

# 280 Series

## Stainless Steel Rotary Direction Control Valve

**For hydraulics in a harsh environment.**

The 280 Series is a high pressure, 316 stainless steel, hydraulic rotary direction control valve. It is the ideal solution for control of hydraulic actuators used in arduous environments 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 (depending on flow size). The 280 Series valve is compatible with water glycol hydraulic fluid.

### 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 BSPP, NPTF, or SAE

Manifold ported 014 O' ring on pitch circle diameter (PCD)

**Material:** Steel components in 316 Stainless Steel body. Nitrile rubber (NBR) Seals.

**Weight:** Typically 3.2 kg, 7lbs

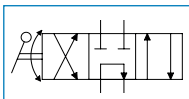
**Mounting:** Standard – 4 x 5/16" UNC holes to fasten screws into valve base

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

### Symbol:

e.g 283



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### Features

- Over 4000 possible configurations
- 3 position / 2 position
- 4 port / 3 port
- Zero leakage (15 lpm, 4 US gpm version)
- Standard documentation:-
  - Manual
  - Certificate of Conformity
  - Performance test Certificate
  - Declaration of Conformity to 'ATEX'
- BS EN13463-1:2009 (ATEX) rating of 'II 3G TX'
- BS ISO 4401-03, NFPA T3.5.1-D03 (CETOP3/NG06/D03) mounting adapter
- Express build available (single unit orders)
- Pressurised tank port with additional drain available



## Ordering Codes

Valve Model (Table 1)	282	-	E	2	F	-	3X	4Y	A
Porting (Table 2)									
Flow Size (Table 3)									
Valve Options (Table 4)									
Position Type (Table 5)									
Port Type (Table 6)									
Non-Standard Options (Table 7)									

**Table 1: Valve Model**

Code	Symbol
282	
283	
285	
287	
288	

**Table 2: Porting (see page 3)**

Code	Port size
F	1/4" NPTF *1
L	9/16" -18UN #6 SAE ORB
E	3/8" NPTF *1
T	3/8" BSPP
C	014 O' ring Manifold mount
A	014 O' ring

**Table 3: Flow Size**

Code	Maximum flow	Maximum pressure *2	Pressure drop curve	Interflow
0	15 lpm 4 US gpm	700 bar 10,000 psi	A	Non-interflow
1	26.5 lpm 7 US gpm	350 bar 5,000 psi	B	Interflow
2	38 lpm 10 US gpm	207 bar 3,000 psi	C	Interflow

**Table 4: Valve Options**

Code	Mount Type			Handle Type		Action	
	Standard	Panel	Manifold *3	Straight	Bent	Detent	Spring *4
A	●			●		●	
B	●			●			●
C	●				●	●	
D	●				●		●
E		●		●		●	
F		●		●			●
G		●			●	●	
H		●			●		●
J			●	●		●	
K			●	●			●
L			●		●	●	
M			●		●		●

\*1 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)

\*2 Maximum Tank line pressure is 17.2 bar, 250 psi, unless Table 7 Code A selected.

\*3 Manifold mount type (selected on Table 4) is used only in conjunction with the manifold mount O' ring port type (Code C on table 2)

\*4 The spring return action has impaired performance above certain pressures. For flow sizes 1 and 2 its performance is compromised above 207 bar, 3,000 psi. For valve flow size 0 the spring performance is compromised above pressures of 138 bar, 2,000 psi. See Table 3: Flow Size.

**Table 5: Position Type**

Code	Position Options	Symbol
3X	Standard 3 positions	
2R	2 Position, Centre & Right only	
2L	2 Position, Centre & Left only	

