



The 3500B, 3600B and 3650B vacuum breakers are designed to provide superior seat tightness while protecting liquid storage vessels, vapor recovery systems, and process systems from excess vacuum.

Introduction

The Varec 3500B, 3600B and 3650B vacuum breakers are designed to protect atmospheric and low pressure tanks from excessive vacuum. The Varec 3500B, 3600B and 3650B Series are dead-weight loaded vacuum breakers utilizing weights proportional to the seat surface area to achieve the desired setting.

Flow curves are provided to help you select the proper size for your vacuum venting requirements. Additionally, Varec's engineering staff and factory trained representatives are always available to assist you.

Features

The Varec 3500B, 3600B and 3650B Series is designed to offer flexibility of installation.

- The 3500B valves are for tank top mounting.
- The 3600B valves are side mounted.
- The 3650B valves are provided with flanged connections on both the intake and discharge sides for "in-line" applications.
- The 3660B valves may be used for either pressure (top mounted) or vacuum (side mounted) relief applications.

An "All-Weather" option is offered for freezing climates. The design features a special non-frosting and icing-resistant coating on the pallet perimeter, stem, guide posts and tip-of-seat ring. The coating, along with the flexible Teflon® seat insert, provides additional protection against pallets freezing closed.

For high temperature and chemical applications, Varec recommends one of the extended service options which offer the selection of O-ring, gasket and screen material.

The Varec 3500B, 3600B and 3650B Series valves feature a pallet drip ring and self-draining housing to protect the seating surface from condensate and freezing. The pallet is side-and-center guided for reliability and stability, and is less likely to bind than hinged pallets. The valve includes an air cushion Teflon® seat insert for the tightest seal available. The port area is oversized to provide maximum flow capacity.



Available Materials

- Aluminum
- Carbon Steel
- Stainless Steel
- Ductile Iron
- Special Materials on Application

The 3500B, 3600B and 3650B are part of Varec's modular products which use interchangeable components for assembling a variety of functional configurations. The modular design provides flexibility of field installation and allows the valve to be reconfigured, repaired and even upgraded on-site by simply replacing or adding components.

Technical Data

- 2" to 12" [50 to 300 mm] sizes available.
- Oversized port for maximum flow.
- "Air Cushion" seating for lowest available leakage for weight-loaded valves.
- "All-Weather" option.
- Wide range of materials for service in most applications.
- Side-and-center guided pallet.
- Vacuum settings to 2 psig [0.14 barg].
- Replaceable seat ring.
- Leakage rate of 1 SCFH [0.03 Nm³/hr] or less at 90% of setpoint.

Setting Information

Size	Minimum Press/Vac Set		Low Set Range	High Set Range
	Aluminum	316 SS		
3500B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.27 oz/in ²	0.56 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
6"	0.26 oz/in ²	0.61 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
8"	0.25 oz/in ²	0.55 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
10"	0.25 oz/in ²	0.63 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
12"	0.23 oz/in ²	0.59 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
3501B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.27 oz/in ²	0.56 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
6"	0.26 oz/in ²	0.61 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
8"	0.25 oz/in ²	0.55 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
10"	0.49 oz/in ²	1.33 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
12"	0.47 oz/in ²	1.28 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
3600B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
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12"	0.25 oz/in ²	0.63 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
3601B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
6"	0.27 oz/in ²	0.56 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
8"	0.26 oz/in ²	0.61 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
10"	0.25 oz/in ²	0.55 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
12"	0.49 oz/in ²	1.33 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
3650B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.27 oz/in ²	0.56 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
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8"	0.25 oz/in ²	0.55 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
10"	0.25 oz/in ²	0.63 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
12"	0.23 oz/in ²	0.59 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
3651B				
2"	0.26 oz/in ²	0.62 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
3"	0.21 oz/in ²	0.49 oz/in ²	Min to 10 oz/in ²	10.01 oz/in ² to 2 psig
4"	0.27 oz/in ²	0.56 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
6"	0.26 oz/in ²	0.61 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
8"	0.25 oz/in ²	0.55 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
10"	0.49 oz/in ²	1.33 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig
12"	0.47 oz/in ²	1.28 oz/in ²	Min to 16 oz/in ²	16.01 oz/in ² to 2 psig

Please consult your sales representative for lower settings.

Specifications

Sizes

3500B and 3600B:

- 2" [50 mm]
- 3" [80 mm]
- 4" [100 mm]
- 6" [150 mm]
- 8" [200 mm]
- 10" [250 mm]
- 12" [300 mm]

3650B:

- 2" x 3", 3" x 4", 4" x 6", 6" x 8",
- 8" x 10", 10" x 12", 12" x 14"

Flanged Connections – Standard Flange Drilling

Aluminum

Drilled to ANSI/ASA Class 125 dimensions (Flat Face)

Drilled to DIN 2633 [16 Bar] dimensions (Flat Face)

CS, DI and SS Body

Drilled to ANSI Class 150 dimensions (Raised or Flat Face)

Drilled to Imperial DIN 2633 [16 Bar] dimensions (Raised or Flat Face)

Mounting Studs

Fractional (Imperial)

Metric

Maximum Working Pressure

2 psig [0.138 barg] for Low Set Range

5 psig [0.345 barg] for High Set Range

This is a function of pallet thickness. Operating above these pressures could cause valve damage. Higher working pressures are available from your sales representative.

Testing

Each valve is tested for proper setting and for a leakage rate of 1 SCFH or less of air at 90 percent of the set point. Each valve is tested for leak tightness at 75 percent of set point as required in API Standard 2000.

Specifications

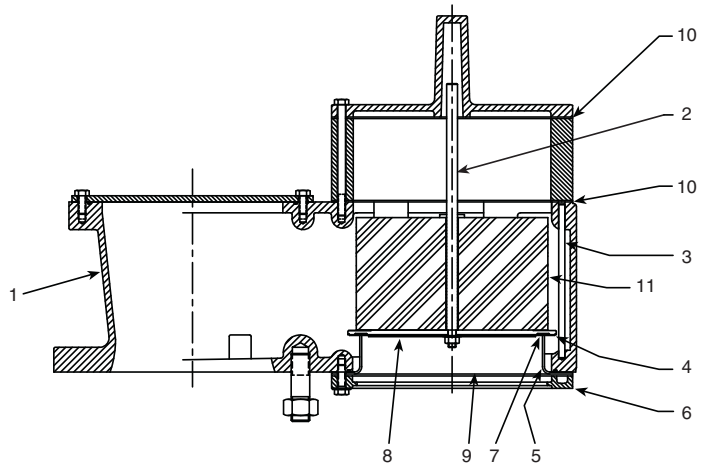
Notes

1. Materials are as standard. See model option code for other materials, and their associated temperature ranges.
2. Teflon® coated aluminum may be supplied with material codes 2 to 5 to achieve lower settings.
3. All nuts and cap screws are 316 SS.

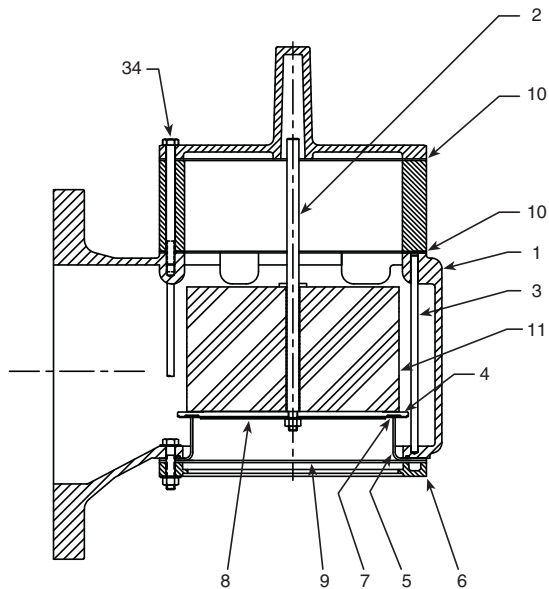
Parts and Materials Table (see page 3)

Item	Material Code				
	1	2	3	4	5
1 Body	Aluminum	Aluminum	Steel	316 SS	Iron
2 Guide Stem	Aluminum	316 SS	316 SS	316 SS	316 SS
3 Guide Posts	316 SS	316 SS	316 SS	316 SS	316 SS
4 Pallet	Aluminum	316 SS	316 SS	316 SS	316 SS
5 Seat Ring	Aluminum	316 SS	316 SS	316 SS	316 SS
6 Seat Ring Retainer ¹	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene
7 Insert ¹	Teflon®	Teflon®	Teflon®	Teflon®	Teflon®
8 Insert Retainer	Aluminum	316 SS	316 SS	316 SS	316 SS
9 Screen ¹	HDPE	HDPE	HDPE	HDPE	HDPE
10 Gaskets ¹	Fiber	Fiber	Fiber	Fiber	Fiber
11 Weights	Lead	Lead	Lead	Lead	Lead

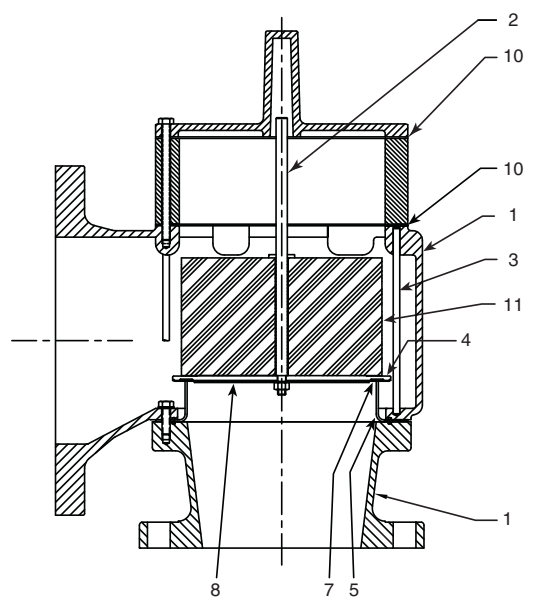
3500B



3600B



3650B



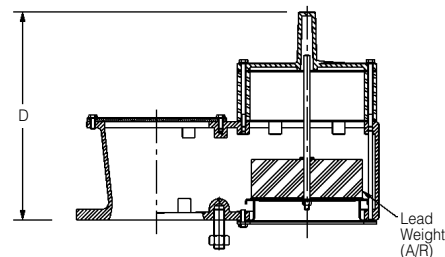
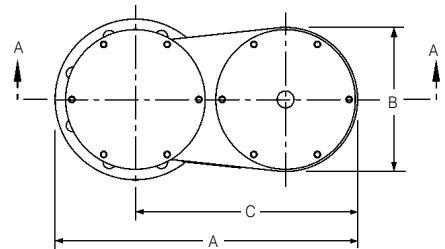
Varec 3500B,3600B and 3650B Series

