

# 180 Series

## Rotary Shear Directional Control Valve

The 180 series of high-pressure aluminium hydraulic rotary shear directional control valves are the ideal solution for control of hydraulic actuators on mobile and industrial applications where internal leakage must be minimised. The valves utilise an optically flat rotary spool with pressure loaded seats, to ensure either zero or near zero leakage. They have excellent tolerance to contaminants.

### Specifications

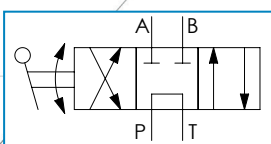
<b>Maximum Rated Pressure:</b>	Up to 700 bar, 10,000 psi
<b>Maximum Rated Flow:</b>	Up to 38 L/min, 10 US gpm
<b>Ambient Temperature:</b>	-20 to 50°C, -4 to 122°F
<b>Media Temperature:</b>	-30 to 120°C, -22 to 248°F
<b>Porting:</b>	BSPP, SAE, NPTF, Manifold Mount
<b>Material:</b>	<b>Body Materials:</b> Aluminium, Phenolic resin knob.
	<b>Internal Materials:</b> Carbon Steel
	<b>Seal:</b> NBR
<b>Weight:</b>	Typically 1.4 kg, 3 lb
<b>Mounting:</b>	<b>Standard:</b> 4 x 5/16" UNC holes to fasten screws into valve base
	<b>Panel:</b> 4 x 5/16" UNC studs to fasten valve into panel
	<b>Manifold:</b> 4 x 5/16" UNC through bolts to fasten valve onto manifold
	4 x M5 through bolts supplied for CETOP3
	4 x #10 UNC through bolts supplied for D03
<b>Maximum Rated Tank Port Pressure:</b>	17 bar, 250 psi

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### Features

- 6 centre conditions.
- 3 position / 2 position.
- Flow throttling capability.
- Zero leakage.
- Spring to centre or detent action.
- Position lock version available. Constructed from zinc plated & stainless steels with technopolymer button or removable key.
- Pressurised tank port with additional drain available.
- Express build available (single unit orders).

**Symbol:**  
e.g 183



## Sales Order Code

Please contact our technical sales team to discuss any special order requirements.

TYPICAL CODE	DESCRIPTION	SEE TABLE	YOUR CODE
180	Valve Model	Table 1	
E	Porting	Table 2	
2	Flow Size	Table 3	
F	Handle Type and Rotor Action	Table 4	
A	Non Standard Options*	Table 5	

\* Only use designator if required.

**Table 1: Valve Model**

CODE	SYMBOL
180* <sup>2</sup>	
181* <sup>2</sup>	
182	
183	
185	
187	
188	

\*<sup>2</sup> Models 180 & 181 are 3 port configurations. Port B plugged.  
Not available with porting codes C, A, M, or U (Table 2).

**Table 2: Porting**

CODE	PORT SIZE
L	9/16" -18UN #6 SAE ORB
E	3/8" NPTF * <sup>3</sup>
T	3/8" BSPP
C	014 O' ring Manifold mount
A	014 O' ring
M	CETOP3 interface Manifold mount
U	D03 interface Manifold mount

\*<sup>3</sup> All NPTF threads are to ANSI B1.20.3 -1976 Class 1. As stated in the standard it is recommended that "sealing is accomplished by the means of a sealant applied to the thread". NPT fittings may also be used to connect to NPTF ports (also with a sealant applied to the thread).

**Table 3: Flow Size**

CODE	MAX. FLOW		MAX. PRESSURE		PRESSURE DROP	THROTTLE CAPABILITY
	L/min	US gpm	bar	psi		
0	15	4	700 * <sup>4</sup>	10,000 * <sup>4</sup>	A	No
1	26.5	7	350	5,000	B	Yes
2	38	10	207	3,000	C	Yes

\*<sup>4</sup> Maximum pressure for valve with port codes M & U is 450 bar (6500 psi).

