



# HYDRA

**45L FW**

*PART*

## 45L FW Monoblock Valve

Simple compact design, this valve only has one section for open centre and closed centre hydraulic systems.

It does not have a carryover port.

\*Fitted with a main pressure relief valve.

\*Spool diameter 16mm/0.63in interchangeable spools.



## Features

Simple, compact designed, this valve is only one section for open center and closed center hydraulic systems. It does not have carryover port.

- ▶ fitted with a main pressure relief valve.
- ▶ Spool diameter 16 mm-0.63 in interchangeable spools.

### Additional information

This catalogue shows the product in the most standard configurations. Please contact Sales Dpt. for more information that is detailed or special request.

### WARNING!

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

Approved Hydraulics IS NOT RESPONSIBLE FOR ANY DAMAGE CAUSED BY AN INCORRECT USE OF THE PRODUCT.

1st edition January 2023:

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## Valve general information

### Working conditions

This catalogue shows technical specifications and diagrams measured with mineral oil of 46 mm<sup>2</sup>/s (46cSt) viscosity at 40°C (104°F) temperature.

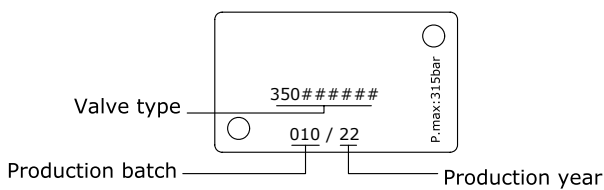
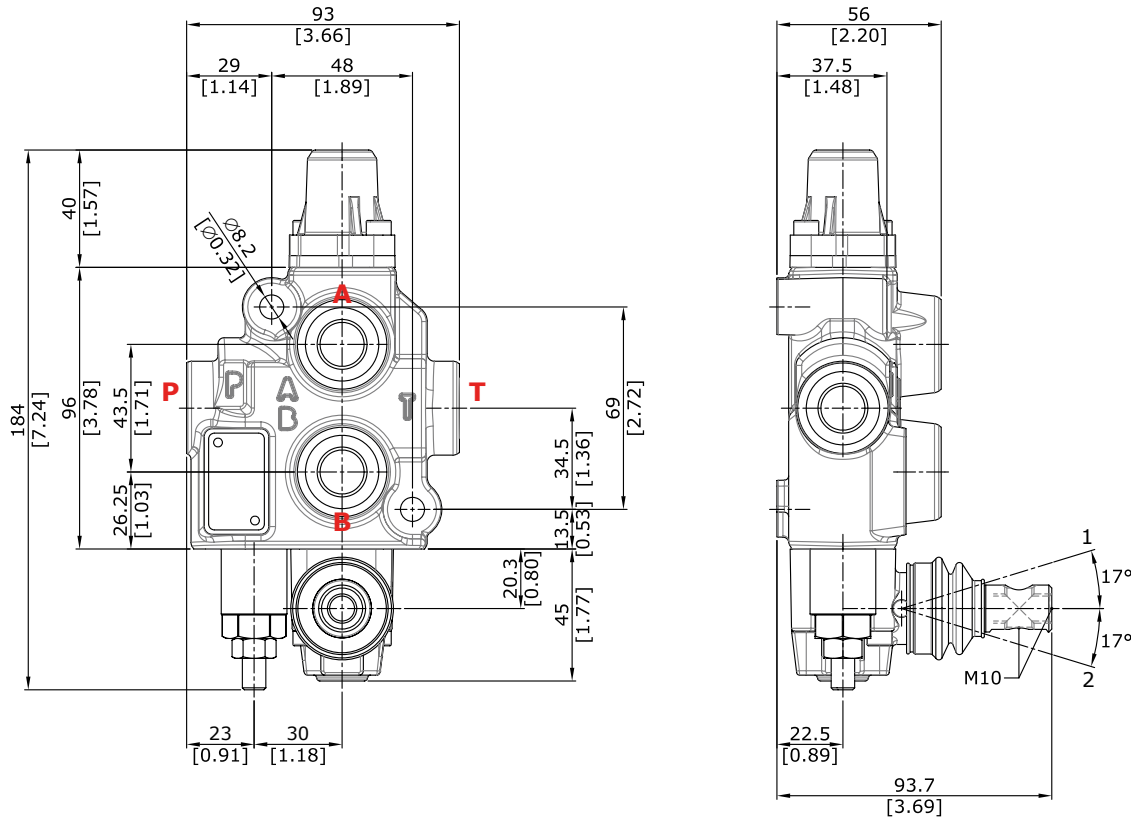
Nominal flow rating		45 l/min.	12 US gpm
Max. flow		55 l	14 US gpm
Operating pressure (max.)		250 bar	3600 psi
Back pressure (max.)	T outlet port	25 bar	360 psi
Internal leakage (standard) A(B) T	p=100 bar (1450 psi)	3cm <sup>3</sup> /min.	0.18 in <sup>3</sup> /min.
Hydraulic fluid		Mineral base oil	
Fluid temperature	with NBR seals	from - 20° to 80°C	from -4°F to 176°F
	with FPM (VITON) seals	from - 20° to 100°C	from -4°F to 212°F
Viscosity	operating range	from 15 to 75 mm <sup>2</sup> /s	from 15 to 75 cSt
	min.	12 mm <sup>2</sup> /s	12 cSt
	max.	400 mm <sup>2</sup> /s	400 cSt
Max. contamination level		-/19/16 - ISO 4406	NAS 1638 - class 10
Ambient temperature for working conditions	with mechanical devices	from -40°C to 60°C	from -40°F to 140°F
	with pneumatic and hydraulic devices	from -30°C to 80°C	from -22°F to 140°F
	with electric devices	from -20°C to 50°C	from -4°F to 122°F

### Standard threads

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

## Valve general information

## Dimensional data



## Standard threads

PORT	BSP (ISO 228/1)	BSP OPTIONAL (ISO 228/1)	UN-UNF (ISO 11926-1)	METRIC (ISO 262)
P inlet			3/4-16 (SAE 8)	
A and B ports	G 3/8	G 1/2	9/16-18 (SAE 6)	M18x1.5
T outlet			3/4-16 (SAE 8)	

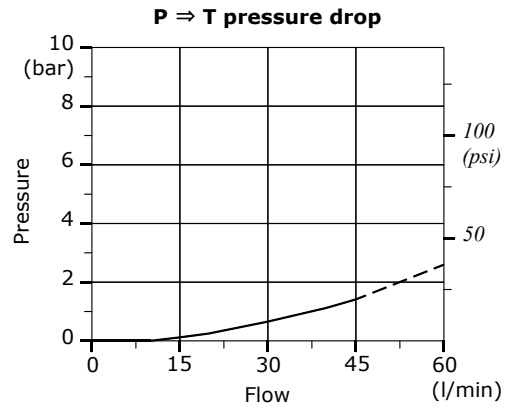
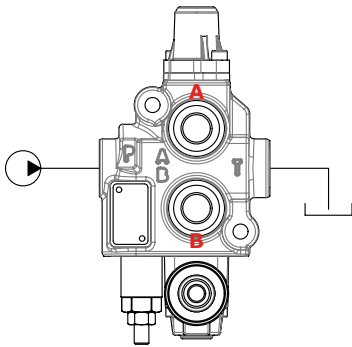
NOTE - Drawings and dimensions are referred to **BSP** thread configuration.

## Valve general information

### Performance data (pressure drop vs. flow)

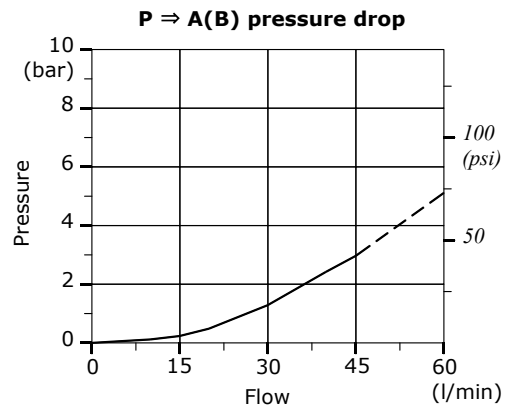
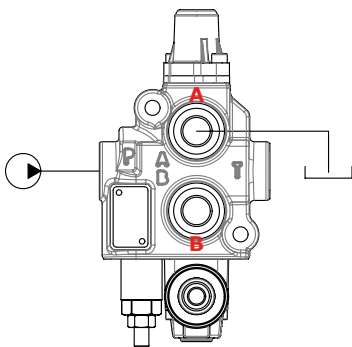
#### Open centre

From inlet to outlet.



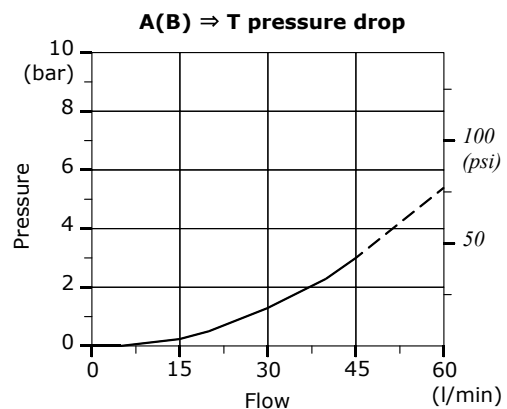
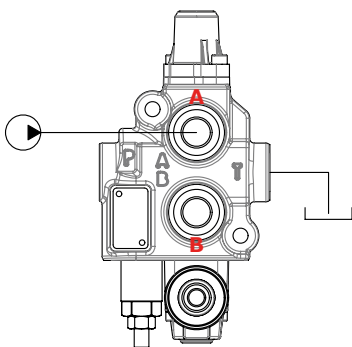
#### Inlet to work port

From inlet to A port (spool in position 1) or B port (spool in position 2).



