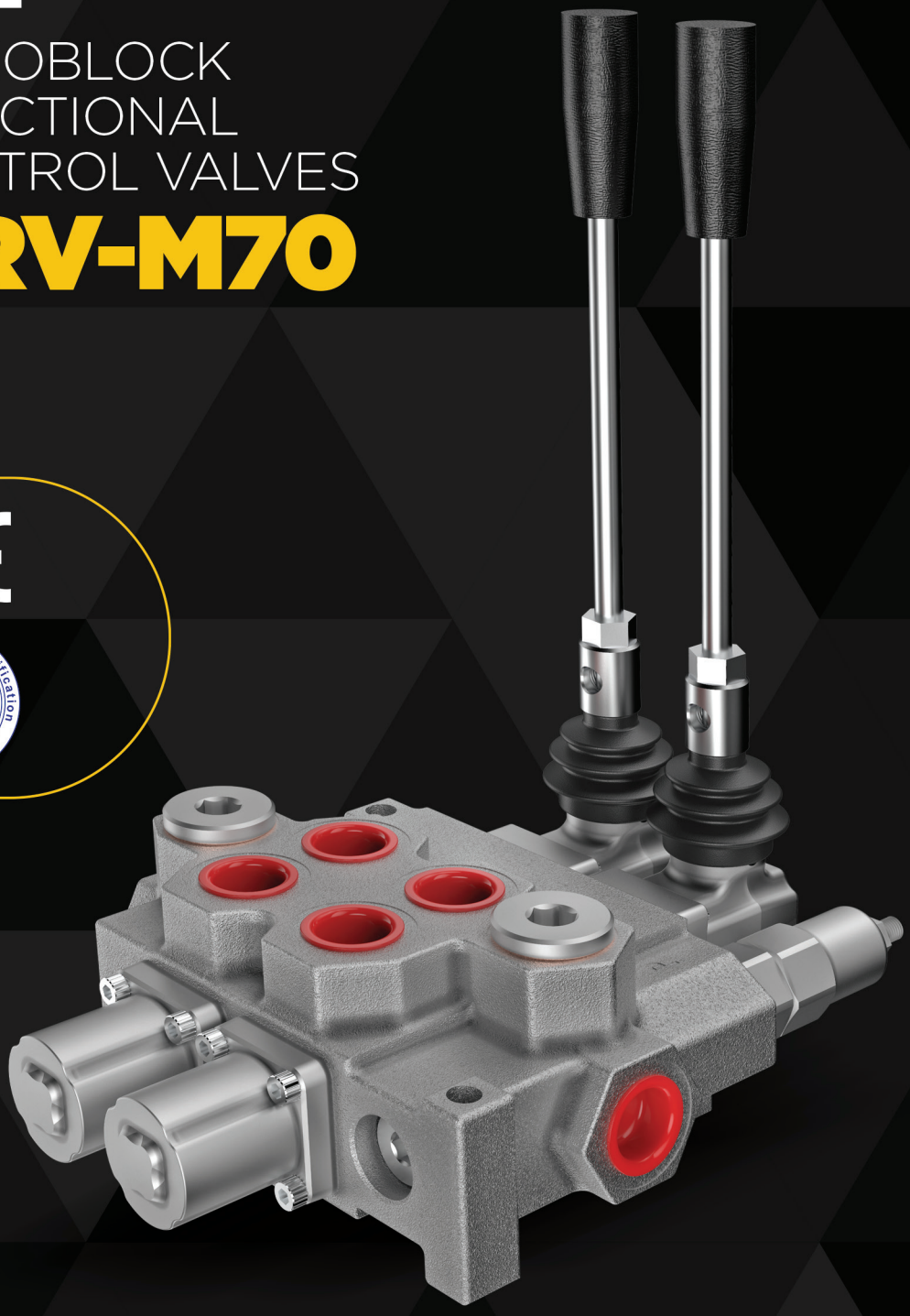
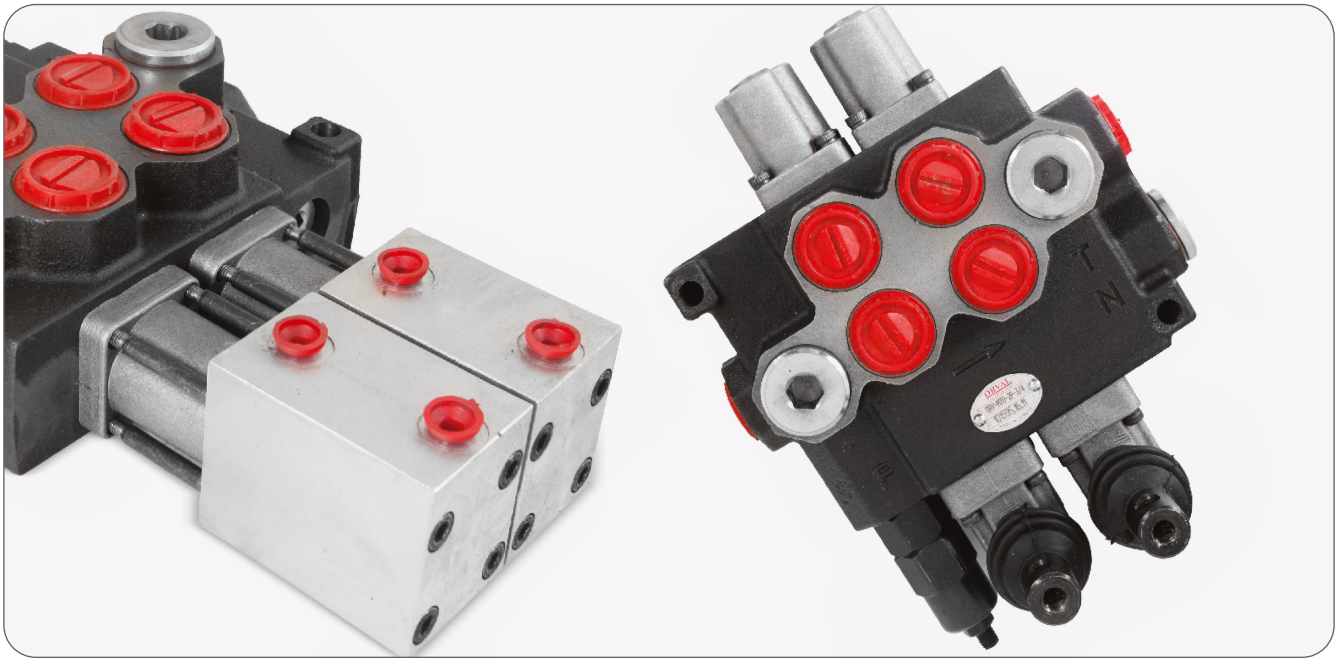
ORVAL HYDRAULIC

# MONOBLOCK DIRECTIONAL CONTROL VALVES

# ORV-M70





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## 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.

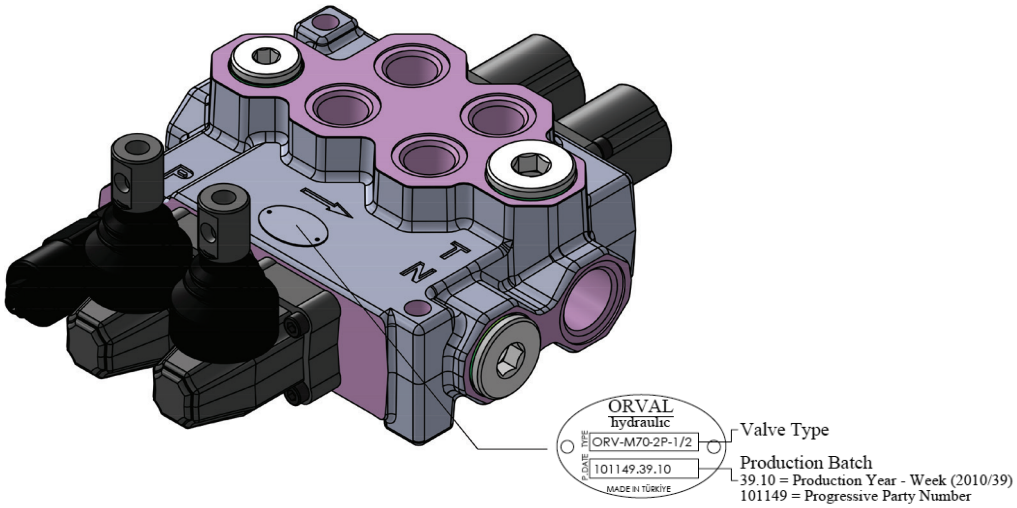
## WORKING CONDITIONS

| | | |
|---|---|---|
| Nominal Flow Rating / Displacement | 70 l/min | 18 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 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 | |

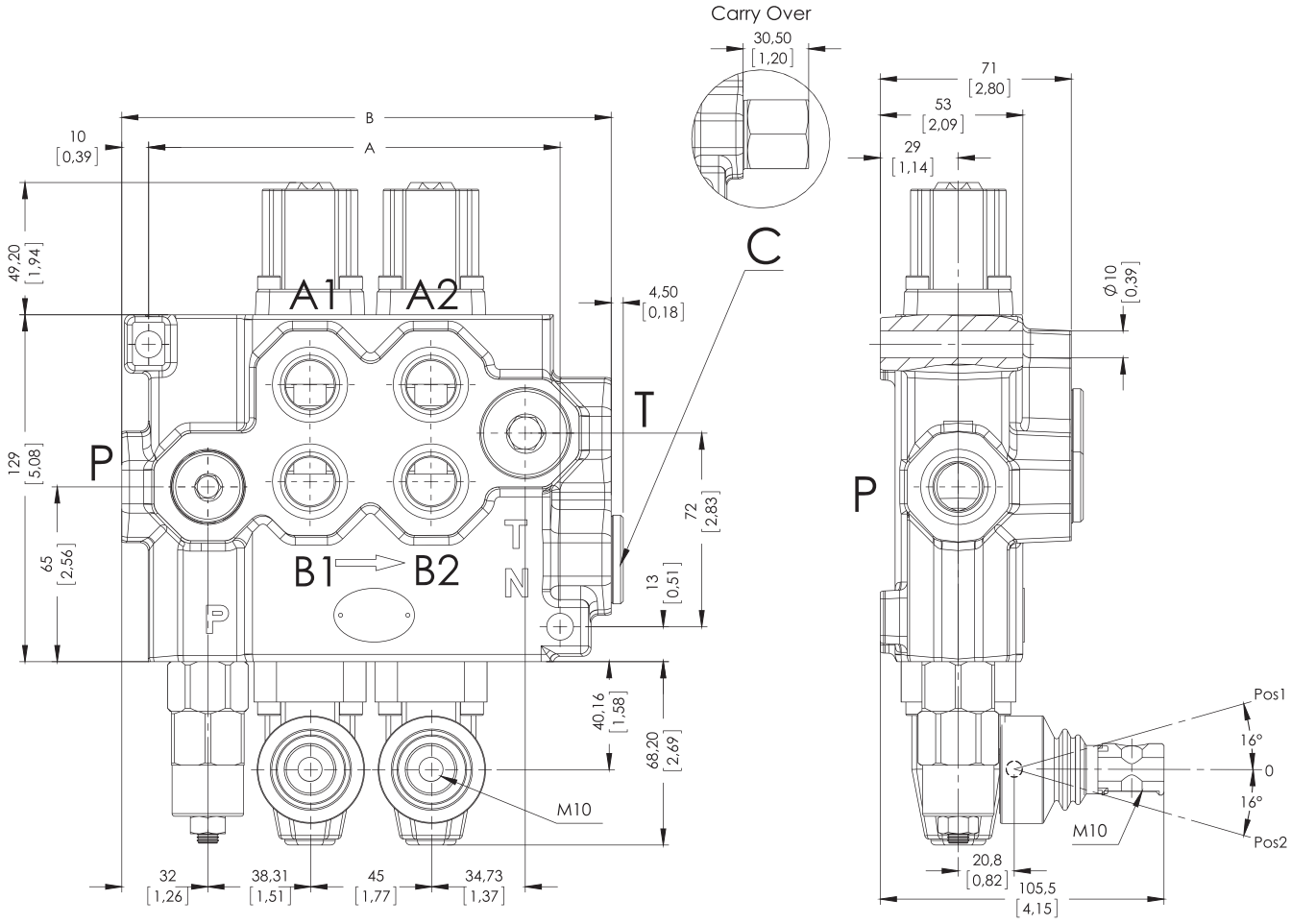
**Not:** This catalogue shows technical specifications measured with mineral oil of 46 mm2/s-46 cSt viscosity at 40 C° temparture.