Weight Loaded Vacuum or Pressure Relief Valves

Dimensions, inches [mm]

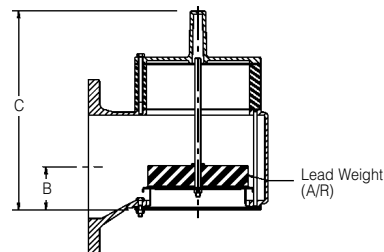
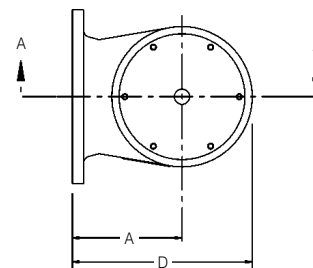
3500B and 3501B

Size Code	2	3	4	6	8	0	1
Nominal Pipe Size	2 [50]	3 [80]	4 [100]	6 [150]	8 [200]	10 [250]	12 [300]
A	13 ¹ / ₈ [333]	16 ¹ / ₈ [410]	16 ¹⁵ / ₁₆ [430]	21 ³ / ₁₆ [538]	26 ⁵ / ₁₆ [668]	32 ¹⁵ / ₁₆ [837]	38 ⁷ / ₈ [987]
B	6 ³ / ₁₆ [157]	7 ⁵ / ₈ [194]	8 [203]	10 ¹ / ₁₆ [256]	12 ⁷ / ₈ [327]	16 ¹ / ₈ [410]	19 ¹ / ₄ [489]
C	9 ⁷ / ₈ [251]	12 ³ / ₁₆ [310]	12 ⁷ / ₁₆ [316]	15 ⁹ / ₁₆ [395]	19 ⁹ / ₁₆ [497]	24 ¹⁵ / ₁₆ [633]	29 ³ / ₈ [746]
D	5 ⁹ / ₁₆ [141]	6 ³ / ₁₆ [167]	11 ¹⁵ / ₁₆ [287]	11 ³ / ₁₆ [284]	13 ³ / ₁₆ [335]	16 ¹ / ₁₆ [408]	18 ³ / ₄ [476]
Low Set							
D	10 ¹ / ₁₆ [256]	11 ³ / ₁₆ [284]	7 ¹¹ / ₁₆ [195]	14 ⁷ / ₁₆ [367]	15 ⁵ / ₈ [397]	17 ³ / ₄ [451]	18 ³ / ₄ [476]
High Set							



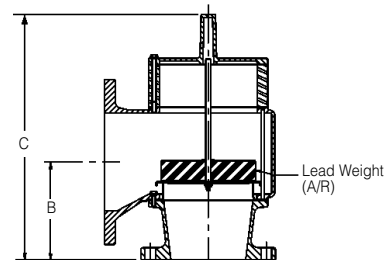
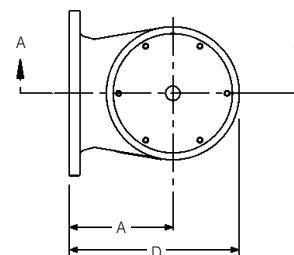
3600B and 3601B

Size Code	2	3	4	6	8	0	1
Nominal Pipe Size	2 [50]	3 [80]	4 [100]	6 [150]	8 [200]	10 [250]	12 [300]
A	5 ¹ / ₂ [140]	4 ¹⁵ / ₁₆ [125]	6 ³ / ₈ [162]	8 [203]	8 ³ / ₄ [222]	11 ³ / ₁₆ [284]	13 ⁵ / ₈ [346]
B	1 ¹¹ / ₁₆ [43]	2 ¹ / ₈ [54]	2 ⁵ / ₁₆ [59]	2 ³ / ₈ [60]	3 ³ / ₄ [95]	4 ¹ / ₈ [105]	5 ⁷ / ₁₆ [138]
C	5 ⁷ / ₈ [149]	5 ¹⁵ / ₁₆ [151]	7 ³ / ₁₆ [183]	8 ⁵ / ₁₆ [211]	12 ¹ / ₂ [318]	14 ¹ / ₁₆ [357]	16 ⁷ / ₈ [429]
Low Set							
C	10 ⁷ / ₁₆ [265]	10 ⁷ / ₁₆ [265]	11 ¹⁵ / ₁₆ [303]	12 ³ / ₈ [314]	15 ¹¹ / ₁₆ [398]	16 ¹ / ₂ [419]	18 ⁹ / ₁₆ [471]
High Set							
D	8 ⁵ / ₈ [219]	8 [203]	10 ³ / ₁₆ [259]	12 ¹ / ₄ [311]	14 ³ / ₁₆ [360]	17 ¹⁵ / ₁₆ [456]	22 ³ / ₈ [568]



3650B and 3651B

Size Code	2	3	4	6	8	0	1
Nominal Pipe Size	2 [50]	3 [80]	4 [100]	6 [150]	8 [200]	10 [250]	12 [300]
A	4 ¹⁵ / ₁₆ [125]	6 ³ / ₈ [162]	8 [203]	8 ⁹ / ₁₆ [217]	11 ³ / ₁₆ [284]	13 ⁵ / ₈ [346]	15 ³ / ₈ [391]
B	5 ¹³ / ₁₆ [148]	6 ¹ / ₄ [159]	6 ⁵ / ₁₆ [160]	8 [203]	8 ⁵ / ₈ [219]	12 ⁵ / ₈ [321]	16 ⁹ / ₁₆ [421]
C	9 ⁹ / ₁₆ [243]	11 ¹ / ₈ [283]	12 ¹ / ₄ [311]	16 ³ / ₄ [425]	18 ⁹ / ₁₆ [471]	24 ¹ / ₁₆ [611]	29 ¹³ / ₁₆ [757]
Low Set							
C	14 ¹ / ₁₆ [357]	15 ⁷ / ₈ [403]	16 ⁵ / ₁₆ [414]	20 [508]	21 ¹ / ₁₆ [535]	25 ³ / ₄ [654]	29 ¹³ / ₁₆ [757]
High Set							
D	8 [203]	10 ³ / ₁₆ [259]	12 ¹ / ₄ [311]	14 ³ / ₁₆ [360]	17 ⁵ / ₁₆ [440]	22 ³ / ₈ [568]	25 ³ / ₈ [645]



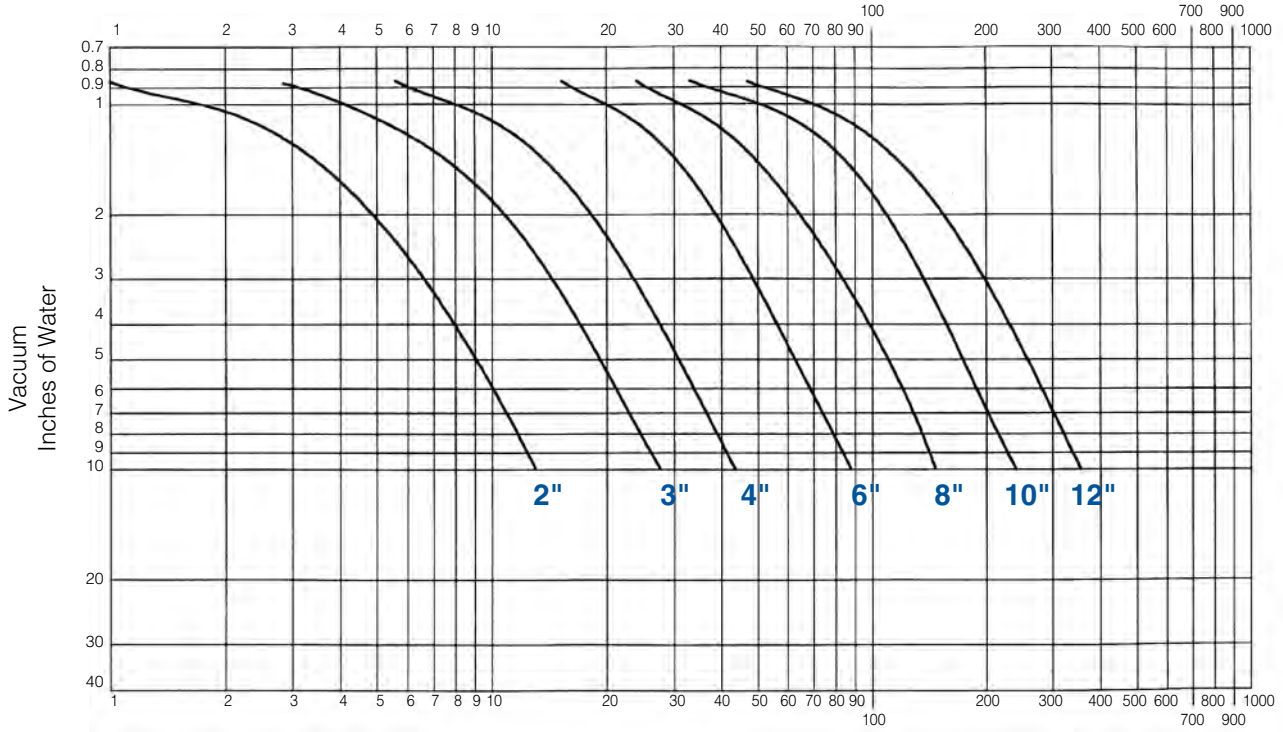
2" x 2" [50 mm x 50 mm] available in Models 3650B and 3651B.

Dimensions shown are for high set option.

Dimensions are for preliminary general information and should not be used for construction purposes. Certified dimensional drawings are available upon request.

