

## General Description

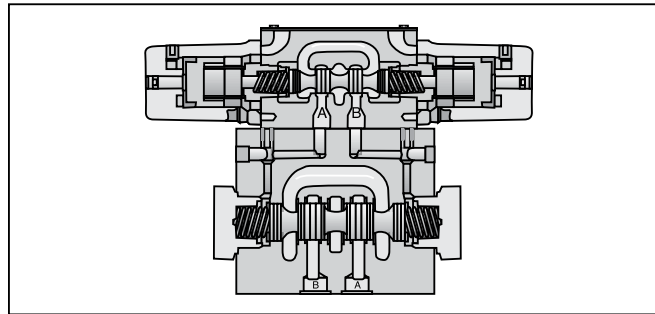
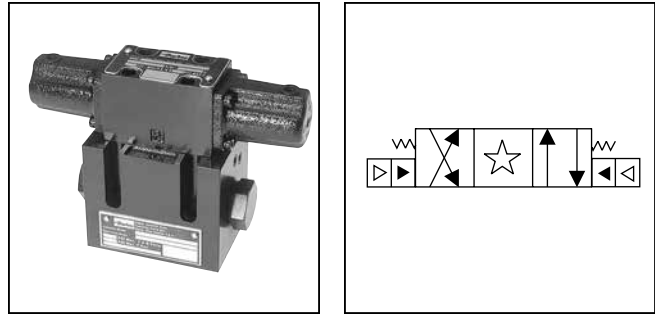
Series D31\*A directional control valves are 5-chamber, air pilot operated valves. The valves are suitable for manifold or subplate mounting.

## Features

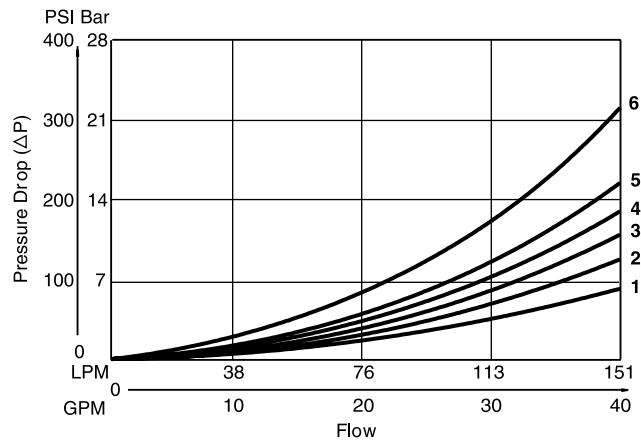
- **World design** – Available worldwide.
- **Mounting bolts below center line of spool** – Minimizes spool binding.
- **Five chamber style** – Eliminates pressure spikes in tubes, increasing valve life.
- **High pressure and flow ratings** – Increased performance options in a compact valve.

## Specifications

<b>Mounting Pattern</b>	NFPA D05H , CETOP 5 NFPA D05HE, CETOP 5H
<b>Max. Operating Pressure</b>	345 Bar (5000 PSI)
<b>Max. Tank Line Pressure</b>	Internal Drain Model: 34 Bar (500 PSI) External Drain Model: 207 Bar (3000 PSI)
<b>Max. Drain Pressure</b>	34 Bar (500 PSI)
<b>Maximum Flow</b>	See Switching Limit Charts
<b>Pilot Pressure</b>	Air Min: 3.4 Bar (50 PSI) Air Max: 10.2 Bar (150 PSI)
<b>Response Time</b>	Varies with pilot line size and length, pilot pressure, pilot valve shift time & flow capacity (GPM)



## Pressure Drop Chart



### VISCOSITY CORRECTION FACTOR

Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141

Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change as per chart.