## Features

• Simple, compact and heavy duty designed monoblock valves from 1 to 6 sections for open and closed center hydraulic systems.
• Fitted with a main pressure relief valve and a load check valve.
• Optionaly Carry-Over port only parallel circuit.
• Interchangeable spool diameter is 18 mm – 0,71 in.
• Available manual, pneumatic, hydraulic and electro-pneumatic spool control kits.



## DIMENSIONAL DATA



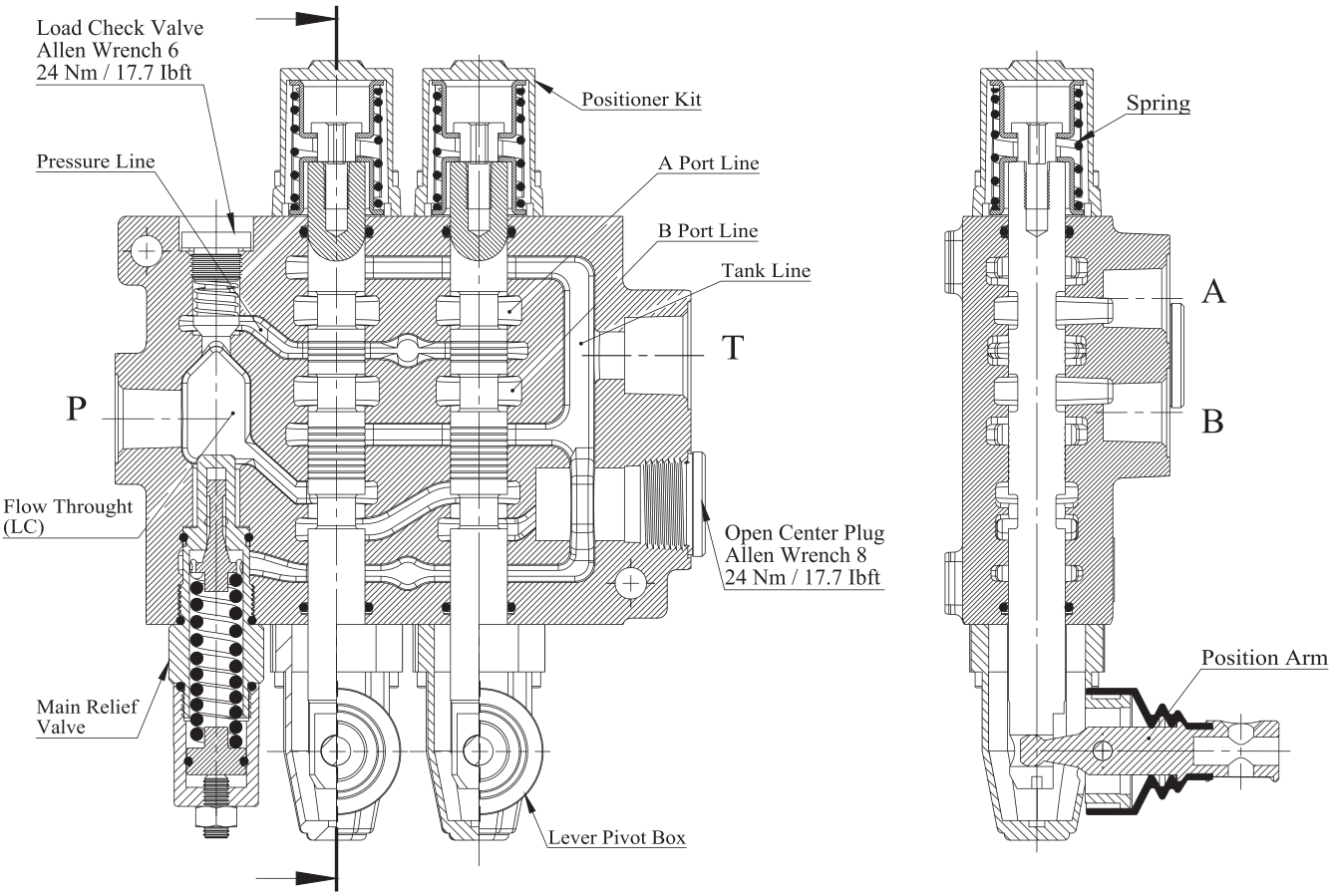

| TYPE | A | | B | | Weight | |
|---|---|---|---|---|---|---|
| | mm | in | mm | in | Kg | lb |
| ORV-M70-1P | 108 | 4,25 | 137 | 5,40 | 5,65 | 12,45 |
| ORV-M70-2P | 153 | 6,03 | 182 | 7,17 | 8,25 | 18,18 |
| ORV-M70-3P | 198 | 7,80 | 227 | 8,94 | 10,85 | 23,92 |
| ORV-M70-4P | 243 | 9,57 | 272 | 10,72 | 13,45 | 29,65 |
| ORV-M70-5P | 288 | 11,35 | 317 | 12,49 | 16,05 | 35,38 |
| ORV-M70-6P | 333 | 13,12 | 362 | 14,26 | 18,65 | 41,11 |

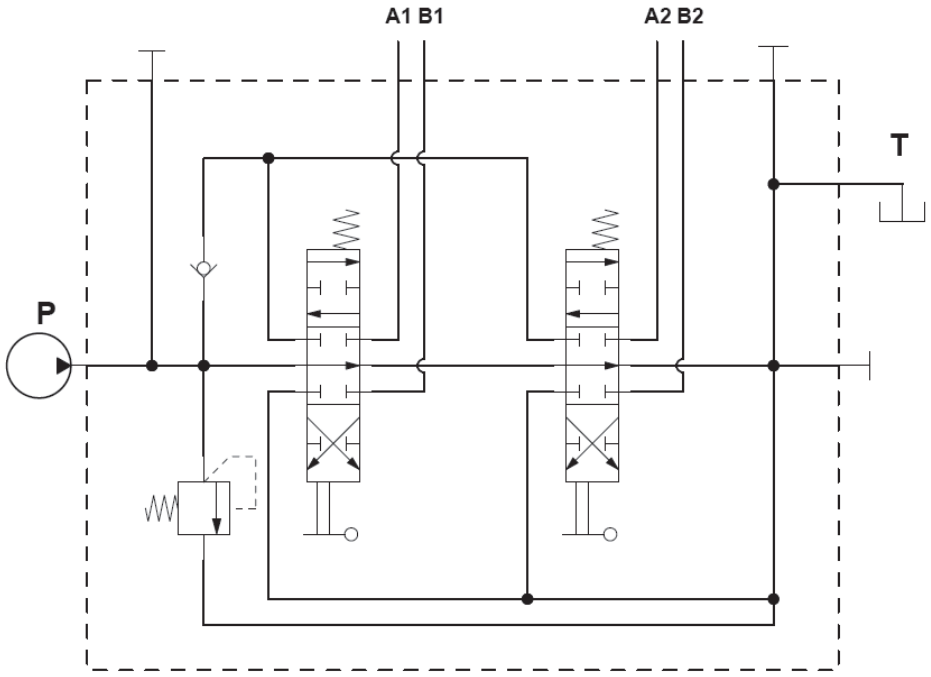
## STANDARD THREADS

| PORT | BSP (Iso 228) 1/2" Series | BSP (Iso 228) 3/4"Series | UN-UNF (Iso 11926-1) | Metric (Iso 262) |
|---|---|---|---|---|
| **P** Inlet | G 1/2 | G 3/4 | 1 1/16-12 UN | M27x2 |
| **A-B** Ports | G 1/2 | G 3/4 | 7/8-14 UNF | M22x1.5 |
| **T** Outlet | G 3/4 | G 3/4 | 1 1/16-12 UN | M27x2 |
| Pneumatic | G 1/4 | G 1/4 | NPTF 1/8 - 27 | NPTF 1/8 - 27 |
| Carry-Over | G 3/4 | G 3/4 | 1 1/16-12 UN | G 3/4 |

## HYDRAULIC CIRCUIT

### Parallel - Standard Configurations With Side Inlet And Outlet Open Center

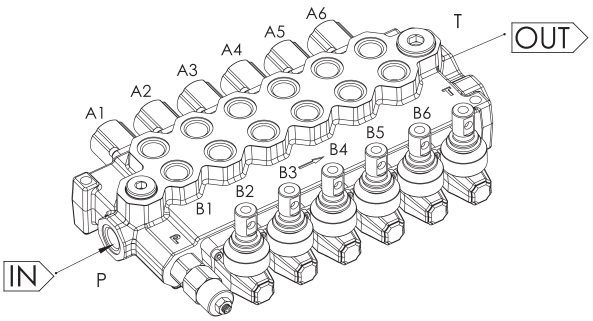


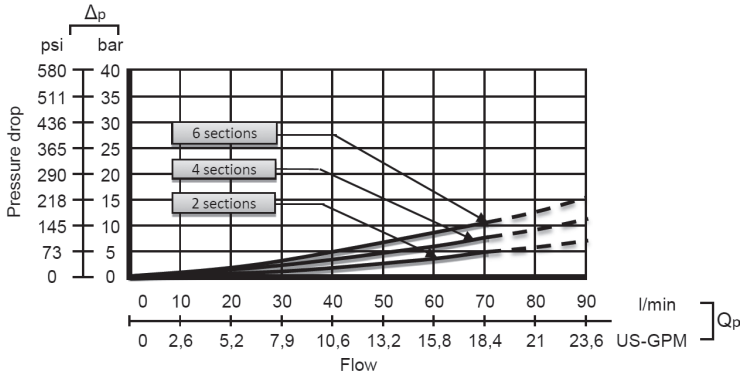




**Code:** ORV M70-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/PA1/SGT

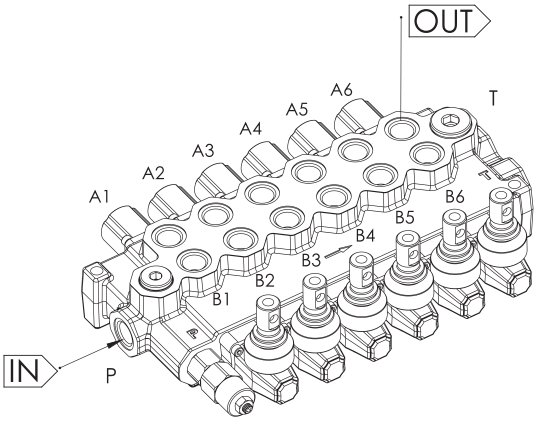
## PERFORMANCE DATA AND CURVE

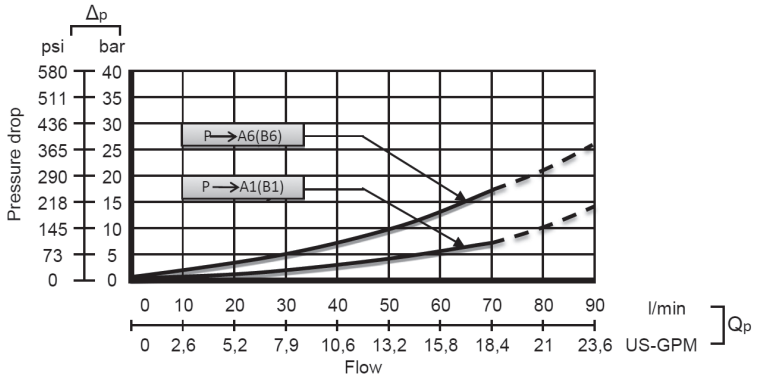
### Open Center - Pressure Drop (P-T)