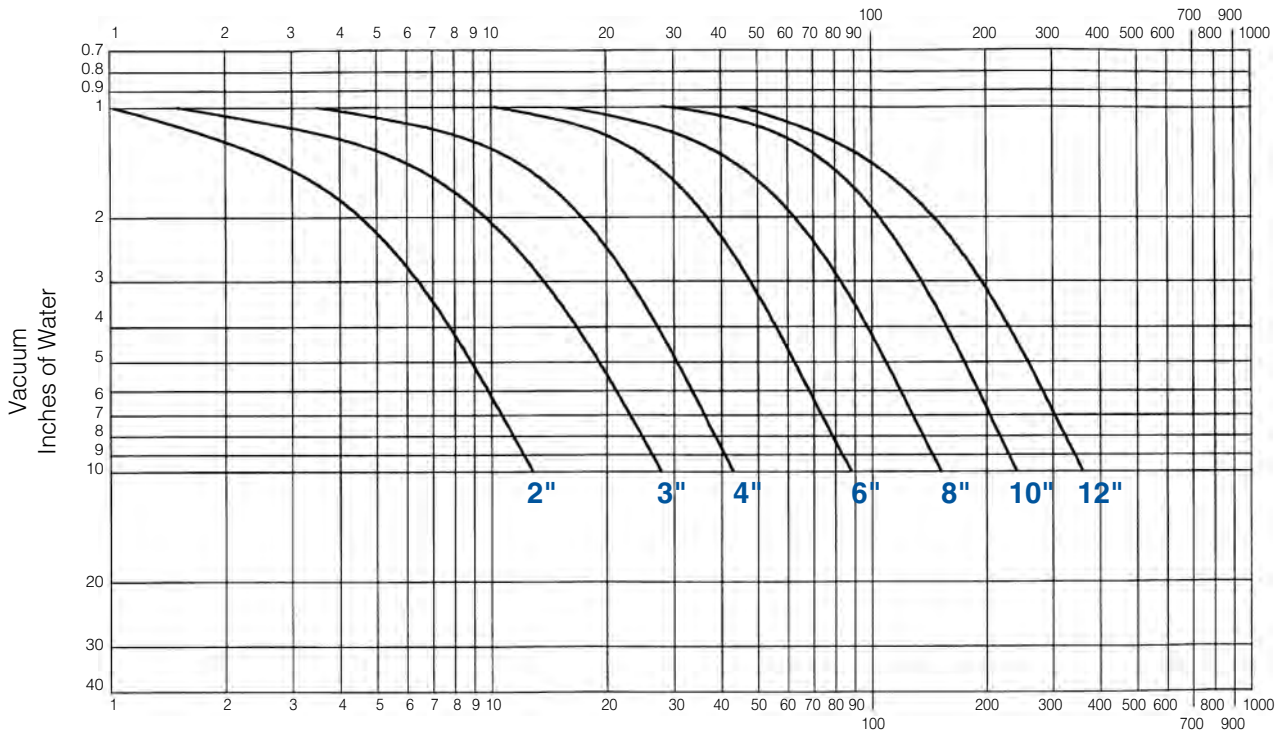
Flow Curves

3500B Series Relief Valve, Set at 0.865 inch of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

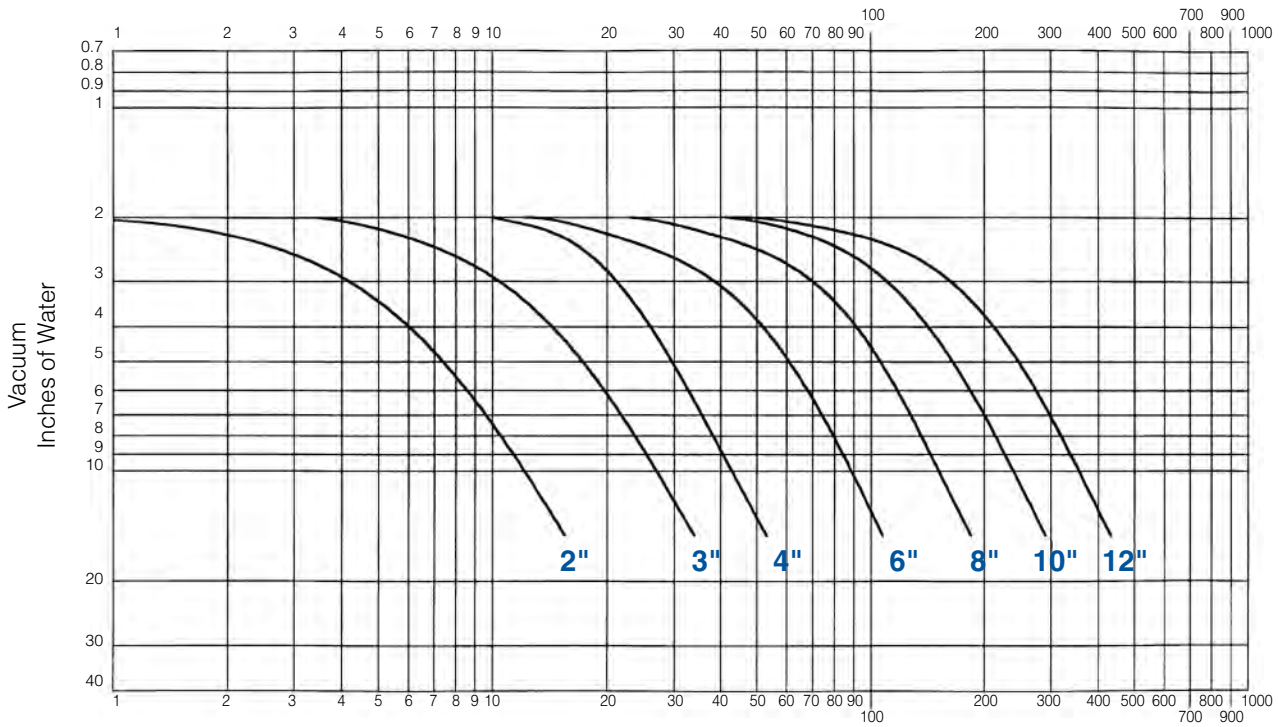
3500B Series Relief Valve, Set at 1 inch of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

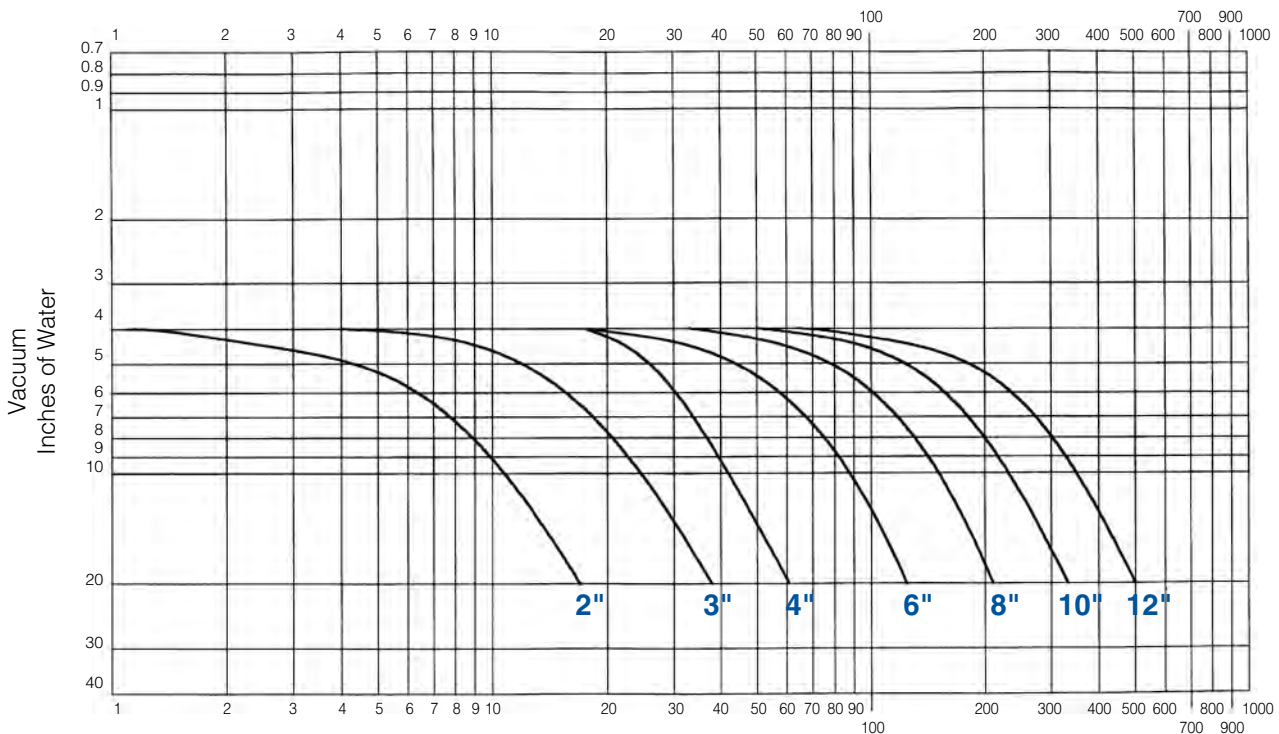
Flow Curves

3500B Series Relief Valve, Set at 2 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

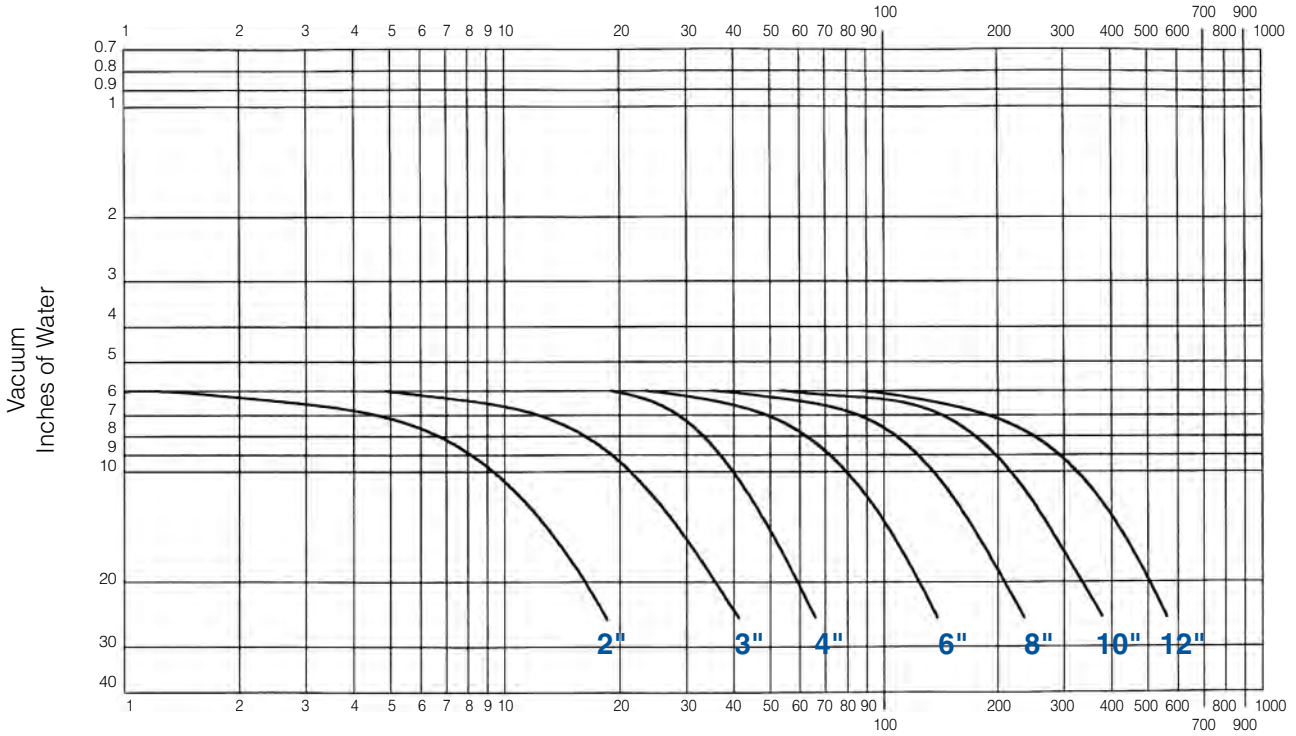
3500B Series Relief Valve, Set at 4 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