**Table 4: Handle Type & Rotor Action**

CODE	HANDLE TYPE	ACTION
D	Straight	Detented Action
E	Straight	Spring Centred Action * <sup>5</sup>
F	Bent 18°	Detented Action + Panel Mount * <sup>6</sup>
G	Bent 18°	Spring Centred Action * <sup>5</sup> + Panel Mount * <sup>6</sup>

\*<sup>5</sup> The performance of the spring return on the 15 lpm, 4 US gpm version is compromised above 207 bar, 3000 psi.

\*<sup>6</sup> Panel mount option is not available with port codes C, M, or U (Table 2).

**Table 5: Non Standard Options (see Page 6)**

CODE	FUNCTION (AND ANY COMBINATION OF THESE FEATURES)
A	Tank port pressurised. Additional 1/8" NPTF drain. * <sup>7</sup>
B	8 port version - side ports with additional 4 x bottom ports * <sup>8</sup>
C	2 Position Valve. Centre & right position only
D	2 Position Valve. Centre & left position only
E	18° Bent Handle (for non-panel mount options)
F	Position lock with push button* <sup>9</sup>
G	Position lock with removable key* <sup>9</sup>

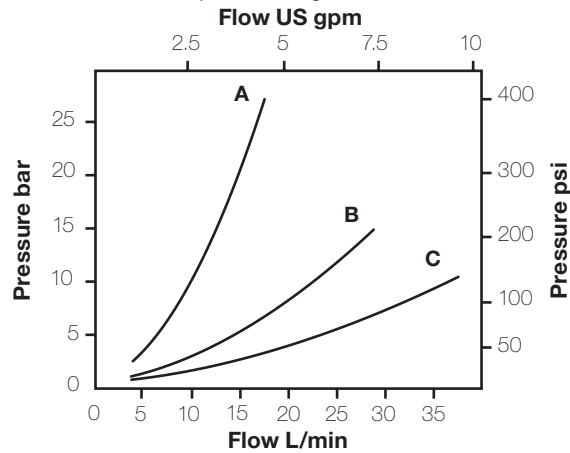
\*<sup>7</sup> Not available with Position Lock version (codes F & G, Table 5) See page 6 for updated hydraulic symbols.

\*<sup>8</sup> Only available with port codes L, E, or T (SAE, NPTF, or BSPP - Table 2).

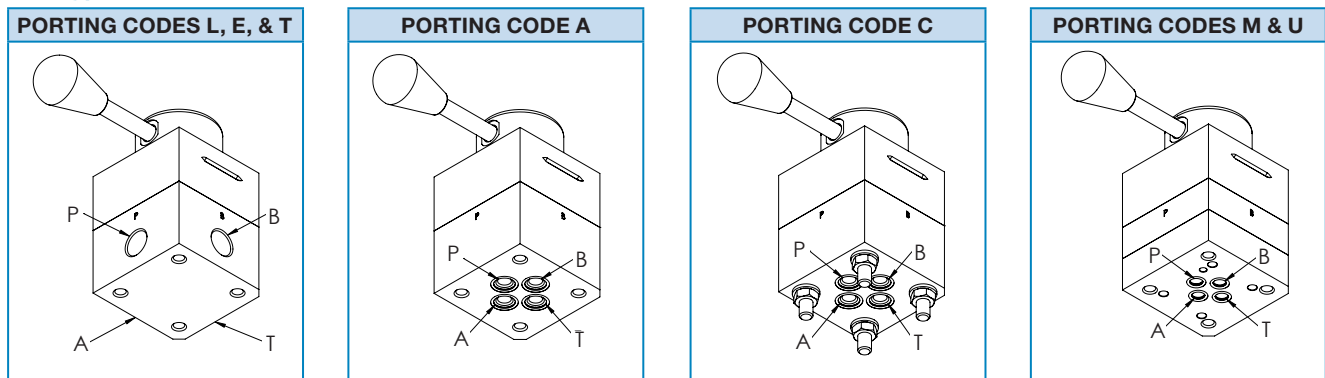
\*<sup>9</sup> Only available with detent action (see Table 4).

