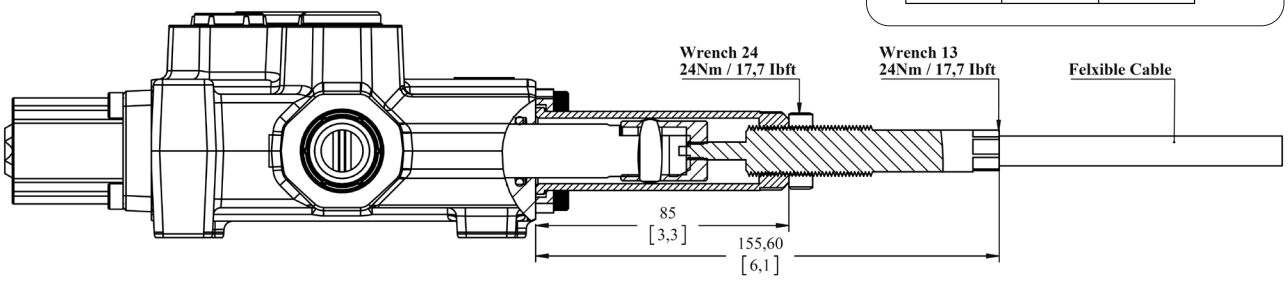
Lever Controls - Cable Control

Kit No: **HL**

Exploded View | Diagram

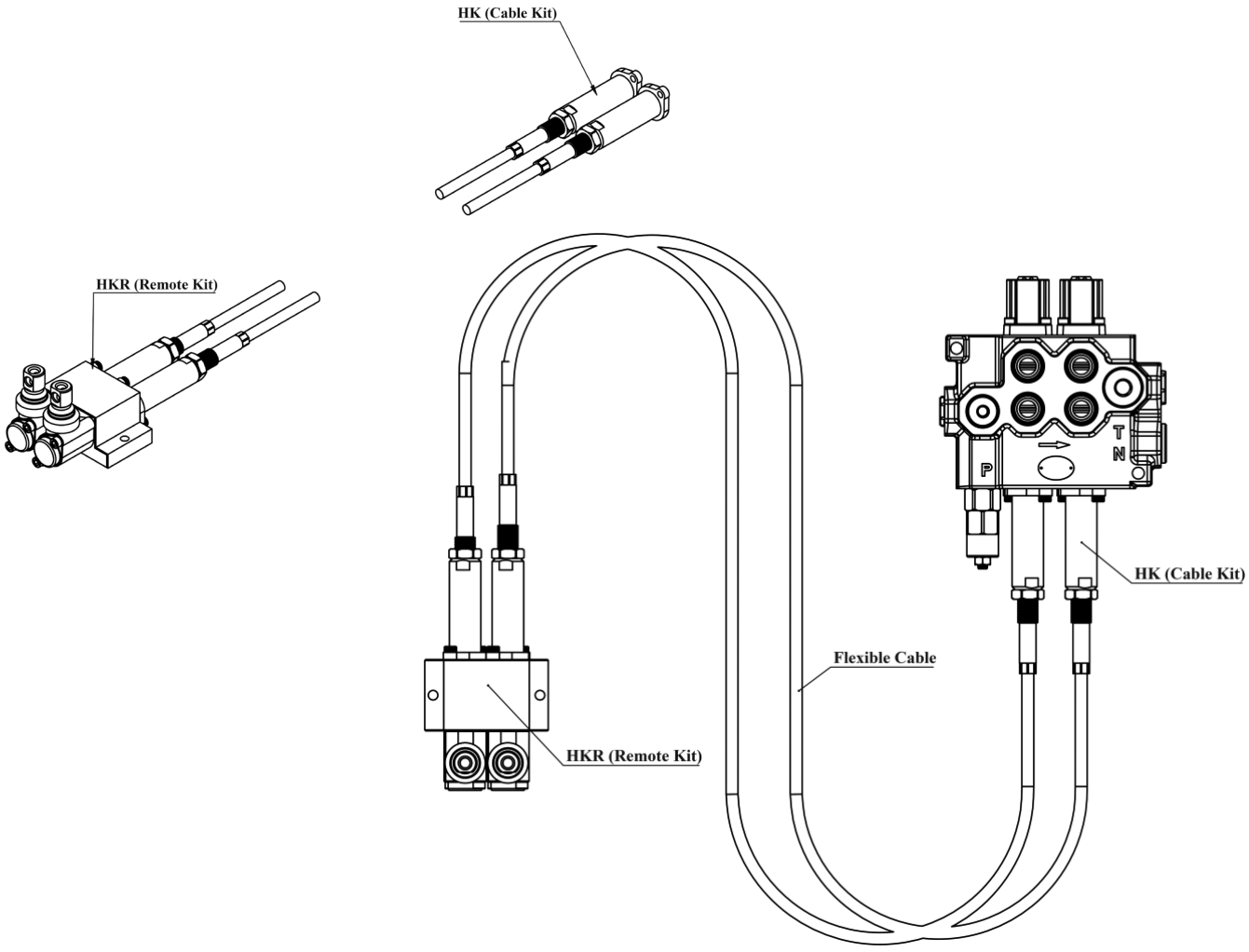
Waterproof cap prearranged for remote control with flexible cable.





