

# 180 Series

## Rotary Shear Directional Control Valve

Up to

- 38 lpm, 10 US gpm
- 700 bar, 10,000 psi

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

**Maximum Pressure:** Up to 700 bar, 10,000 psi

**Maximum Flow:** Up to 38 lpm, 10 US gpm

**Ambient Temperature:** -20 to 50°C, -4 to 122°F

**Media Temperature:** -30 to 120°C, -22 to 248°F

**Porting:** Side ported 3/8" BSPP, 3/8" NPTF, or 9/16"-18UN #6 SAE ORB  
Manifold ported 014 O' ring on pitch circle diameter (PCD)  
CETOP3/D03

Side ports with additional 4 x 1/4" NPTF bottom ports

**Material:** Steel components in an Aluminium body. Nitrile rubber (NBR) seals.  
Phenolic resin knob. Low density polyethylene plug.

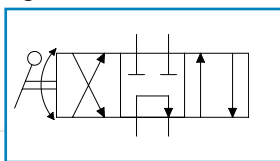
**Weight:** Typically 1.4 kg, 3 lbs

**Mounting:** Standard: 4 x 5/16" UNC holes to fasten screws into valve base  
Panel: 4 x 5/16" UNC studs to fasten valve into panel  
Manifold: 4 x 5/16" UNC through bolts to fasten valve onto manifold

**Tank Port Pressure:** Maximum tank port pressure 17 bar, 260 psi

Symbol:

e.g 183



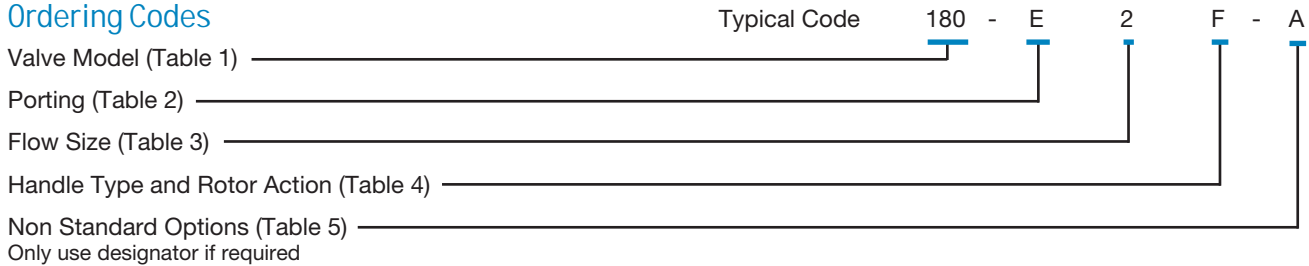
P T



### 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)

## Ordering Codes



**Table 1: Valve Model**

Code	Symbol
180*1	
181*1	
182	
183	
185	
187	
188	

\*1 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 *2
T	3/8" BSPP
C	014 O' ring Manifold mount
A	014 O' ring
M	CETOP3 interface Manifold mount *3
U	D03 interface Manifold mount *3

\*2 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 *3	Pressure drop curve	Throttle capability
0	15 lpm, 4 US gpm	700 bar, 10,000 psi *3	A	No
1	26.5 lpm, 7 US gpm	350 bar, 5,000 psi	B	Yes
2	38 lpm, 10 US gpm	207 bar, 3,000 psi	C	Yes

\*3 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 *4
F	Bent 18°	Detented Action + Panel Mount *5
G	Bent 18°	Spring Centred Action *4 + Panel Mount *5

\*4 The performance of the spring return on the 15 lpm, 4 US gpm version is compromised above 207 bar, 3000 psi

\*5 Panel mount option is not available with port codes C, M, or U (Table 2).