### D31VA Pressure Drop Reference Chart -- Curve Number

Spool No.	Shifted				Center Condition							
	P-A	P-B	B-T	A-T	(P-T)	(B-A)	(A-B)	(P-A)	(P-B)	(A-T)	(B-T)	
001	3	3	2	1	-	-	-	-	-	-	-	
002	3	3	1	1	3	3	3	4	4	1	1	
004	3	3	1	1	-	-	-	-	-	1	1	
009	3	3	1	1	6	-	-	-	-	-	-	
020	5	4	2	2	-	-	-	-	-	-	-	
030	4	3	1	1	-	-	-	-	-	-	-	

## D31VA Pressure Drop vs. Flow

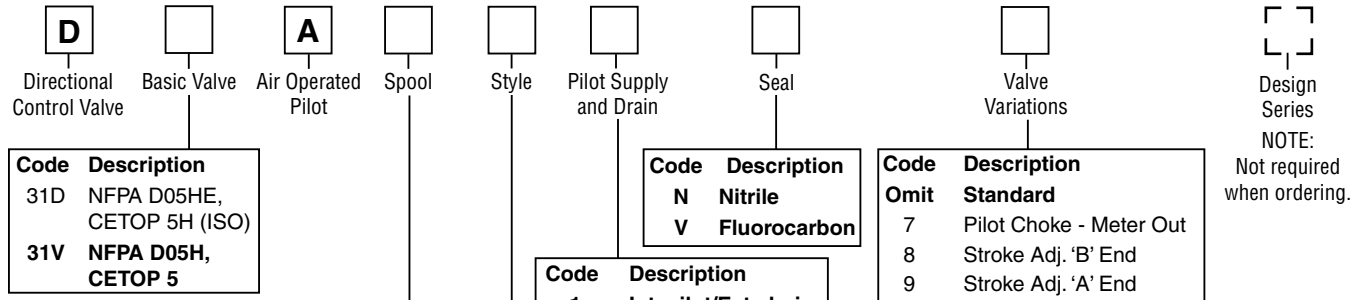
The chart to the left provides the flow vs. pressure drop curve reference for the D31VA Series valves by spool type.

### Example:

Find the pressure drop at 76 LPM (20 GPM) for a D31VA with a number 001 spool. To the right of spool number 001, locate the number 3 in the P-A column, and 2 in the B-T column.

Using the top graph, locate curves 2 and 3 and read the pressure drop values. Total pressure drop through the valve is the sum of the two values.

**Ordering Information**



Code	Description
31D	NFPA D05HE, CETOP 5H (ISO)
<b>31V</b>	<b>NFPA D05H, CETOP 5</b>

Code	Description
<b>N</b>	<b>Nitrile</b>
<b>V</b>	<b>Fluorocarbon</b>

Code	Description
Omit	<b>Standard</b>
7	Pilot Choke - Meter Out
8	Stroke Adj. 'B' End
9	Stroke Adj. 'A' End
60	Pilot choke - Meter In
89	Stroke Adj. 'A' & 'B' Ends
90	1/4 BSPP Threads

Code	Description
<b>1</b>	<b>Int. pilot/Ext. drain</b>
<b>2</b>	<b>Ext. pilot/Ext. drain</b>
<b>4#</b>	<b>Int. pilot/Int. drain</b>
<b>5</b>	<b>Ext. pilot/Int. drain</b>

# Not available with 002, 008 & 009 spools.

Valve schematic symbols are per NFPA/ANSI standards, providing flow P to A when energizing operator A. Note operators reverse sides for #008 and #009 spools. See installation information for details.

Code	Symbol
<b>001</b>	
<b>002</b>	
<b>004</b>	
<b>008†</b>	
<b>009*</b>	
<b>020†</b>	
<b>030*</b>	

† 008 and 020 spools have closed crossover.  
 \* 009 and 030 spools have open crossover.