Note: Remote cable control is several options. Please indicte the cable length demanded and contact our sales department.

Example Operation



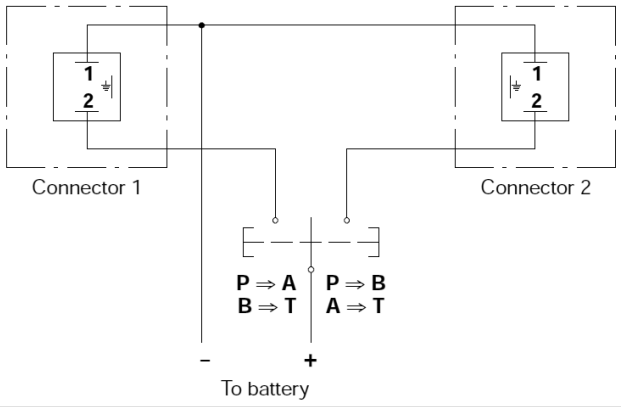
COMPLETE CONTROL – ON / OFF SOLENOID CONTROL

ON/OFF Solenoid Control

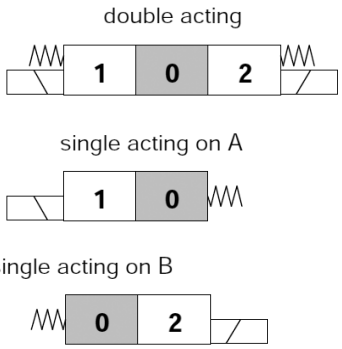
Kit No: **SEC**

Sectional Appearance

Electric wiring example



Diagram

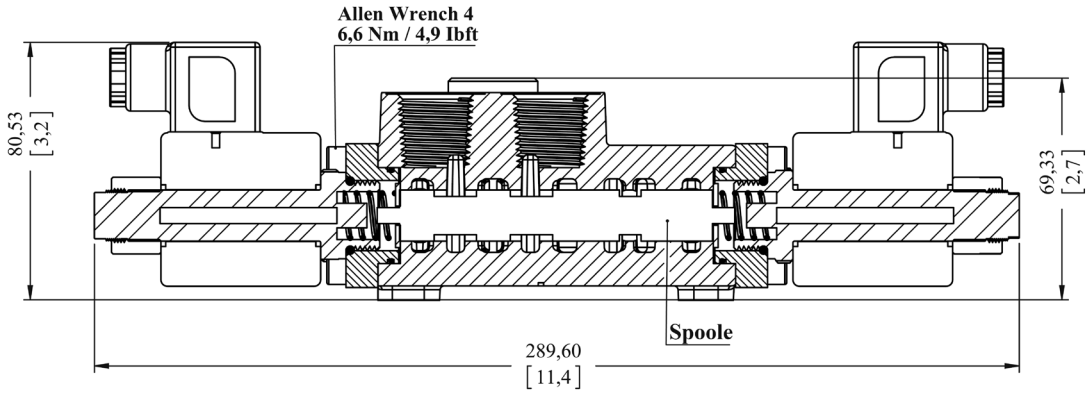


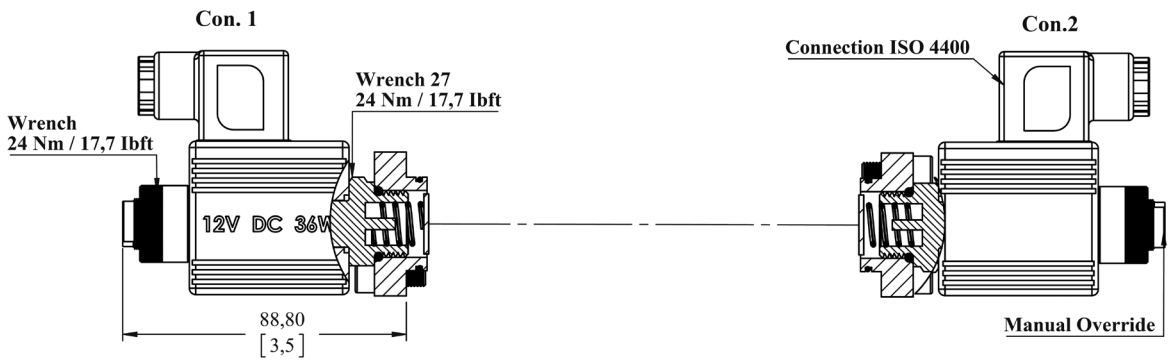
Operating Features

Max Working Pressure.....: 230 Bar / 3300 Psi
Max back pressure .....: 5 Bar / 80 Psi
Internal Lekage.....: 10 cm3 / min

Selenoid Operating Features

Nominal voltage.....: 12 VDC / 24 VDC
Power rating.....: 36 W
Duty cycle.....: %100
Nominal voltage tolerance.....: ±10
Coil insulation .....: Class H
Stroke.....: ±3