### Typical Pressure Drop

All tests completed using ISO32 Mineral oil at 45°C



### Port Type Position



### CETOP3/D03 interface Manifold mount type (M & U, Table 2 of Order Code)

These manifold mount valves have interfaces compatible with CETOP3/D03 standards. The end user should note that the overall width of the valve assembly exceeds that required by the standard.

CETOP3 (M) type is supplied with 4 x M5 steel cap head screws.  
D03 (U) type is supplied with 4 x #10-24UNC steel cap head screws.

Both port types are supplied with 4 x BS ISO 3601, AS568A – 011 NBR O' rings, & with additional instructions.

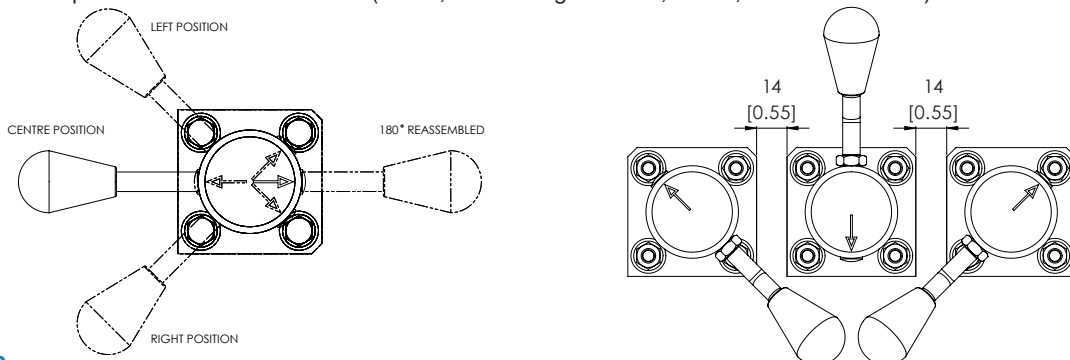
### Leakage between flow paths

Closure tests with low pressure air (82 psi) were conducted on Webtec's 180 Series of rotary directional control valves. Flow size 0 with non-interflow was found to have no visually detectable leakage for the duration of the test (60 seconds). Flow sizes 1 & 2 with interflow were found to have a leakage of  $1.67 \times 10^{-4}$  L/min which equates to less than 1 drop of water every 10 minutes.

Note: The performance of the valve in terms of leakage across paths is adversely affected by a reduction in fluid viscosity.

### Handle Position

The handle can be re-assembled through 180 degrees. This minimizes the pitch between banked valves (16mm, 0.63" straight handle, 14mm, 0.55" bent handle).



### Tank Port Pressure

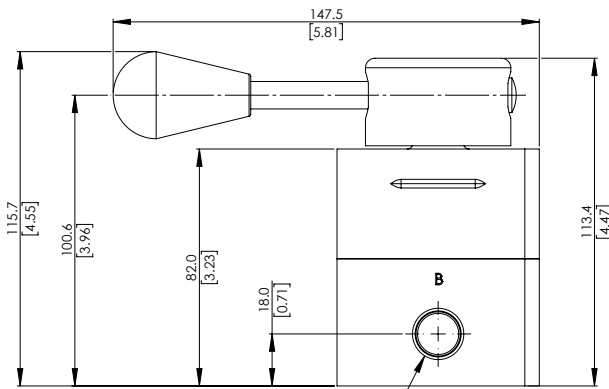
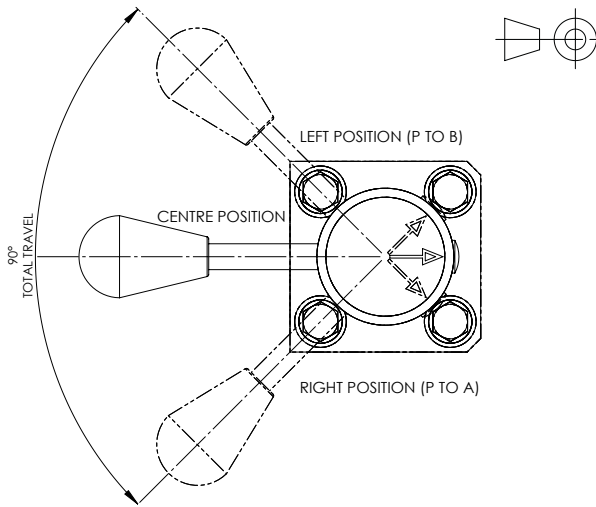
Maximum tank port pressure 17 bar, 250 psi, unless 'Tank port pressurised' option ordered. See table 5, ordering codes.

