# 71000

# Long Life Harsh Process Gate Valves

# **Table of Contents**

Introduction		Page	84
Specifications		Page	85
Model Key Guid	e	Page	86
2.0" ID	(DN50mm)	Page	87
2.5" ID	(DN63mm)	Page	88
3.0" ID	(DN75mm)	Page	89
4.0" ID	(DN100mm)	Page	90
6.0" ID	(DN150mm)	Page	91
8.0" ID	(DN200mm)	Page	92

# Introduction





Model Number 71210-0403R 4" ID (DN100) Pneumatic ISO-F

### **Product Features**

- Extreme durability for the most demanding processes
- Robust dual containment design and low particles
- > 250,000 cycles
- HV with machined stainless steel billet body
- Sizes from 2" ID (DN50) to 8" ID (DN200)
- Manual and pneumatic actuation
- Stainless steel welded bellows outside of process
- Standard KF, ISO, CF, ANSI, JIS or custom flange options
- High temperature options up to 250°C
- Easily customizable to work with almost any application
- Designed, manufactured and assembled in the USA

# **Description**

The 71000 Series Gate Valves are machined out of solid stainless steel billet and feature a simple dual containment design at the gate that seals on both sides. There are very few moving parts, so the valves have low particle generation. With virtually no moving parts in the gate mechanism the movement is not affected by dirty processes that would normally interfere with a standard mechanical gate. The bellows is outside of process, and is protected by a wiper ring. The body and all major internal components are vacuum furnace brazed at 1100°C, at 1x10-6 mbar, ensuring maximum joint integrity. This eliminates the possibility of virtual leaks or entrapment areas and minimizes body distortion found in conventionally welded valves. For maintenance purposes, the carriage assembly can easily be removed from the body without removing the valve from the system.

# **Applications**

KF Flanges, ISO Bolted and Clamped Flanges, ANSI and optional JIS Models are designed for high vacuum applications specifically when pressure ranges approximate 1x10<sup>-9</sup> mbar and bakeout temperatures do not exceed 250°C. These valves provide valving for anything needing vacuum in a dirty or harsh environment. They can be customized to work with almost any application.

## **Internally Heated and Water-Cooled**

These valves can easily be fitted with heaters to internally heat a process from the inside up to 250°C. See custom internally heated valve section on page 187. They can also be used to cool process internally via the gate and the flanges.



# **Specifications**

# **Standard Specifications**

### **Materials**

Valve body and mechanism 304 stainless steel Welded bellows shaft seal AM-350

Bonnet / gate seals

HV Viton® elastomer

### **Vacuum**

Pressure range

HV 1 x  $10^{-9}$  mbar Leak rate  $< 2 \times 10^{-9}$  mbar l/s Differential pressure 2 bar in either direction Maximum  $\Delta$  pressure before opening  $\leq 1$  bar

**Temperature** without solenoid

Elastomer sealed bonnet 150°C

Actuator

Manual 60°C Pneumatic 60°C

### Mechanism

Air service 80 psig (5.5 bar)
Solenoid 4.0 Watts
supplied voltage 120 VAC 50/60 Hz
optional voltage 24, 200, 240 VAC 50/60 Hz

or 12, 24 VDC

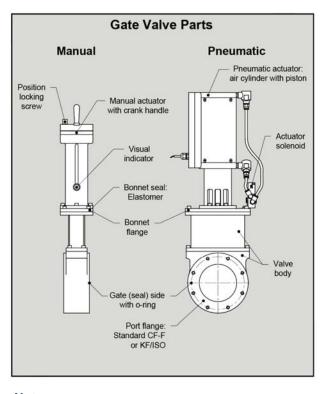
> 250,000

Position indicator, max. 115 VAC

or 28 VDC, 20 mA

# Cycles Until Service

(Application dependent)



### **Notes**

- Dimensions given in U.S. System and [metric]
- Conductance ratings based on air, given in liters per second
- Due to ongoing product development, prices, dimensions and specifications are subject to change without notice

### **Options**

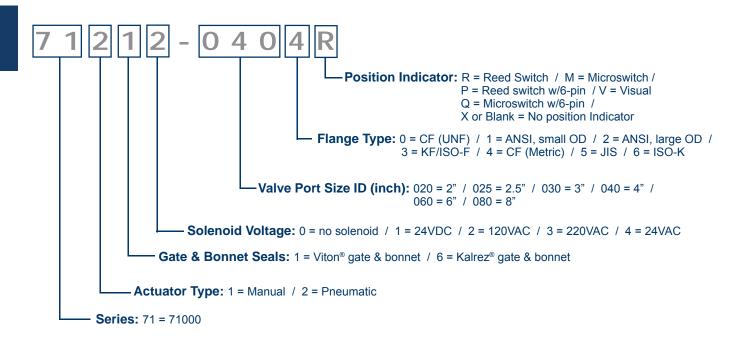
All 71000 Series Valves may be equipped with alternative flanges, solenoids and seals. Contact HVA to discuss your requirements.