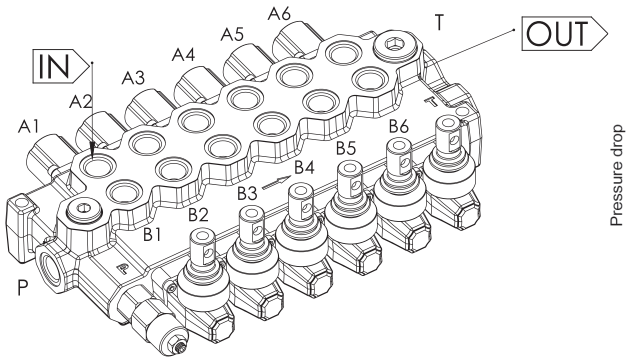



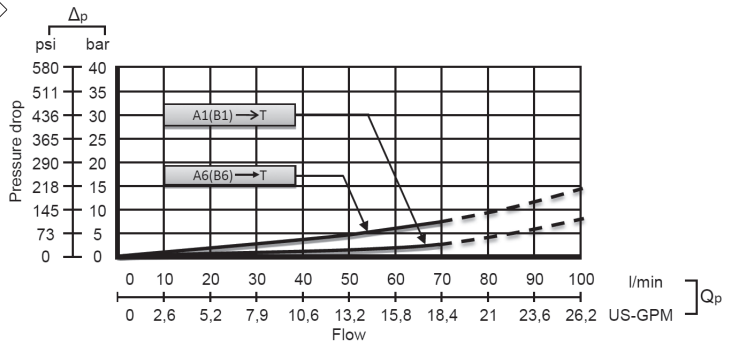

### Inlet to Work Port - Pressure Drop (P-A/B)




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




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

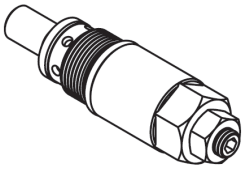
# INLET RELIEF OPTIONS

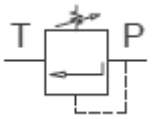
## Direct Pressure Relief Valve

**Code:**

**SMR2 – 120**

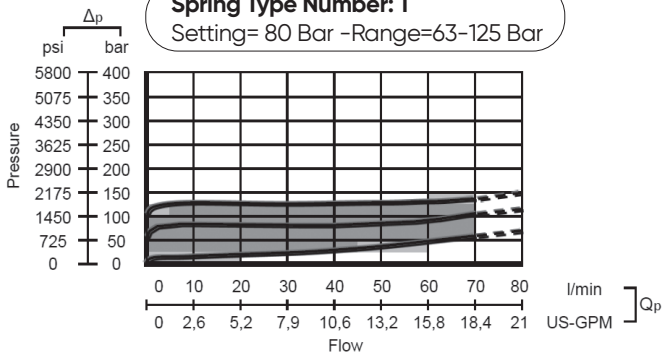
- Pressure Setting Bar in (Standard 120 bar)
- Standard Main Relief Spring Type -2



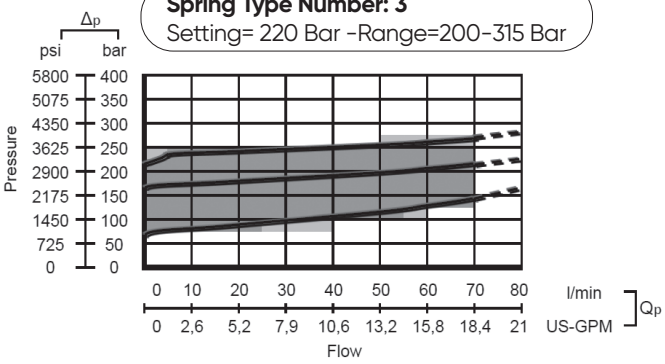



## Performance Data

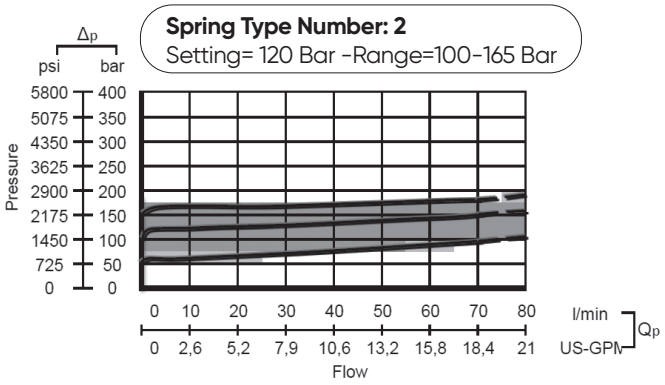
**Spring Type Number: 1**
Setting= 80 Bar -Range=63-125 Bar

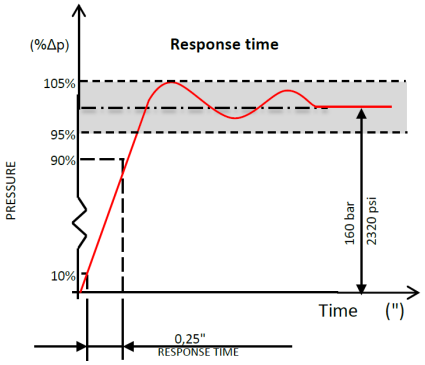



**Spring Type Number: 3**
Setting= 220 Bar -Range=200-315 Bar

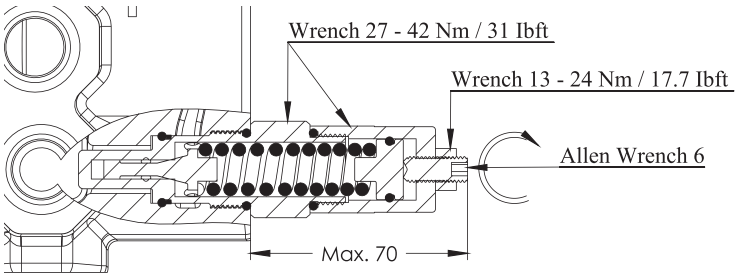



**Spring Type Number: 2**
Setting= 120 Bar -Range=100-165 Bar

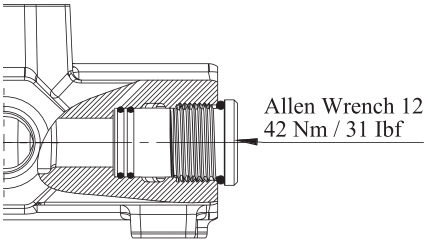


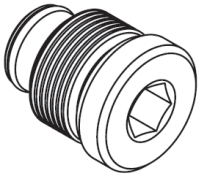



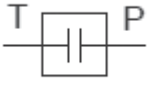

## Adjustment Type on Valve




## Relief Blanking Plug - WM



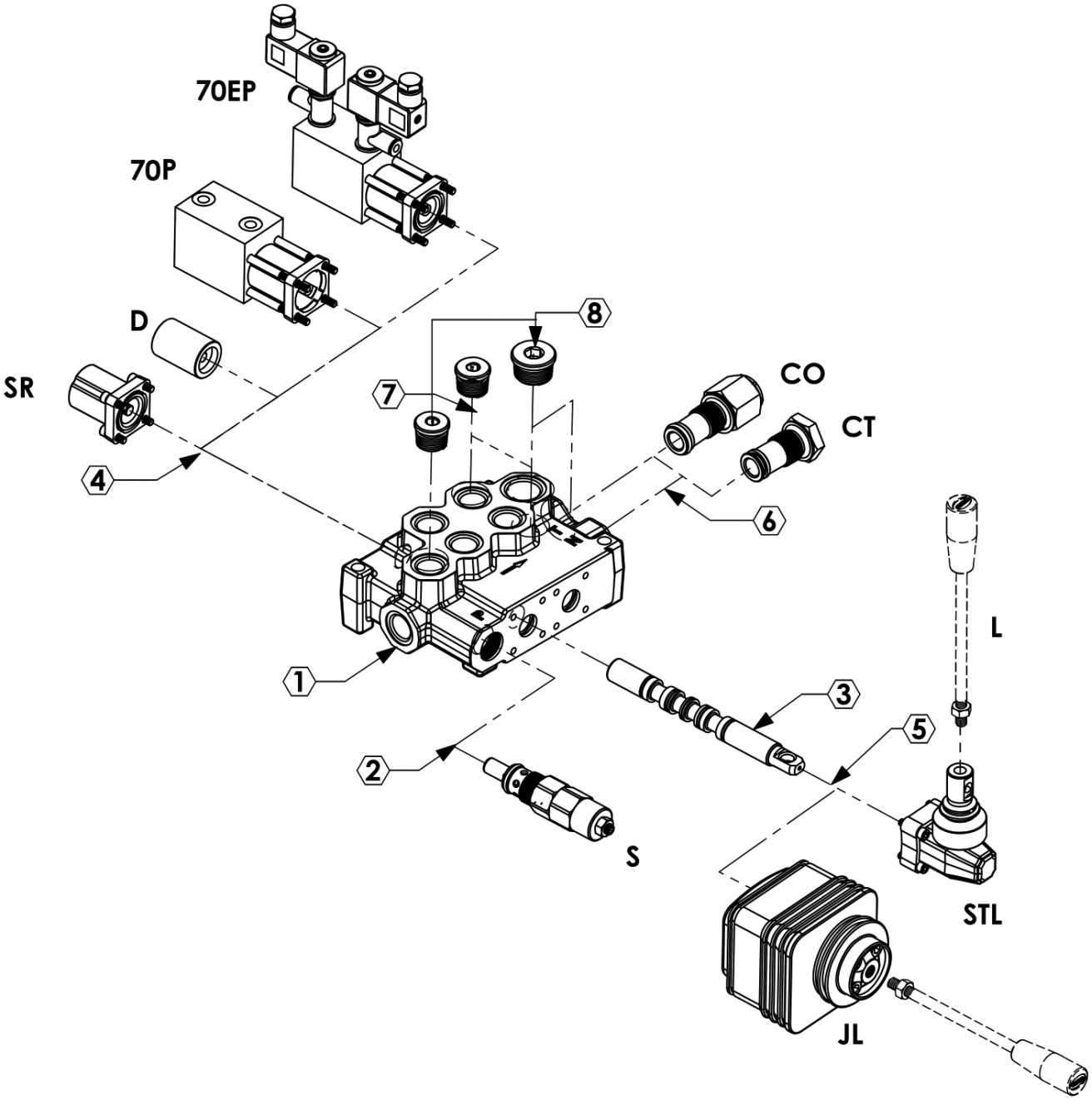


## ORDERING CODES

### Order Example

ORV M70-2P / SMR2-120 / 1A-SR-STL / 1A-80P-STL / CO - PL1 - P1 / SGT

1 | 2 | 3 4 5 (1 st Section) | Following Section | 6 7 8 (Output Section) | 9



# ORDERING CODES

## 1- Valve Type and Body

M70 = Valve Type - (M) - Monoblok
(70) - Max. Flow Rate
**1P** = Body for 1 Section - (1BM170100)
**2P** = Body for 2 Sections - (1BM270100)
**3P** = Body for 3 Sections - (1BM370100)
**4P** = Body for 4 Sections - (1BM470100)
**5P** = Body for 5 Sections - (1BM570100)
**6P** = Body for 6 Sections - (1BM670100)

## 2- Pressure Relief Options

SMR = Standard direct pressure relief valve
**SMR1-080** – (2SMR170080)–Range 63-125 bar
Setting 80 bar
**SMR2-120** – (2SMR270120)–Range 100-165 bar
Setting 120 bar
**SMR3-220** – (2SMR370220)–Range 200-315 bar
Setting 220 bar

## 3- Spool Options

1A -(3SM170110) – 3 Positions ,Double acting
2A -(3SM170120) – 3 Positions ,Double acting
A to tank B Blocked
3A -(3SM170130) – 3 Positions ,Double acting
B to tank A blocked
4A -(3SM170140) – 3 Positions ,Double acting
A and B tank
5A -(3SM170150) – 3 Positions ,Single acting on
A (A to tank)
6A -(3SM170160) – 3 Positions ,Single acting on
B (B to tank)

## 4- Spool Positioners

SR = Spring Return in neutral position – (4SR080100)
D = Detent in position 1, neutral and 2 - (4D080100)
70P = ON/OFF Pneumatic – (445P070100)
70EP = 12 VDC ON/OFF electro-pneumatic –
(480EP070112)
70EH = 12 VDC/24 VDC ON/OFF electro-hydraulic
(3670EH100112)

## 5- Lever Options

**STL** = Standard lever –(5STL080100)
**JL** = Joystick lever for two sections operation
- (5JL 080100)

## 6- Output Options

**PA2(T)** =G3/4 Top output plug - (6PL1080134)
**PA2(S)** =G3/4 Side output plug - (6PL1080134)
**CO** =G3/4 Carry–Over Connector - (6CO080100)
**CT** = G3/4 Carry–Over Plug - (6CT070100)

## 7- Ports Plug Options "If Required"

**PL3(5A)** = Plug for single action spool for 5A
G3/4 –(6PL1080134)
**PL3(6A)** = Plug for single action spool for 6A
G3/4 –(6PL1080134)
**PL2(5A)** = Plug for single action spool for 5A
G1/2- (6PL1040112)
**PL2(6A)** = Plug for single action spool for 6A
G1/2- (6PL1040112)
*Page 12 for detail spool options.

