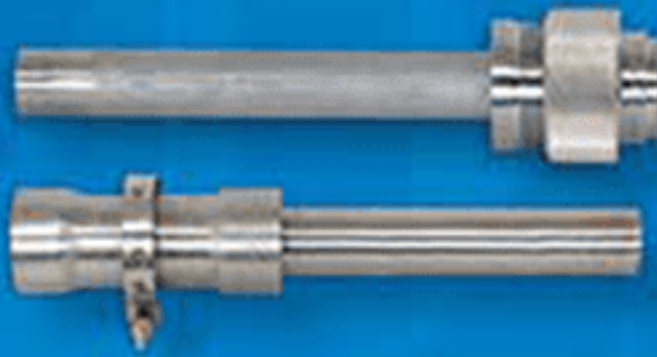




Cryogenic Valves Vacuum Components



Vacuum Jacketed
Cryogenic Valves

Cryogenic Bayonets

Custom Manifolds



Vapor Vent Heaters



Vacuum Seal-off
Valves & Operators

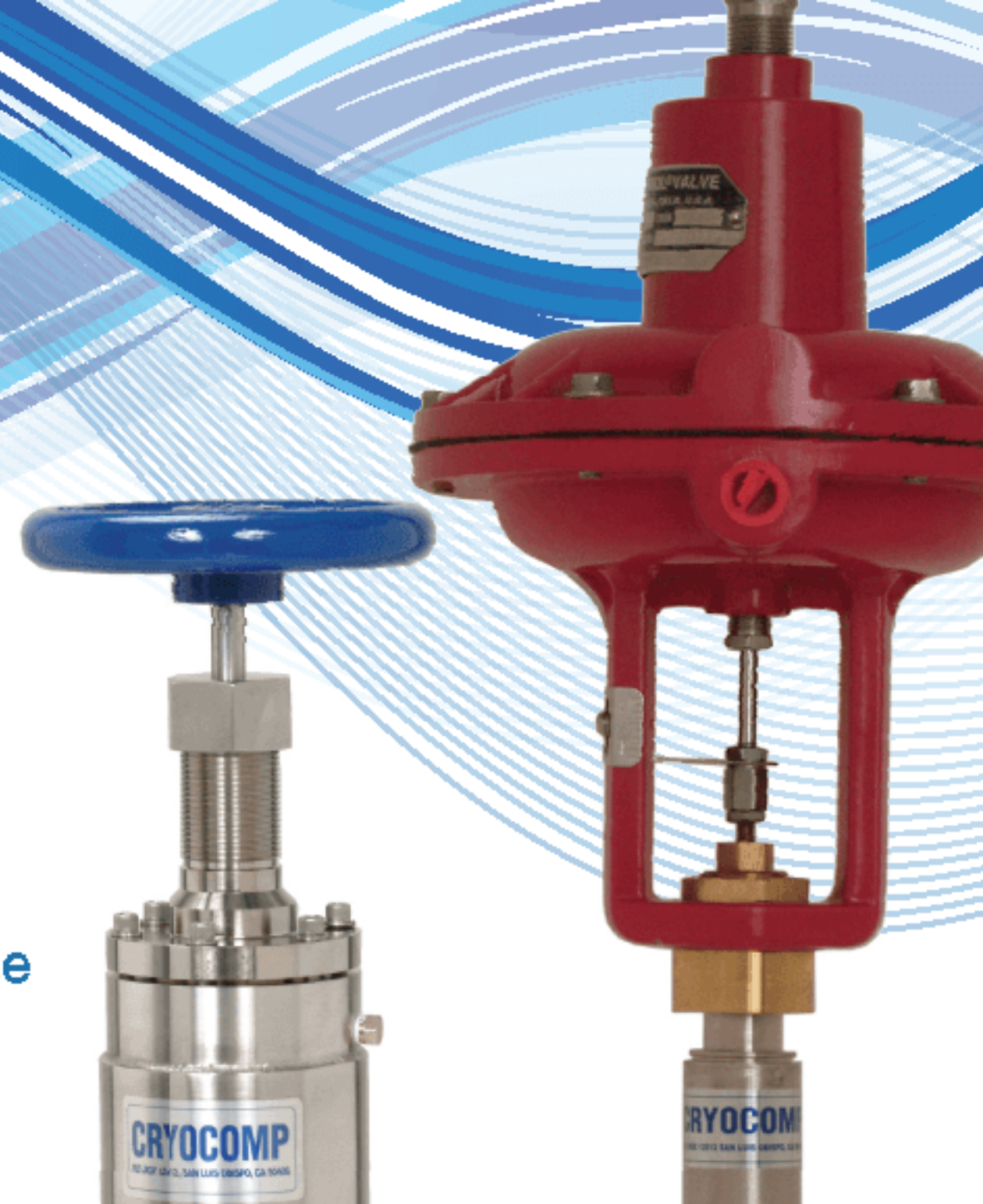


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Cryogenic Valves

Cryocomp valves are available in 1/4" tube through 2" pipe size weld ends, manual or actuated function. Our valves are also available in 3 different body configurations, globe, right angle or y-pattern. Accessories and options increase the capabilities and performance of our high quality valves.



C2000 Valve Series Pipe Size Manual and Actuated



C2000 Series
Manual YPattern Valve



C2000 Series
Manual Globe Valve



C2000 Series
Actuated Globe Valve

C2000 valves range from 1/2" tube (with optional adapter) to 2" pipe size weld ends. Applications for the C2000 Series include vacuum-jacketed piping, cold boxes, manifolds and tank systems. These vacuum-jacketed valves can be used with liquid nitrogen, helium, argon, oxygen service (with proper cleaning) and other cryogenic liquids. Precision trim options available, please see back page.

C5000 Valve Series Tube Size Manual and Actuated



C5000 Series
Manual Globe Valve



C5000 Series
Actuated Globe Valve



C5000 Series
Right Angle Valve

CryoComp C5000 vacuum-jacketed valves are available in 1/4" to 1/2" tube size weld ends in globe or right angle body configuration. Applications for the C5000 Series include vacuum-jacketed piping, cold boxes, helium transfer lines and cryogenic piping systems.

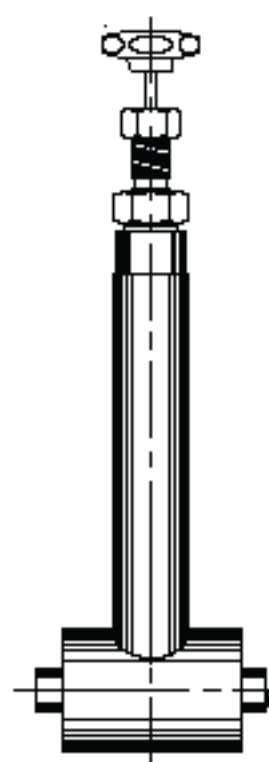


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Cryogenic Valves &
Vacuum Components