#### Work port to outlet

From A port (spool in position 2) or B port (spool in position 1) to outlet.

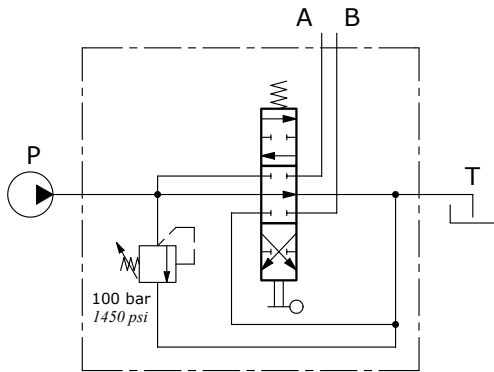


## Valve general information

### Hydraulic circuit

#### Standard configuration

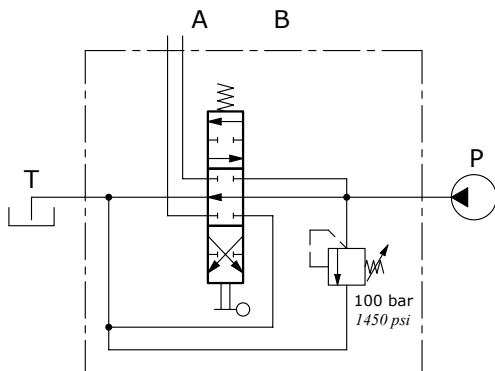
Standard valve is supplied with positive overlap spool (1CP).



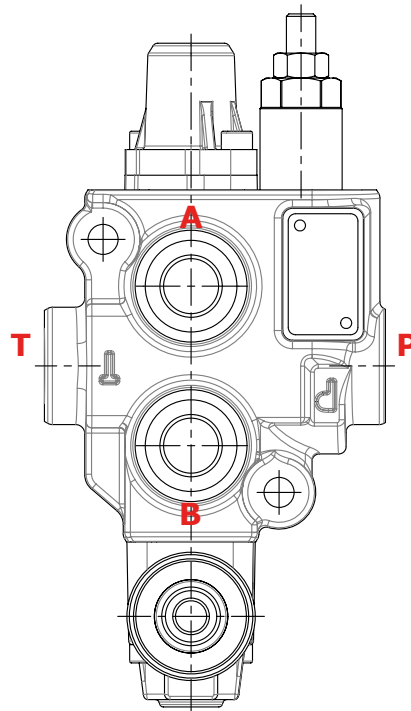
**Description example**  
45L FW08/1(X-100)/1CP8L

#### Right inlet

A symmetrical body allows the reverse assembly of spool and relative control kit and lever (ED configuration).



**Description example**  
45L FW08/1(X-100)/ED-1CP8L



## Valve general information

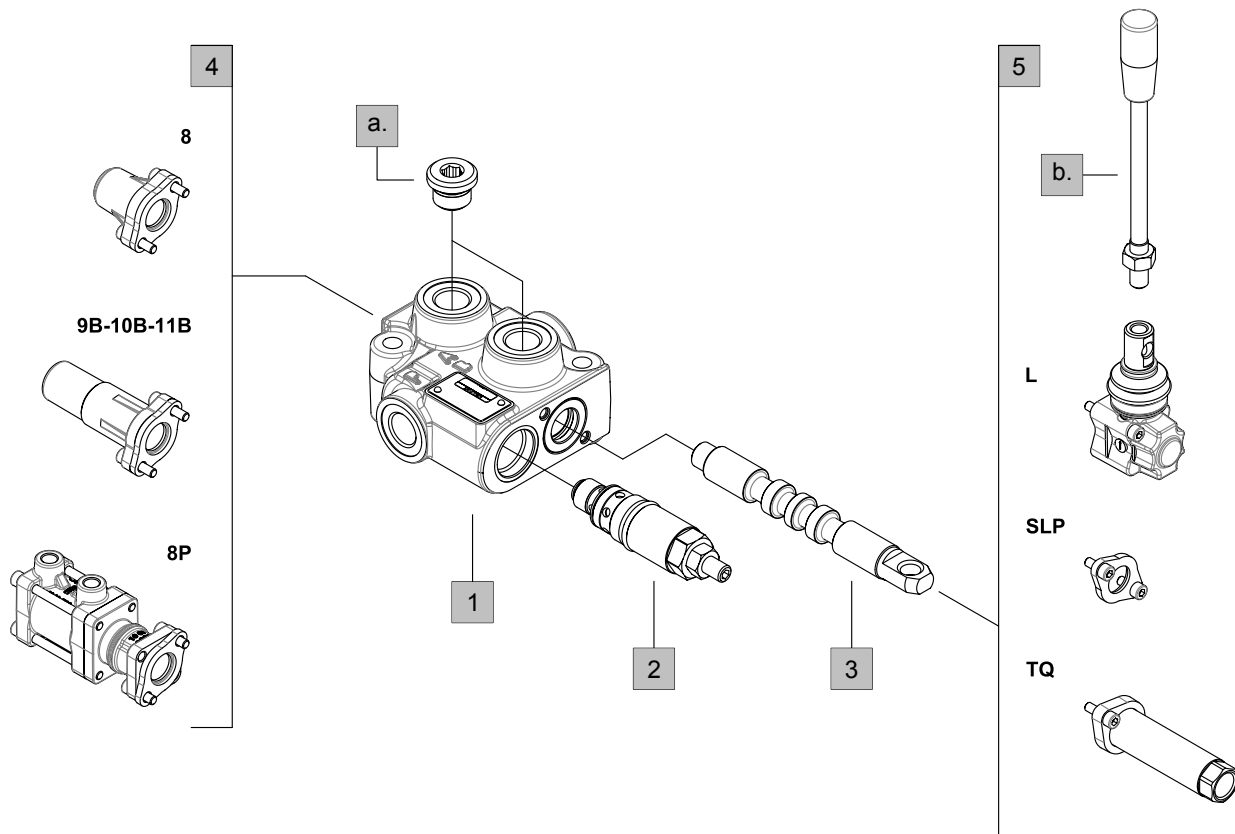
### Ordering codes

#### Description example:

45L FW08 / 1 ( X - 100 ) / 1CP 8 L

1 2      3 4 5

↑  
Valve setting (bar)



### 1. Body kits \*

TYPE	CODE	DESCRIPTION
1	30 08 9108	1 section

*Include body, seals, rings and load check valve.*

### 2. Inlet relief options page 9

TYPE	CODE	DESCRIPTION
<b>Direct pressure relief valve X type (standard)</b>		
(X-100)	30 05 4917	Range 20-315 bar (290-4600 psi) standard setting 100 bar (1450 psi)
Standard setting is referred to 6 l/min flow.		
V	30 05 5004	Relief valve blanking plug

### 3. Spools page 10

TYPE	CODE	DESCRIPTION
1CP	30 01 3534	Double acting, 3 positions, with A and B closed in neutral position
2	30 01 3536	Double acting, 3 positions, with A and B to tank in neutral position
3	30 01 3543	Single acting on A, 3 positions, B plugged; requires G3/8 plug (see part a)
4	30 01 3544	Single acting on B, 3 positions, A plugged; requires G3/8 plug (see part a)
6	30 01 3535	Double acting, 3 positions, closed center
7	30 01 3542	Double acting, 3 positions, closed center with A and B to tank in neutral position
D4	30 01 3537	Double acting, 2 positions, without neutral position

NOTE (\*) – Codes are referred to **BSP** thread.



## Valve general information

### Ordering codes

#### 4. "A" side spool positioners page 11

TYPE	CODE	DESCRIPTION
<b>8</b>	30 07 5427	With spring return in neutral position
<b>8D</b>	30 07 5449	As type 8, M6 female threaded pin extension for dual control
<b>8D2</b>	30 07 5450	As type 8, M8 male threaded pin extension for dual control
<b>8T</b>	30 07 7513	With spring return in neutral position, for single acting spool type 3 and 4
<b>8TL</b>	-	As type 8, for flexible cable control
<b>8F2</b>	30 07 5444	As type 8 with adjustable stroke limiter
<b>19</b>	30 07 5471	With spring return in position 0 from 1
<b>20</b>	30 07 5472	With spring return in position 0 from 2
<b>11</b>	30 07 5445	Detent in positions neutral, 1 and 2
<b>12</b>	30 07 5446	Detent in positions 1 and 2
<b>15</b>	30 07 5447	2 positions, detent in positions 1 and neutral
<b>16</b>	30 07 5448	2 positions, detent in positions 2 and neutral
<b>17</b>	30 07 5467	With spring return position 1
<b>18</b>	30 07 5468	With spring return position 2
<b>17D</b>	30 07 5469	With spring return position 1 and pin with M6 female thread for dual control
<b>18D</b>	30 07 5470	With spring return position 2 and pin with M6 female thread for dual control
<b>9B</b>	30 07 5451	With detent in position 1 and spring return in neutral position
<b>10B</b>	30 07 5452	With detent in position 2 and spring return in neutral position
<b>11B</b>	30 07 5453	Detent in positions 1 and 2 and spring return in neutral position
<b>8MG3(NO)</b>	30 07 5455	As type 8, operation with microswitch (NO) in positions 1 and 2
<b>8P</b>	30 07 5463	ON/OFF pneumatic kit
<b>8EP3</b>	30 07 5473	12 VDC ON/OFF electro-pneumatic kit
	30 07 5464	24 VDC ON/OFF electro-pneumatic kit
<b>8EP4</b>	-	12 VDC ON/OFF electro-pneumatic kit with manifold
	-	24 VDC ON/OFF electro-pneumatic kit with manifold

#### 5. "B" side options page 18

TYPE	CODE	DESCRIPTION
<b>L</b>	30 07 5335	Standard lever box
<b>LF1</b>	30 07 5337	Lever box with spool stroke limiter in position 1
<b>SL</b>	-	Without lever box
<b>SLP</b>	30 07 5338	Without lever box, with dust-proof plate
<b>TQ</b>	30 07 5328	Flexible cable connection; for CT cables
<b>LEB</b>	30 07 5340	Safety lever box, vertical configuration
<b>LUP</b>	30 07 5341	Safety lever box, horizontal configuration
<b>SLCZ</b>	30 07 7621	Without lever box, with endcap.