## 8- Ports Input Plug Options

**PI1(T)** = G1/2 Top input – (6PL1040112)
**PI1(S)** = G1/2 Side input – (6PL1040112)
**PI3(T)** = G3/4 Top input - (6PL1080134)
**PI3(S)** = G3/4 Side input - (6PL1080134)

## 9- Ports Thread Options

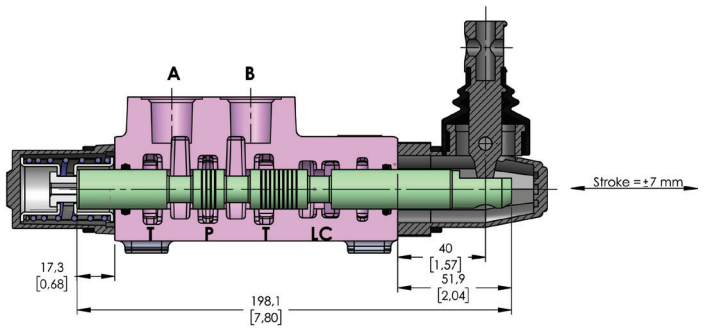
**SGT1** = 1/2" Series Port Options - (9P045112)
**SGT3** = 3/4" Series Port Options - (9P080134)
**UNF** = UNF Series Port Options - (9U045138)
**M** = Metric Series Port Options - (9M045138)
*Page 4 for detail port information.

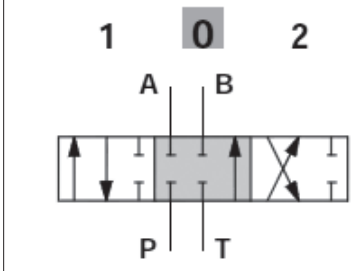
## HandLever

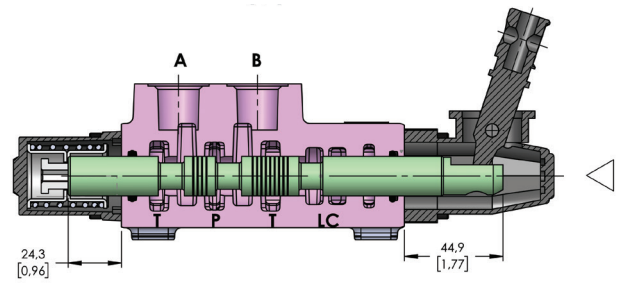
**L** = Standard HandLever (L=120mmxM8) - (7L040100)
**HL** = Remote Cable Kit – (80HL80100)

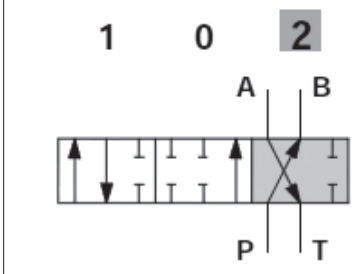
## SPOOL OPTIONS

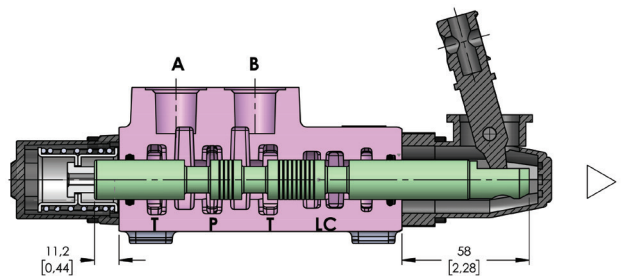
### Spool Type - 1A

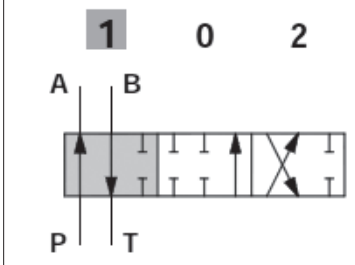


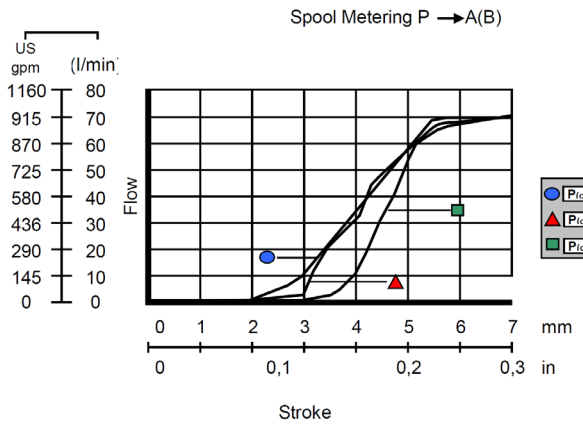



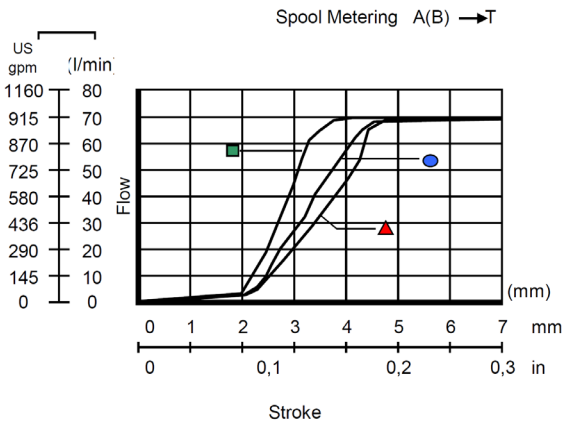



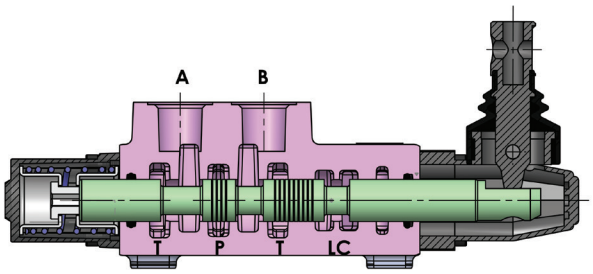

## Performance Curve And Data

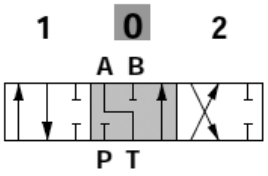


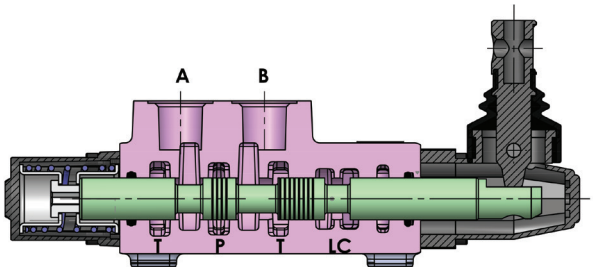
## SPOOL OPTIONS

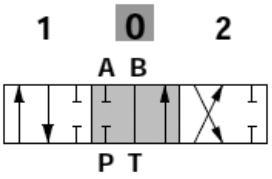
### Spool Type - 2A



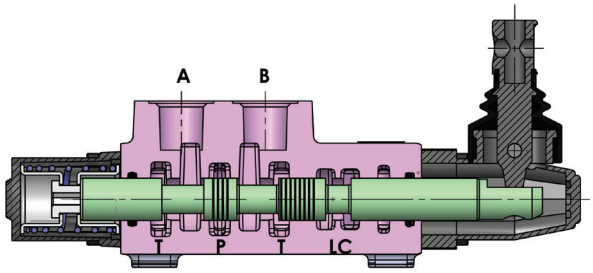



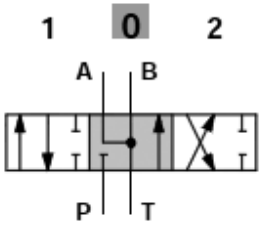

### Spool Type - 3A



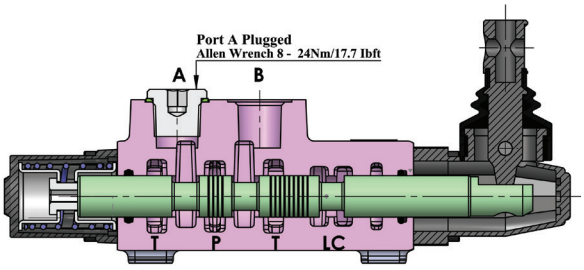



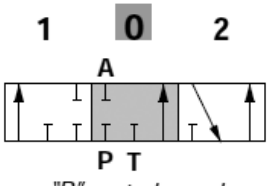

### Spool Type - 4A



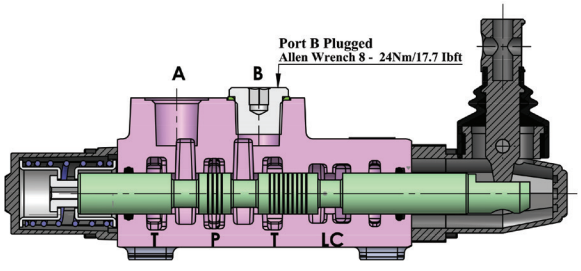

### Spool Type - 5A

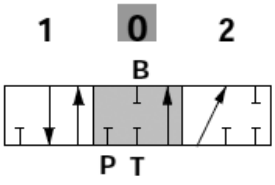



*"B" port plugged*

### Spool Type - 6A



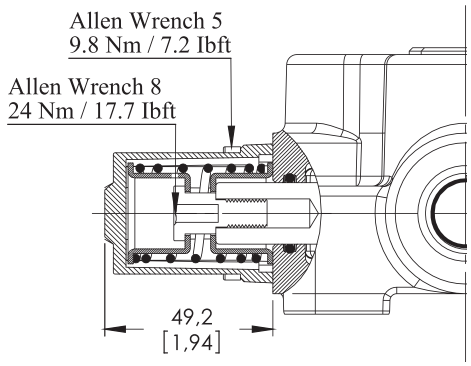

*"A" port plugged*

## SPOOL POSITIONERS – SIDE OF RETURN

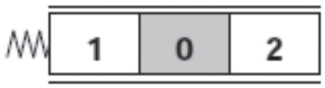
### With Spring Return in Neutral Position