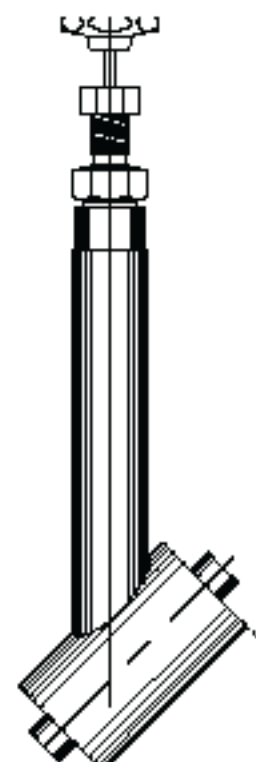
Design The Perfect Valve



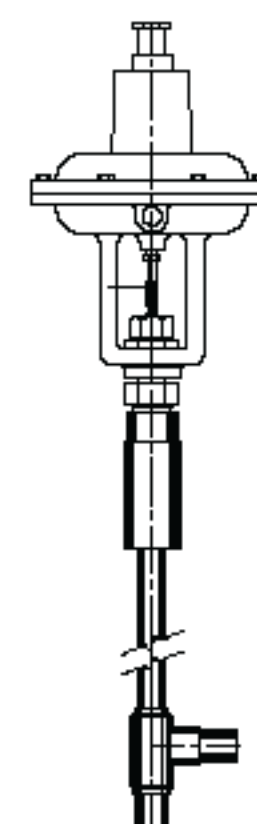
Globe



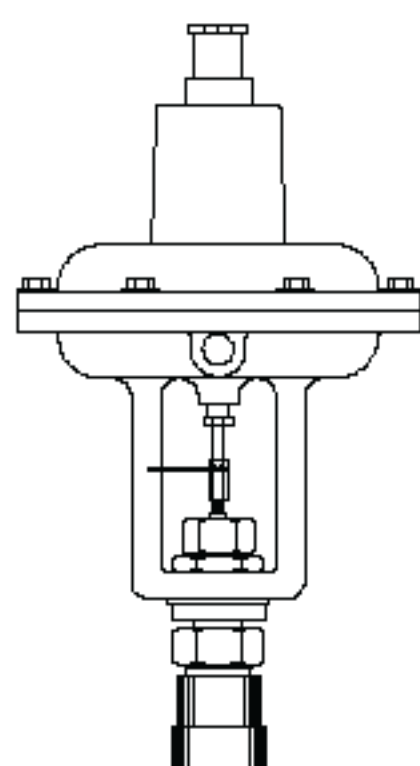
Right Angle



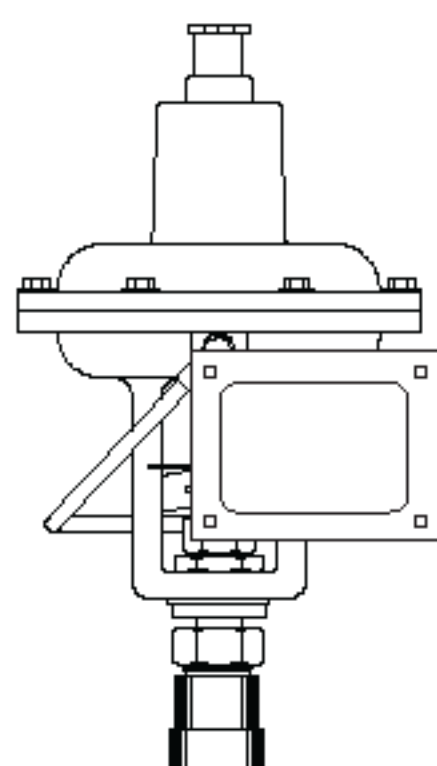
Y-Pattern*



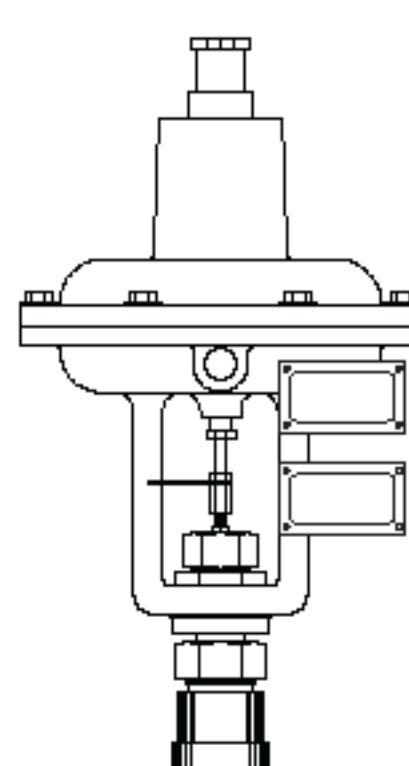
Cold Box Jacket



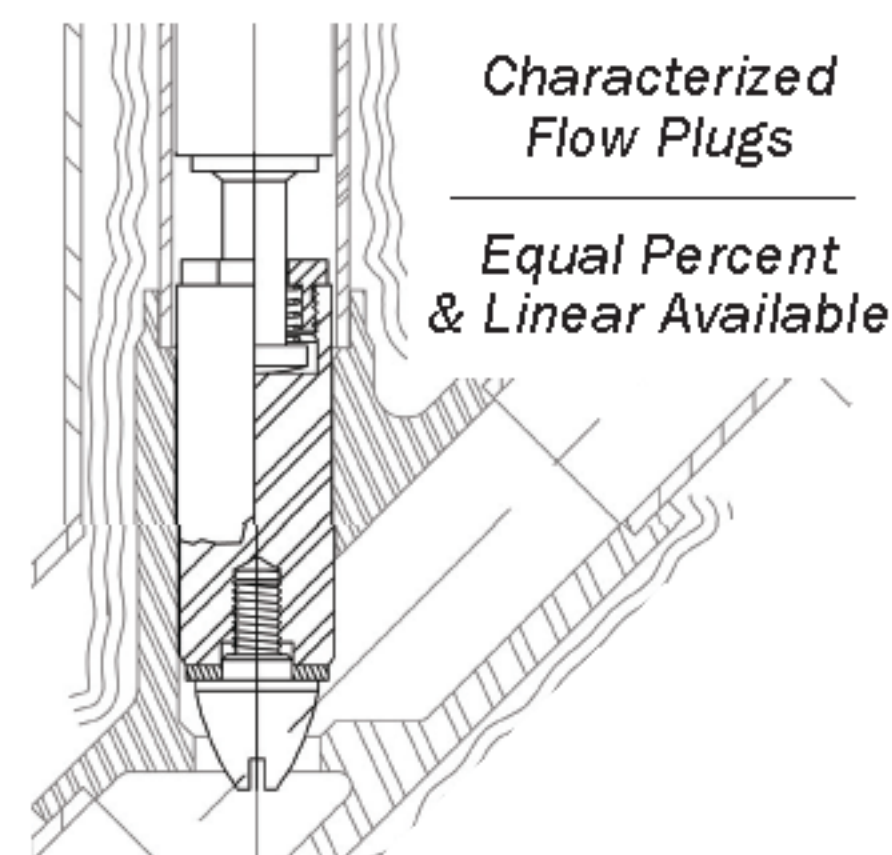
Actuator



Actuator with Positioner I-P
and P-P



Limit
Switches



Characterized Flow Plugs

Characterized
Flow Plugs

Equal Percent
& Linear Available



Cryogenic Valve Part Numbering System

To specify the cryogenic valve you'd like to order, select the features you require and build the part number using the option codes provided. See examples below. Call for more information or assistance designing your cryogenic valve.

C 0 0 0 0

PRODUCT

All Vacuum-Jacketed Style
Cryogenic Valves = **C**

DESIGN SERIES

C2000 Series = **2**
C3000 Series = **3**
C5000 Series = **5**

SIZE (1/8")

1/4" (2/8) = **02**
3/8" (3/8) = **03**
1/2" (4/8) = **04**
1" (8/8) = **08**
1 1/2" (12/8) = **12**
2" (16/8) = **16**

BODY

Globe = **1**
Right Angle = **2**
Y-Pattern = **3***
(Butt Weld Ends)

Product Number Example:

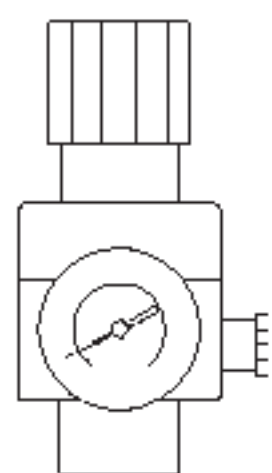
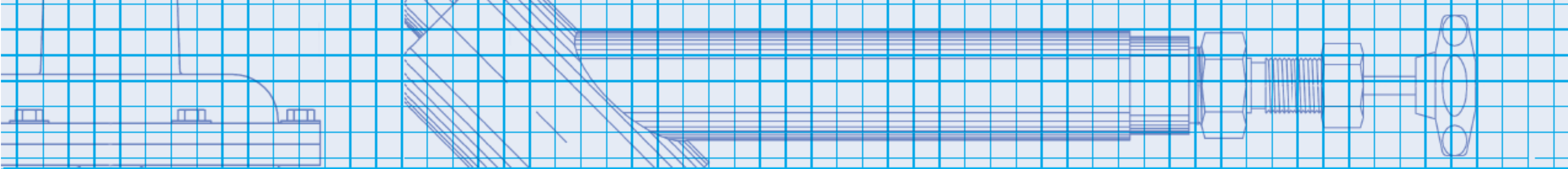
Model number C2041-M21 =

Series 2000, 1/2", globe, manual, port with pipe plug, full jacket

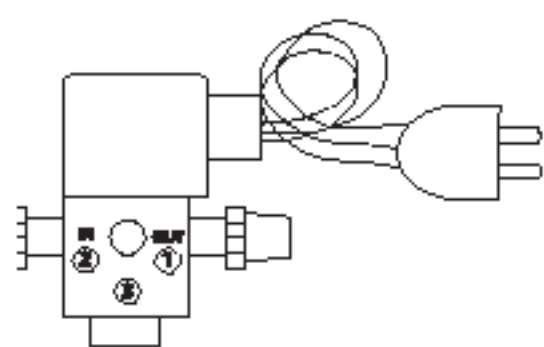
* For C3000 or C5000 Y-pattern Valves, consult factory.