### Optional Express Build - 7 working-day lead-time

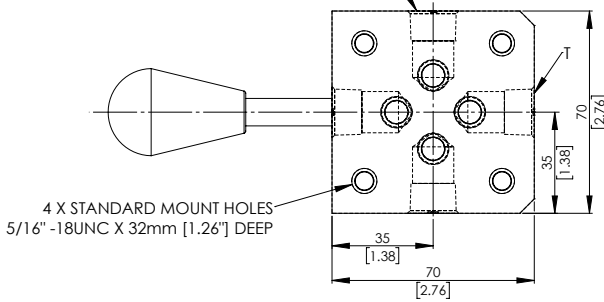
Available on ALL single-unit orders, subject to confirmation at time of order, maximum 7 working days from receipt of order to dispatch, surcharge applies.

## Installation Details Dimensions in millimetres (Inches)

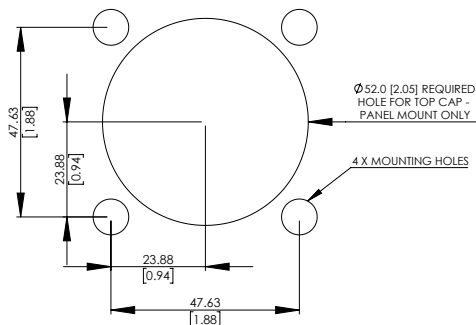
**SAE / NPTF / BSPP (order codes L, E, T)  
with standard mount & straight handle**



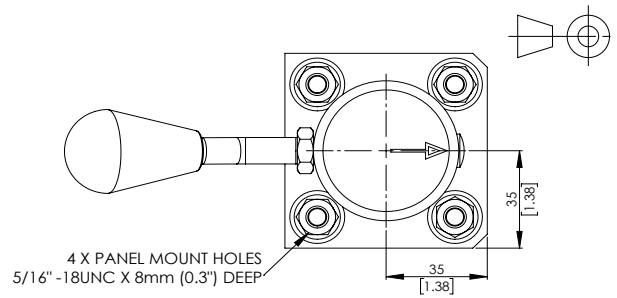
4 X SIDE PORTS (SAE, NPFT, OR BSPP)