- Alternate voltage controls
- · JIS configurations
- · Custom flange sizes
- Gauge ports, roughing ports and purge ports
- · Microswitches for position indicators
- High temperature components, including O-rings, microswitches and actuator
- Custom materials, such as Inconel® or Kalrez®
- Internally heated up to 250°C
- Water cooled gate and flanges
- Special solenoid or position indicator connectors

# **Model Key Guide**



**Example:** 71212-0404R = 71000 Series gate valve, pneumatic actuator, Viton gate & bonnet seals, 120VAC solenoid, 4" ID CF (6" OD) flanges with Metric thread, reed switch position indicator



# Note

- A suffix of -001 to -999 at the end of or a '9' or 'S' within a Model Number indicates a valve with custom configuration.
- If a roughing/gauge/purge port is needed add the following after the position indicator:

A = KF 25 B = KF 40 C = 1.33" OD CF fixed with thru holes D = 2.75" OD CF fixed with thru holes S = special/custom or other



# 71000 Series Long Life Harsh Process Gate Valves 2.0-inch 50-mm

CF-F 3.37 Flanges 50-mm 2.0-inch Ship Wt. **Bonnet-Gate** Flange Type **Model Number \*** lbs [Kg] Manual Viton-Viton (HV) U.S. Bolt 24 [11] 71110-0200V Pneumatic Viton-Viton (HV) U.S. Bolt 26 [12] 71212-0200R

> \* For metric flanges, replace last 0 in model number with 4

Manual	Pneumatic
Ø2.75 [69.8]	Ø3.22 [81.8]
[09.0]	[01.0]
1.97	1 1 9 1
[50.0]	
7.74	9.53
[196.5]	17.65
	[448.3]
	17.47
5.50	[443.6]
5.45	7]
[138.4]	
22.5°	
2.49	
[63.2]	1 1 1
4.35 [110.5]	2.56 [65.0]
7,300 [110.0]	1.86 [47.3]
3.37 CF-F	
O.D. = Ø3.38 [85.7] I.D. = Ø2.00 [50.8]	
Hole depth = .625 [15.9] No. of holes = 8, 5/16-24 [M8 x 1.	25]
Bolt circle = Ø2.850 [72.4] Conductance = 279 liters/sec	

<u>Specifications</u> HV Pressure Range: 1 x 10<sup>-9</sup> mbar Helium Leak Rate: Materials: < 2 x 10<sup>-9</sup> mbar l/s Maximum △ Pressure Before Opening: ≤ 1 bar Materials:

Body = 304 Stainless Steel 304 Stainless Steel Gate = Bellows = AM-350 Actuator = 6061-T6 Aluminum

### Operating Temperature:

150°C\* Body, Gate Open (Viton®) = 150°C\* Body, Gate Closed (Viton®) = 60°C\* Actuator w/out solenoid (Viton®) = 150°C\* Position Indicator (Viton®) =

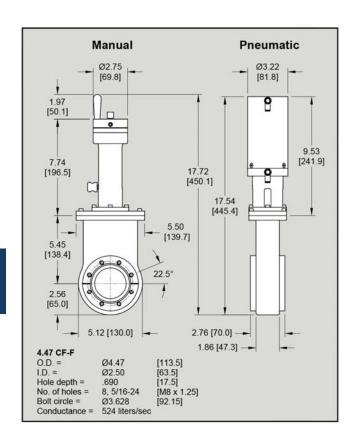
\*250°C options available on request.