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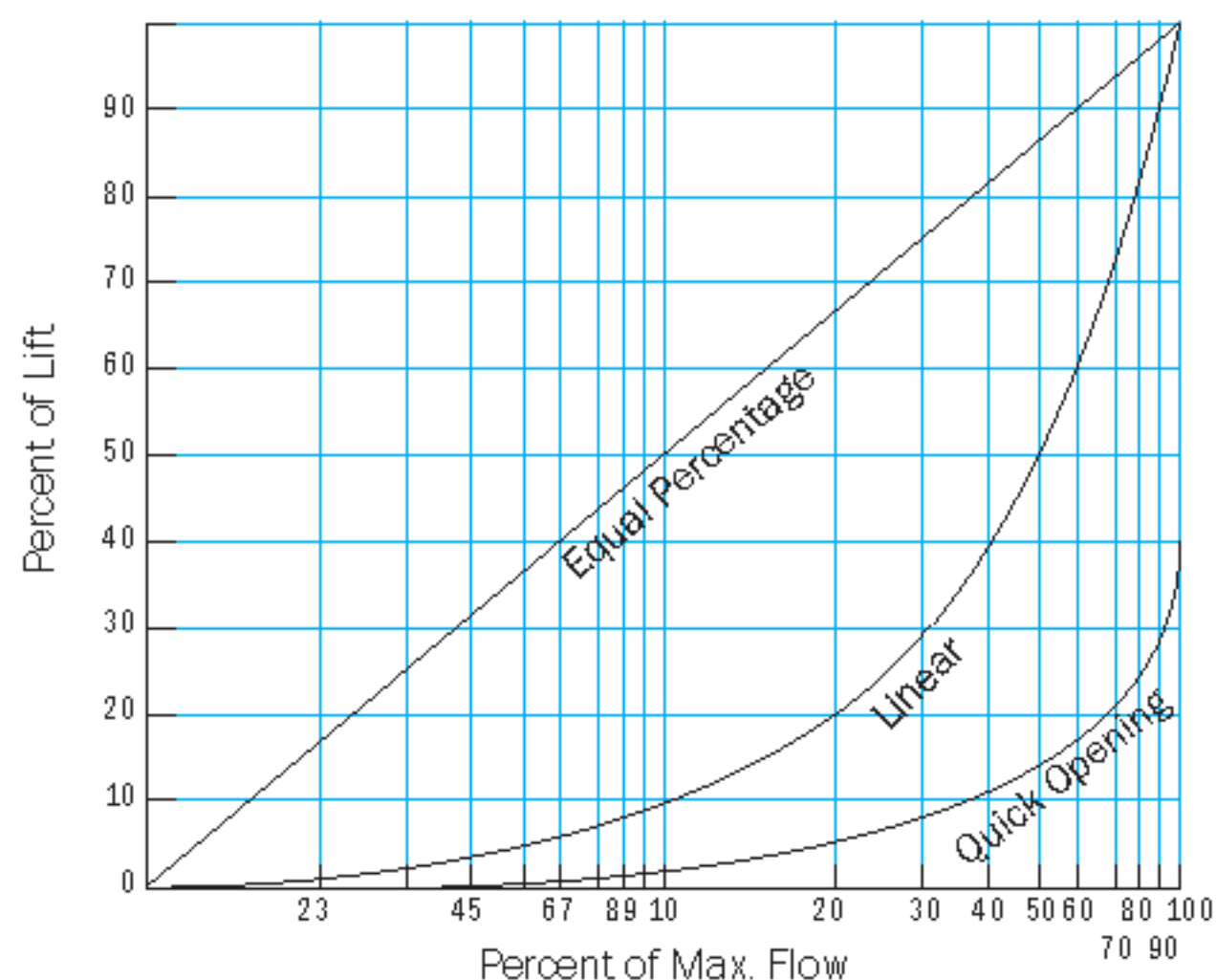


Filter
Regulator



Solenoid
Valve

Typical Lift Flow Curves



Valve Sizing: Flow Calculations

Basic Liquid Flow Formula

$$C_v = Q_L \sqrt{\frac{SG}{\Delta P}}$$

C_v = Flow Coefficient

Q_L = Flow (GPM)

SG = Specific Gravity

ΔP = Pressure Drop (PSIA)

Table of Flow Coefficients

Cryofab Valve Size	Cv by Body Style		
C2000 & C3000	Globe	Angle	Y-Pattern*
1/2"	2.6	5.7	5.6
1"	16.3	28.6	25
1 1/2"	31	37	42
2"	42.3	54	59.4
C5000	Globe	Angle	
1/2"	1.1	2.3	

Specific Gravity Table for Common Fluids (SG)

Water	1.000
LN ₂	0.808
LH ₂	0.071
LHe	0.125
LAr	0.400
LO ₂	1.140

() - X 0 0 X

SPECIAL CONNECTIONS

MPT = P
FPT = F
Tube = T
AN Male = A
Butt Weld Tube = M
Socket Weld Pipe = S
Soc Weld Tube = B
Soc Solder Copper = C
Flare Tube and Nut = N

OPERATION

Manual = M
Actuated/Pneumo/NC = A
Actuated/Pneumo/ NO = B
Actuated/Pneumo/ Special = C
Actuated Valve Assembly without Actuator = D
Actuator with Solenoid = E
Actuator with Solenoid and Filter/Regulator = F
Check Valve = K

PURGE PORT

No Port = 1
Port with Pipe Plug = 2
Port with Relief Valve (150 PSIG) = 3
Port with Relief Valve (XXX PSIG) (specify with order) = 4

VACUUM JACKET

Full Jacket = 1
No Jacket = 2
Cold Box Jacket = 3
Special = 4

OTHER FEATURES

Flow Plug (EQ%) = A
Flow Plug (Linear) = B
Specify with Order = X
Gas Trap = T

**We Make
Custom Valves**

Liquid Helium Valves & Manifolds

C3000 Liquid Helium Valve Series Manual and Actuated



*C3000 Series
Manual Globe Valve*



*C3000 Series
Actuated Right Angle Valve
Cold Box Jacket (Cuff)*

Cryocomp Liquid Helium valves are available in 1/2" and 1" pipe size weld ends. There are two body styles: globe and angle, as well as manual and actuated designs. Options include flow plugs, solenoid valves, regulators/filters, switches and positioners to increase capabilities and performance. C3000 valves are ideal for vacuum-jacketed piping, cold boxes, helium transfer lines and helium liquefiers.

Cryocomp Custom Manifolds



*Vacuum-Insulated
Custom Manifolds*



*LN₂ Cold Box
Switcher*

Custom manifolds are fabricated to customer requirements for cryogenic liquids including nitrogen, argon, oxygen, hydrogen and helium service. Any number of manual or actuated valves may be incorporated into the design. Inner line sizes range from 1/4" o.d. tube to 2" pipe. Manifolds & assemblies can include tees, elbows, bayonets, flexible hose sections, internal expansion joints, instrumentation and customer specified components.

Precision Flow with "Needle and Seat Trim"

Cryocomp offers an option for our 1/2" C2000 valves which greatly enhances the performance to specific Cv values. A control range of Cv=0.500 down to 0.0003 is accomplished through the use of several "needle and seat" combinations that are machined and installed into the valve bodies. These precision Cv trim values are typically available for the globe and right angle configuration valves with a pneumatic actuator and precision positioner. The ability to select appropriate flow characteristics through the selection of unique "trim" sizes enables a system to function and many times exceed the client's design specifications. Please consult the factory for additional information on this option.

**Contact us
today
for a quote**

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phone 908.686.3643 fax

908.686.9538

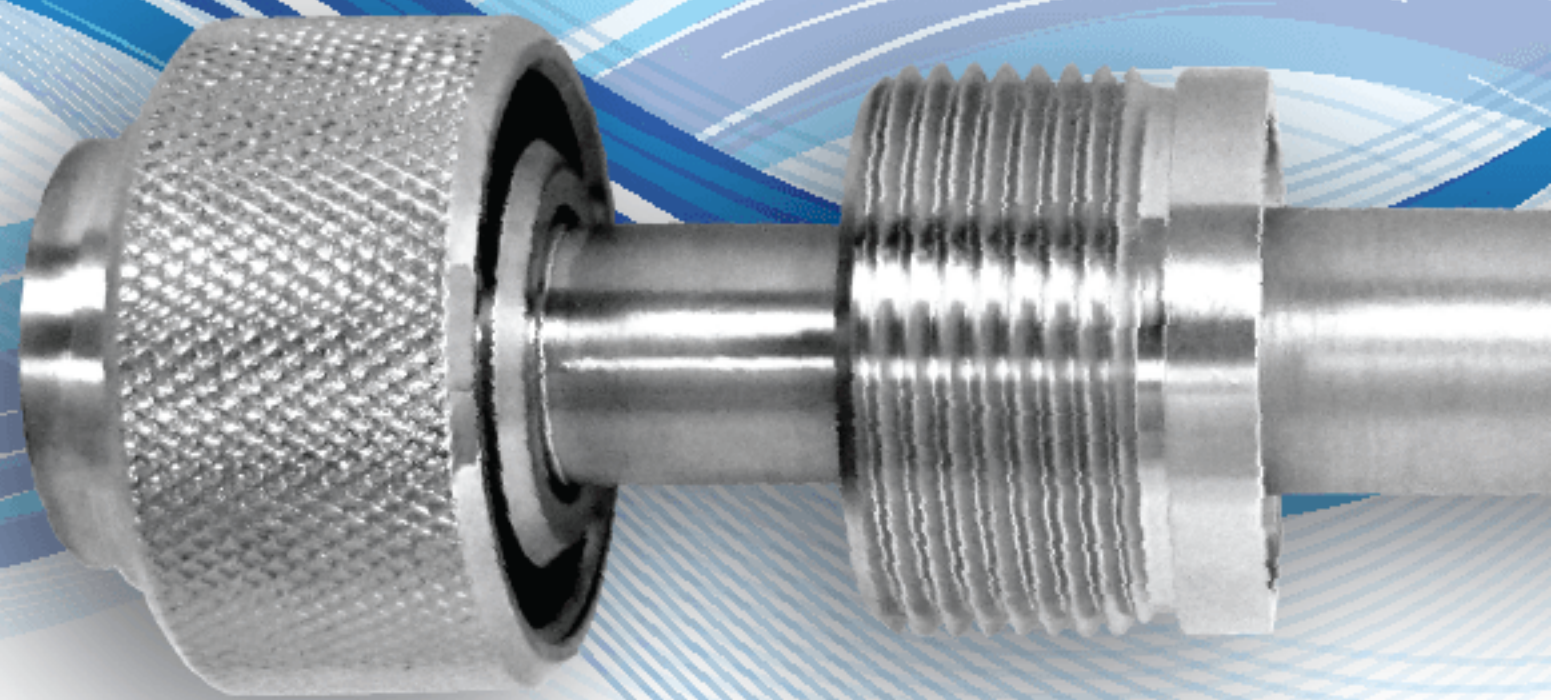
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**Cryogenic Valves &
Vacuum Components**