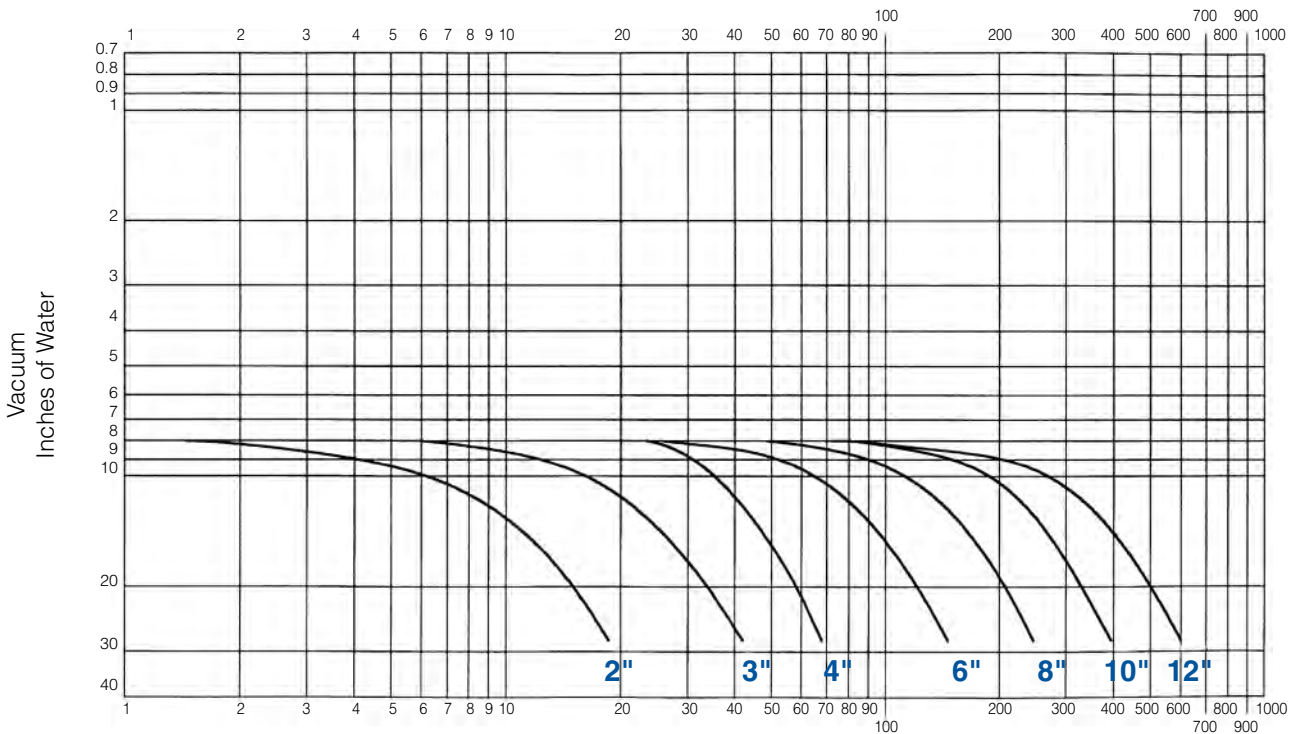
Flow Curves

3500B Series Relief Valve, Set at 6 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

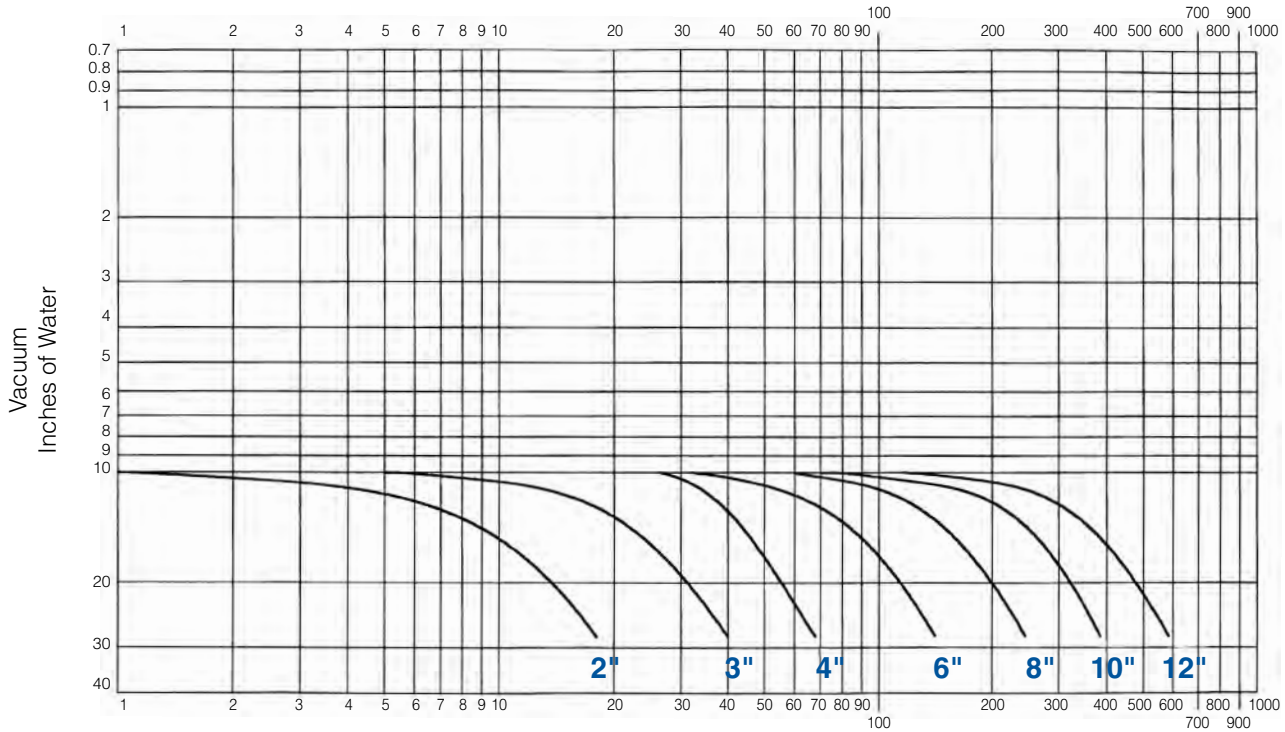
3500B Series Relief Valve, Set at 8 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

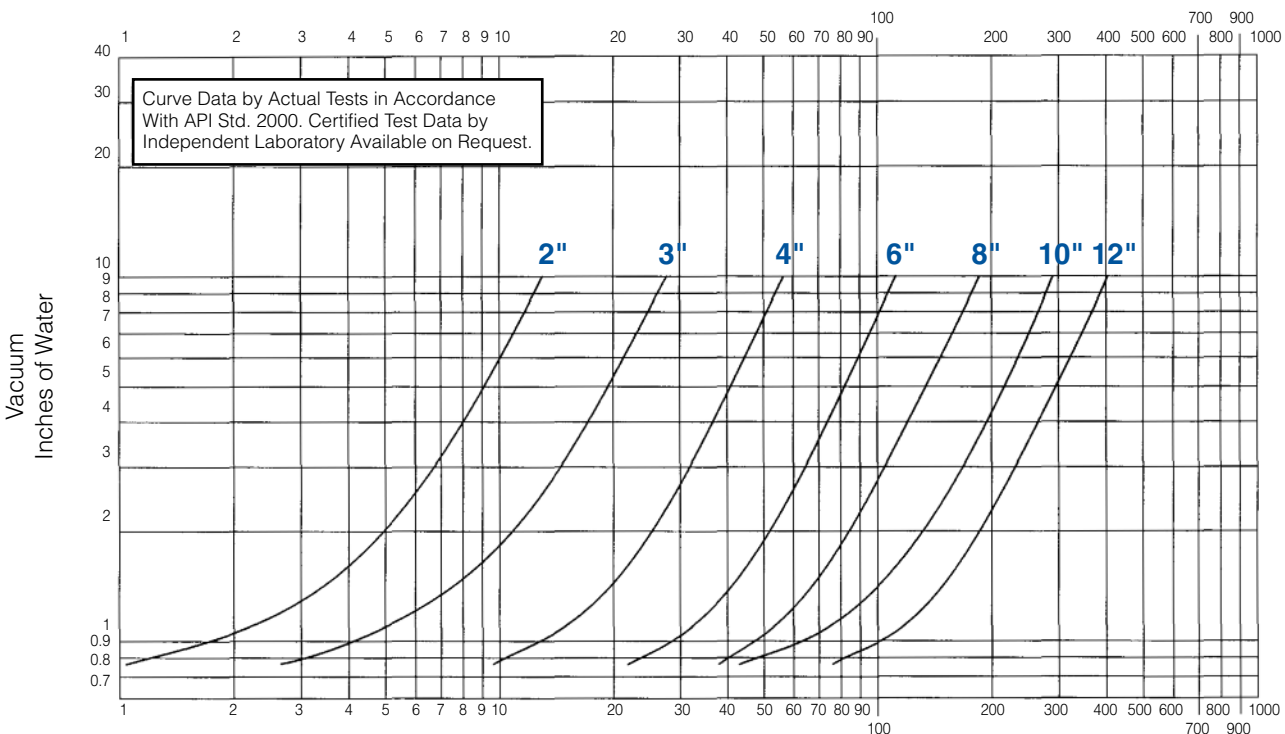
Flow Curves

3500B Series Relief Valve, Set at 10 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