#### 6. Complete controls page 21

TYPE	CODE	DESCRIPTION
		Rotative control type <b>R</b> and ON/OFF solenoid controls type <b>8ES</b>

#### a. "A" and "B" ports plugs

TYPE	CODE	DESCRIPTION
<b>G3/8</b>	30 05 4918	For single acting spools type 3 and 4

#### b. Optional handlevers

TYPE	CODE	DESCRIPTION
<b>M10x180</b>	20 03 2380	Lenght L = 180mm / 7.09in

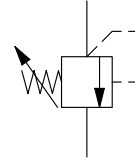
NOTE (\*) – Codes are referred to **BSP** thread.

## Inlet relief options

### Direct pressure relief valve

30 05 4917 ( **X - 100** )

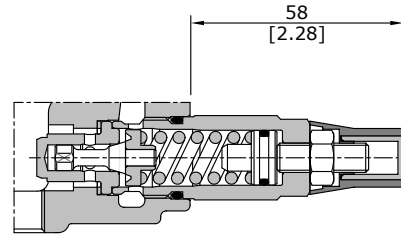
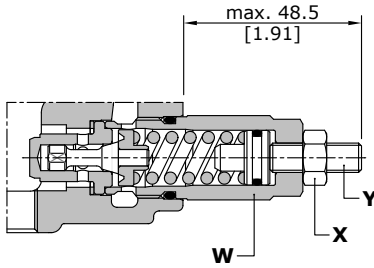
Configuration ——— Valve setting (bar)



### Adjustment type

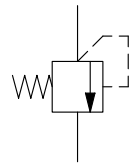
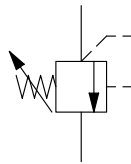
Configuration **X** type: adjustable with screw

Configuration **XH** type: valve set and locked



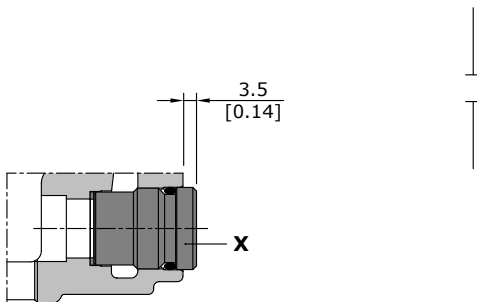
#### Wrenches and tightening torques

- X = wrench 13 - 24 Nm (17.7 lbf<sup>t</sup>)
- Y = allen wrench 4
- W = wrench 19 - 42 Nm (31 lbf<sup>t</sup>)



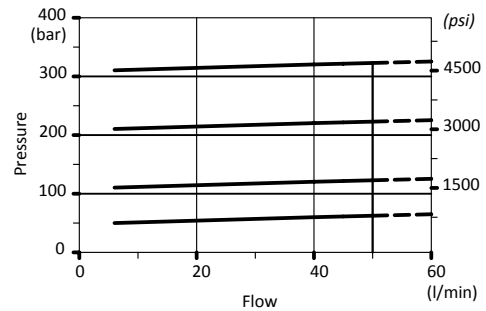
### V: relief valve blanking plug

### Performance data



#### Wrenches and tightening torques

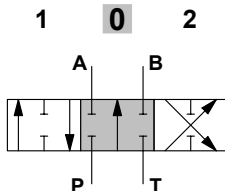
- X = allen wrench 8 - 42 Nm (31 lbf<sup>t</sup>)



## Spools options

### 1CP, ED-1CP (30 01 3534) spool type

Double acting, 3 positions, with A and B closed in neutral position

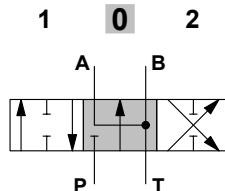


**Spool stroke**

position 1: + 6 mm (+ 0.24 in)  
position 2: - 6 mm (- 0.24 in)

### 2, ED-2 (30 01 3536) spool type

Double acting, 3 positions, with A and B open to tank in neutral position

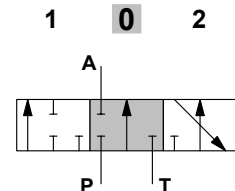


**Spool stroke**

position 1: + 6 mm (+ 0.24 in)  
position 2: - 6 mm (- 0.24 in)

### 3, ED-3 (30 01 3543) spool type

Single acting on A, 3 positions, B plugged; requires G3/8 plug

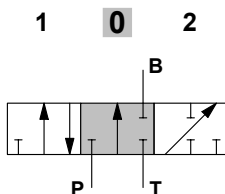


**Spool stroke**

position 1: + 4.2 mm (+ 0.17 in)  
position 2: - 4.2 mm (- 0.17 in)

### 4, ED-4 (30 01 3544) spool type

Single acting on B, 3 positions, A plugged; requires G3/8 plug

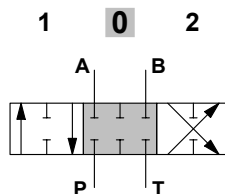


**Spool stroke**

position 1: + 4.2 mm (+ 0.17 in)  
position 2: - 4.2 mm (- 0.17 in)

### 6, ED-6 (30 01 3535) spool type

Double acting, 3 positions, closed center

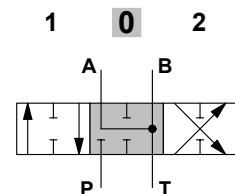


**Spool stroke**

position 1: + 6 mm (+ 0.24 in)  
position 2: - 6 mm (- 0.24 in)

### 7, ED-7 (30 01 3542) spool type

Double acting, 3 positions, closed center with A and B to tank in neutral position

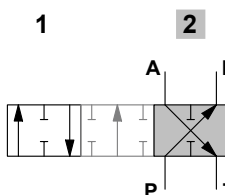


**Spool stroke**

position 1: + 6 mm (+ 0.24 in)  
position 2: - 6 mm (- 0.24 in)

### D4 (30 01 3537) spool type

Double acting, 2 positions, without neutral position



**Spool stroke**

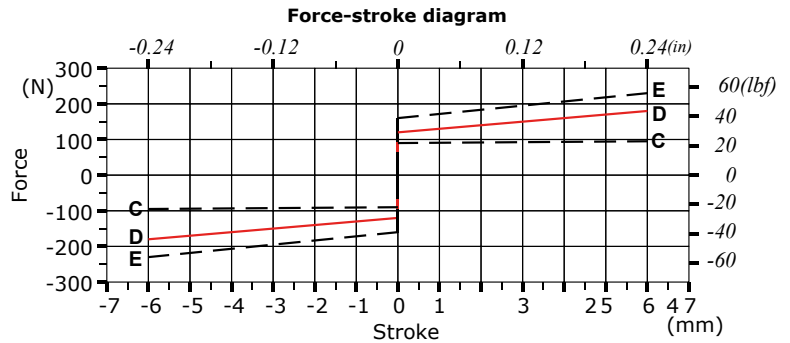
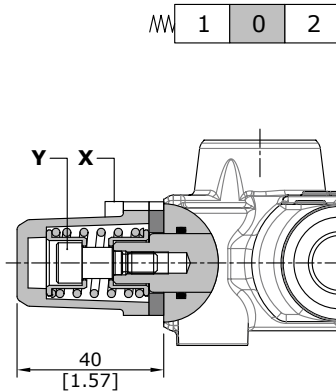
position 1: + 12 mm (+ 0.48 in)

## "A" side spool positioners

### With spring return in neutral position

#### 8 type (30 07 5427)

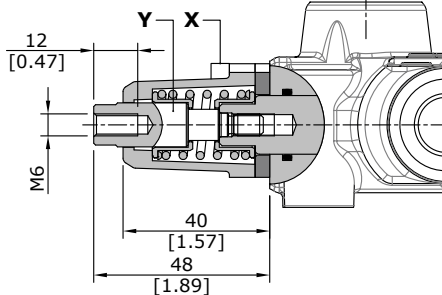
It's supplied with standard spring type D (see force-stroke diagram) and available with lighter spring type C (**8MC**) or heavier type E (**8ME**).



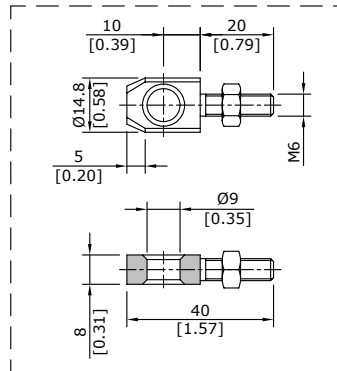
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = allen wrench 6 - 9 Nm (6.6 lbft)

#### 8D type (30 07 5449)

With M6 female threaded pin extension for dual control.