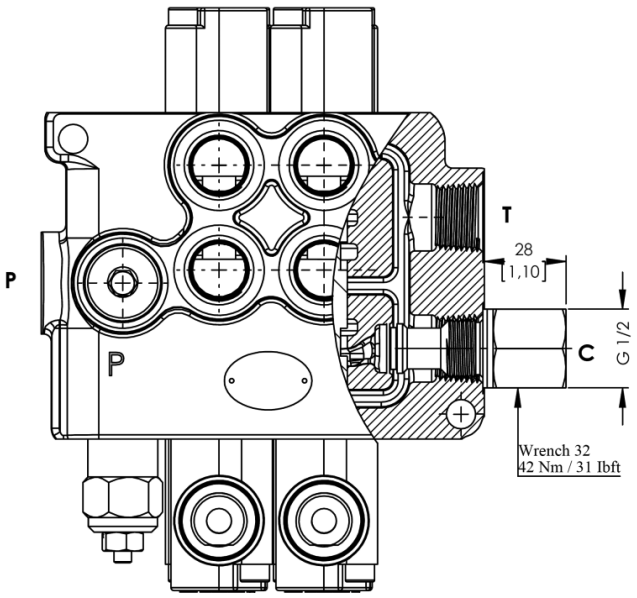




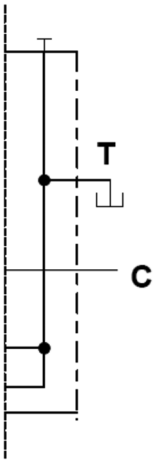
OUTLET PORT OPTIONS

Carry - Over Connection

Kit No: **CO**

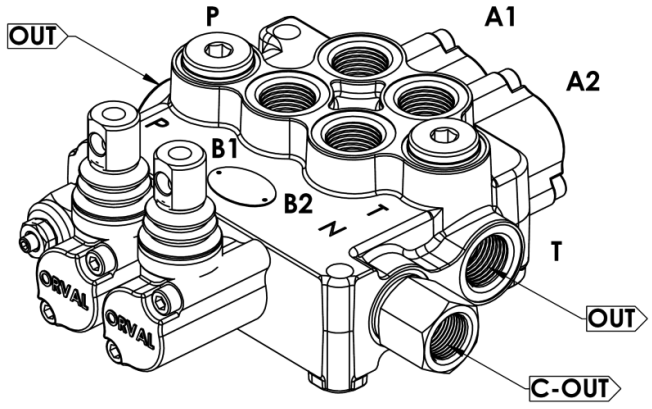


Sectional Appearance



Hydraulic Circuit

Code: ORV MS45-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/CO-PA1/SGT



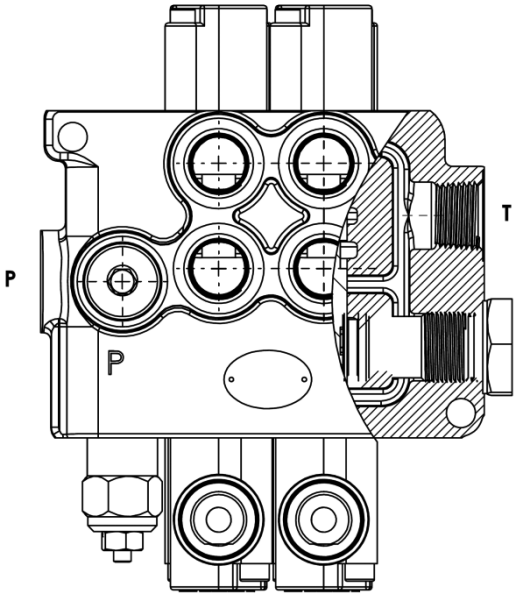
Direction of Port Connectted