**Valve Weight:**  
 Double Operator  
 5.7 kg (12.7 lbs.)  
**Standard Bolt Kit:**  
 BK98  
**Metric Bolt Kit:**  
 BKM98

Code	Description	Symbol
<b>B†</b>	<b>Single operator, 2 position, spring offset. P to A and B to T in offset position.</b>	
<b>C</b>	<b>Double operator, 3 position, spring centered.</b>	
<b>D†</b>	<b>Double operator, 2 position, detent.</b>	
<b>E</b>	Single operator, 2 position, spring centered. P to B and A to T when energized.	
<b>H†</b>	<b>Single operator, 2 position, spring offset. P to B and A to T in offset position.</b>	
<b>K</b>	Single operator, 2 position, spring centered. P to A and B to T when energized.	

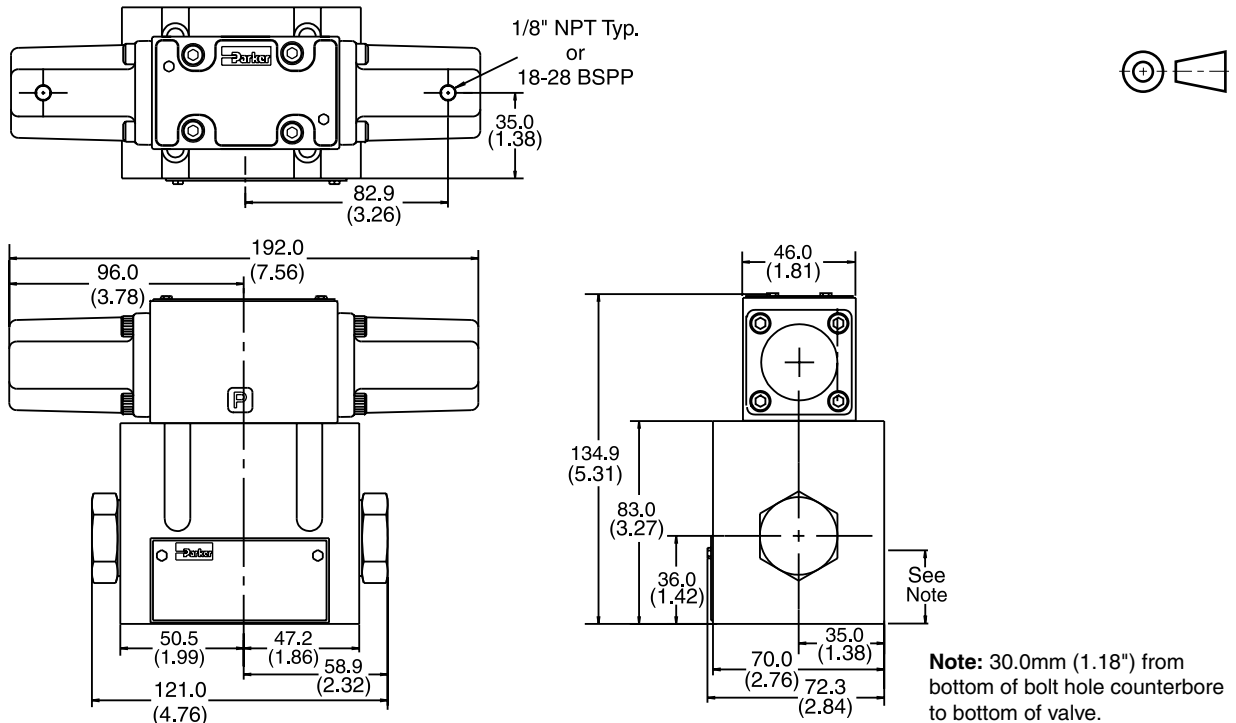
† Only spools 020 and 030.

This condition varies with spool code.

**Bold: Designates Tier I products and options.**

**Non-Bold: Designates Tier II products and options. These products will have longer lead times.**

**Dimensions – Air Operated** Inch equivalents for millimeter dimensions are shown in (\*\*)



**Note:** 30.0mm (1.18") from bottom of bolt hole counterbore to bottom of valve.