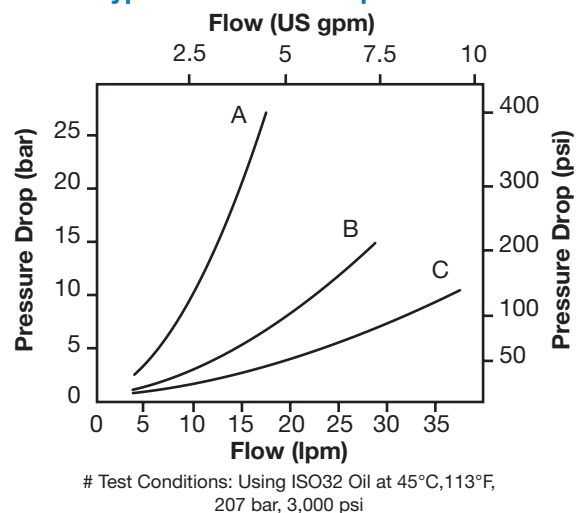
**Table 6: Port Type**

Code	Port Options	Symbol
4Y	Standard 4 ports	
3A	3 Side Ports, port A open (B plugged)	
3B	3 Side Ports, port B open (A plugged)	

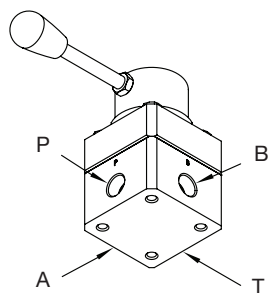
**Table 7: Non-Standard Options**

Code	Function
A	Tank port pressurised Additional 1/8"NPTF drain

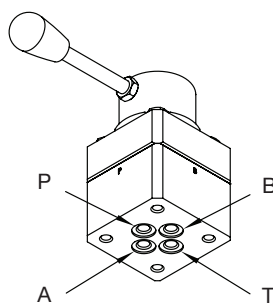
**Typical Pressure Drop Curve #**



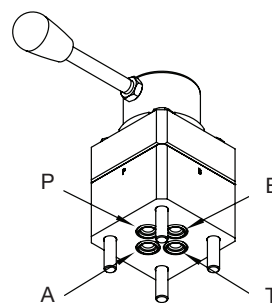
### Porting Code L, E, F & T



### Porting Code A



### Porting Code C



### Leakage between flow paths.

Closure tests with low pressure air (82 psi) were conducted on Webtec's 280 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

### Interflow

Interflow is a transient effect that occurs on flow size 1 & 2. It occurs as the valve is operated between positions. During this time a small flow from ports A, B and P to port T is possible, which can cause the pressure of lines A, B or P to drop slightly. Note that interflow will not occur when the valve is fully seated in either the centre, left or right positions.

The magnitude of interflow is highly dependent upon the valve's operating conditions and speed of actuation. If no pressure drop during actuation is permissible then a non-interflow valve should be selected (see Table 3, page 2).

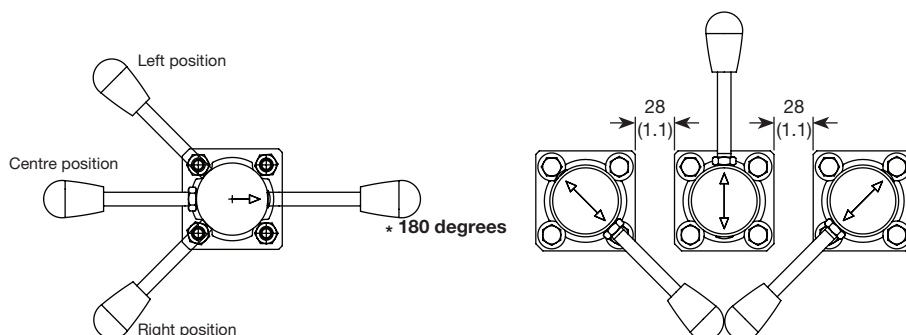
### ATEX Statement

The 280 Series Valve has been designed, manufactured, and tested to the ATEX directive (BS EN 13463-1:2009), & is rated to 'II 3G TX'.

### Handle Position

The handle can be re-assembled through 180 degrees.