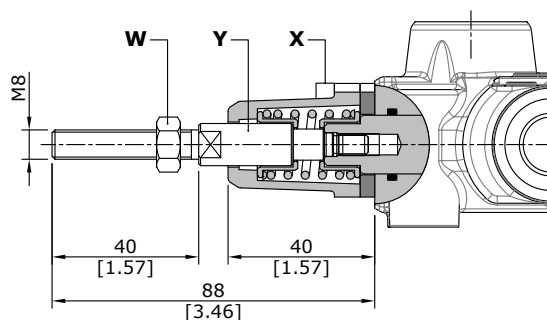
#### Spool end joint dimensions (optional)



**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = wrench 10 - 9 Nm (6.6 lbft)

#### 8D2 type (30 07 5450)

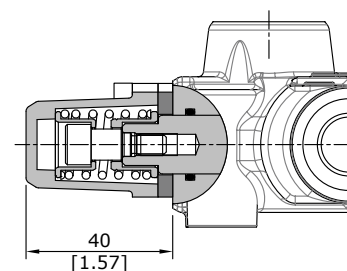
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = wrench 9 - 9 Nm (6.6 lbft)  
 W = wrench 13 - 24 Nm (17.7 lbft)



#### 8T type (30 07 7513)

For single acting spool type 3 and 4

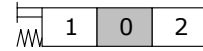
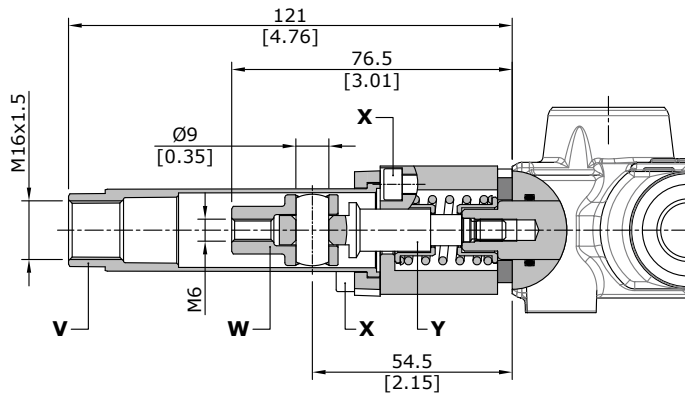
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = allen wrench 6 - 9 Nm (6.6 lbft)



## "A" side spool positioners

### With spring return in neutral position

#### 8TL type



#### Wrenches and tightening torques

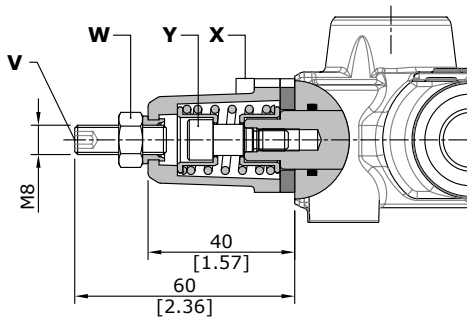
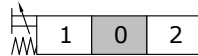
- X = allen wrench 4 - 6 Nm (4.4 lbft)
- Y = wrench 8 - 9 Nm (6.6 lbft)
- W = wrench 13
- V = wrench 20

#### 8F2 type (30 07 5444)

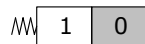
With spool stroke adjustment in position 2 (P→B)

#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbft)
- Y = allen wrench 6 - 9 Nm (6.6 lbft)
- W = wrench 13 - 24 Nm (17.7 lbft)
- V = allen wrench 4

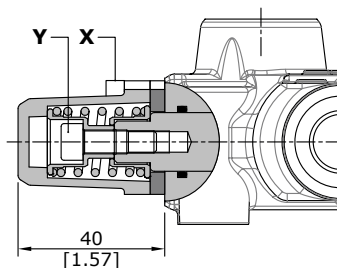


#### 19 type (30 07 5471)



#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbft)
- Y = allen wrench 5 - 9 Nm (6.6 lbft)

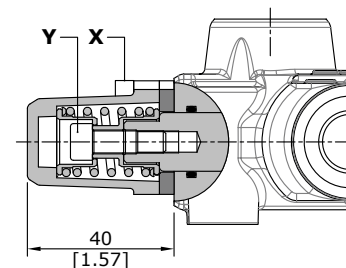


#### 20 type (30 07 5472)



#### Wrenches and tightening torques

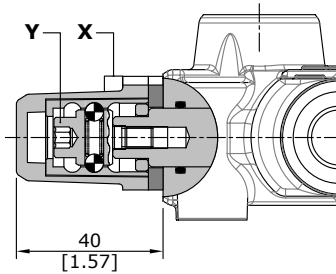
- X = allen wrench 4 - 6 Nm (4.4 lbft)
- Y = allen wrench 5 - 9 Nm (6.6 lbft)



## "A" side spool positioners

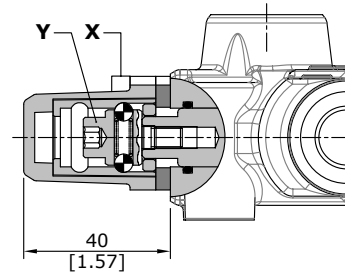
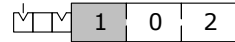
### With detent

#### 11 type (30 07 5445)



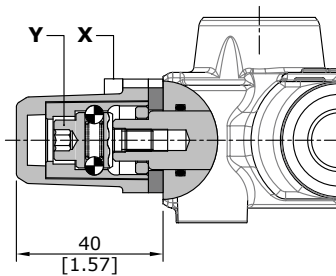
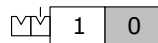
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)  
 Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)

#### 12 type (30 07 5446)



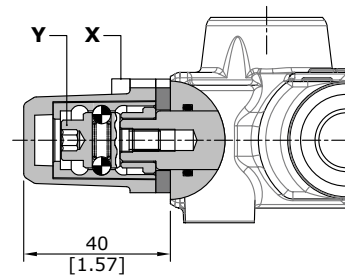
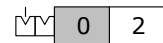
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)  
 Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)

#### 15 type (30 07 5447)



**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)  
 Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)

#### 16 type (30 07 5448)

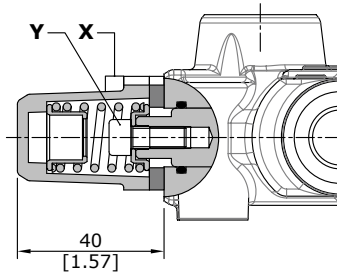


**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)  
 Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)

## "A" side spool positioners

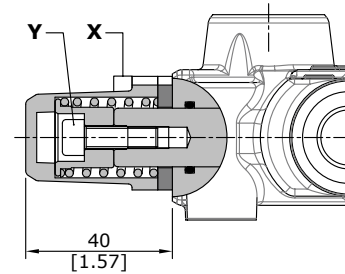
### With spring return

#### 17 type (30 07 5467)



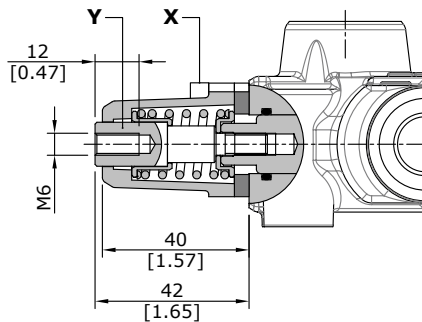
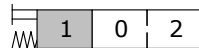
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = allen wrench 5 - 9 Nm (6.6 lbft)

#### 18 type (30 07 5468)



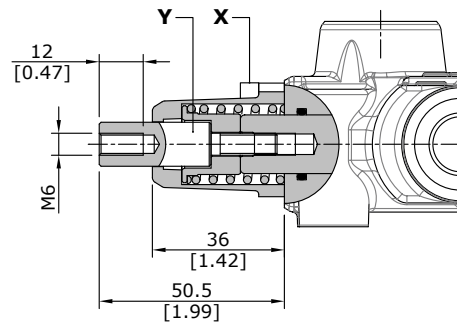
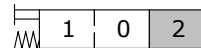
**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = allen wrench 5 - 9 Nm (6.6 lbft)

#### 17D type (30 07 5469)



**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = wrench 11 - 9 Nm (6.6 lbft)

#### 18D type (30 07 5470)

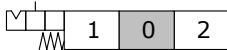


**Wrenches and tightening torques**  
 X = allen wrench 4 - 6 Nm (4.4 lbft)  
 Y = wrench 11 - 9 Nm (6.6 lbft)

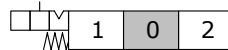
## "A" side spool positioners

With detent and spring return to neutral position from either directions

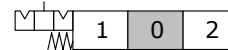
**9B type (30 07 5451)**  
detent in position 1  
(curve A)