SGT : See page 5 for Standard center

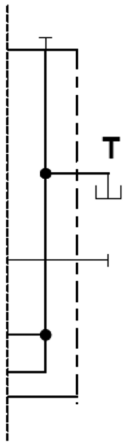
OUTLET PORT OPTIONS

Closed Center

Kit No: **CT**



Sectional Appearance



Hydraulic Circuit

Code: ORV MS45-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/CT-PA1/SGT

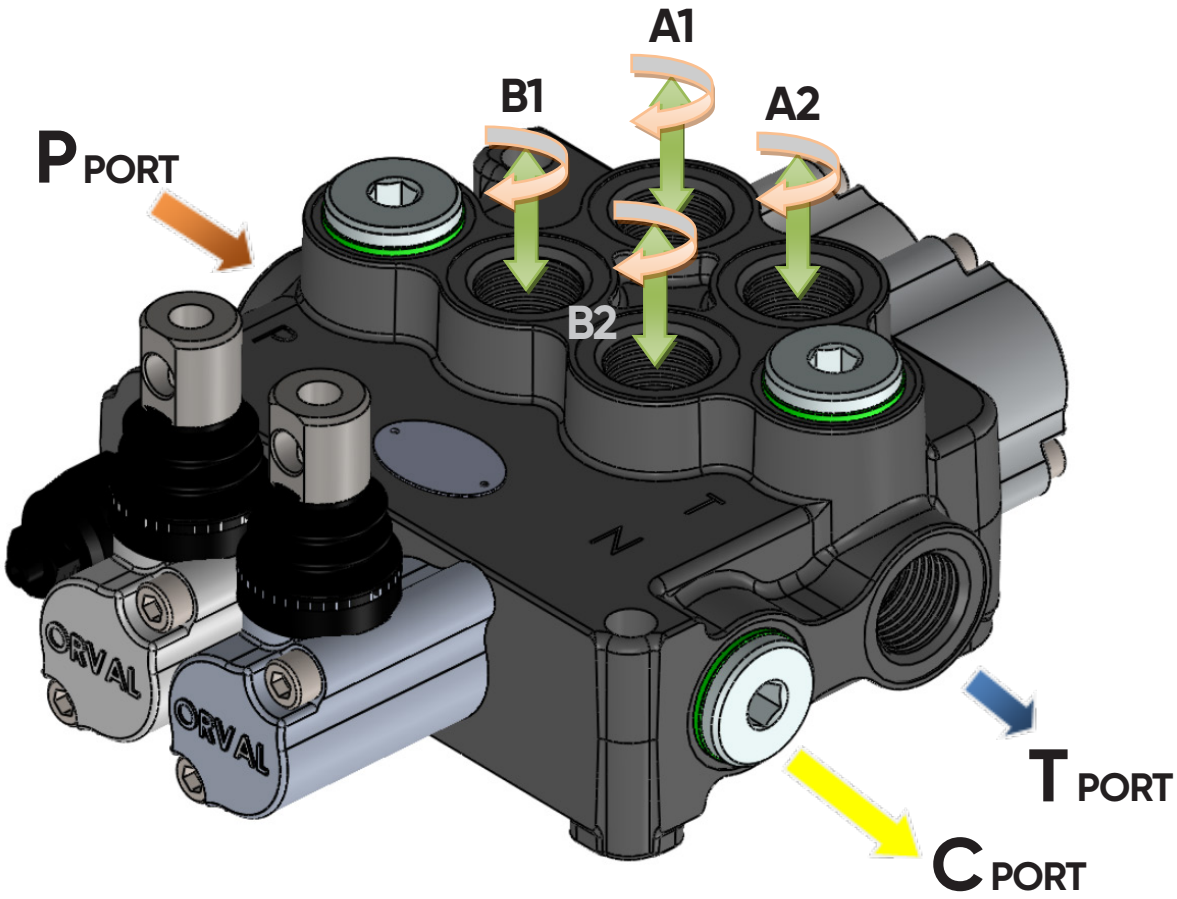
INSTALLATION AND MAINTENANCE

The ORV MS45 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;