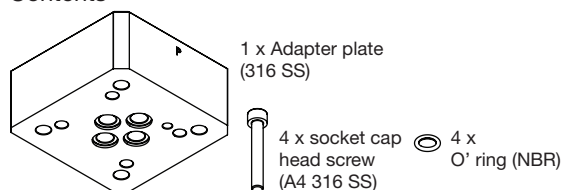
This minimizes the pitch between banked valves (28mm, 1.1" for straight handle type, 21mm, 0.8" for bent handle type)



### BS ISO 4401-03, NFPA T3.5.1-D03 (CETOP3/NG06/D03) mounting adapter kit

This can adapt the 014 O' ring Manifold mount type valve (Table 2, Code C) to a BS ISO 4401-03 or NFPA T3.5.1-D03 mounting pattern.

#### Contents



	BS ISO 4401-03	NFPA T3.5.1-D03
Adapter Plate	316L	316L
Socket cap head screw	M5 x 35mm	#10-24UNC x 1.25"
O' ring	BS ISO 3601-011	AS568A-011
Instructions leaflet	280-CETOP3	280-D03
Maximum pressure	350 bar	3,000 psi

### 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.

### Tank Port Pressure

Maximum tank port pressure 17 bar, 250 psi, unless 'Tank port pressurised' option ordered.

See table 7, ordering codes.

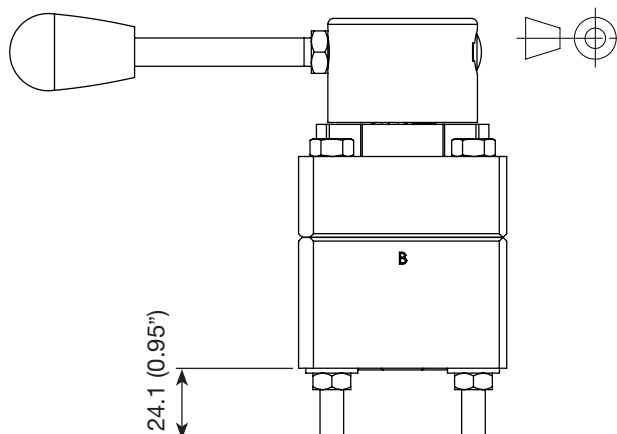


## Installation Details

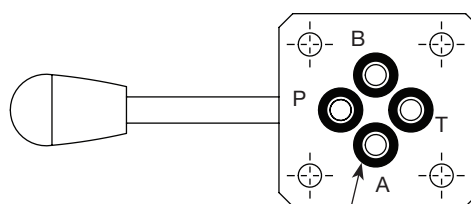
Dimensions in millimetres (Inches)

### 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 through bolts, washers, & nuts.

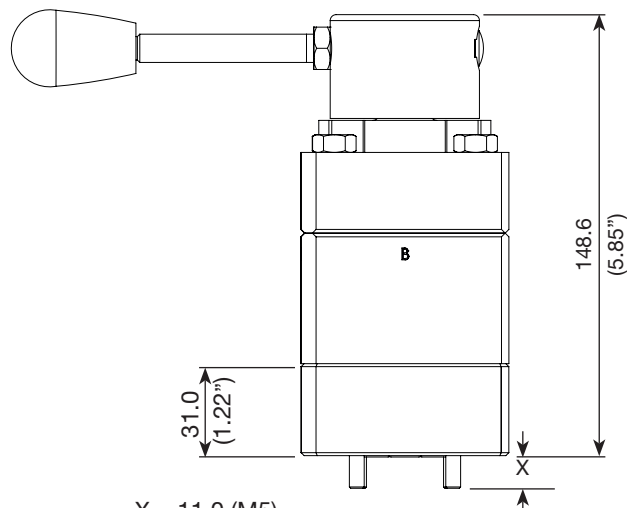


4 x counter-bores with supplied BS ISO 3601, AS568A -014 O' rings (NBR)

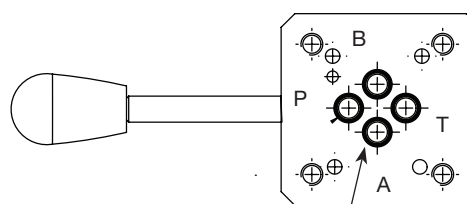
See 014 O' ring template

### 014 O' ring manifold mount with 280-CETOP3 / D03 Kit

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



X = 11.0 (M5)  
X = 0.31" (#10UNC)