Kit No: **SR**

Sectional Appearance



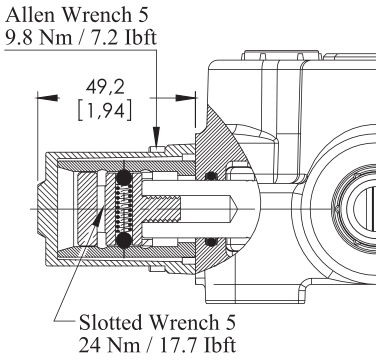

Diagram



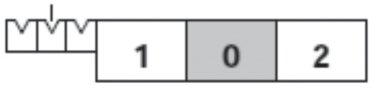

### With Detent

Kit No: **D**

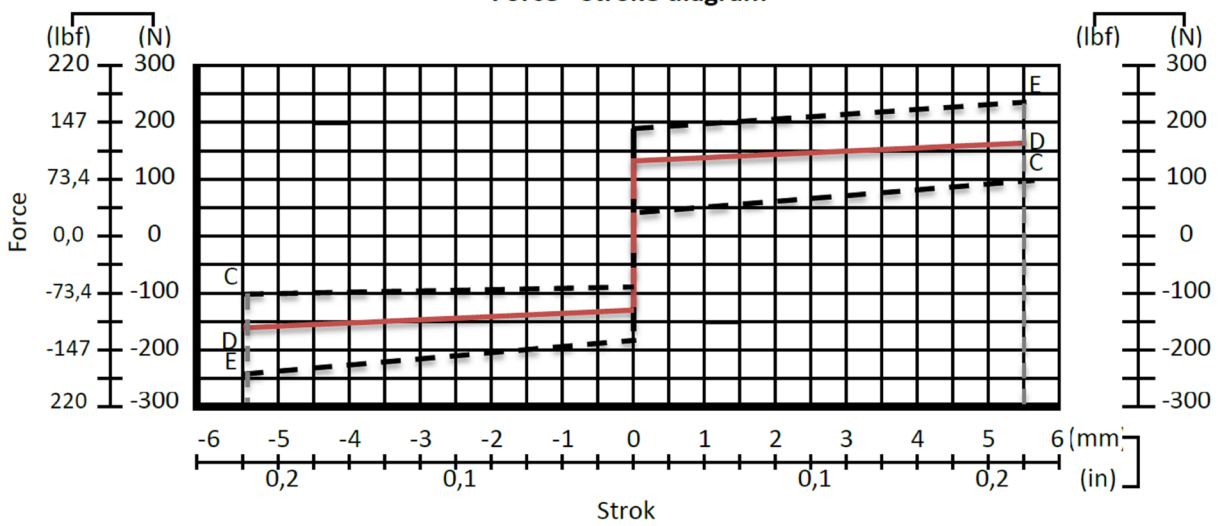
Sectional Appearance




Diagram




**Force - stroke diagram**

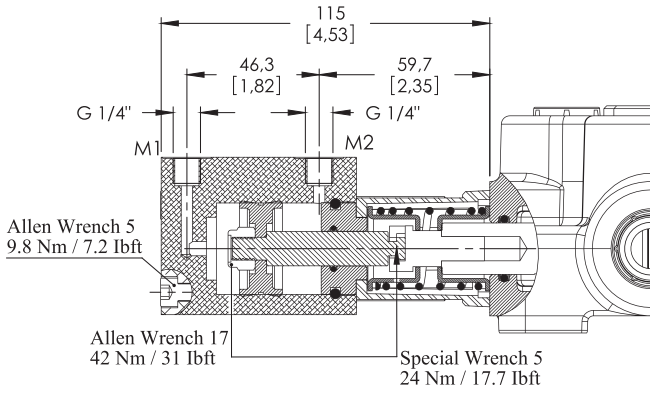


# SPOOL POSITIONERS – SIDE OF RETURN

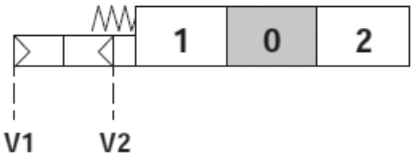
## ON/OFF Pneumatic Control

### Kit No: **70P**

Sectional Appearance




Diagram



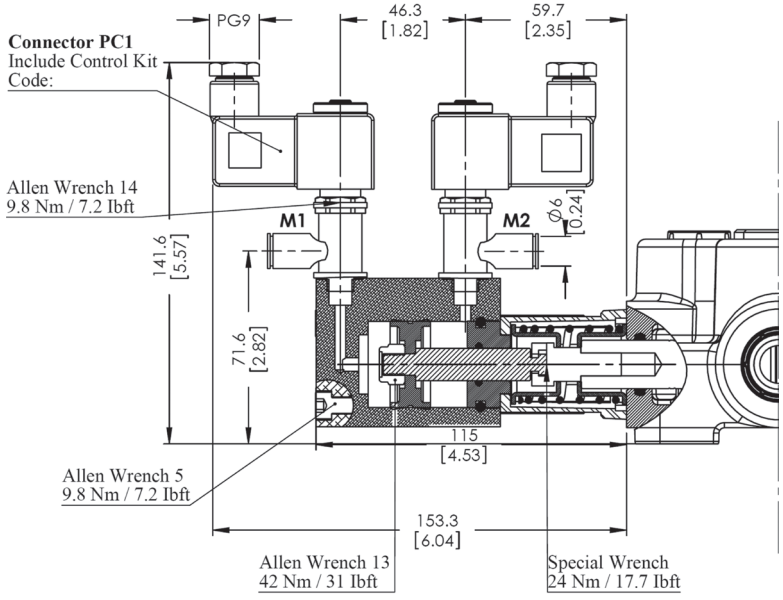

**Operating Features**

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

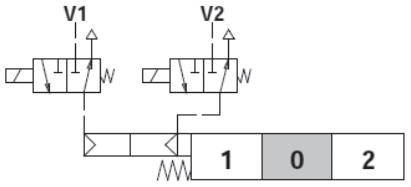
## ON/OFF Electro-Pneumatic Control

### Kit No: **70EP**

Sectional Appearance




Diagram




**Operating Features**

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

**Selenoid Operating Features**

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

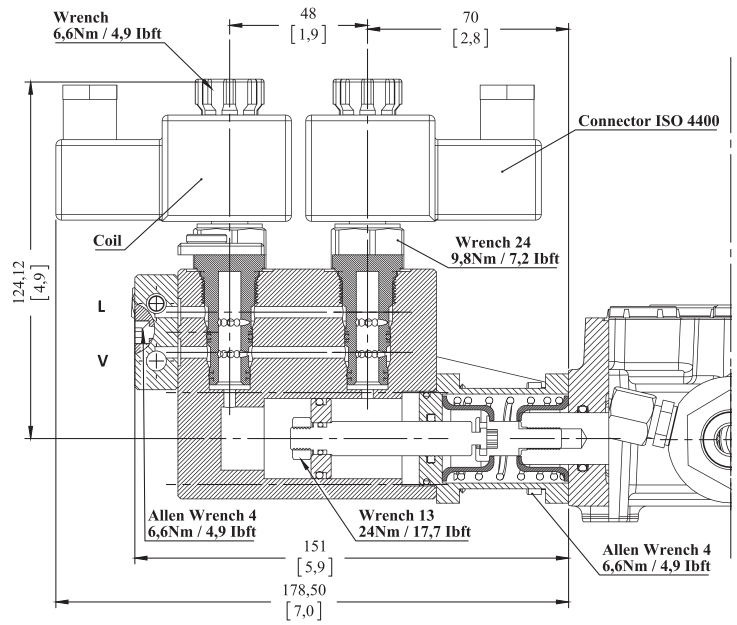
Power Rating.....: 6 W

# SPOOL POSITIONERS – SIDE OF RETURN

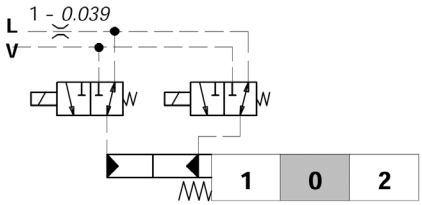
## ON/OFF Electro - Hydraulic Control

Kit No: **70EH**

### 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

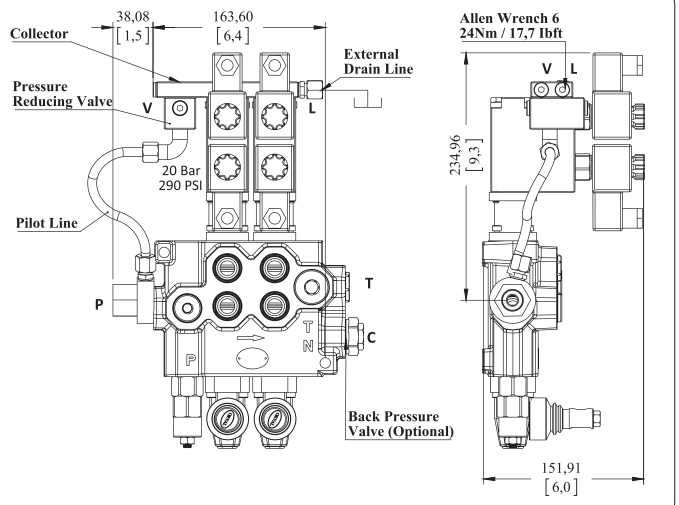
| External Pilot Collector | Standard Pilot Collector |
|---|---|
| COL 11 - 10COL1001 – Kit For Section 1 | COL 21 - 10COL2001 – Kit For Section 1 |
| COL 12 - 10COL1001 – Kit For Section 2 | COL 22 - 10COL2001 – Kit For Section 2 |
| COL 13 - 10COL1001 – Kit For Section 3 | COL 23 - 10COL2001 – Kit 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

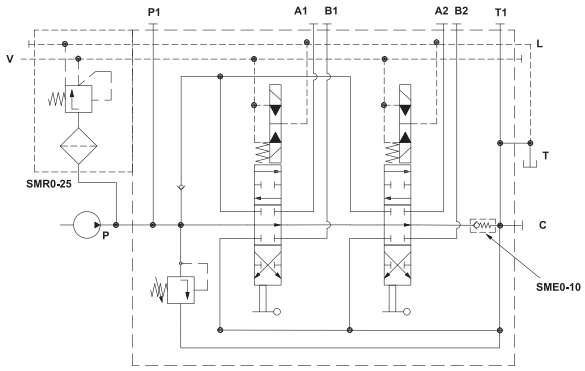
## ON/OFF Electro - Hydraulic Control Connections

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

Sectional Appearance




Diagram



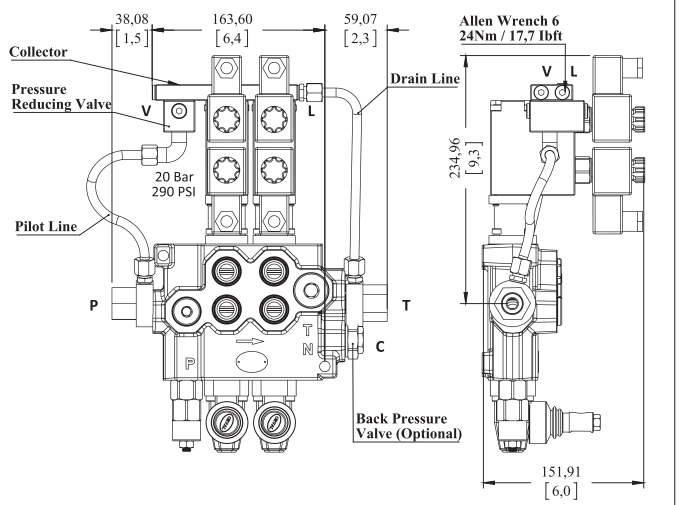

**Operating Features**

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

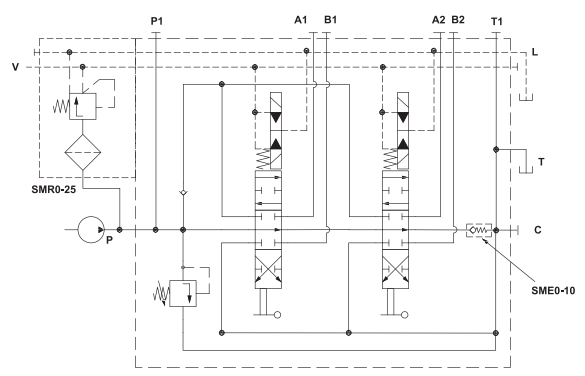
Code= ORV M70-2P (SD(LA)-SMR2-125-PP )/P-1A-STL-70EH/ P-1A-STL-70EH (SMR0 -COL12-12V)/ SO-PT1 / SGT

### 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

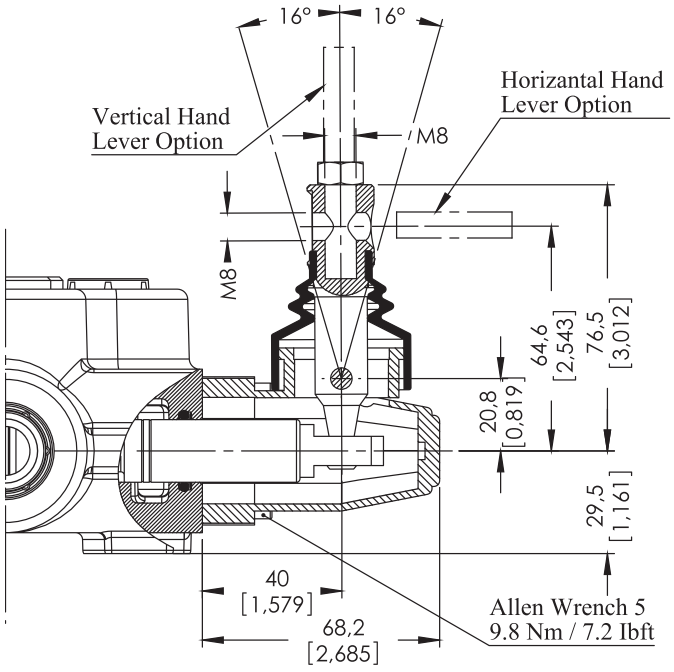
Code = ORV M70-2P (SD(LA)-SMR2-125-PP )/P-1A-STL-70EH/ P-1A-STL-70EH (SMR0 –COL22-12V)/ SO-PT1 / SGT