Manual	Pneumatic
Ø2.75 [69.8]	Ø3.22 [81.8]
1.97 [50.1]	1 1 9
7.74 [196.5]	17.65 [448.3]
	.50 39.7]
2.49 [63.2]	Ø2.9 [74.9
4.35 [110.5]	2.36 [60.0] —
KF-50 O.D. = Ø2.95 [74.9 I.D. = Ø2.00 [50.8 Assembly = Hiinged clamp Conductance = 317 liters/sec	

KF-50 Flanges			50-mm 2.0-inch
Bonnet-Gate	Flange Type	Ship Wt. lbs [Kg]	Model Number
Manual			
Viton-Viton (HV)	Hinged clamp	21 [9]	71110-0203V
Pneumatic			
Viton-Viton (HV)	Hinged clamp	23 [10]	71212-0203R

# 63-mm 2.5-inch





CF-F 4.47 Flanges			63-mm 2.5-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number *
Manual	2		
Viton-Viton (HV)	U.S. Bolt	26 [12]	71110-0250V
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	27 [12]	71212-0250R

\* For metric flanges, replace last 0 in model number with 4

### **Specifications**

 HV Pressure Range:
 1 x 10° mbar

 Helium Leak Rate: Materials:
 < 2 x 10° mbar l/s</td>

 Maximum Δ Pressure Before Opening:
 ≤ 1 bar

 Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

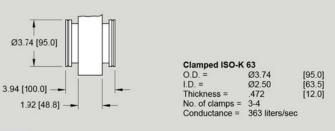
### Operating Temperature:

 $\begin{array}{lll} \mbox{Body, Gate Open ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \\ \mbox{Body, Gate Closed ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \\ \mbox{Actuator w/out solenoid ($\it Viton$^0$) =} & 60^{\circ}\mbox{C*} \\ \mbox{Position Indicator ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \end{array}$ 

\*250°C options available on request.

Manual	Pneumatic
Ø2.75 [69.8]	Ø3.22 [81.8]
1.97 [50.1]	
	9.53 [241.9] 150.1]
5.50	17.54 [445.4]
5.45 [138.4]	
2.56 [65.0]	
' → Ø5.12 [130.0]	2.36 [60.0] —       -       1.86 [47.3] —     -

ISO-63 Flanges			63-mm 2.5-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number
Manual			
Viton-Viton (HV)	Metric Bolt	25 [11]	71110-0253V
Viton-Viton (HV)	Clamp	26 [12]	71110-0256V
Pneumatic			
Viton-Viton (HV)	Metric Bolt	27 [12]	71212-0253R
Viton-Viton (HV)	Clamp	28 [13]	71212-0256R



No. of holes =

Conductance =

Bolt circle =

4, M8 x 1.25

615 liters/sec

Ø4.331

[110.0]



O.D. =

No. of holes =

Conductance =

Bolt circle =

Bolt circle =

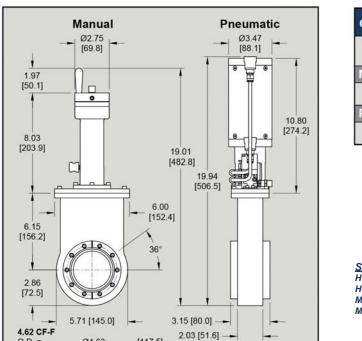
Conductance =

Ø4.920

1,071 liters/sec

[125.0]

I.D. = Hole depth =



[117.5] [76.2] [19.05]

[102.4]

[M8 x 1.25]

Ø4 63 Ø3.00

750

Ø4.030

10, 5/16-24

823 liters/sec

CF-F 4.62 Flanges			75-mm 3.0-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	28 [13]	71110-0300V
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	32 [15]	71212-0300R

75-mm

\* For metric flanges, replace last 0 in model number with 4

3.0-inch

<u>Specifications</u> HV Pressure Range: 1 x 10<sup>-9</sup> mbar Helium Leak Rate: Materials: < 2 x 10<sup>-9</sup> mbar l/s Maximum A Pressure Before Opening: ≤ 1 bar

> Body = 304 Stainless Steel 304 Stainless Steel Gate = Bellows = AM-350 Actuator = 6061-T6 Aluminum

### Operating Temperature:

150°C\* Body, Gate Open (Viton®) = 150°C\* Body, Gate Closed (Viton®) = 60°C\* Actuator w/out solenoid (Viton®) = Position Indicator (Viton®) =

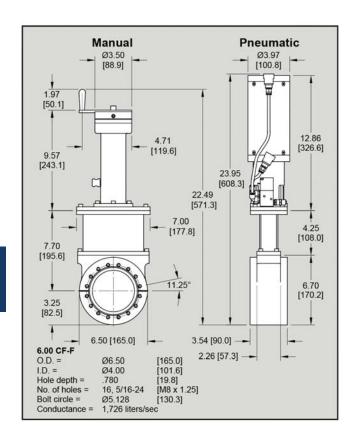
\*250°C options available on request.