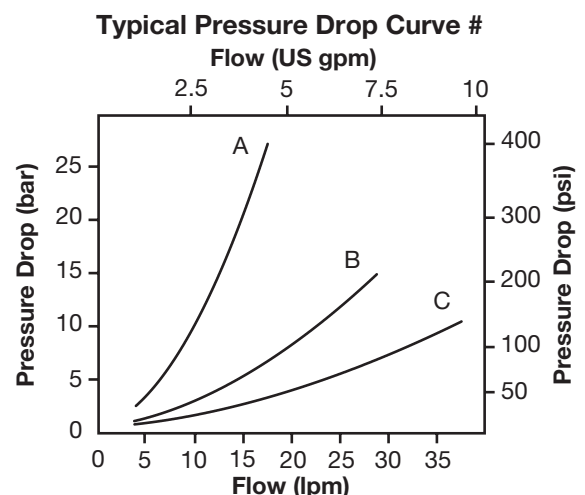
**Table 5: Non Standard Options (see Page 6)**

Code	Function (and any combination of these features)
A	Tank port pressurised. Additional 1/8"NPTF drain. *6
B	8 port version - side ports with additional 4 x bottom ports *7
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*8
G	Position lock with removable key*8

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

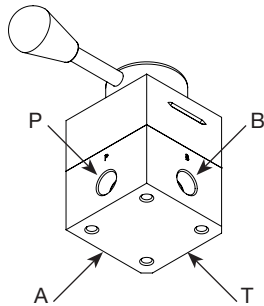
\*7 Only available with port codes L, E, or T (SAE, NPTF, or BSPP - Table 2)

\*8 Only available with detent action (see Table 4).

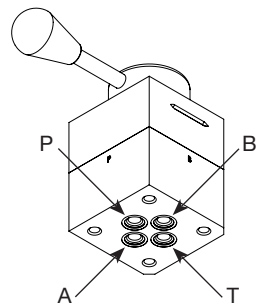


# Test Conditions: Using ISO32 Oil at 45°C, 113°F, 207 bar, 3,000 psi

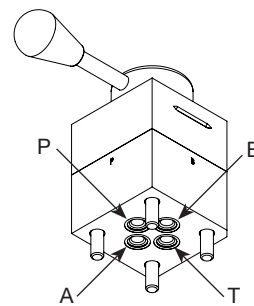
### Porting Codes E, L, & T



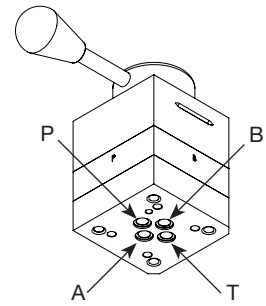
### Porting Code A



### Porting Code C



### Porting Codes M & U



### 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.

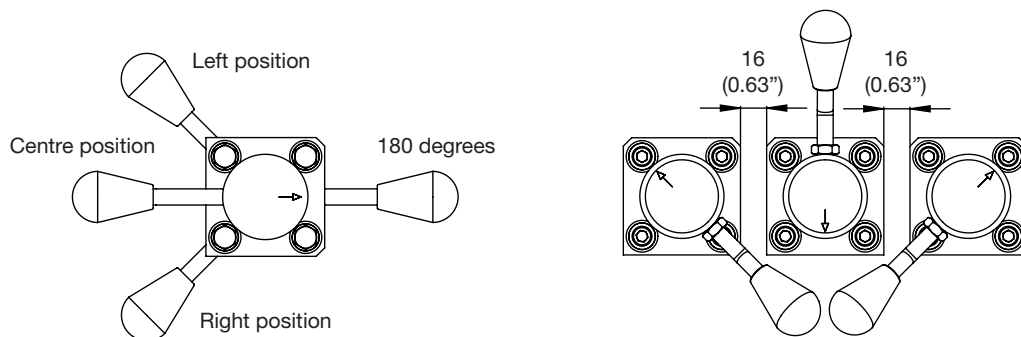
Closure tests with low pressure air (82 psi) were conducted on Webtec's 180 Series of rotary directional control valves. Flow size 0 with non-interflow was found to have no visually detectable leakage for the duration of the test (60 seconds). Flow sizes 1 & 2 with interflow were found to have a leakage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

### Spare Kits

It may be necessary to update your 180 Series valve to incorporate the new handle cap design. This new design allows for easier assembly when panel mounting as access to the set screw is now hidden behind the black polyethylene plug. The steel shaft is no longer visible, and the direction arrow has been enhanced. The new handle cap spares kit can be retrospectively fitted without alteration to the older style valve.

The new handle cap design is fitted to all new valves as standard.