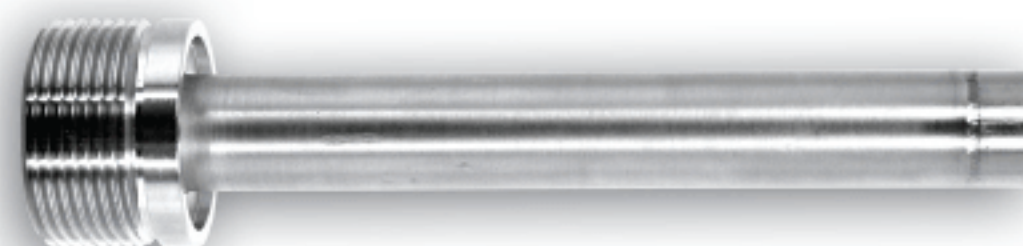
Cryogenic Bayonets

Cryocomp manufactures high quality cryogenic bayonets, needed for safe and efficient cryogenic transfer & piping systems. The bayonet is a mechanical joint which allows for the connection of sections of vacuum-jacketed/flex lines & pipe that can be dismantled and assembled easily in the field while maintaining low heat leak at the joint.

CB700 Series Cryogenic Bayonets (Linde style)



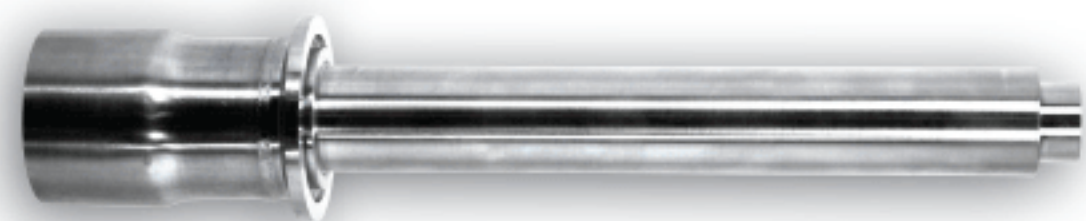
CB700 Male Bayonet



CB700 Female Bayonet

The CB700 Series Cryogenic Bayonet design is a tube sized high-efficiency connection for vacuum insulated piping and transfer line applications. This series utilizes a threaded connection nut to facilitate easy connection and separation functions. A close tolerance seal design maximizes the efficiency and a silicone O-ring assures tight sealing at cryogenic temperatures. The bayonet is available in four lengths, 3", 6", 9" & 15" to interchange with new or existing installations. The CB700 will operate efficiently in the vertical or horizontal positions and is recommended for use with most cryogenic fluids including nitrogen, oxygen (with proper cleaning) argon and helium.

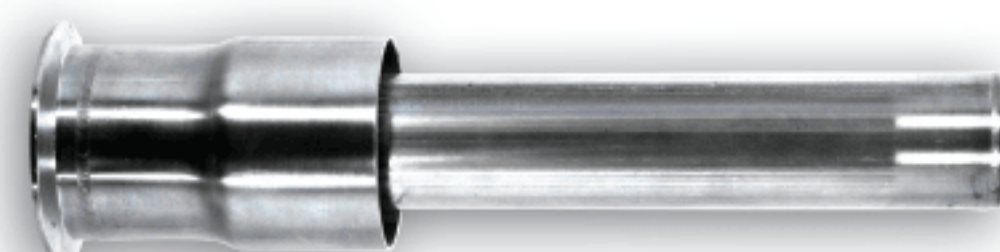
B3000 Series Cryogenic Bayonets (Piping)



B3000 Male Bayonet



Seal & V-Band



B3000 Female Bayonet

Cryocomp bayonet assemblies offer low heat leak and quick solution field installation. Our B3000 Cryogenic Bayonet series is a high-efficiency tube & pipe connection for vacuum-jacketed transfer lines and vacuum insulated piping systems. The assemblies range from 1/2" tube to 1" pipe with a 150 PSI MAWP. The design utilizes an extremely close tolerance fit between the male and female components establishing a gas pocket (vapor lock) between the components to form a seal, which is at process stream temperature at one end and ambient at the other. The very small gas pocket and thin stainless elements contribute to the high-efficiency of the design. The close tolerance design eliminates the necessity of a nose seal. Other advantages are frost-free transfers, minimization of heat leak and easy disassembly. The pipe product line connects with a clamping system for continuous leak-free operation. Bayonet assemblies offer savings in terms of decreasing field assembly time and lower installation costs coinciding with low heat leak.



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**Cryogenic Valves &
Vacuum Components**

Design The Perfect Bayonet

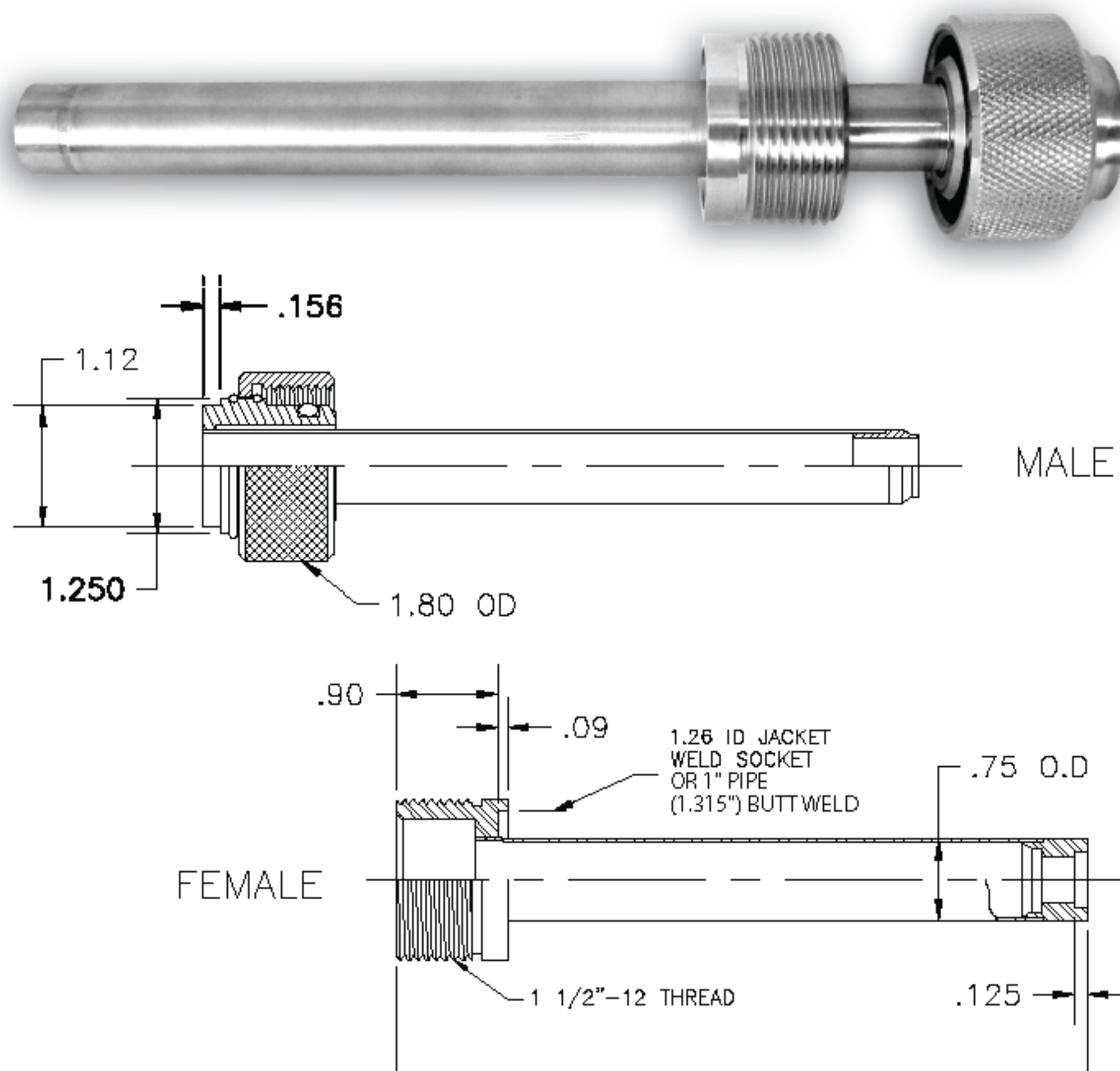
CB700 Tube Size Linde Style Bayonets

TECHNICAL DATA

- Will operate efficiently in the vertical or horizontal positions.
- Designed in four thermal lengths: 3" to interchange with existing Linde installations, 6", 9" and 15" to fit most thermal and physical criteria.
- Inner lines are tube size and available in 1/2" OD only. Adapters are available for 1/4" and 3/8".
- MAWP: 150 PSIG.
- Recommended for use with most cryogenic fluids including nitrogen, oxygen (with proper cleaning and seal material), argon, and helium.