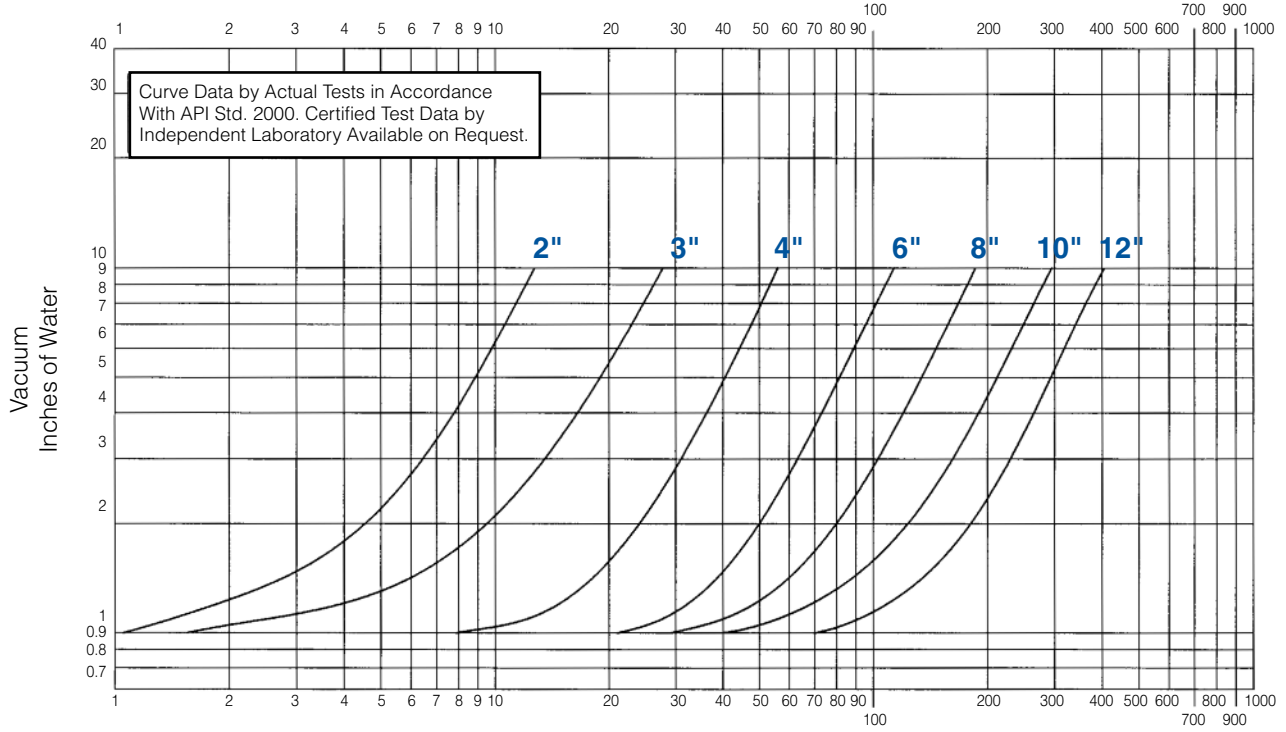
3600B Series Relief Valve, Set at 0.865 inch of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

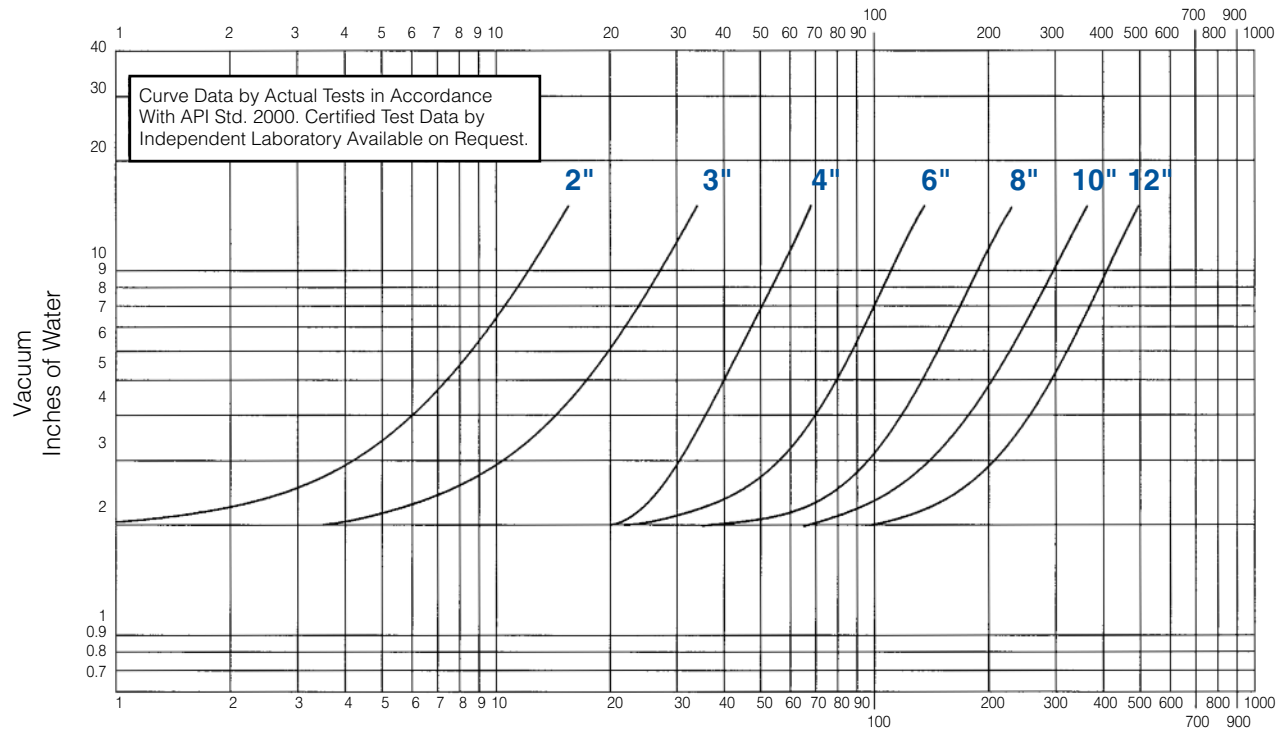
Flow Curves

3600B Series Relief Valve, Set at 1 inch of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

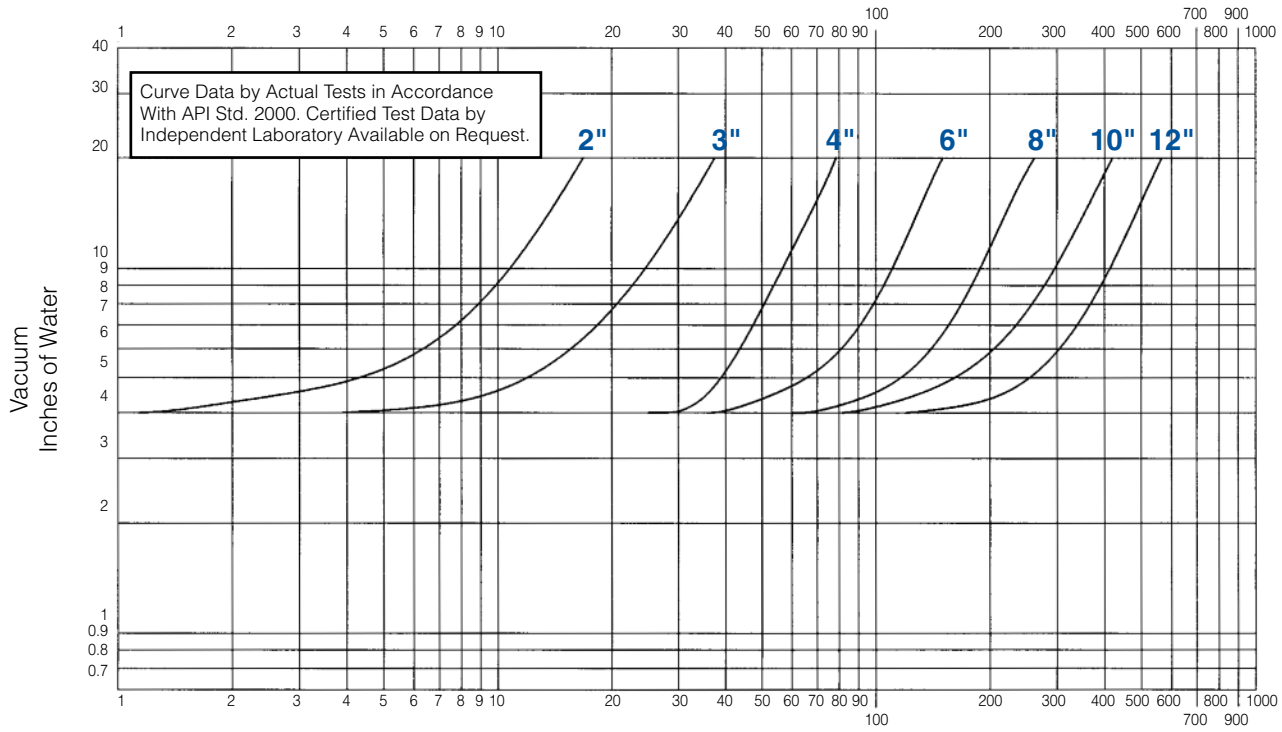
3600B Series Relief Valve, Set at 2 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

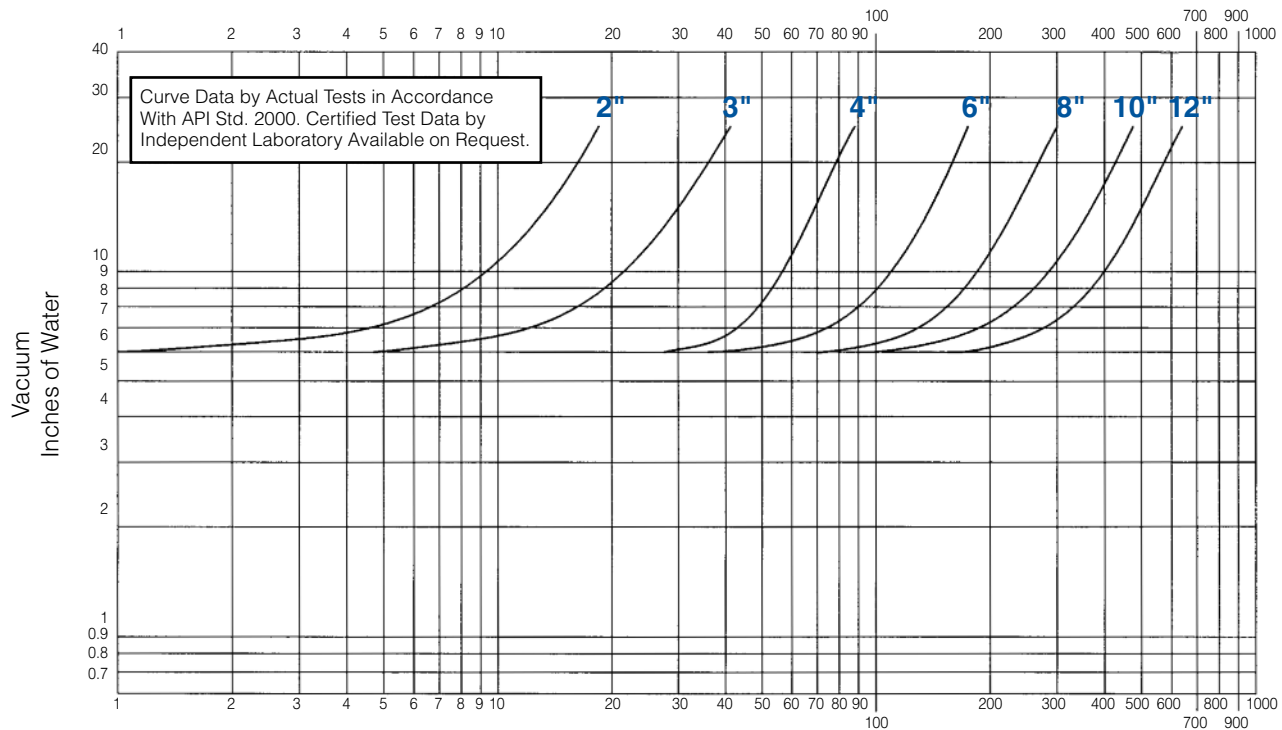
Flow Curves

3600B Series Relief Valve, Set at 4 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