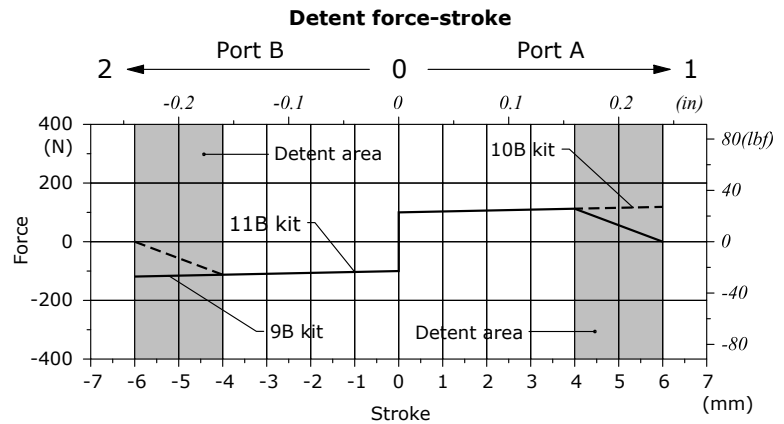
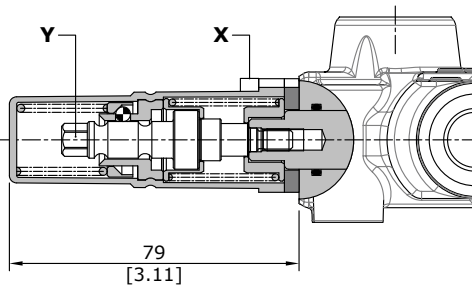
**10B type (30 07 5452)**  
detent in position 2  
(curve B)



**11B type (30 07 5453)**  
detent in position 1 and 2  
(curves A and B)



**11B type**



**Wrenches and tightening torques**

X = allen wrench 4 - 6 Nm (4.4 lbf)  
Y = wrench 8 - 9 Nm (6.6 lbf)

**Position 1** - Detent force: 120 N (27 lbf) ± 10% / Release force: 230 N (51.7 lbf) ± 10%  
**Position 2** - Detent force: 120 N (27 lbf) ± 10% / Release force: 230 N (51.7 lbf) ± 10%

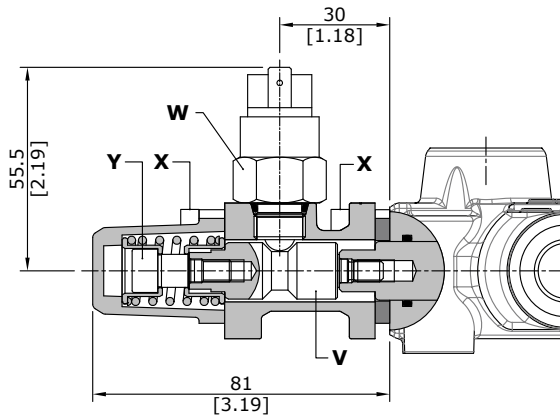


## "A" side spool positioners

### With microswitch

#### 8MG3(NO) type (30 07 5455)

With spring return in neutral position and microswitch operated in both directions.  
 Also available **8MG1(NO)** (microswitch operated in position 1) and **8MG2(NO)** (microswitch operated in position 2) configurations; dimension are the same of **8MG3(NO)** configuration.  
 Same configurations are available with normally closed (NC) contact.  
 For more information contact Sales Department.



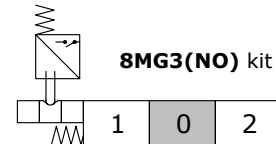
#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)
- Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)
- W = wrench 22 - 42 Nm (31 lbf<sub>t</sub>)
- V = wrench 10 - 9.8 Nm (7.2 lbf<sub>t</sub>)

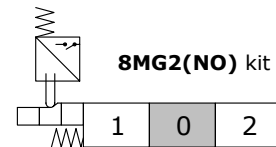
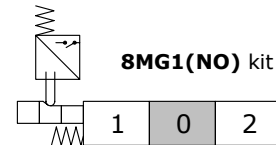
#### Operating features

##### MICROSWITCH

- Mechanical life : 5x10<sup>5</sup> operations
- Electrical life (resistive load) : 5x10<sup>4</sup> operations 10A / 12VDC
- : 5x10<sup>4</sup> operations 3A / 24VDC

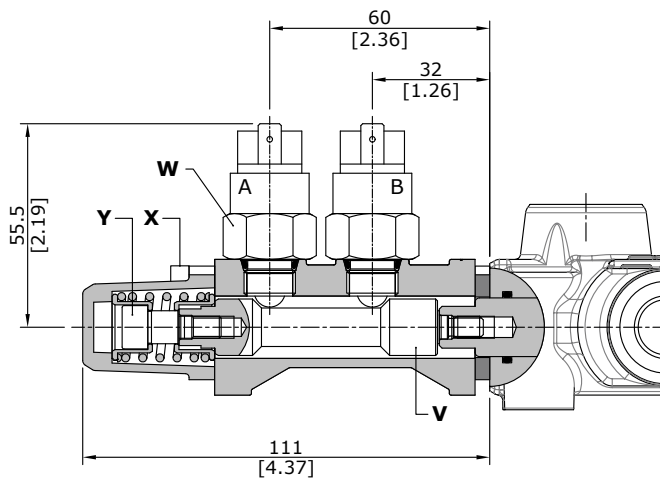


#### Other configurations



#### 8MG1\MG2(NC\NC) type (30 07 5462)

With double microswitch in position 1 and 2.



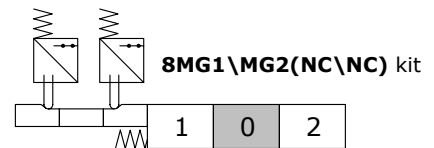
#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)
- Y = allen wrench 6 - 9 Nm (6.6 lbf<sub>t</sub>)
- W = wrench 22 - 42 Nm (31 lbf<sub>t</sub>)
- V = wrench 10 - 9.8 Nm (7.2 lbf<sub>t</sub>)

#### Operating features

##### MICROSWITCH

- Mechanical life : 5x10<sup>5</sup> operations
- Electrical life (resistive load) : 5x10<sup>4</sup> operations 10A / 12VDC
- : 5x10<sup>4</sup> operations 3A / 24VDC



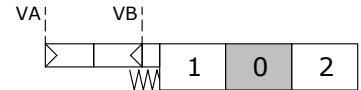
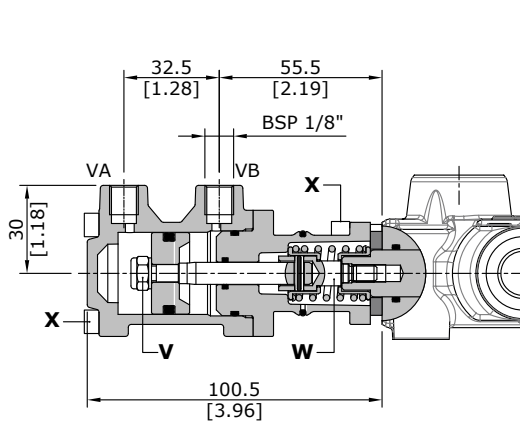
Positions	A	B
1		
0		
2		

## "A" side spool positioners

### ON/OFF pneumatic kit

#### ON/OFF pneumatic: 8P type (30 07 5463)

With spring return to neutral position.



#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbft)
- W = wrench 10 - 9 Nm (6.6 lbft)
- V = wrench 10 - 9 Nm (6.6 lbft)

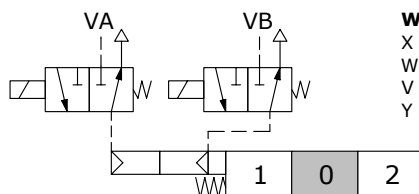
#### Common features

Pilot pressure.....: min. 5.5 bar (min. 80 psi)  
: max. 10 bar (min. 145 psi)

### ON/OFF electro-pneumatic kit

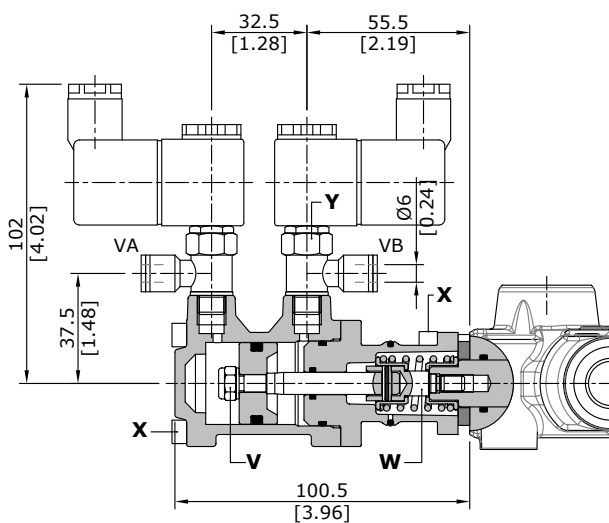
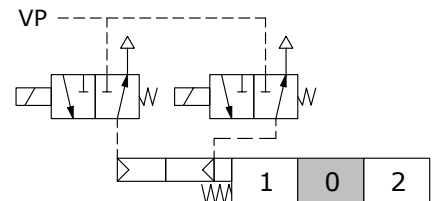
#### Electro-pneumatic: 8EP3 type

With spring return to neutral position.