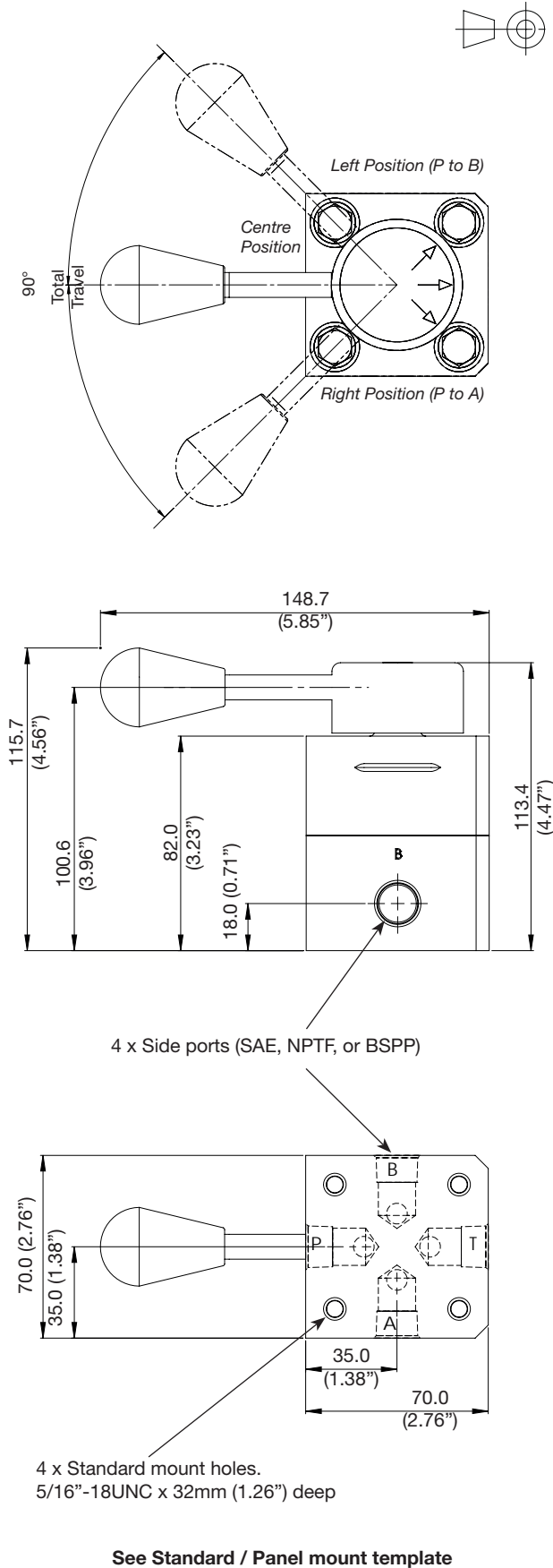
Please ask for more details



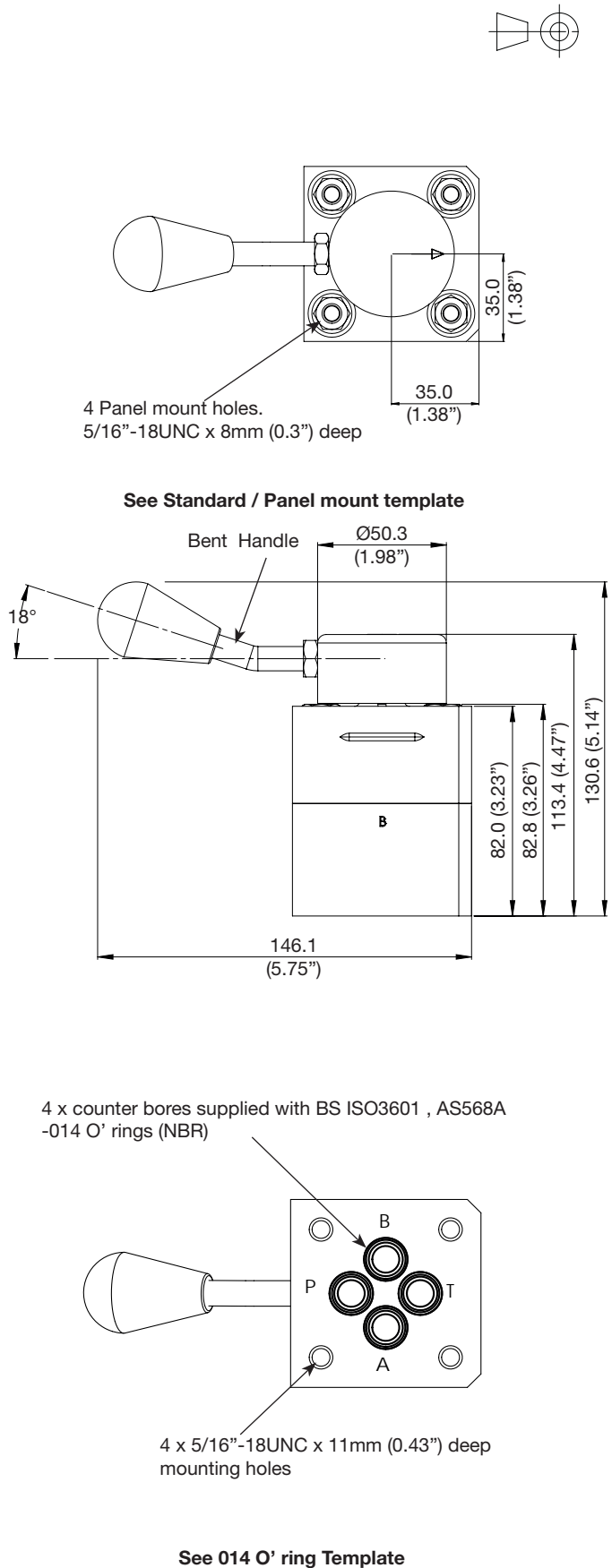
## Installation Details

Dimensions in millimetres (Inches)

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



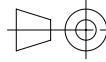
### 014 O' ring (order code A) with panel mount & bent handle



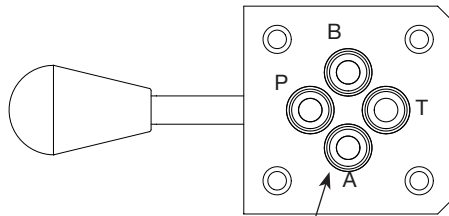
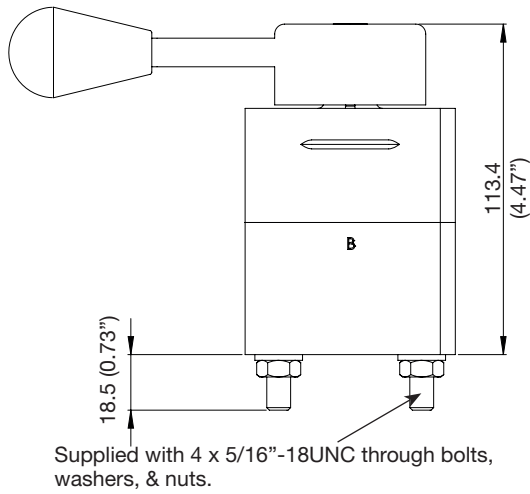