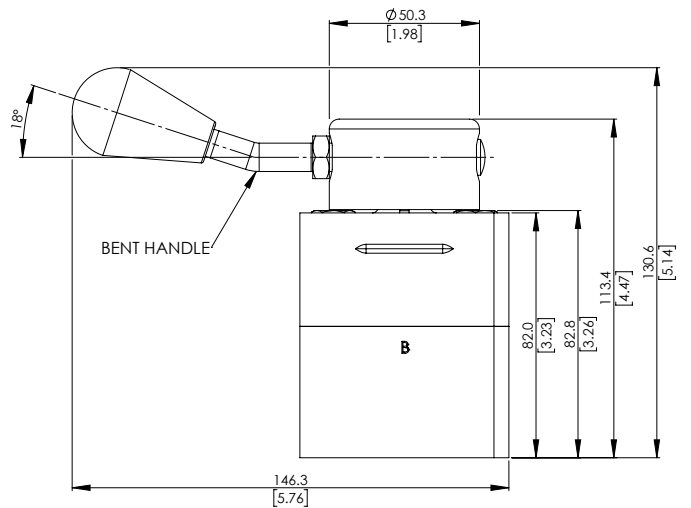
### Standard / Panel Mount Template



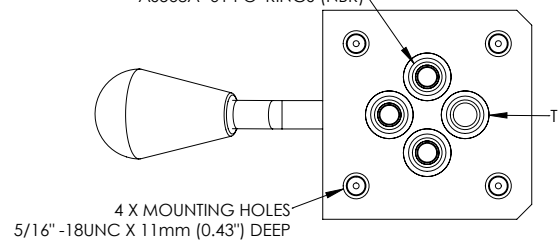
**Ø14 O' ring (order code A)  
with panel mount & bent handle**



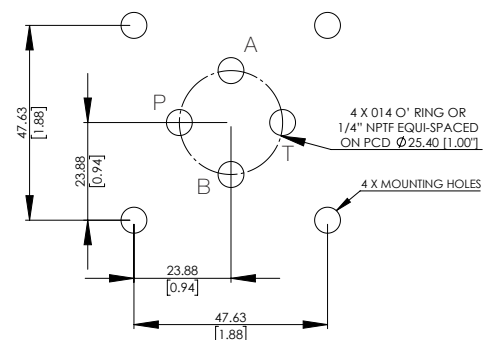
See Standard / Panel mount template



4 X COUNTER BORES SUPPLIED WITH BS ISO3601,  
AS568A -Ø14 O' RINGS (NBR)

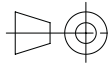


### Ø14 O' ring /1/4" NPTF bottom port Template

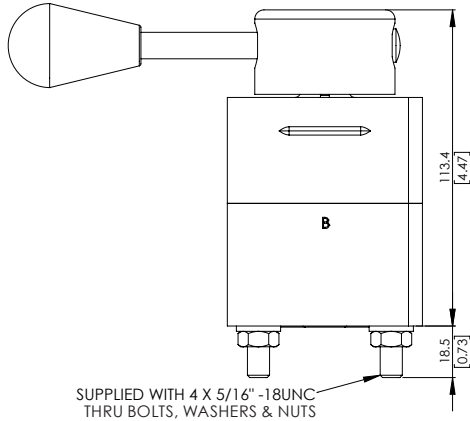


## Installation Details Dimensions in millimetres (Inches)

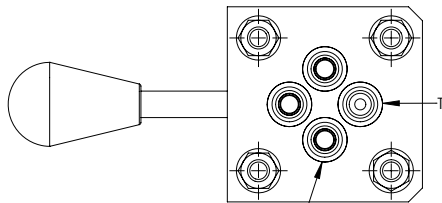
### 014 O' ring Manifold mount (order code C)



Some dismantling & re-assembly is required for installation.  
See 014 O' ring manifold mount installation details below.



SUPPLIED WITH 4 X 5/16" -18UNC  
THRU BOLTS, WASHERS & NUTS



4 X COUNTER BORES SUPPLIED WITH BS ISO3601,  
AS568A -014 O' RINGS (NBR)

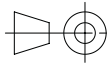
See 014 O' ring template

### 014 O' ring Manifold mount Installation details

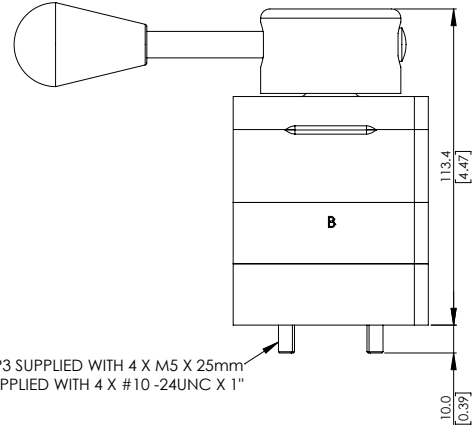
The valve is pre-assembled for test using 4 x 5/16"-18UNC through bolts, with nuts and washers. Some dismantling is required for installation, during which care should be taken not to allow debris to enter the valve. This requires a 13mm (1/2") A/F spanner and 13mm (1/2") hexagon bit.