HEAT LEAK

Length	BTU/HR (set)
3"	21
6"	11
9"	7.2
15"	4.3



Part Numbers

To specify the Linde style bayonet you'd like to order, select the features you require and build the part number using the option codes provided. See examples below. Call for more information or assistance designing your bayonet.

CB700-0000B

DESIGN SERIES

All Linde Style Bayonets

SIZE (1/8")

1/4" (2/8) = 02
3/8" (3/8) = 03
1/2" (4/8) = 04
3/4" (6/8) = 06*

MATERIAL

Stainless = 5

GENDER

Male = M
Female = F
Set = S

LENGTH (STANDARDS)

3" Thermal Length = 3
6" Thermal Length = 6
9" Thermal Length = 9
15" Thermal Length = 15

FUNCTION

Bayonet (standard) = B (or no number)
VJ Cap or Plug with Pipe Outlet = A
VJ Cap or Plug, Blank = C
NJ Cap or Plug - pressure only, no cryo = D
NJ Cap or Plug with 1/4" FPT - pressure only, no cryo = E
Protective Cover - usually plastic, vented code = P

Product Number Examples:

VJ Plug, Blank for 1/2" x 3" Female Bayonet = CB704-5M3C

VJ Cap for 1/2" x 6" Male Bayonet with Pipe Outlet = CB704-5F6A

* 3/4" bayonet only available in 9" & 15" thermal length

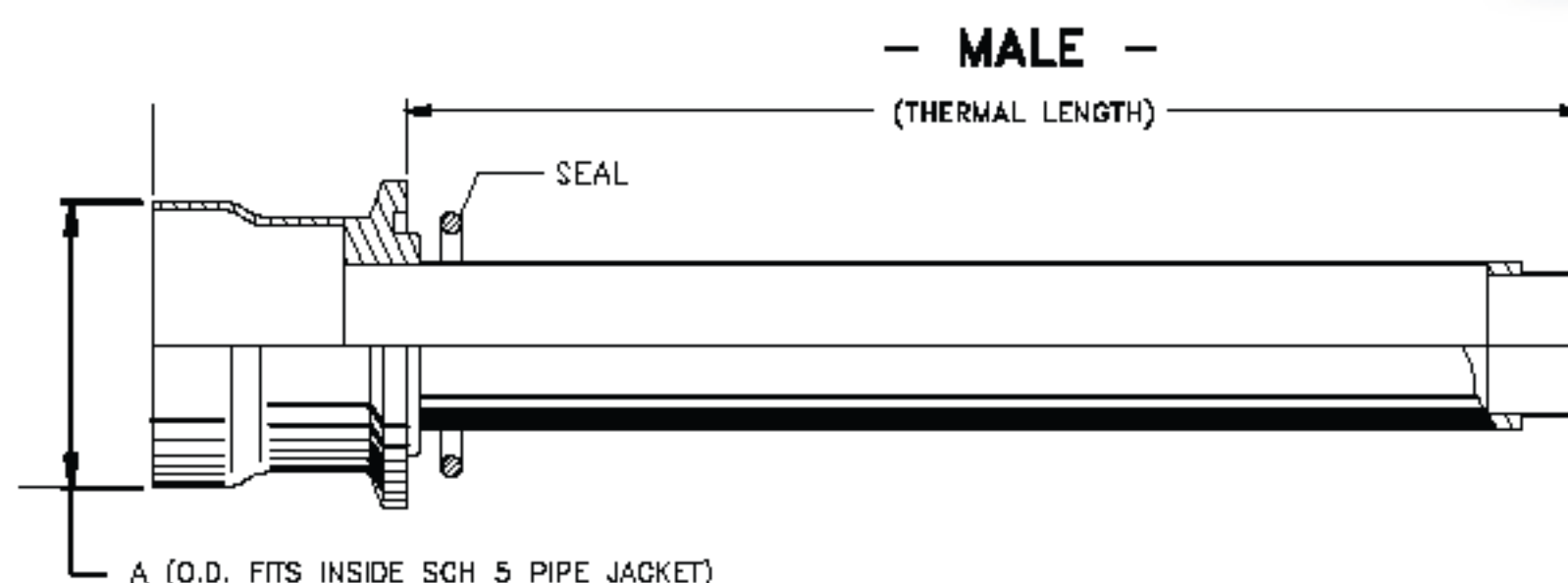
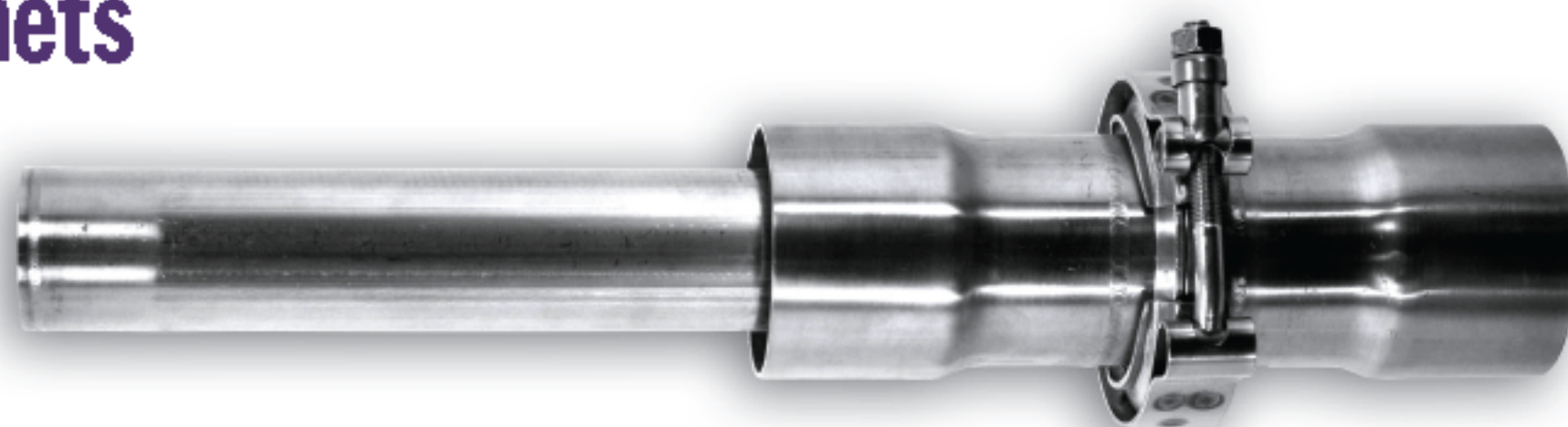


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B3000 Series Pipe Size Bayonets