## Installation Details

Dimensions in millimetres (Inches)

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



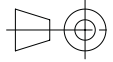
Some dismantling & re-assembly is required for installation.  
See 014 O' ring manifold mount installation details below.



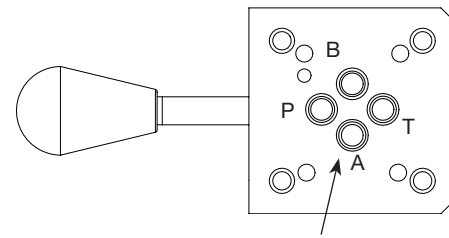
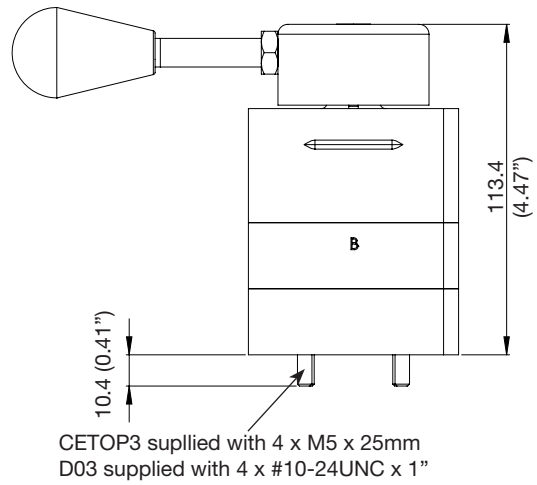
4 x counter-bores with supplied BS ISO 3601, AS568A -014 O' rings (NBR)