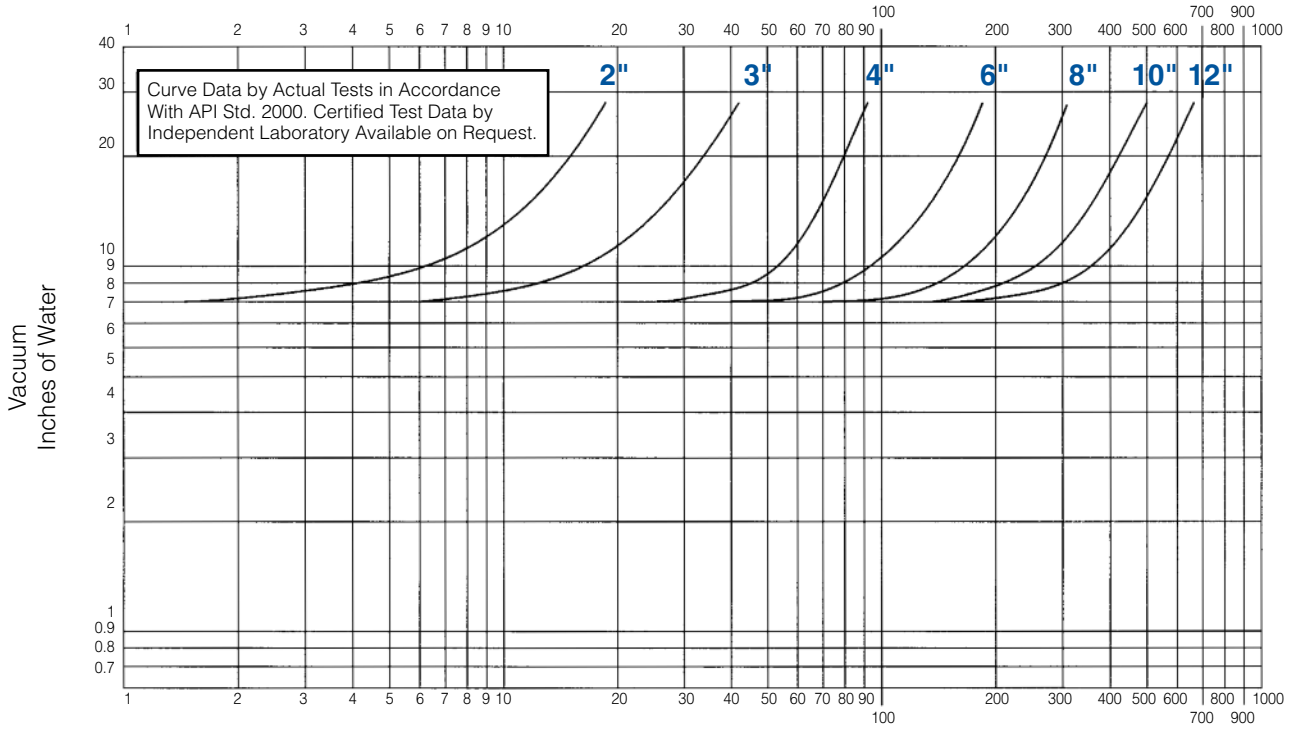
3600B Series Relief Valve, Set at 6 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

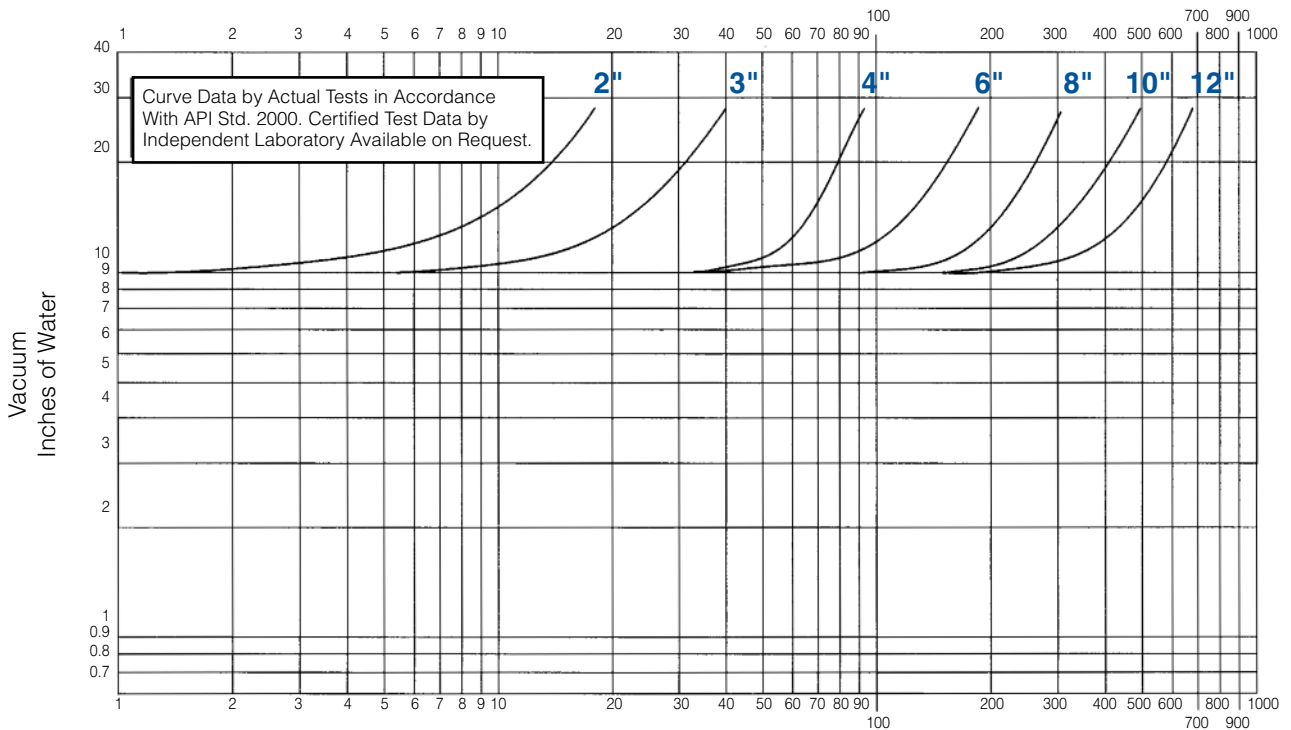
Flow Curves

3600B Series Relief Valve, Set at 8 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

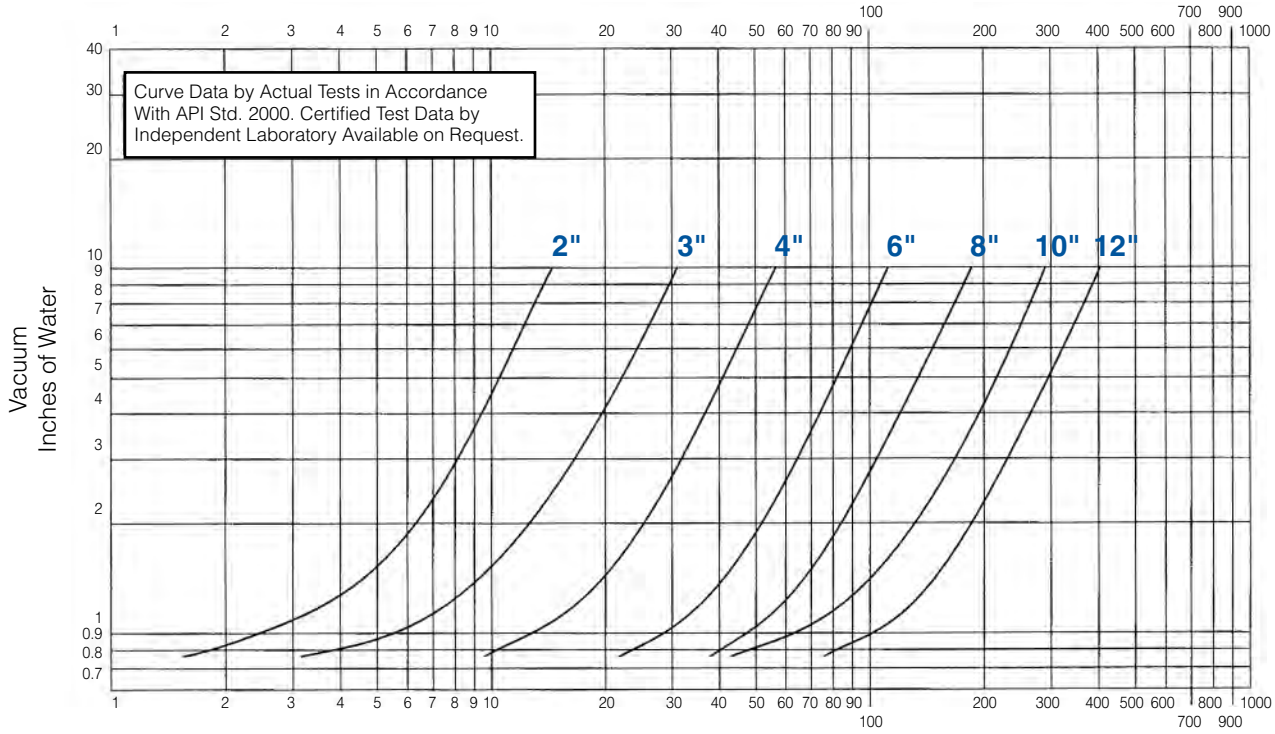
3600B Series Relief Valve, Set at 10 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