## SPOOL POSITIONERS – SIDE OF LEVER CONTROL

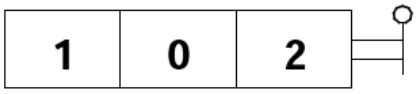
### Lever Controls

Kit No: **STL - L0**

Sectional Appearance

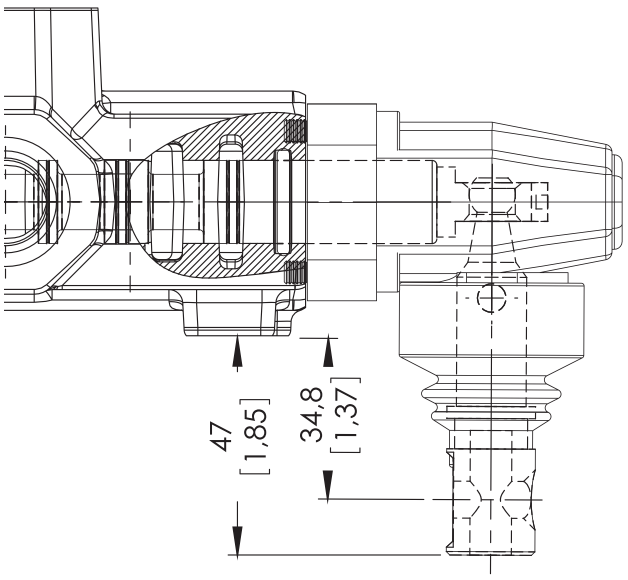



Diagram

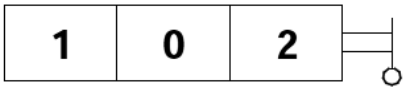



Kit No: **STL - L180**

Sectional Appearance




Diagram



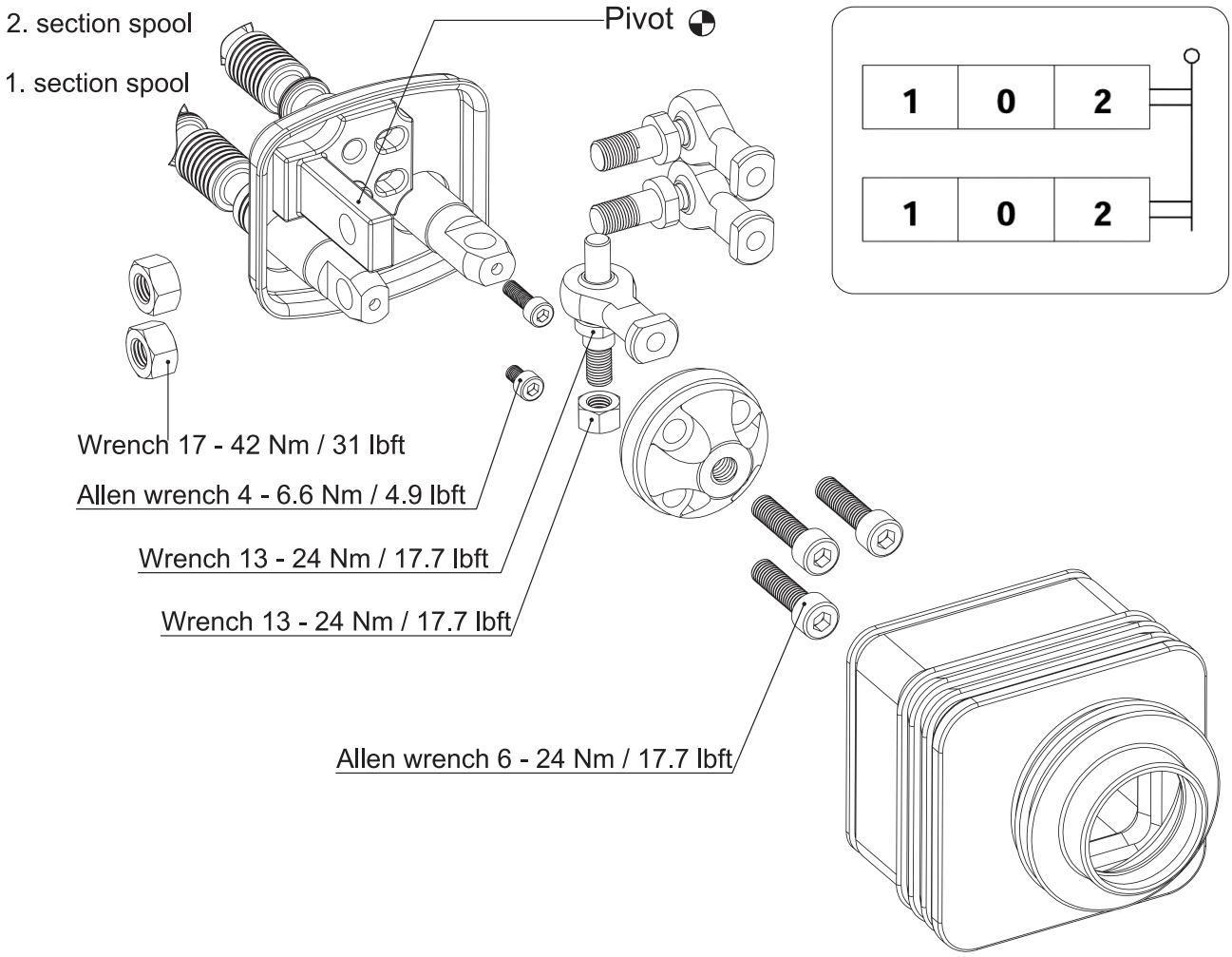

**Note:** Aluminium protected arm lever pivot box can be rotated 180º.

## SPOOL POSITIONERS – SIDE OF LEVER CONTROL

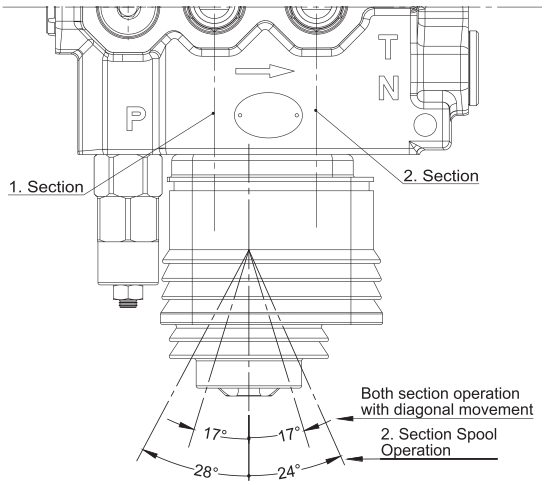
### Lever Controls - Joystick

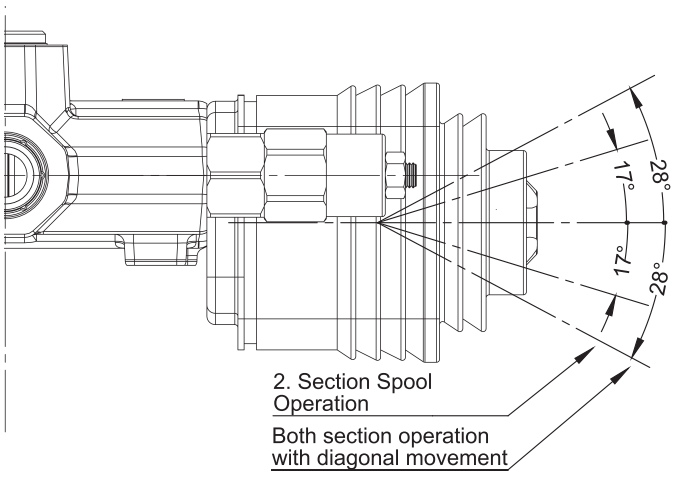
Kit No: **JL**

Exploded View | Diagram




### Operation Angle:



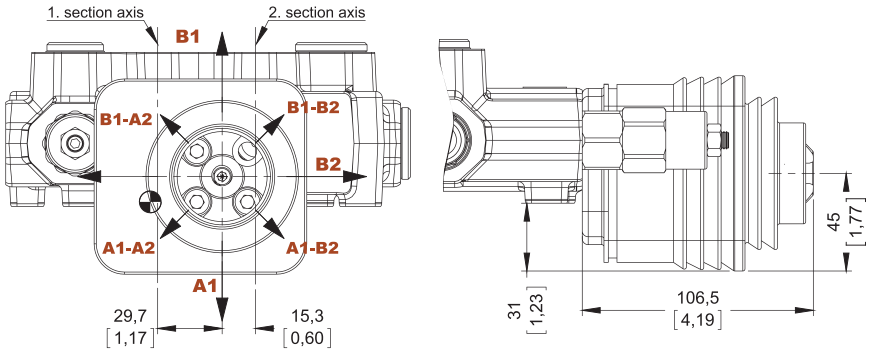



## SPOOL POSITIONERS – SIDE OF LEVER CONTROL

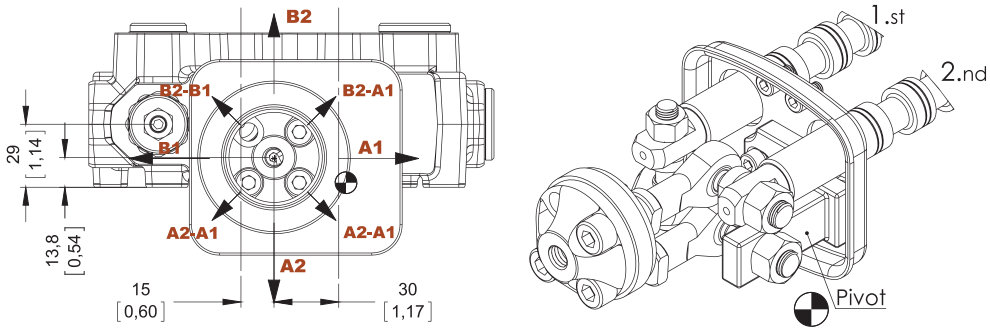
### Lever Controls - Joystick

#### Dimensions and movement sceme

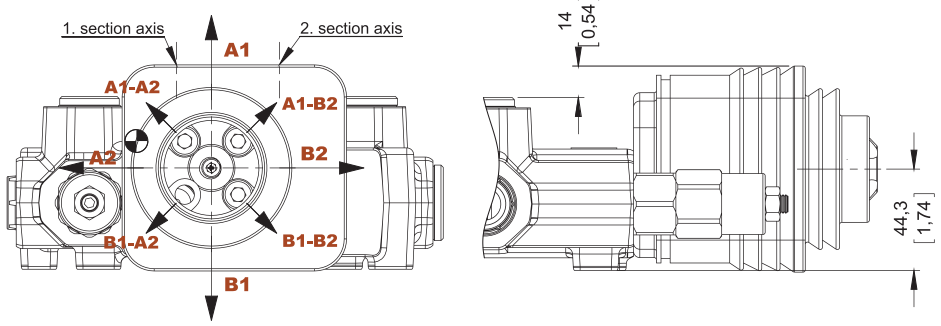
Type No: **JL1** — **Application:** Pivot placed down on the Left