See 014 O' ring template

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



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



4 x counter-bores with supplied BS ISO 3601, AS568A -011 O' rings (NBR)

See CETOP3/D03 Template

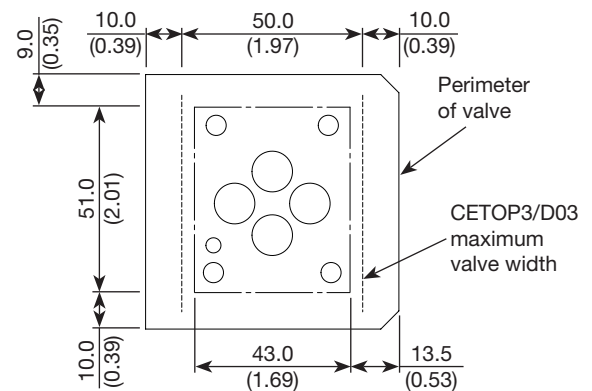
### 014 O' ring Manifold mount Installation details

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.

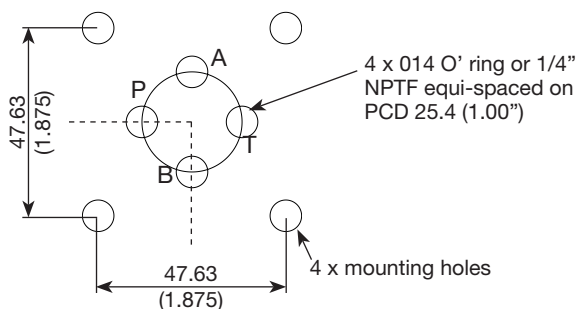
To ensure correct operation, the valve re-assembly tightening torque to be used is 23Nm, 7lbf

### CETOP3/D03 Template

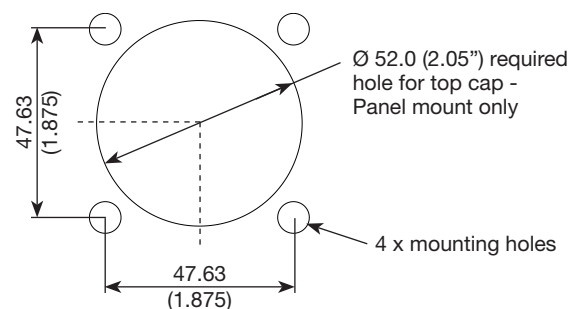
Note: The valve assembly exceeds the maximum width required by CETOP3/D03 standards