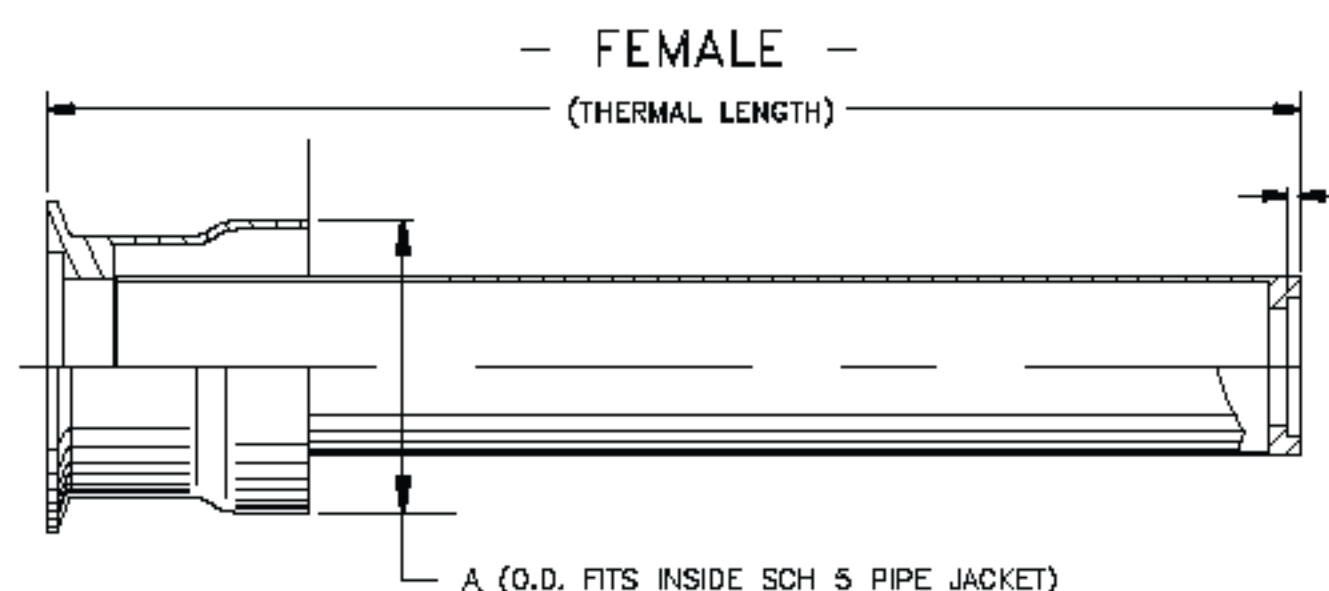
TECHNICAL DATA

- Highly efficient and reliable close tolerance design for vertical or horizontal applications.
- Designed for fast and convenient installation for piping fabricators.
- No clam shell required.
- MAWP: 300 PSIG.
Proof: 450 PSIG.
- All internal components leak tested to 1×10^{-9} SCC GHe/SEC.
- Convenient v-band closure.



HEAT LEAK

Length - Pipe Size	BTU/HR
9"	8.4
12" - 1/2" & 3/4" Pipe	11.2 @78K
12" - 1" Pipe	18.1 @78K



Part Numbers

To specify the bayonet you'd like to order, select the features you require and build the part number using the option codes provided. See examples below. Call for more information or assistance designing your bayonet.

B3000-0B

DESIGN SERIES

B3000 Series = B3

SIZE (1/8")

1/2" (Pipe) = 04
3/4" (Pipe) = 06
1" (Pipe) = 08

LENGTH (STANDARDS)

9" Thermal Length = 9
12" Thermal Length = 12

GENDER

Male = M
Female = F
Set = S

FUNCTION

Bayonet (standard) = B
VJ Cap or Plug with Pipe Outlet = A
VJ Cap or Plug Blank = C
NJ Cap or Plug (pressure only, no cryo) = D
NJ Cap or Plug with 1/4" FPT (pressure only, no cryo) = E
Pressure Plug with KF-25 Flange = E-25
Protective Cover (usually plastic, vented) = P

Product Number Examples:

VJ Plug, Blank for 1/2" Female Bayonet= B3049-FC
VJ Cap for Male Bayonet with Pipe Outlet= B3049-MA

Cryocomp Cryogenic Products

Cryocomp, a subsidiary of Cryofab, offers the specialized cryogenic and vacuum components you need to guarantee a reliable, efficient, long-life cryogenic system. Our valves and accessories are designed and fabricated to the highest standards for original equipment manufacturers involved in the fabrication and rehabilitation of:

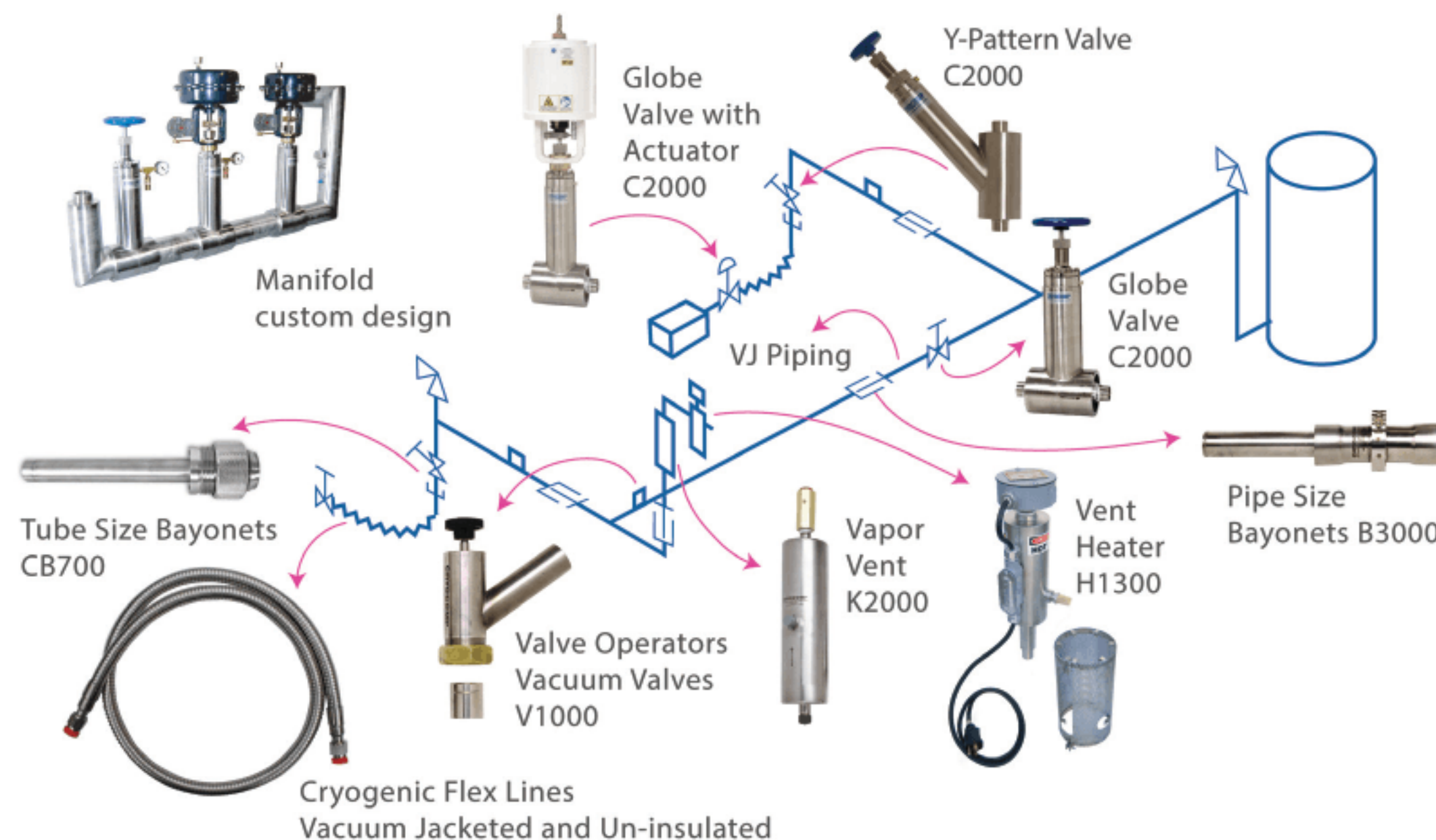
- Vacuum-Insulated Pipe
- Cold boxes
- Tankage
- Helium Transfer Lines
- Flexible Lines
- Cryogenic Pumps
- Vacuum-Jacketed Manifolds
- Cryogenic Trailers
- Dewars
- Specialized Systems

At Cryocomp we strive for

QUALITY

AVAILABILITY

REASONABLE PRICES



Bayonet Installation

Vertical bayonets must be installed with the male above the female, no exceptions. (FIG. 1) For best thermal results it is necessary to have the flange or closure junction and seal at the upper most location and the cold interface at the bottom. This forms a gas pocket between the liquid interface and the O-ring which keeps the seal at a nearly ambient temperature.

Horizontal bayonet sets can be installed with the male either up stream or down stream. [FIG. 2] Industry convention has generally located the male upstream, but it does not physically or thermally make a difference. On all bayonets, be sure to lightly grease the O-ring seal with a system compatible grease. This allows the O-ring to establish a much tighter seal. With the CB700 style bayonets, be sure the knurled nut is tight to 5 to 10 ft-lbs.

For flanged bayonets, be sure to grease the O-ring seal with a system compatible grease. After tightening the V-band tension nut, tap the outside of the strap at several points around the OD with a plastic hammer to firmly seat the "V" section on the flange and then re-torque the nut. (FIG. 3) Repeat this process at least 2 more times.