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

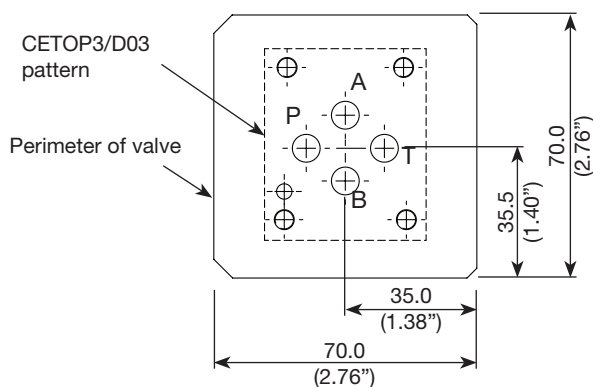
See 280-CETOP3/D03 Template

### 014 O' ring Manifold mount Installation details

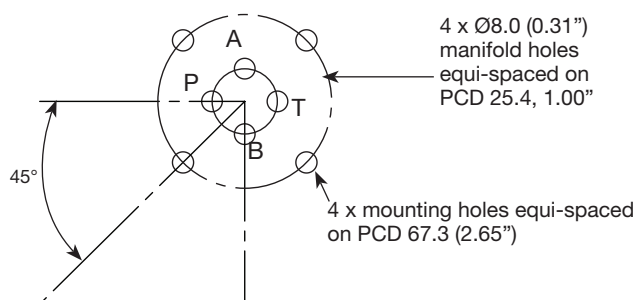
The valve is pre-assembled for test using 4 x 5/16"-18UNC through bolts, with nuts and washers. Some dismantling is required for installation, during which care should be taken not to allow debris to enter the valve. This requires a 13mm (1/2") A/F spanner and 13mm (1/2") hexagon bit.

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

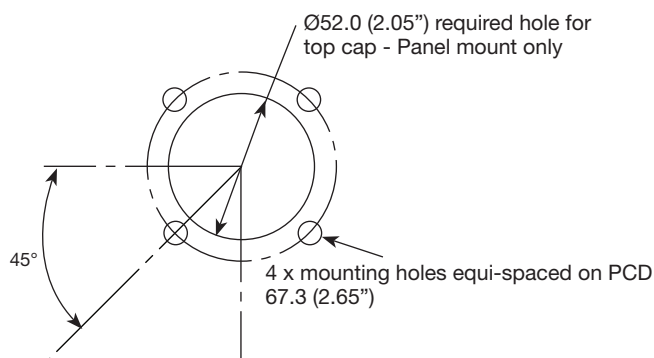
### 280-CETOP3/D03 Template



### 014 O' ring Template



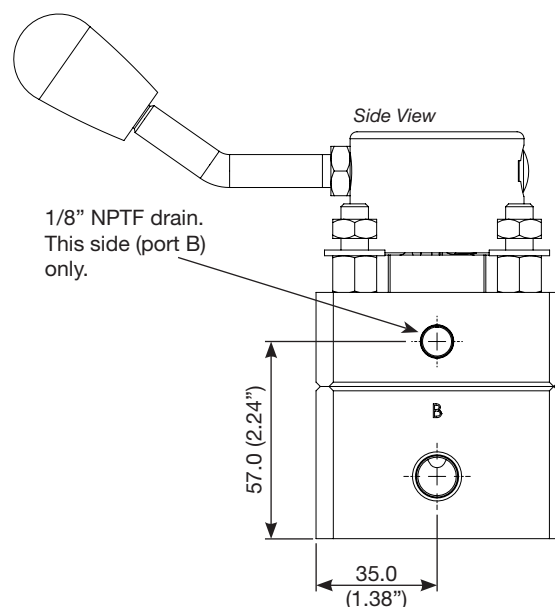
### Standard / Panel Mount Template



## Non-Standard Options (order code table 7)

### 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 (17 bar, 250 psi) 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