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



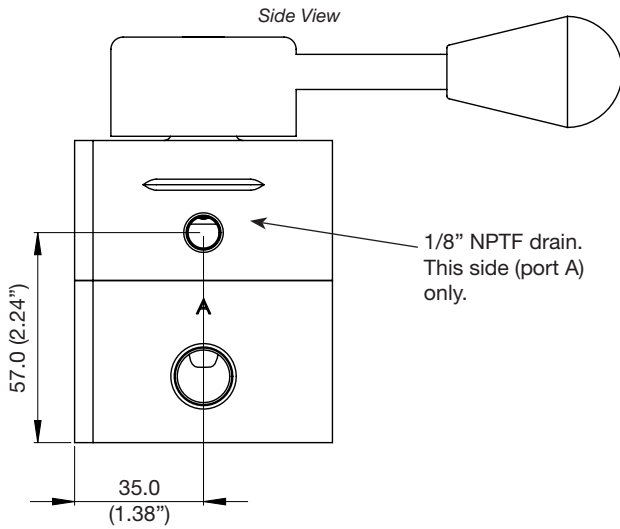
### Standard / Panel Mount Template



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

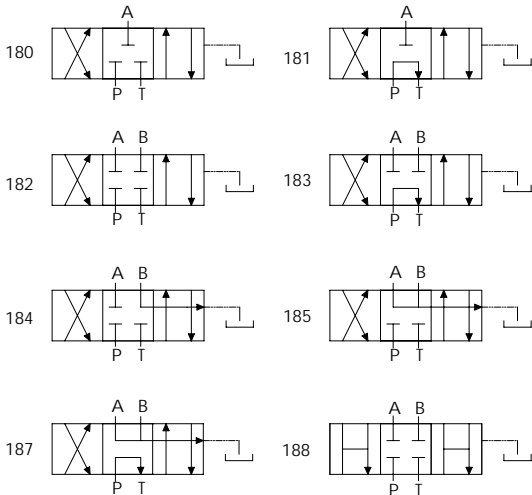
### Option A - tank port pressurised with additional drain

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.

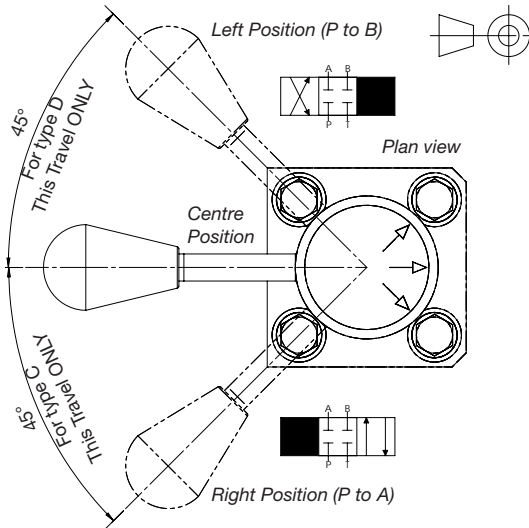


#### Note:

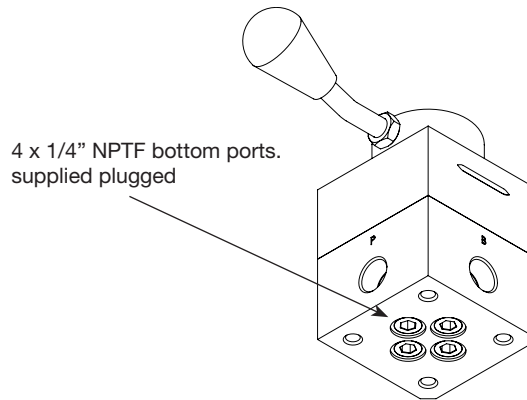
Updated hydraulic symbols for valve with pressurised tank port & additional drain



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



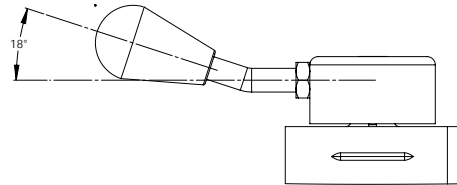
### Option B - 8 port valve. Side ports (SAE, NPTF, or BSPP) with additional 4 x bottom ports on PCD



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

### Option E - Bent handle

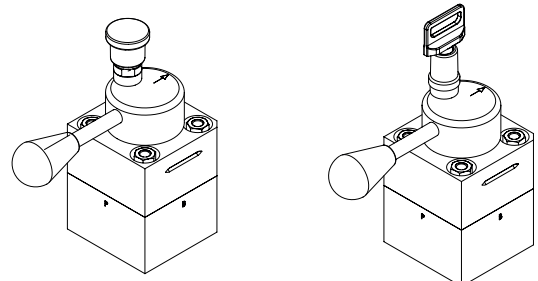
Available for non panel mount versions



### Options F & G - 180 valve with position lock.

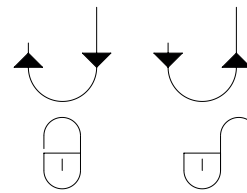
AISI 303 stainless steel plunger in zinc-plated steel threaded body.

Some black technopolymer external parts

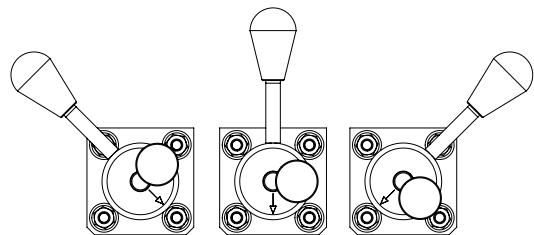


Option F - Button type.

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.