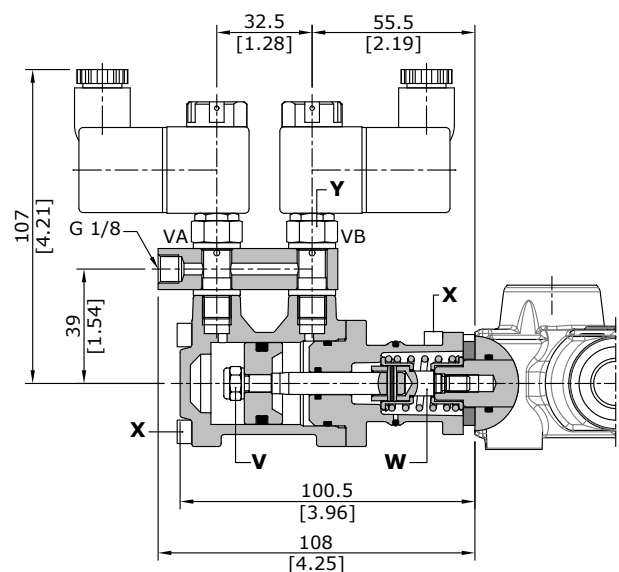
#### Wrenches and tightening torques

- X = allen wrench 4 - 6 Nm (4.4 lbft)
- W = wrench 10 - 9 Nm (6.6 lbft)
- V = wrench 10 - 9 Nm (6.6 lbft)
- Y = wrench 15 - 6 Nm (4.4 lbft)



#### Common features

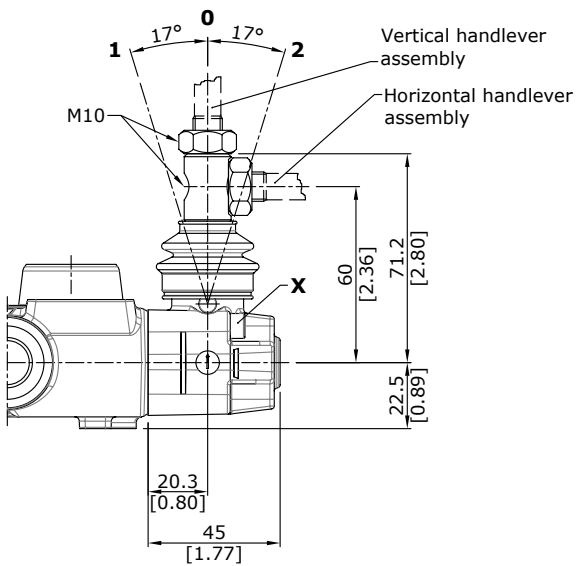
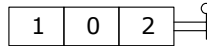
Pilot pressure.....: min. 5.5 bar (min. 80 psi)  
: max. 10 bar (min. 145 psi)



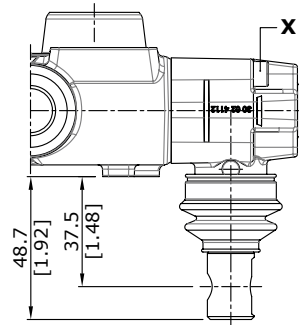
## Lever control

### L type (30 07 5335)

Alluminium lever pivot box with protective rubber bellow; it can be roated 180° (configuration **L180**).



configuration L180

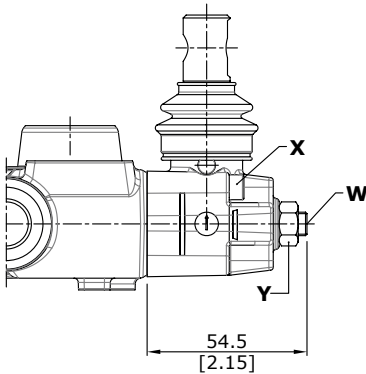
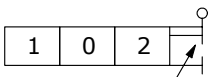


#### Wrenches and tightening torques

X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)

### LF1 type (30 07 5337)

With spool stroke adjustment in position 12 (P A). It can be roated 180° (configuration **LF1180**).



#### Wrenches and tightening torques

X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)

Y = wrench 13 - 24 Nm (17.7 lbf<sub>t</sub>)

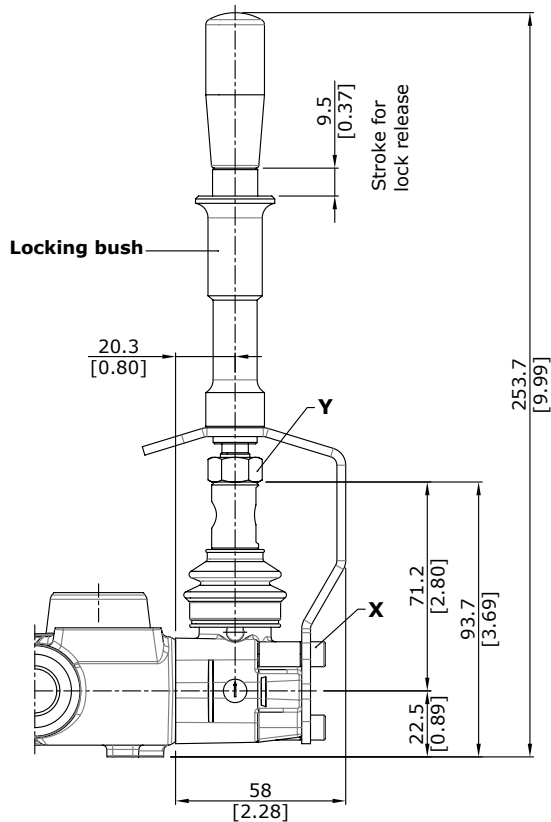
W = allen wrench 4

## "B" side options

### Lever control

#### Safety lever LEB type (30 07 5340)

Safety levers with lock in neutral complete with handlever; lift handlever knob to operate.



#### Wrenches and tightening torques

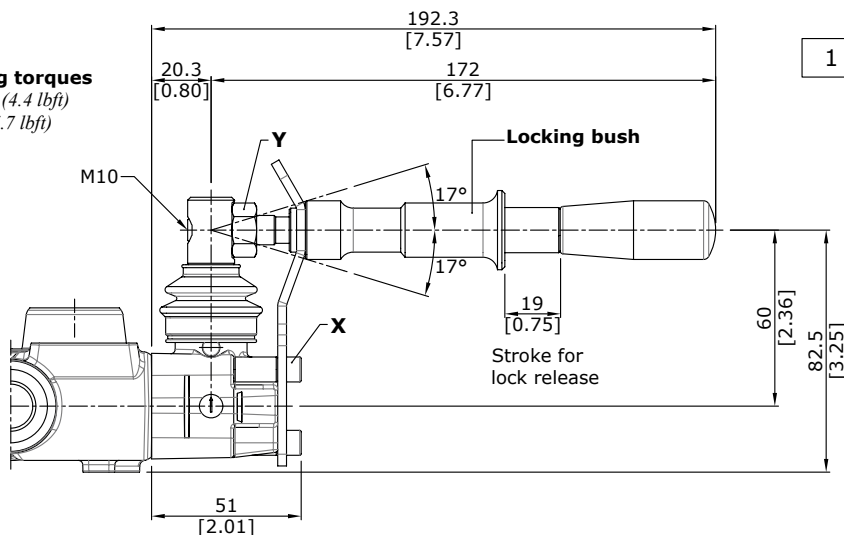
X = allen wrench 4 - 6 Nm (4.4 lbft)  
Y = wrench 17 - 24 Nm (17.7 lbft)

#### Safety lever LUP type (30 07 5341)

Available as **LUP** configuration

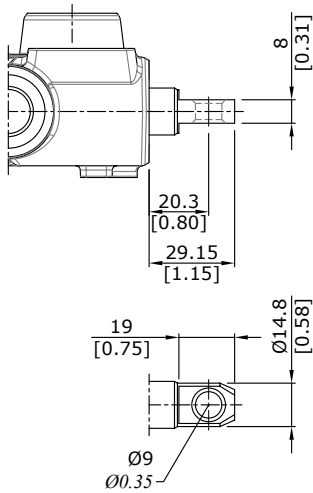
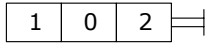
#### Wrenches and tightening torques

X = allen wrench 4 - 6 Nm (4.4 lbft)  
Y = wrench 17 - 24 Nm (17.7 lbft)



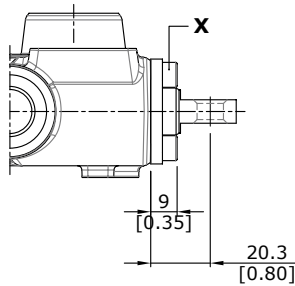
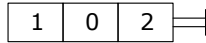
## "B" side options

### SL type



### SLP type (30 07 5338)

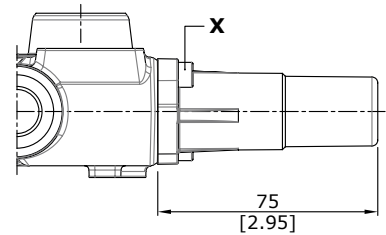
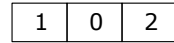
Mechanical control with dust-proof plate kit.



**Wrenches and tightening torques**  
X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)

### SLCZ type (30 07 7621)

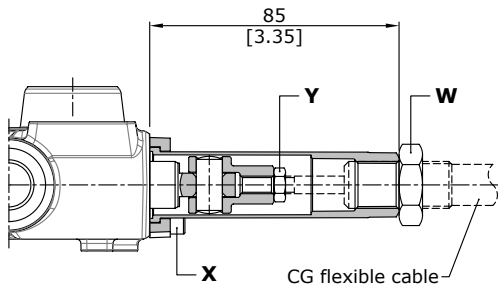
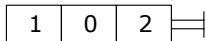
Protection cap usable with pneumatic, electropneumatic, and electrohydraulic spool positioners.