Manual	Pneumatic
Ø2.75 [69.8]	Ø3.47 [88.1] -
1	
1.97 [50.1]	<u> </u>
1 0	
	10.80
8.03 [203.9]	
~	19.01
W	19.94
<u> </u>	[506.5]
	00
6.15	52.4]
[156.2]	
22.5°	
2.86	
[72.5]	
5.71 [145.0]	2.76 [70.0] —
O.D. = Ø5.71 [145.0	
I.D. = Ø3.00 [76.2]	

ISO-80 Flanges			75-mm 3.0-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number
Manual			
Viton-Viton (HV)	Metric Bolt	29 [13]	71110-0303V
Viton-Viton (HV)	Clamp	28 [13]	71110-0306V
Pneumatic			
Viton-Viton (HV)	Metric Bolt	33 [15]	71212-0303R
Viton-Viton (HV)	Clamp	32 [15]	71212-0306R

# 100-mm 4.0-inch





CF-F 6.00 Flanges		100-mm 4.0-inch	
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number *
Manual	,		
Viton-Viton (HV)	U.S. Bolt	41 [19]	71110-0400V
Pneumatic		20	
Viton-Viton (HV)	U.S. Bolt	45 [20]	71212-0400R

\* For metric flanges, replace last 0 in model number with 4

### **Specifications**

 HV Pressure Range:
 1 x 10° mbar

 Helium Leak Rate: Materials:
 < 2 x 10° mbar l/s</td>

 Maximum Δ Pressure Before Opening:
 ≤ 1 bar

 Materials:

Body = 304 Stainless Steel Gate = 304 Stainless Steel Bellows = AM-350 Actuator = 6061-T6 Aluminum

### Operating Temperature:

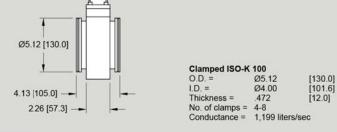
 $\begin{array}{lll} \mbox{Body, Gate Open ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \\ \mbox{Body, Gate Closed ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \\ \mbox{Actuator w/out solenoid ($\it Viton$^0$) =} & 60^{\circ}\mbox{C*} \\ \mbox{Position Indicator ($\it Viton$^0$) =} & 150^{\circ}\mbox{C*} \end{array}$ 

\*250°C options available on request.

<b>Manual</b> → Ø3.50 [88.9]	Pneumatic  Ø3.97 [100.8]
1.97	
9.57 [243.1]	12.86 [326.6]
	[608.3] 2.49 71.3] 4.25
7.70 [195.6]	[108.0]
3.25 [82.5]	6.70 [170.2]
B # 1100 B 100	.76 [70.0] —

[145.0]

ISO-100 Flanges 100-mm 4.0-inch				
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number	
Manual				
Viton-Viton (HV)	Metric Bolt	37 [17]	71110-0403V	
Viton-Viton (HV)	Clamp	37 [17]	71110-0406V	
Pneumatic				
Viton-Viton (HV)	Metric Bolt	41 [19]	71212-0403R	
Viton-Viton (HV)	Clamp	41 [19]	71212-0406R	



Bolt circle =

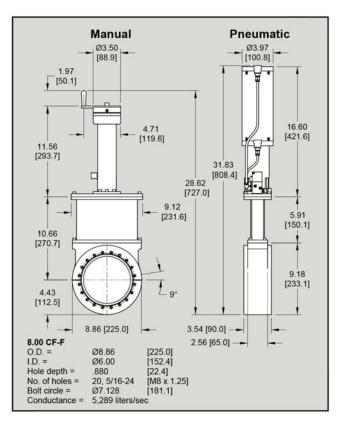
Conductance =

Ø5 709

2,122 liters/sec



150-mm 6.0-inch



CF-F 8.00 Flanges 150-mm 6.0-inc				
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number *	
Manual				
Viton-Viton (HV)	U.S. Bolt	56 [25]	71110-0600V	
Pneumatic				
Viton-Viton (HV)	U.S. Bolt	91 [41]	71212-0600R	

\* For metric flanges, replace last 0 in model number with 4

Specifications
HV Pressure Range: 1 x 10<sup>-9</sup> mbar Helium Leak Rate: Materials: < 2 x 10<sup>-9</sup> mbar l/s Maximum A Pressure Before Opening: ≤ 1 bar Materials:

Body = 304 Stainless Steel 304 Stainless Steel Gate = Bellows = AM-350 Actuator = 6061-T6 Aluminum

### Operating Temperature:

150°C\* Body, Gate Open (Viton®) = 150°C\* Body, Gate Closed (Viton®) = 60°C\* Actuator w/out solenoid (Viton®) = Position Indicator (Viton®) =

\*250°C options available on request.