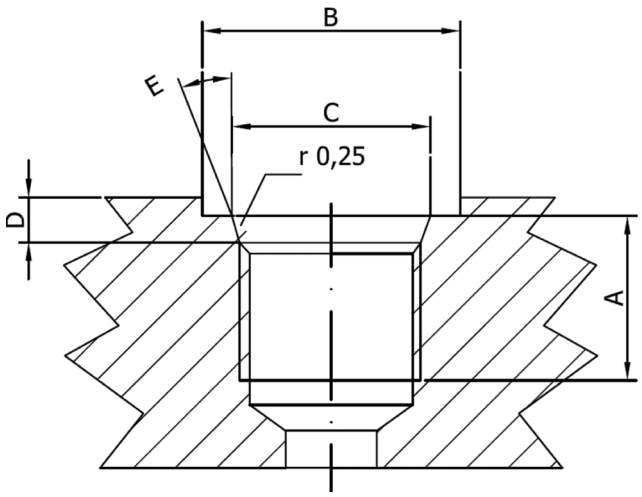
• Before painting, ensure plastic port plugs are tightly in place.



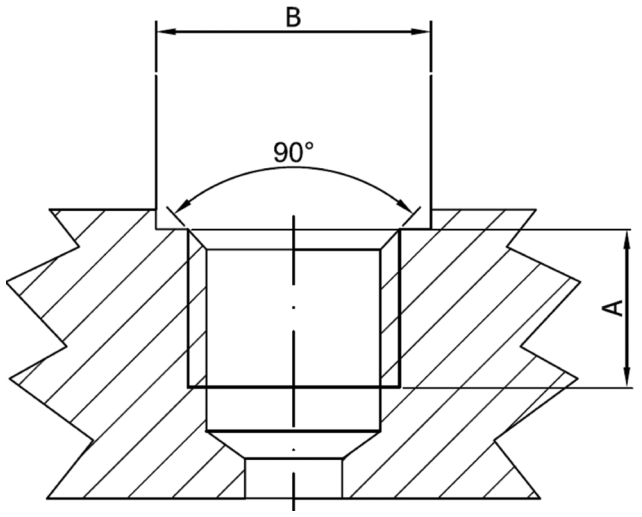
Threads Type (Nm / lbft)	P Port	A and B Port	T and C Port
BSP (ISO 228/1)	G 3/8	G 3/8	G 1/2
With O--Ring seal	35 / 25.8	35 / 25.8	50 / 36.9
With copper washer	40 / 29.5	40 / 29.5	60 / 44.3
With steel and rubber washer	30 / 22.1	30 / 22.1	60 / 44.3
BSP (ISO 228/1)	G 1/2	G 1/2	G 1/2
With O--Ring seal	50 / 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

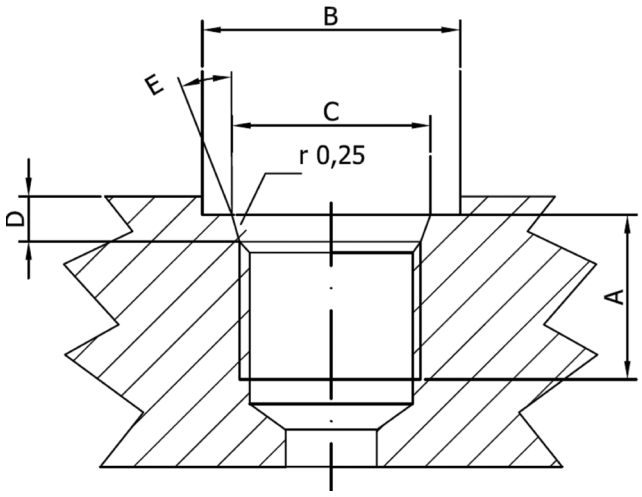
Ports Dimensional Data



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	13	0,51	15
B		25	0,83	30	25	0,83	30
C		13,6	0,61	20,6	13,6	0,61	20,6
D		2,5	0,10	2,5	2,5	0,10	2,5
E		15°		15°		15°	



BSP (ISO 228)						
Dimensions		G1/4		G3/8		G1/2
mm	in					
A		14	0,55	14	14	0,55	14
B		19	0,75	23	19	0,75	23



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

ORIGINAL VALVE

ORVAL HYDRAULIC

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