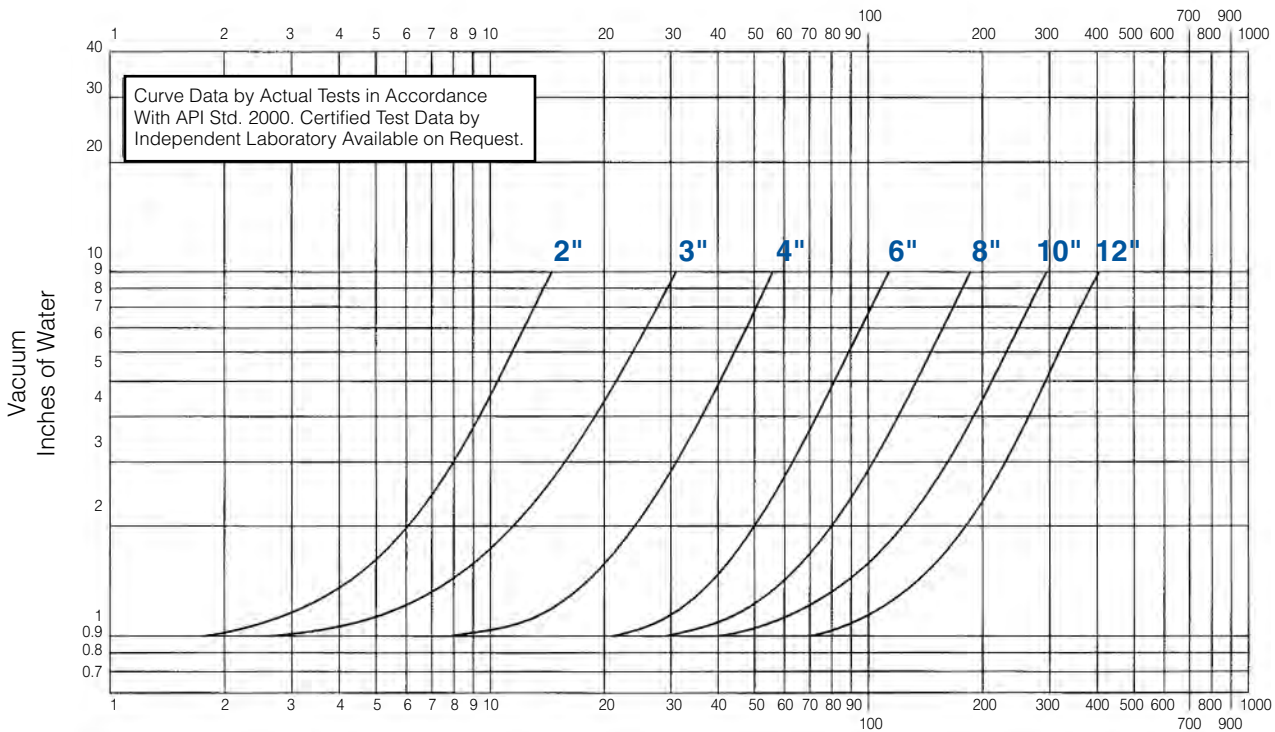
Flow Curves

3650B Series Relief Valve, Set at 0.865 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

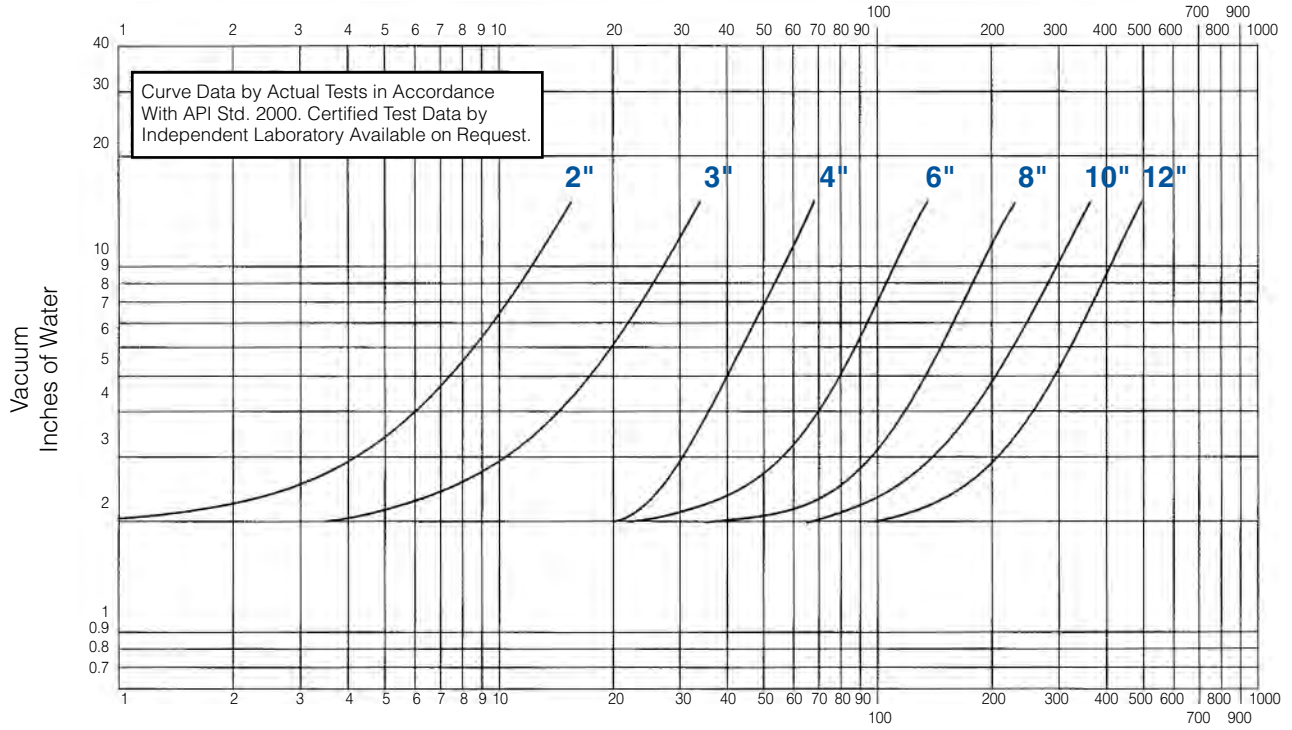
3650B Series Relief Valve, Set at 1 inch of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

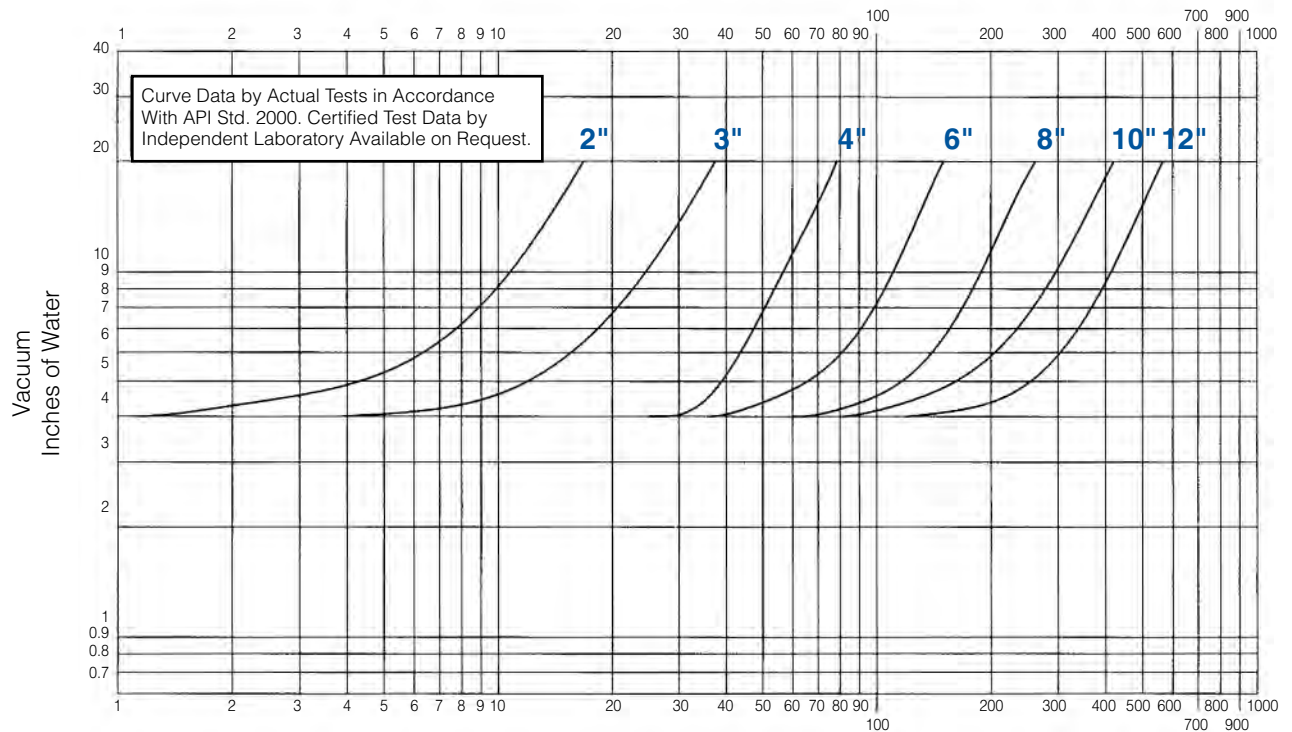
Flow Curves

3650B Series Relief Valve, Set at 2 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

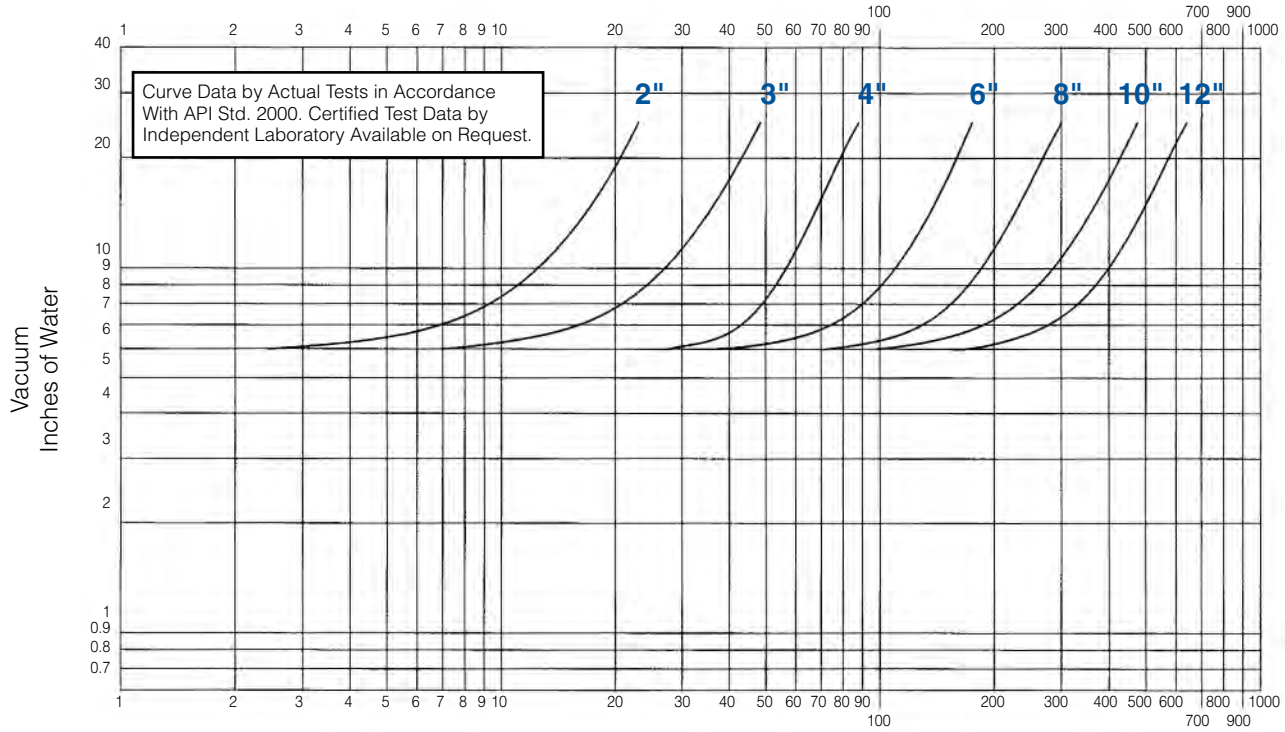
3650B Series Relief Valve, Set at 4 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