Manual	Pneumatic	l
Ø3.50	Ø3.97	ı
[88.9]	[100.8]	l
1.97 [50.1]	1	l
	<u> </u>	l
		l
4.71	16.60	l
11.56	[421.6]	l
[293.7]	34 CS   #	ı
	31.83	l
<b>4</b>	28.62	l
<u> </u>	[727.0]	l
9.12	"   TF +	l
[231.6	5] 5.91 [150.1]	l
10.66	1 1 1 1 1 1	l
[270.7]		L
22.5°	9.18	
	[233.1]	
4.43		
[112.5]	<u> </u>	
8.86 [225.0]	2.76 [70.0]	
Bolted ISO-F 160		
O.D. = Ø8.86 [225.0]	2.56 [65.0] —	
I.D. = Ø6.00 [152.4]		
Hole depth = .500 [12.7] No. of holes = 8, M10 x 1.50		
Bolt circle = Ø7.874 [200.0]		
Conductance = 7 140 literalese		

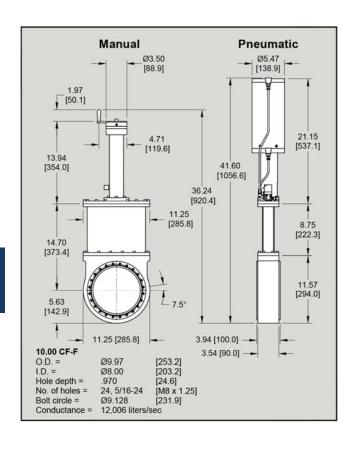
Conductance =

7,140 liters/sec

ISO-160 Flanges 150-m			150-mm 6.0-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number
Manual			
Viton-Viton (HV)	Metric Bolt	49 [22]	71110-0603V
Viton-Viton (HV)	Clamp	52 [24]	71110-0606V
Pneumatic			
Viton-Viton (HV)	Metric Bolt	85 [39]	71212-0603R
Viton-Viton (HV)	Clamp	87 [39]	71212-0606R

# 200-mm 8.0-inch





CF-F 10.00 Flar	iges		200-mm 8.0-inch
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number *
Manual			
Viton-Viton (HV)	U.S. Bolt	117 [53]	71110-0800V
Pneumatic			
Viton-Viton (HV)	U.S. Bolt	133 [60]	71212-0800R

\* For metric flanges, replace last 0 in model number with 4

### **Specifications**

 HV Pressure Range:
 1 x 10° mbar

 Helium Leak Rate: Materials:
 < 2 x 10° mbar l/s</td>

 Maximum Δ Pressure Before Opening:
 ≤ 1bar

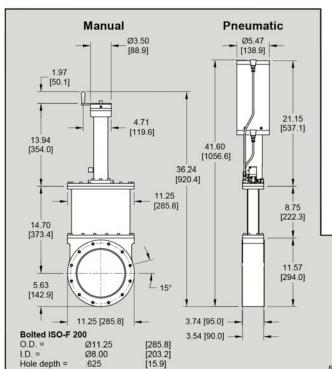
 Materials:

Body = 304 Stainless Steel
Gate = 304 Stainless Steel
Bellows = AM-350
Actuator = 6061-T6 Aluminum

### Operating Temperature:

Body, Gate Open ( $Viton^0$ ) = 150°C\* Body, Gate Closed ( $Viton^0$ ) = 150°C\* Actuator w/out solenoid ( $Viton^0$ ) = 60°C\* Position Indicator ( $Viton^0$ ) = 150°C\*

\*250°C options available on request.



12, M10 x 1.50 Ø10.236

11,597 liters/sec

[260.0]

No. of holes =

Conductance =

Bolt circle =

ISO-200 Flanges 200-mm 8.0-incl				
Bonnet-Gate	Flange Type	Ship Wt. Ibs [Kg]	Model Number	
Manual				
Viton-Viton (HV)	Metric Bolt	117 [53]	71110-0803V	
Viton-Viton (HV)	Clamp	122 [55]	71110-0806V	
Pneumatic				
Viton-Viton (HV)	Metric Bolt	133 [60]	71212-0803R	
Viton-Viton (HV)	Clamp	139 [63]	71212-0806R	