To ensure correct operation, the valve re-assembly tightening torque to be used is 23Nm, 7lbf

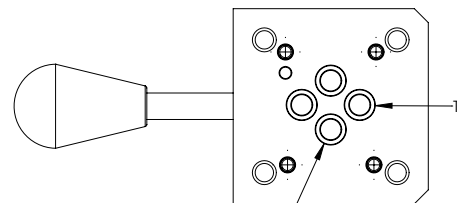
### CETOP3 / D03 interface Manifold mount (order codes M & U)



Some dismantling & re-assembly is required for installation.  
See supplied instruction leaflet



CETOP3 SUPPLIED WITH 4 X M5 X 25mm  
D03 SUPPLIED WITH 4 X #10 -24UNC X 1"

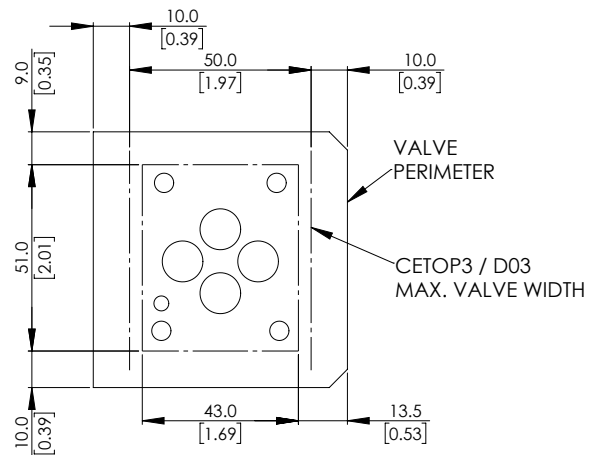


4 X COUNTER BORES SUPPLIED WITH BS ISO3601,  
AS568A -011 O' RINGS (NBR)

See CETOP3/D03 Template

### CETOP3/D03 Template

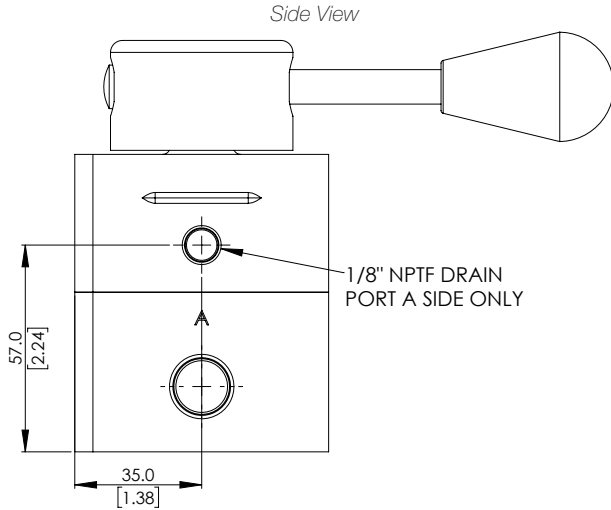
Note: The valve assembly exceeds the maximum width required by CETOP3/D03 standards



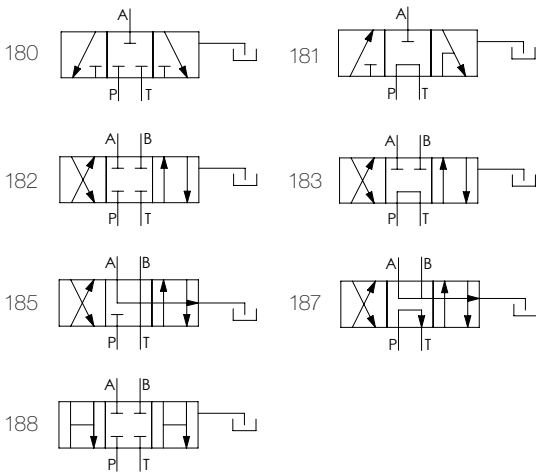
## Non-Standard Options (order code table 5)