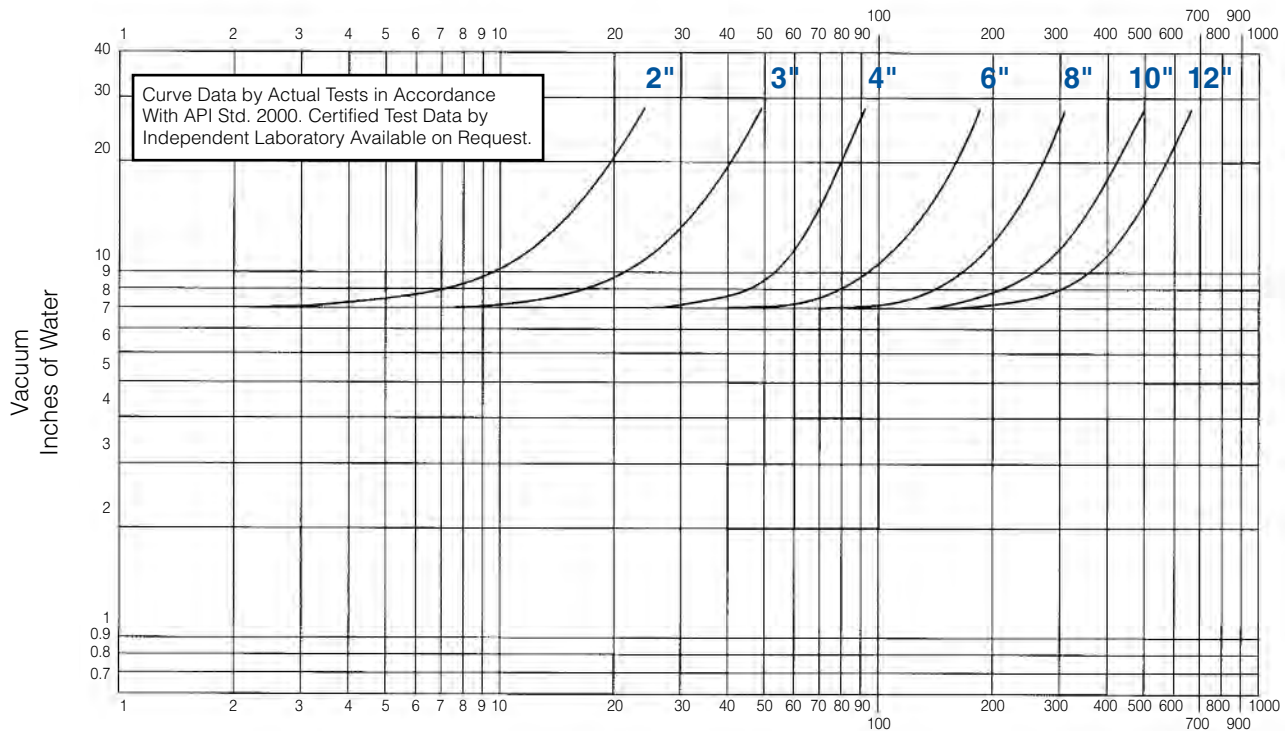
Flow Curves

3650B Series Relief Valve, Set at 6 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

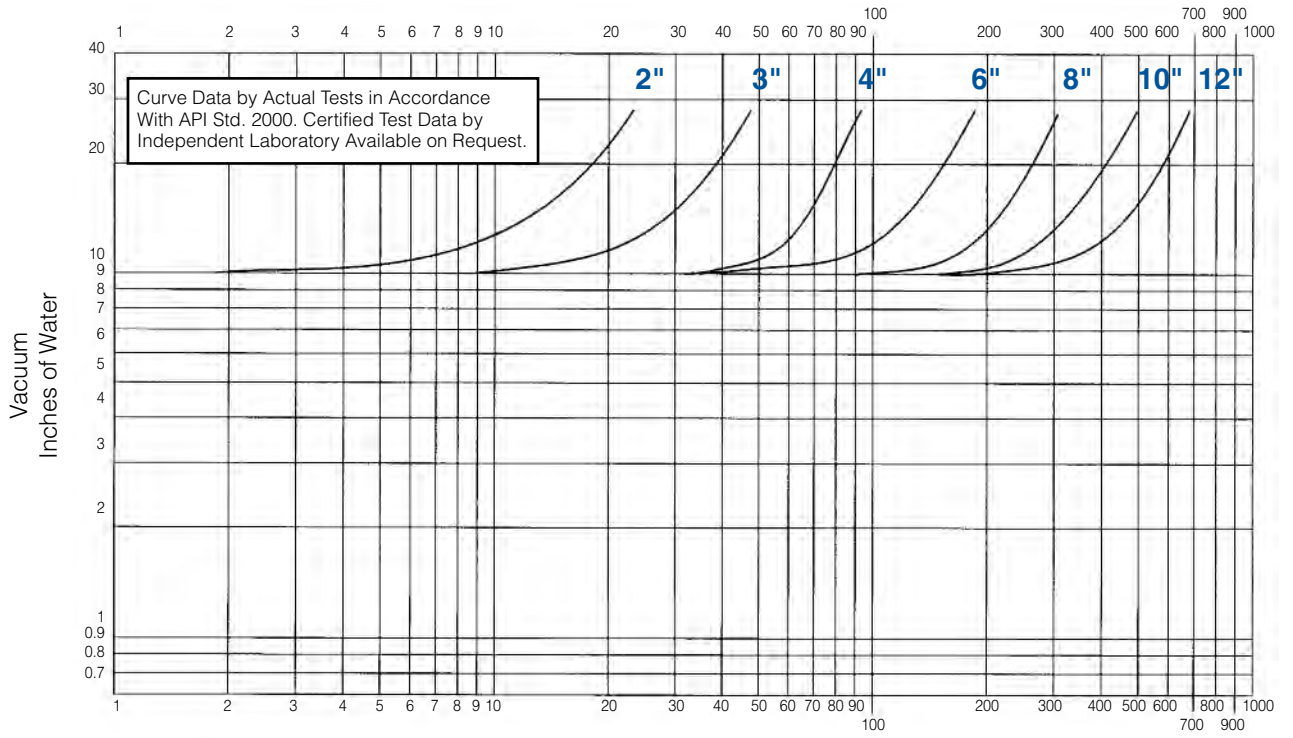
3650B Series Relief Valve, Set at 8 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

Flow Curves

3650B Series Relief Valve, Set at 10 inches of Water



Thousands of Cubic Feet/Hour at 60°F and 14.7 psia, Air Flow (SCFH)

Ordering Information

Code Description

3 Air Cushion Vacuum Relief Valve

Code Model

50 Top Mounted Vacuum Relief Valve
 60 Side mounted Vacuum Relief Valve
 65 "In-line" Pressure or Vacuum Relief Valve

Code Configuration

0B Standard
 1B "All Weather Type" (-25°F to 200°F)

Code Size 3650B/3651B Vacuum Connection Size

Code	Size	3650B/3651B Vacuum Connection Size
2	2"	3"
3	3"	4"
4	4"	6"
6	6"	8"
8	8"	10"
0	10"	12"
1	12"	14"

Code Body/Trim Material

1 Aluminum/Aluminum (-20°F to 250°F)
 2 Aluminum/316 Stainless Steel (-20°F to 250°F)
 3 Carbon Steel/316 Stainless Steel (-20°F to 350°F)
 4 Stainless Steel/316 Stainless Steel (-65°F to 350°F)
 5 Ductile Iron/316 Stainless Steel (2" to 8" only)(-20°F to 325°F)

Code Insert Material

T Teflon® (-65°F to 400°F)
 B BUNA-N (-40°F to 250°F)
 V Viton®-A (-15°F to 400°F)

Code Flange Finish

FF 125# ANSI/ASA Flat Face Flange Drilling with Fractional Studs
 MF 125# ANSI/ASA Flat Face Flange Drilling with Metric Studs
 FR 150# ANSI/ASA Raised Face Flange Drilling with Fractional Studs (not available on Aluminum)
 MR 150# ANSI/ASA Raised Face Flange Drilling with Metric Studs (not available on Aluminum)
 DF DIN Flat Face Flange Drilling
 DR DIN Raised Face Flange Drilling (not available on Aluminum)

Code Gasket/O-Ring and Retainer/Screen Material

OP Standard (Fiber/BUNA-N) and Plastic (-40°F to 250°F)
 OS Standard (Fiber/BUNA-N) and Stainless Steel (-40°F to 250°F)
 TP Teflon® and Plastic (-65°F to 250°F)
 TS Teflon® and Stainless Steel (-65°F to 350°F)
 BP BUNA-N and Plastic (-40°F to 250°F)
 BS BUNA-N and Stainless Steel (-40°F to 250°F)
 VP Viton® and Plastic (-15°F to 250°F)
 VS Viton® and Stainless Steel (-15°F to 350°F)

Code Setting Range (see table, page 2)

02 Low Setting - max. W.P.: 2 psig (see page 2)
 04 High Setting - max. W.P.: 2 psig (see page 2)

3 50 0B 2 1 T FF 0P 02 (Example)

(Example: 2" top mounted vacuum relief valve, aluminum body with aluminum trim, Teflon® insert, Flat Faced Flange, Standard Fiber/BUNA-N gaskets, low vacuum set range, temperature range: -20°F to 250°F.)

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