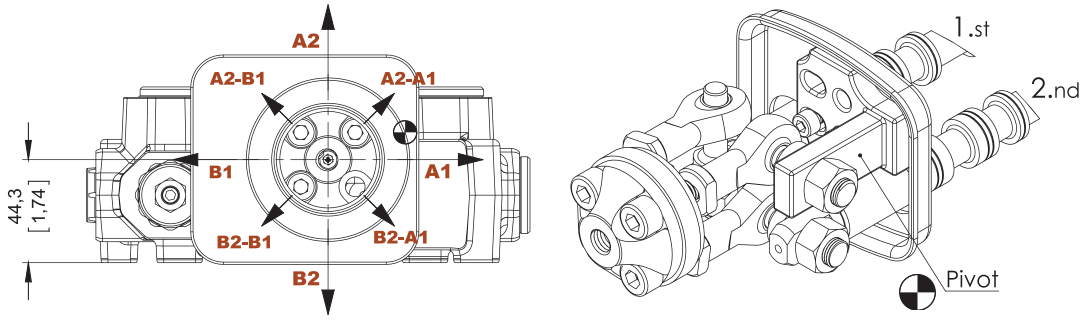

Type No: **JL2** — **Application:** Pivot placed down on the right




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




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



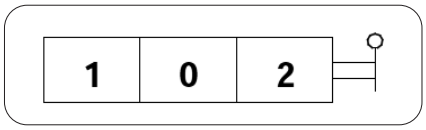
## SPOOL POSITIONERS – SIDE OF LEVER CONTROL

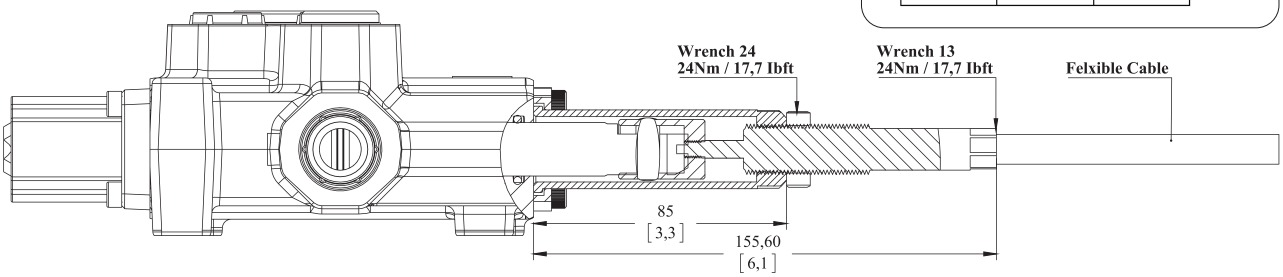
### Lever Controls - Cable Control

Kit No: **HL**

Exploded View | Diagram

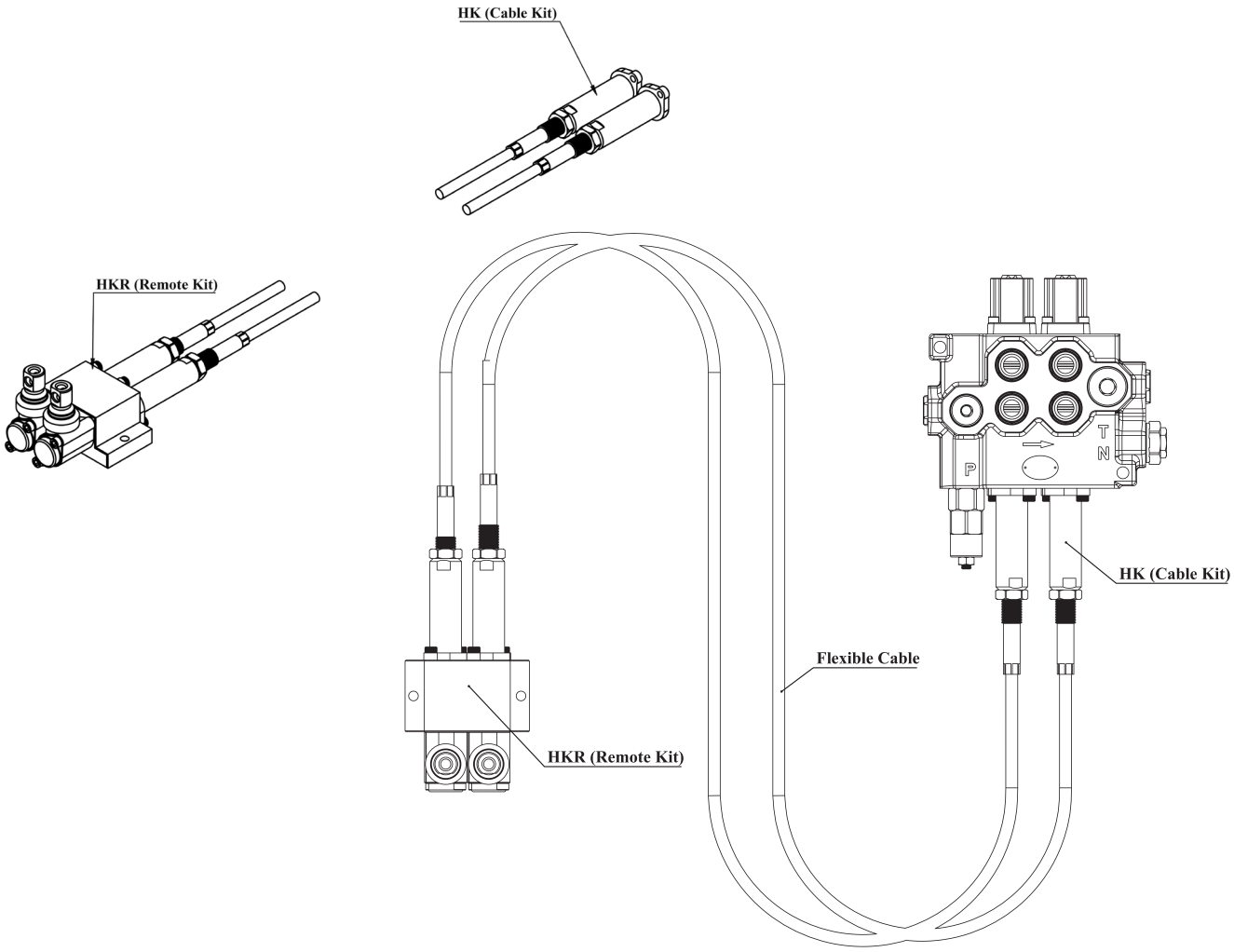
Waterproof cap prearranged for remote control with flexible cable.