### Option A - tank port pressurised with additional drain

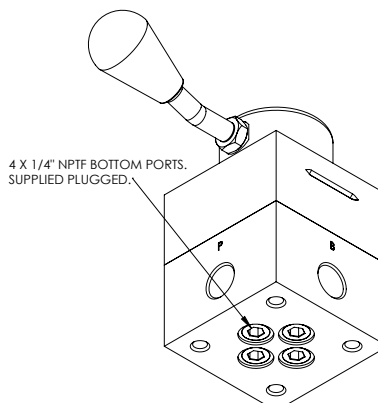
Port T can now be used at full system working pressure (depending on flow size. Maximum tank line pressure now applies to the drain port. The drain port must not be plugged.



**Note:** Updated hydraulic symbols for valve with pressurised tank port & additional drain

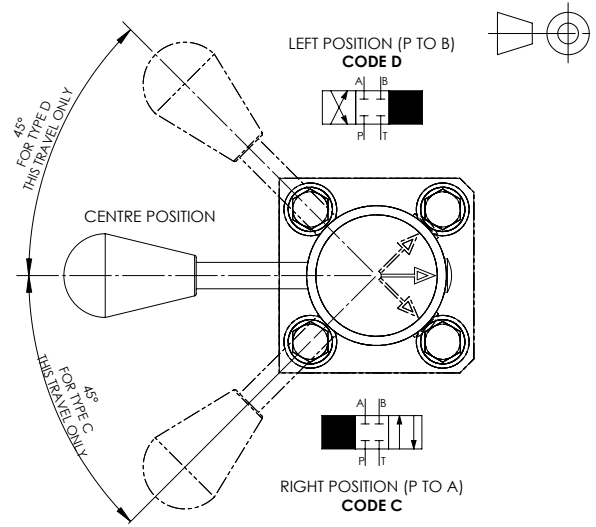


**Option B - 8 port valve. Side ports**  
(SAE, NPTF, or BSPP) with additional 4 x bottom ports on PCD

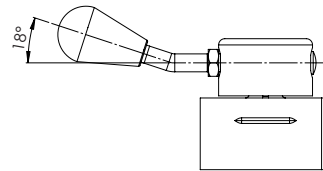


See 1/4" NPTF bottom port Template on page 5

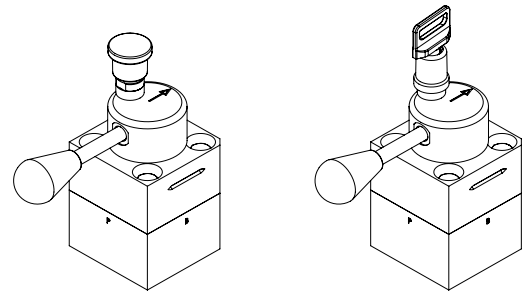
**Options C & D - 2 position. Centre and right only**  
(order code C) or Centre and left only (order code D)



**Option E - Bent handle**  
Available for non panel mount versions

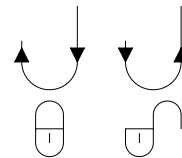


**Options F & G - 180 valve with position lock**  
AISI 303 stainless steel plunger in zinc-plated steel threaded body.  
Some black technopolymer external parts

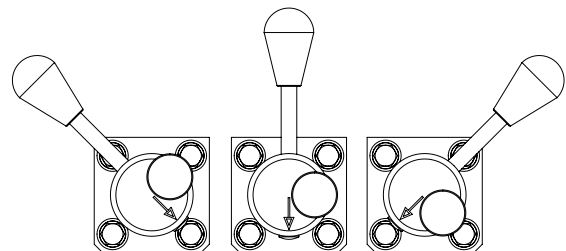


**Option F - Button type.**

**Option G - Key type**  
(key removable).



Push button (or key) down and twist clockwise to lock.  
Push button (or key) down and twist anti-clockwise to unlock.



Lock in any of the three positions.

Webtec reserve the right to make improvements and changes to the specification without notice