**Wrenches and tightening torques**  
X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)

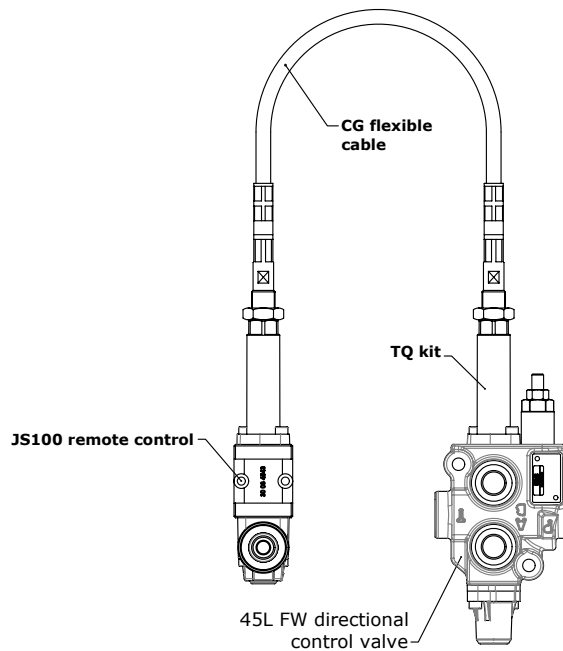
### TQ cable remote control kit (30 07 5328)

Prearranged for remote control with flexible cable.



**Wrenches and tightening torques**  
X = allen wrench 4 - 6 Nm (4.4 lbf<sub>t</sub>)  
Y = wrench 10 - 9.8 Nm (7.2 lbf<sub>t</sub>)  
W = wrench 24 - 24 Nm (17.7 lbf<sub>t</sub>)

### Example of cable control

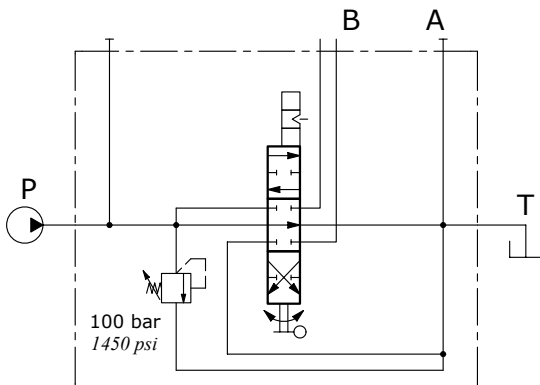
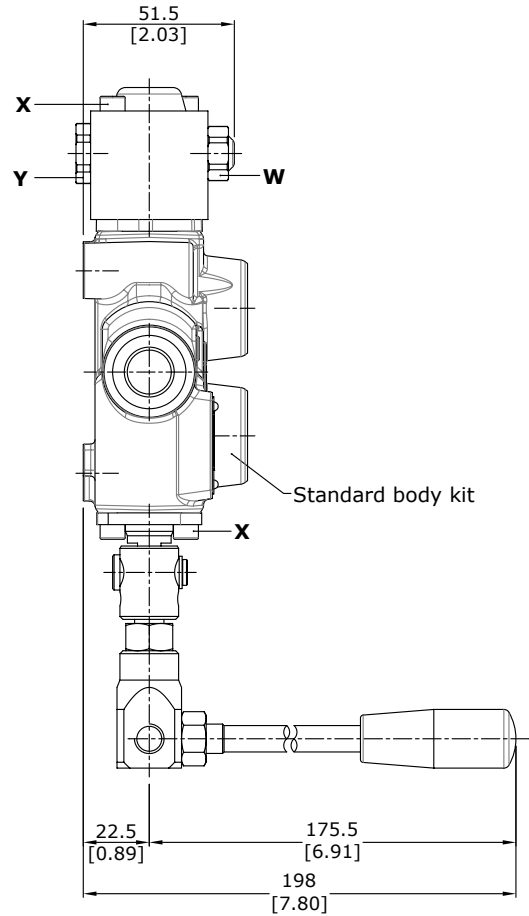
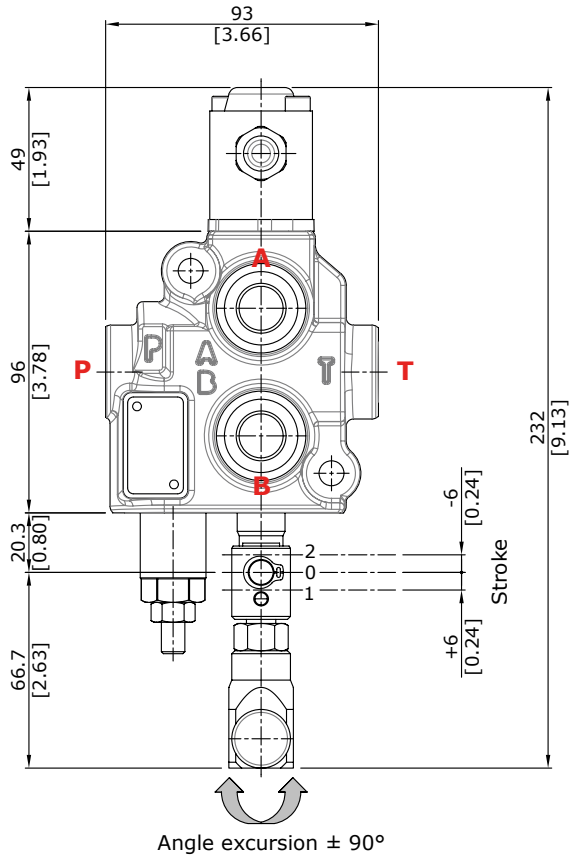


NOTE : For further information about remote cable control, require related documentation.

## Special configurations

### Directional valve with rotary control kit

#### R type (30 07 5595)



**Description example**  
45L FW08/1(X-100)/1CP R SLP

#### Wrenches and tightening torques

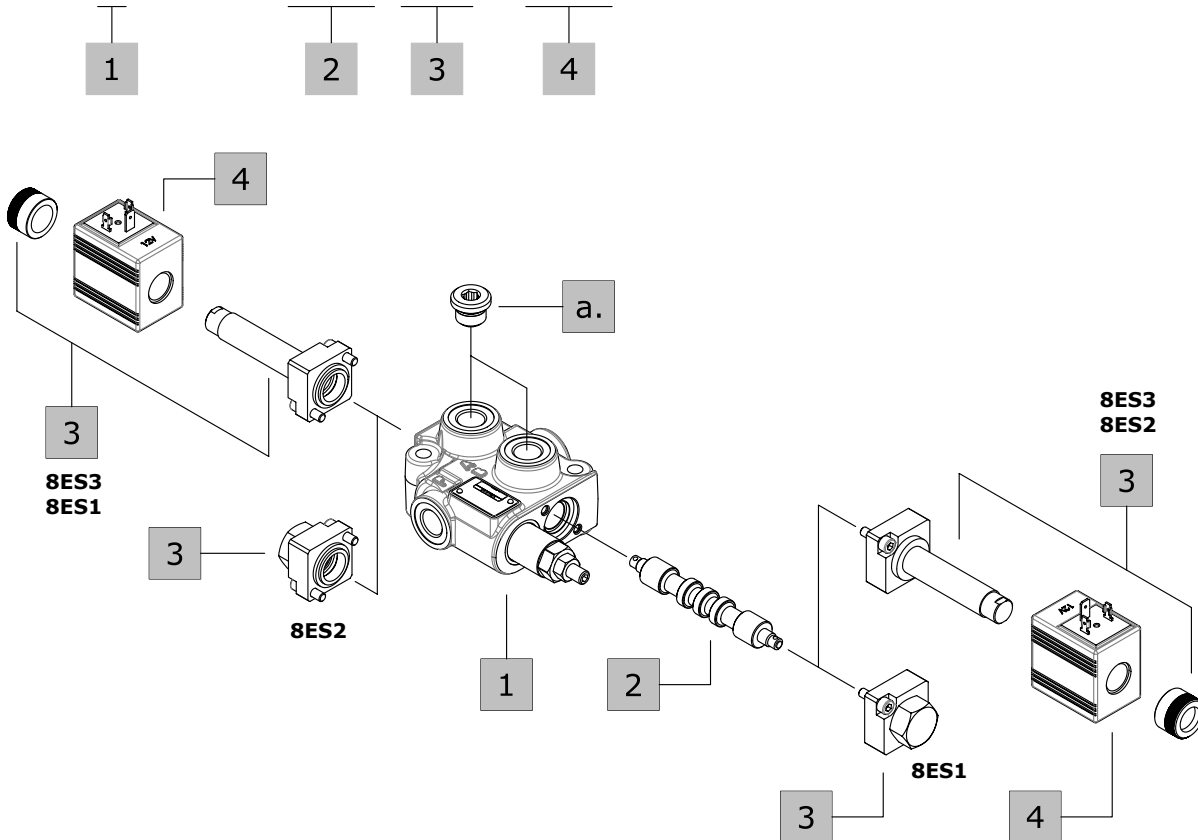
- X = allen wrench 4 - 6 Nm (4.4 lbft)
- Y = wrench 19 - 9.8 Nm (7.23 lbft)
- W = wrench 17 - 9.8 Nm (7.23 lbft)

### 8ES solenoid control

Solenoid direct control with spring return to neutral position; it needs special spools and standard body (body kit without seals on spool).

### Description example:

45L FW08 / 1 (X-100) / 1N(ES) 8ES3 - 12VDC



#### 1. Body kit \*

TYPE	CODE	DESCRIPTION
1	30 08 9109	1 section

Include body, seals and rings.