**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

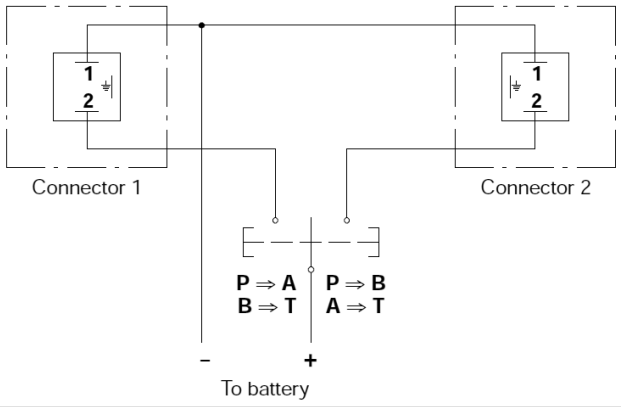
## ON/OFF Solenoid Control

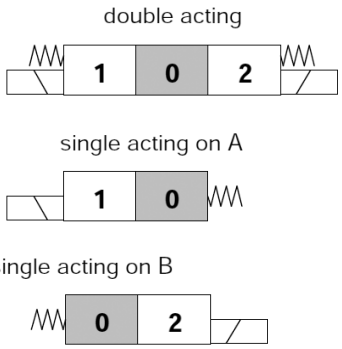
Kit No: **SEC**

Sectional Appearance

Diagram

**Electric wiring example**



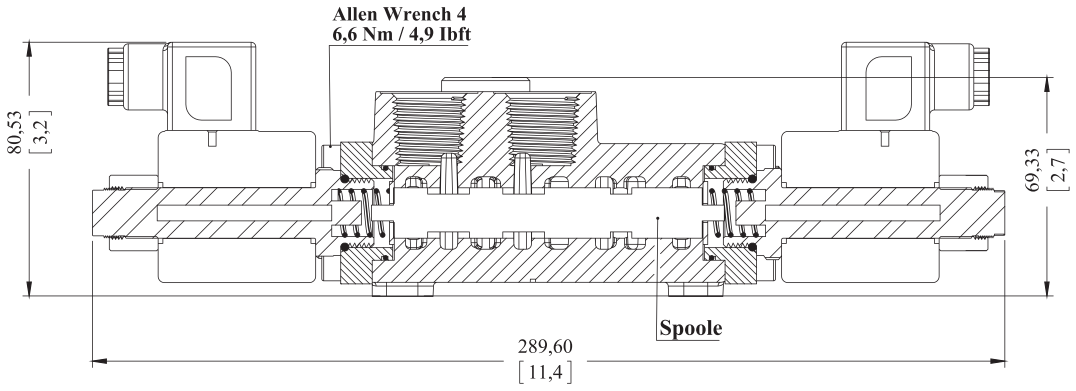



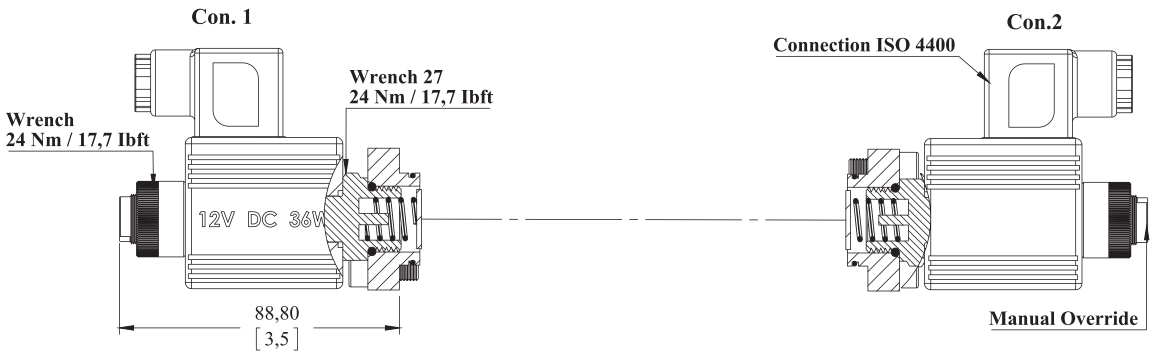

**Operating Features**

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

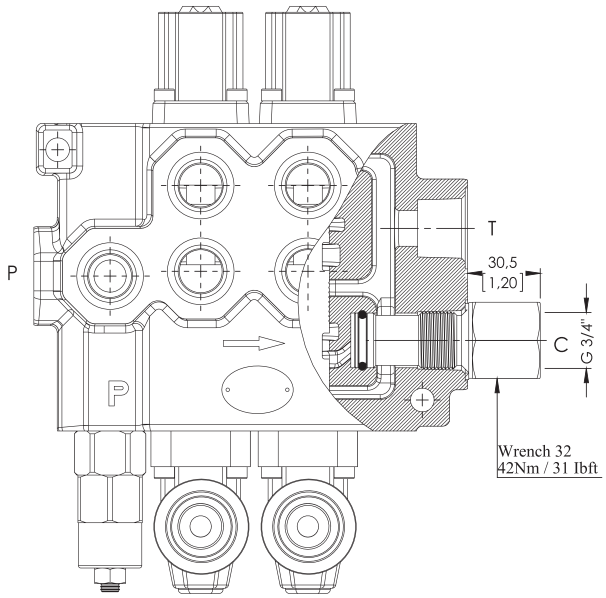


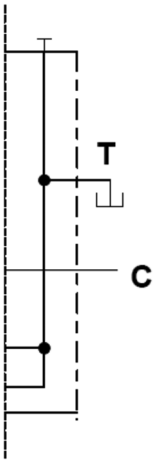
## OUTLET PORT OPTIONS

### Carry - Over Connection

Kit No: **CO**

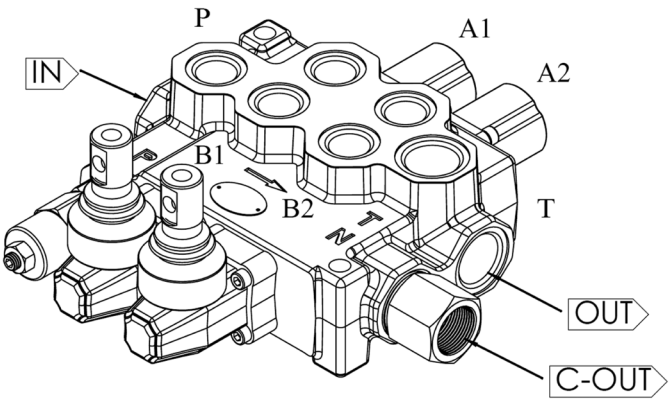



Sectional Appearance




Hydraulic Circuit

**Code:** ORV M70-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/CO-PA1/SGT



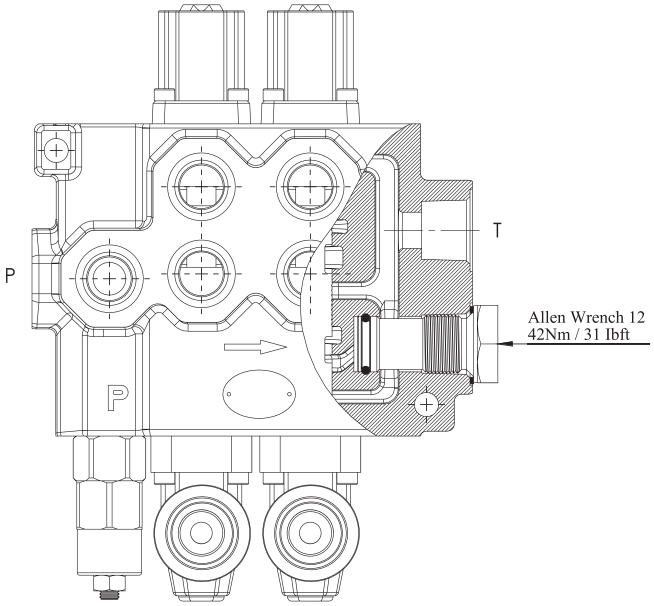

Direction of Port Connectted

SGT : See page 5 for Standard center

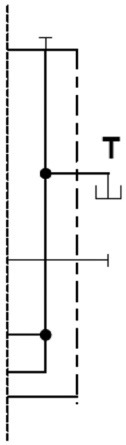
## OUTLET PORT OPTIONS

### Closed Center

Kit No: **CT**




Sectional Appearance




Hydraulic Circuit

**Code:** ORV M70-2P / SMR2-120 / 1A-SR-STL/1A-SR-STL/CT-PA1/SGT

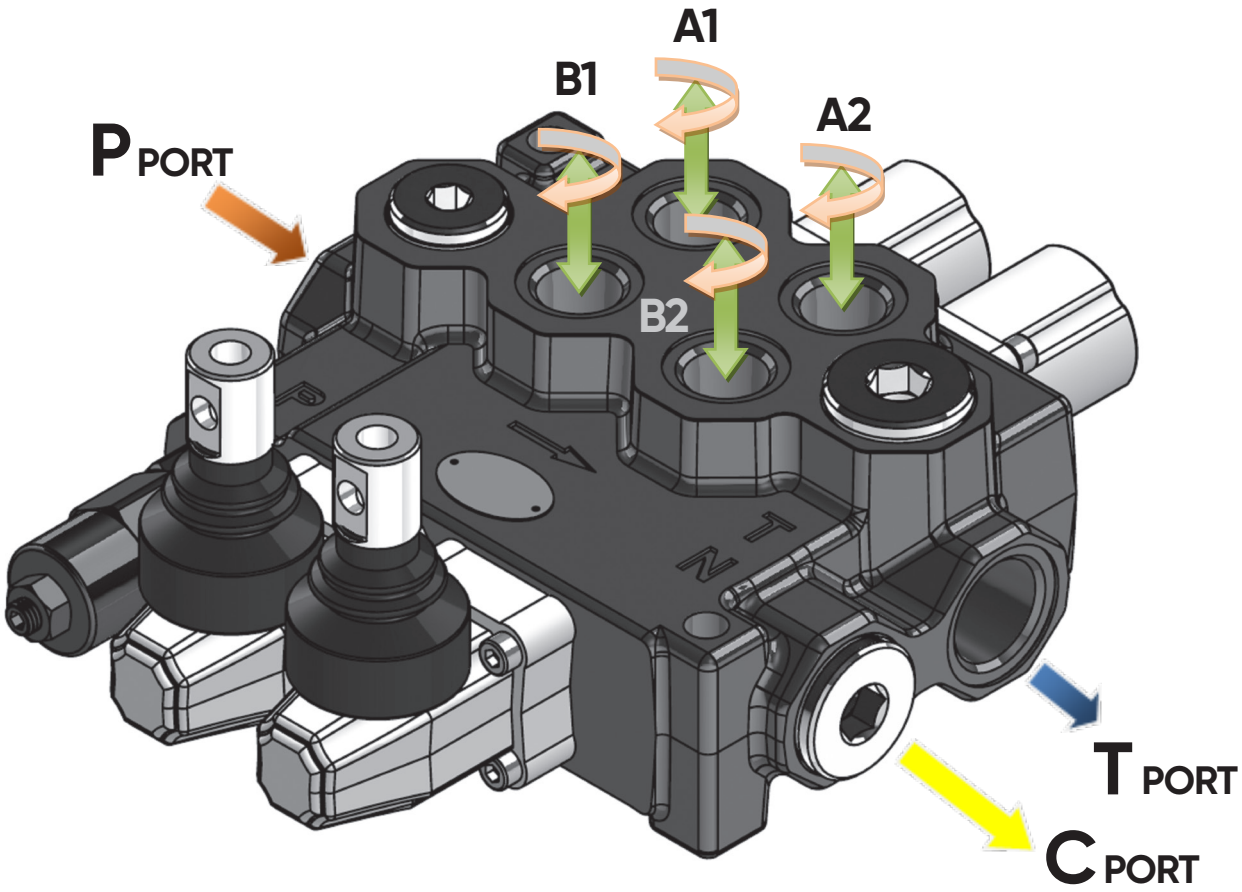
## INSTALLATION AND MAINTENANCE

The ORV M70 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;

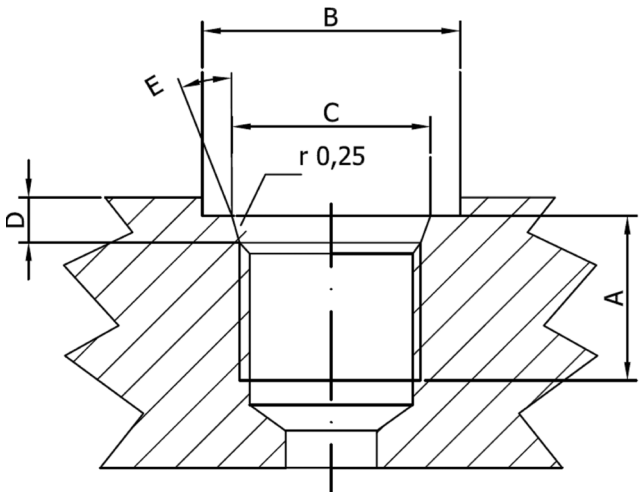
• Before painting, ensure plastic port plugs are tightly in place.



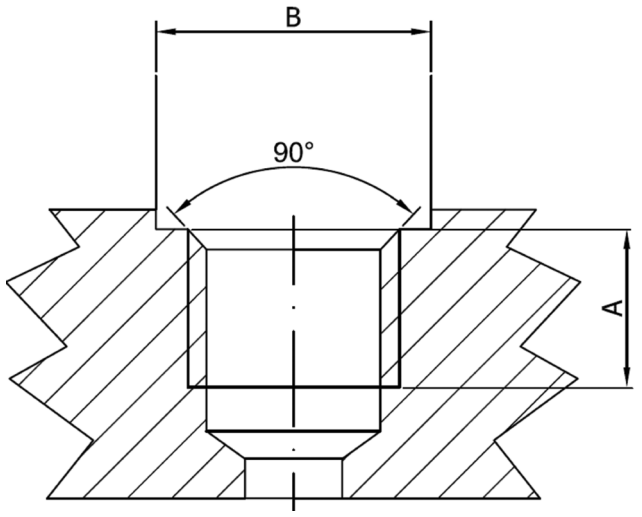

| Threads Type (Nm / lbft) | P Port | A and B Port | T and C Port |
|---|---|---|---|
| BSP (ISO 228/1) | G 1/2 | G 1/2 | G 3/4 |
| With O--Ring seal | 50 / 36.9 | 50 / 36.9 | 70 / 51.6 |
| With copper washer | 60 / 44.3 | 60 / 44.3 | 70 / 51.6 |
| With steel and rubber washer | 60 / 44.3 | 60 / 44.3 | 70 / 51.6 |
| | | | |
| BSP (ISO 228/1) | G 3/4 | G 3/4 | G 3/4 |
| With O--Ring seal | 70 / 51.6 | 70 / 51.6 | 70 / 51.6 |
| With copper washer | 70 / 51.6 | 70 / 51.6 | 70 / 51.6 |
| With steel and rubber washer | 70 / 51.6 | 70 / 51.6 | 70 / 51.6 |
| | | | |
| UN--UNF (ISO 11926--1) | 11/16--12 UNF--2B | 9/16--18 UNF--2B | 11/16--12 UNF--2B |
| With O--Ring seal | 95 / 70 | 30 / 22.1 | 95 / 70 |
| | | | |
| METRIC (ISO 262) | M27 x 2 | M22 x 1.5 | M27 x 2 |
| With O--Ring seal | 100 / 73.8 | 50 / 36.9 | 100 / 73.8 |
| With copper washer | 100 / 73.8 | 60 / 44.3 | 100 / 73.8 |
| With steel and rubber washer | 100 / 73.8 | 60 / 44.3 | 100 / 73.8 |

## TECHNICAL DATA

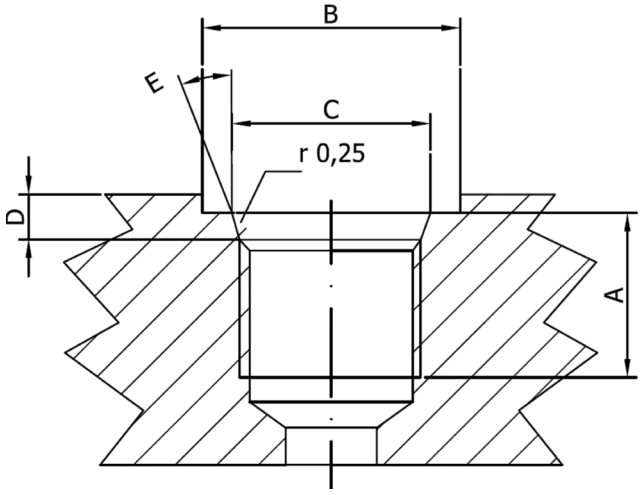
### Ports Dimensional Data




| SAE UN-UNF (ISO 725) | | | | | | |
|---|---|---|---|---|---|---|
| Dimensions | | 7/8-14 UNF SAE10 | | 1"1/16-12 UN SAE12 | | 1"5/16-12 UN SAE16 | |
| mm | in | | | | | | |
| A | | 17 | 0,67 | 20 | 0,79 | 20 | 0,79 |
| B | | 34 | 1,34 | 41 | 1,61 | 49 | 1,92 |
| C | | 23,9 | 0,94 | 29,2 | 1,15 | 35,5 | 1,40 |
| D | | 2,5 | 0,10 | 3,3 | 0,13 | 3,3 | 0,13 |
| E | | 15° | | 15° | | 15° | |




| BSP (ISO 228) | | | | | | |
|---|---|---|---|---|---|---|
| Dimensions | | G 1/2" | | G 3/4 | | G1 | |
| mm | in | | | | | | |
| A | | 16 | 0,63 | 18 | 0,71 | 20 | 0,79 |
| B | | 27 | 1,06 | 33 | 1,30 | 40 | 1,57 |




| METRIC (ISO 262) | | | | | |
|---|---|---|---|---|---|
| Dimensions | | M22x1,5 ISO 262 | | M27x2 ISO 262 | |
| mm | in | | | | |
| A | | 16 | 0,63 | 18 | 0,71 |
| B | | 31,5 | 1,24 | 37,7 | 1,48 |

# ORIGINAL VALVE

ORVAL HYDRAULIC


Büsan Org. San. Fevzi Çakmak Mah. Kosgeb Cad.
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