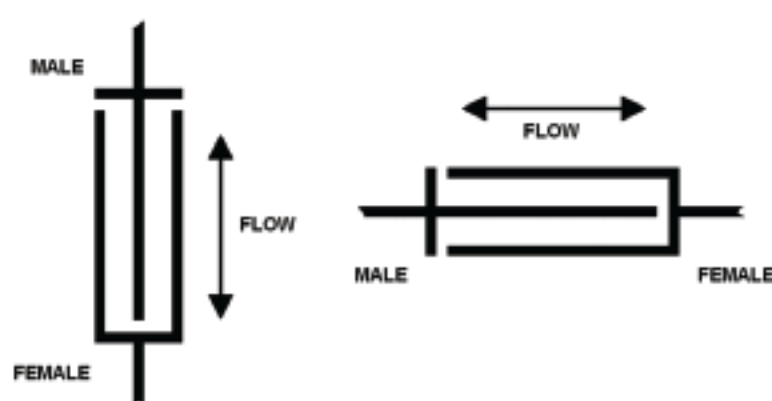


Fig. 1

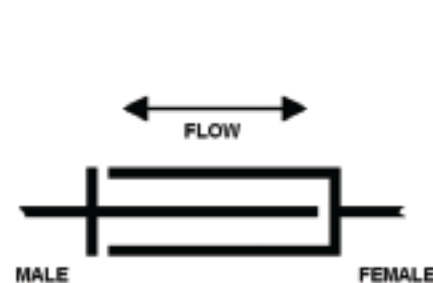


Fig. 2

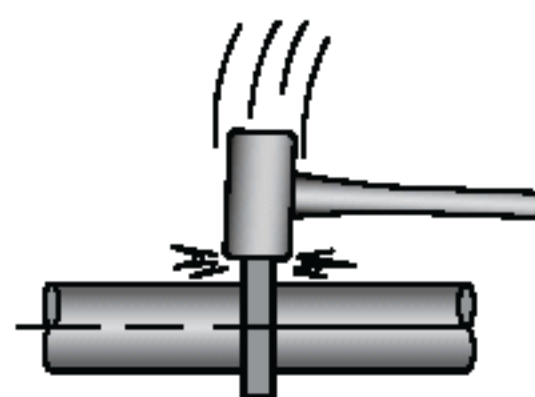


Fig. 3

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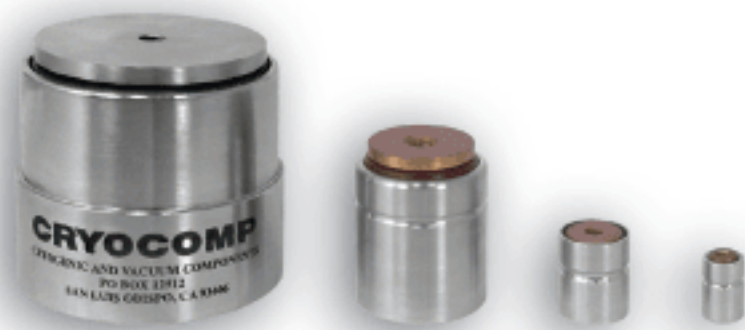
**Cryogenic Valves &
Vacuum Components**



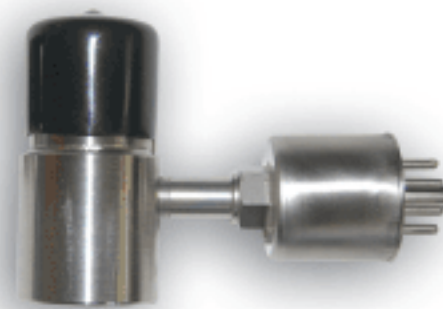
Vacuum/Evacuation Components

Cryocomp offers cryogenic vacuum components for applications where a user requires a vacuum entry which is **simple, reliable and tamper resistant**. Components available include **seal-off valves, valve operators and pressure-relieving valves**.

V1000 Series Simple Seal-off Valves & Operators



V1000 Seal-off Valves



V1000 Seal-off Valve with Side Port



V1000 Valve Operators

The V1000 series is simple, inexpensive and reliable. Valve sizes range from 1/4" through 3" with matching operators. The V1000 vacuum seal-off valve provides an extra dimension to the vacuum system designer because it is compact, vacuum tight, has excellent capacitance and offers positive pressure relief. The basic weld on installation and simple operation will reduce installation and evacuation time, improving vacuum reliability and reducing product cost. An optional integrated port on the side of the 1/2" and 1" standard seal-off valves allows installation of vacuum sensor, eliminating the need for drilling and welding on the system. Designed for use with vacuum-insulated piping systems, manifolds, flex lines, dewars, tanks, chambers, furnaces and any fabrication that requires a vacuum jacket.

V2000 Series Seal-off Valves & Operators for Large Systems



V2000 Seal-off Valve



V2000 Valve Operator

The V2000 vacuum valve series is designed for evacuation of a large 2.0" vacuum system such as cryogenic tanks, dewars, vacuum-insulated piping and MRI magnet vacuum containers. This unique seal-off valve has a high conductance, compact design that is vacuum-tight during normal evacuation with an spring-loaded poppet for relief. The operator connects to a vacuum pump and is specially engineered to engage the poppet on the seal-off valve.

V3000 Pressure Relief Disc

The V3241-10-(set) is a positive pressure relieving valve that is cryogenic-compatible, spring-loaded, and vacuum-tight. The poppet will lift if the pressure in a vacuum enclosure reaches the "pre set" relieving pressure. It seats against a Viton o-ring seal. The valve body is designed with a flange connection allowing for installation into any standard ISO flange.



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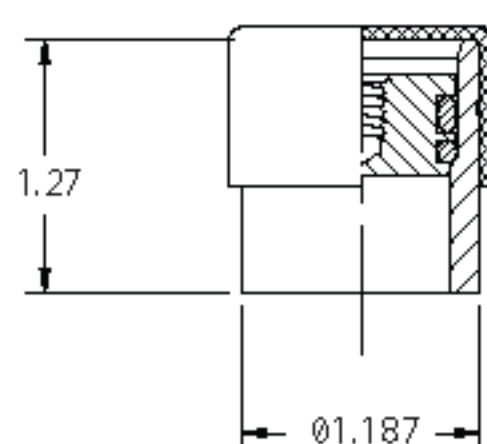


**Cryogenic Valves &
Vacuum Components**

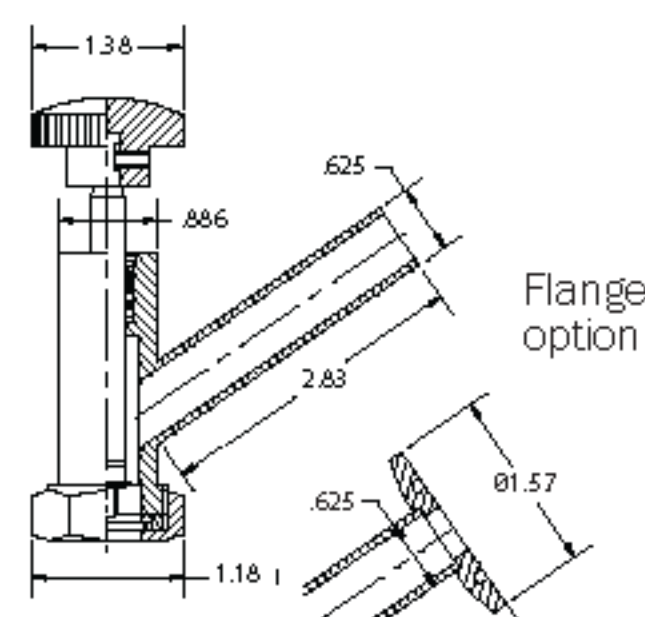
Technical Data & Part Numbering

V1000 Series

- SERVICE: High Vacuum.
- PRESSURE: 1×10^{-8} TORR Vacuum up to 15 PSIG Positive.
- TEMPERATURE: $+150^{\circ}\text{F}$ TO -60°F .
- LEAK RATE: 1×10^{-8} STD CC GHe/SEC. (Seal Permeability).
- CONNECTION: Weld junction is standard. Thread and flange junctions available on request.



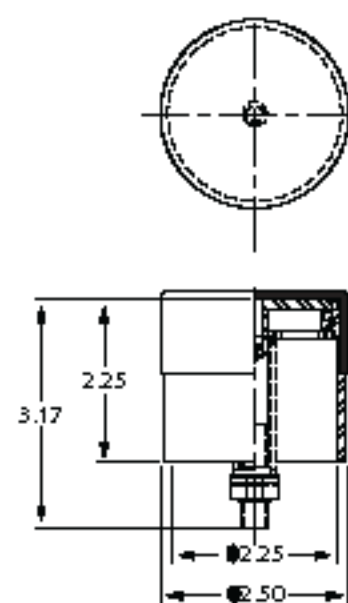
V1085-1



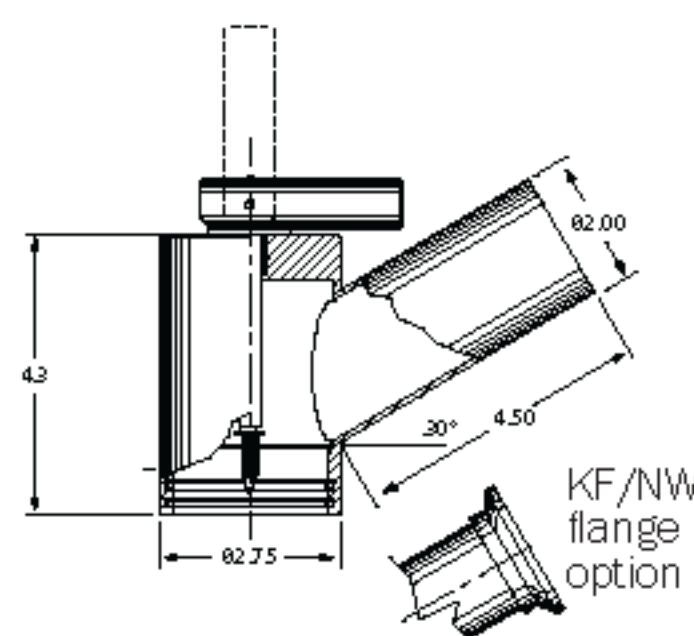
V1045-2, V1045-3-XX*

V2000 Series

- Vacuum Leak Tested @ 1×10^{-5} TORR, Leak Rate Less Than 1×10^{-9} SCC GHe/SEC.
- Relief Pressure 2-6 PSIG.
- TC Vacuum Tube Port Available — P/N V2165-11.
- CONNECTION: Standard weld jacket. Threaded and KF/NW flange connections on request.