#### 2. Spools

TYPE	CODE	DESCRIPTION
1N(ES)	30 01 3664	Double acting, 3 positions, with A and B closed in neutral position
2(ES)	30 01 3665	Double acting, 3 positions, with A and B open to tank in neutral position

#### 3. Control kit

TYPE	CODE	DESCRIPTION
8ES1	30 07 5474	P→A, with spring return to neutral position
8ES2	30 07 5474	P→B, with spring return to neutral position
8ES3	30 07 5475	Double acting with spring return to neutral position

#### 4. Coils

TYPE	CODE	DESCRIPTION
12VDC	20 03 2295	Nominal voltage 12VDC
24VDC	20 03 2296	Nominal voltage 24VDC

#### a. "A" and "B" ports plugs

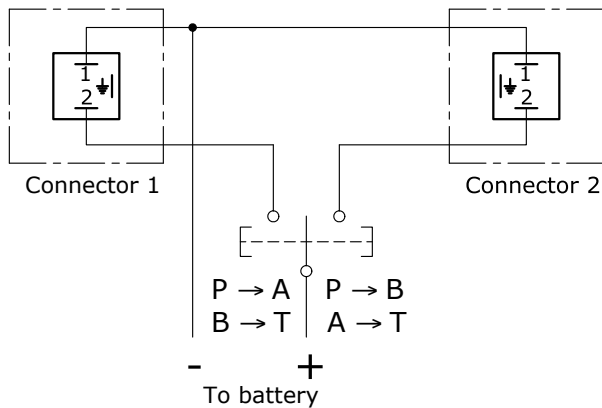
TYPE	CODE	DESCRIPTION
G3/8	30 05 4918	For single acting controls type 8ES1 and 8ES2

NOTE (\*) – Codes are referred to **BSP** thread.

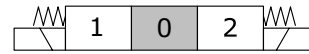
## Complete controls

### 8ES solenoid control

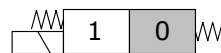
Electric wiring example



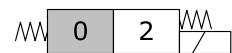
8ES3 kit  
double acting



8ES1 kit  
single acting on A



8ES2 kit  
single acting on B



### Operating features

#### CONTROL

Internal leakage A(B) → T

( $\Delta p = 100 \text{ bar} - 1450 \text{ psi} / T = 40^\circ\text{C}$ ) : max.  $15 \text{ cm}^3/\text{min} - 0.91 \text{ in}^3/\text{min}$

#### COIL

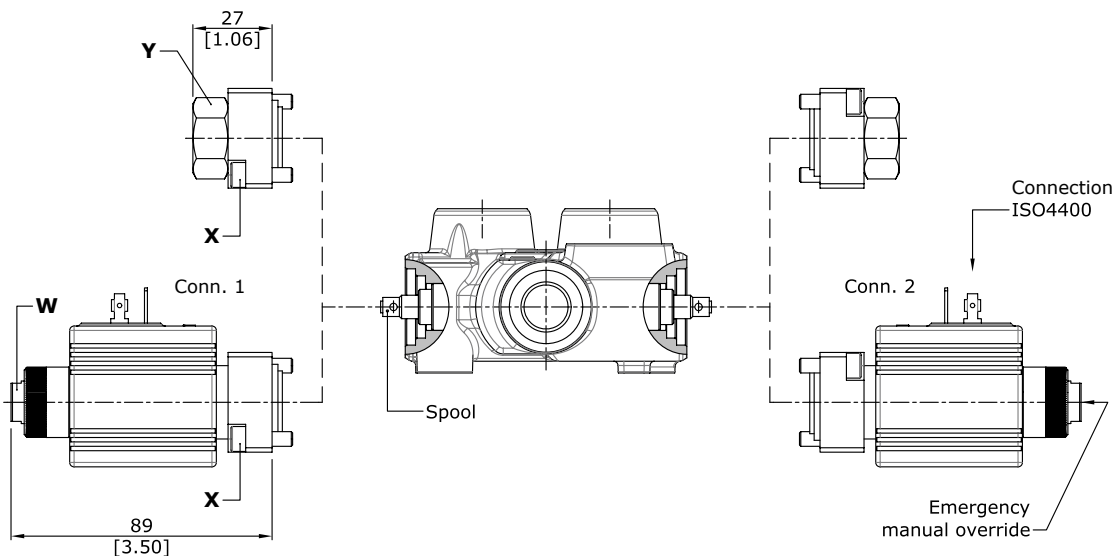
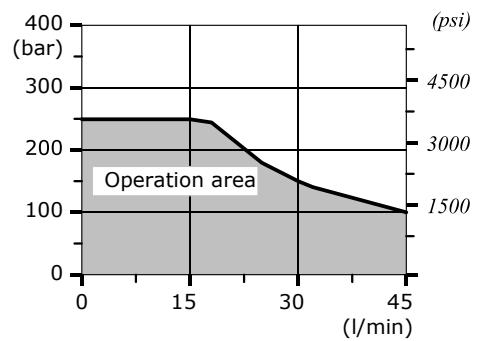
Nominal voltage tolerance..... :  $\pm 10\%$

Power rating..... : 36 W

Coil insulation..... : class H

Duty cycle..... : 100%

Operating condition diagram



### Wrenches and tightening torques

X = allen wrench 4 - 6 Nm (4.4 lbft)

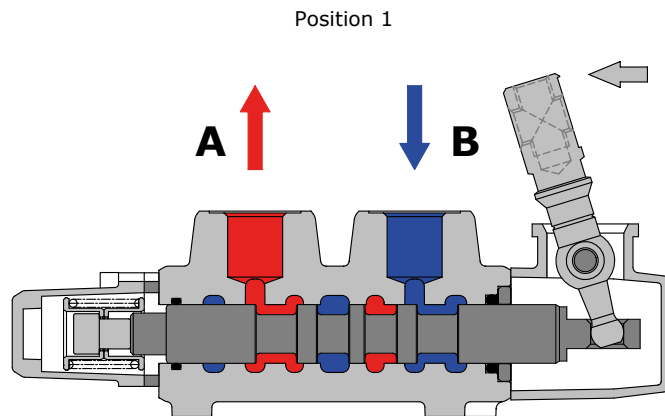
Y = Wrench 24 - 24 Nm (17.7 lbft)

W = Wrench 13 - 24 Nm (17.7 lbft)

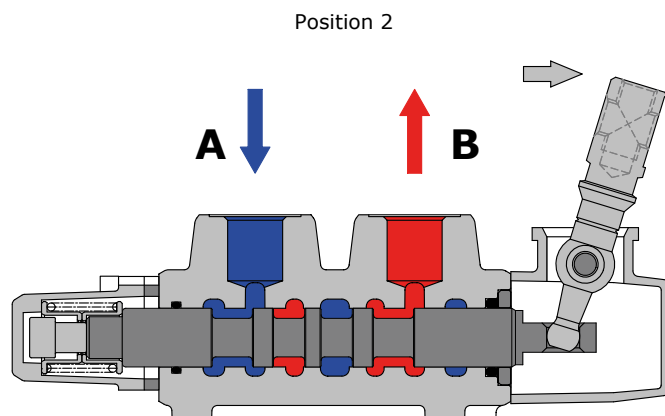


## Sectional drawing

When hand lever pushed (spool out position) P to A port. B to T port.



When hand lever pulled (spool in position) P to B port. A to T port.

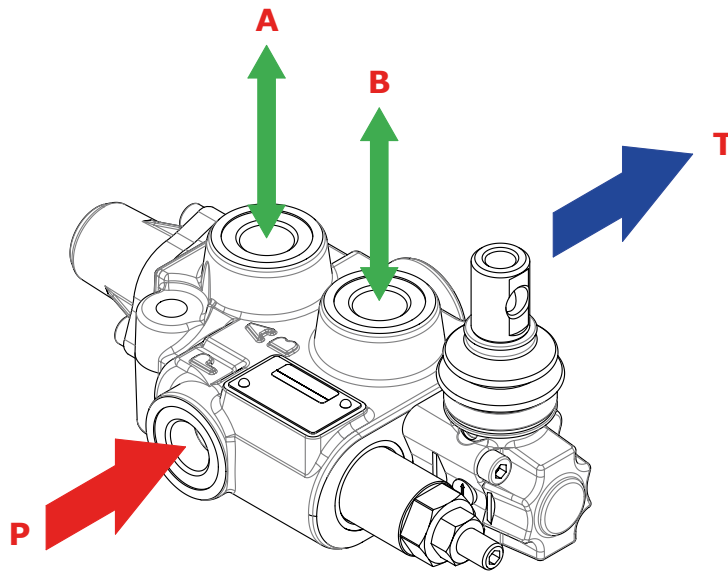


## Installation and maintenance

The 45L FW valve is assembled and tested as per the technical specification of this catalogue.

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

- the valve can be assembled in any position; in order to prevent body deformation and spool sticking mount the product on a flat surface;
- In order to prevent the possibility of water entering the 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.



Fitting tightening torque - Nm ( <i>lbft</i> )			
THREAD TYPE	P port	A,B ports	T port
BSP (ISO 228/1)	G 3/8	G 3/8	G 3/8
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	30 (22.1)	30 (22.1)	30 (22.1)
UN-UNF (ISO 11926-1)	3/4-16 (SAE 8)	9/16-18 (SAE 6)	3/4-16 (SAE 8)
With O-Ring seal	50 (36.9)	30 (22.1)	50 (36.9)
METRIC (ISO 262)	M18x1.5	M18x1.5	M18x1.5
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)

NOTE – These torque are recommended. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer shall be consulted.