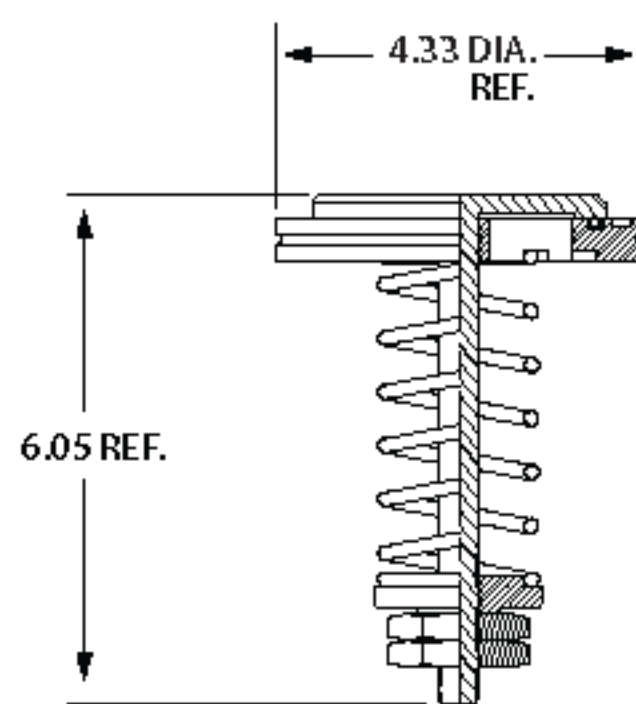
V2165-10



V2165-20, V2165-30-XX*

V3000 Series

- SERVICE: High Vacuum.
- PRESSURE: 1×10^{-8} TORR vacuum to 10 PSIG positive.
- TEMPERATURE: $+150^{\circ}\text{F}$ to -60°F .
- LEAK RATE: 1×10^{-8} SCC GHe/SEC.
- CONNECTION: Standard ISO flange face.
- CONNECTION: Standard weld jacket. Thread and ISO flange connections available on request.

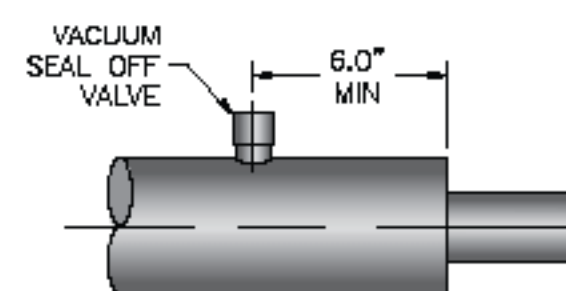


V3241-10-(set)

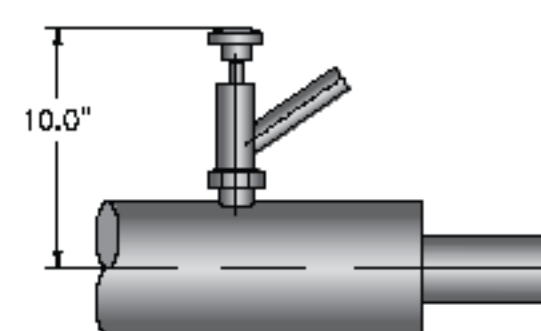
Installation Notes

Seal-off valves must be installed no closer than 6" to 8" from a jacket termination or other cold location. (FIG. 1) Excessively low temperatures will cause the O-ring seals to shrink and allow leakage into the vacuum space. It is good practice to install the vacuum seal-off valve near the center of the vacuum mass.

Orientation on the pipe is not critical. To assure future servicing of the vacuum, the seal-off valve should be in a location that will allow a valve operator to be installed after the pipe is in service. (FIG. 2)



(FIG. 1)



(FIG. 2)

Seal-off Valve Part Numbering System

Select the features you require and build the part number using the option codes provided. See examples (right).

V0000-0-0

Product Number

Example:

V1085-1 = Series 1000, 1.0", Stainless, Vacuum Seal-off Valve

DESIGN SERIES

V1000 Series = V1
V2000 Series = V2
V3000 Series
Relief Disc = V3

SIZE (1/8")

1/4" (2/8) = 02
1/2" (4/8) = 04
3/4" (6/8) = 06
1" (8/8) = 08
2" (16/8) = 16
3" (24/8) = 24

BODY MATERIAL

Aluminum = 1[†]
Stainless Steel = 5
[†]Limited Availability

SEAL-OFF VALVE OR OPERATOR

Seal-Off Valve = 1
Valve Operator with Tube End = 2
Valve Operator with KF/NW = 3
(add size as Special Detail)

SPECIAL DETAIL

No Side Port = 0
1/8" FPT/TC Port = 5
Non-Relieving/Snap Ring Groove or Plug Arrestor Accessory = 3
*KF/NW Size = 10, 16, 25, 40, 50 or 80



a division of Cryofab, Inc. 908.686.3643



Cryogenic Valves & Vacuum Components



Cryo Vents & Heaters

A cryo vent (also called a keepfull or vapor vent) keeps liquid flowing in a vacuum-jacketed pipe system by allowing the boil-off of gases to escape, but not the liquid. Vapor vent heaters warm the exhaust gas to eliminate condensation and ice build-up on piping and fixtures.



K2041 & K2042 Cryogenic Vapor Vents



*K2041 Cryo Vent
Male Pipe Connection*



*K2042 Cryo Vent
Male Bayonet Connection*

Cryocomp offers the vacuum insulated cryo vent in two versions, the K2041 with a 1/2" pipe inlet and the K2042 with a 1/2" tube-style bayonet inlet. The pipe inlet design can be installed in any liquid nitrogen system and the bayonet design can be designed into a vacuum insulated piping system for a more efficient interface. The Cryocomp cryo vent is a fully mechanical system requiring no electrical or pressure assistance.

H1300 & H1500 Vapor Vent Heaters

The model H1300 and model H1500 vent heaters install on any liquid nitrogen keepfull device to stop ice formation and prevent condensate on floor and ceiling tiles. There is no need for insulation or vent piping in a large room discharge area. The heaters are electrical devices that increase the temperature of the cryogen and expels it as vapor. The gas/liquid mixture enters the vent heater assembly where, through use of an internal heater, it is vaporized and vented to outside safe area. Both the model H1300 (375 watt) and H1500 (500 watt) vapor vent heaters are available in 110 VAC or 220 VAC configurations. Cryocomp strongly recommends that all heaters have the available "System Heater Guard" protective mesh enclosure installed to prevent injury.



Vapor Vent Heater & Heater Guard



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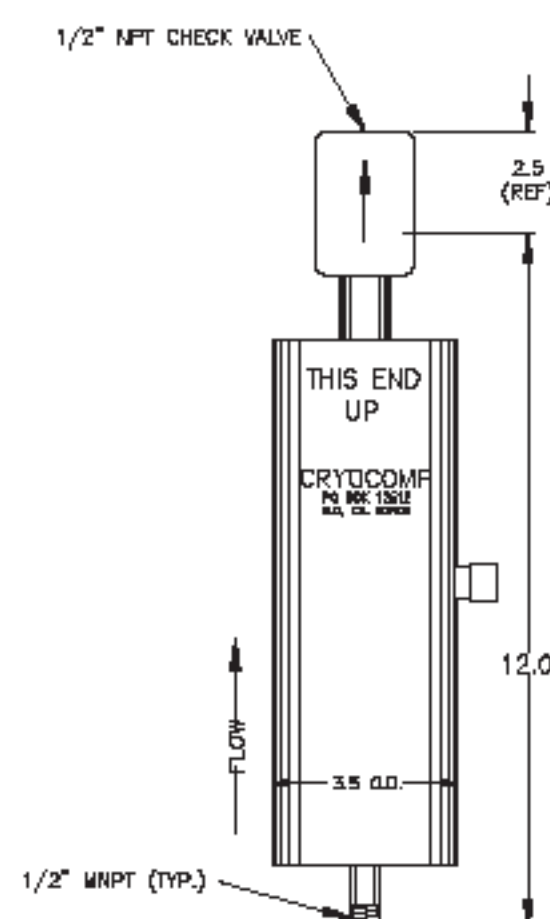


**Cryogenic Valves &
Vacuum Components**

Technical Data

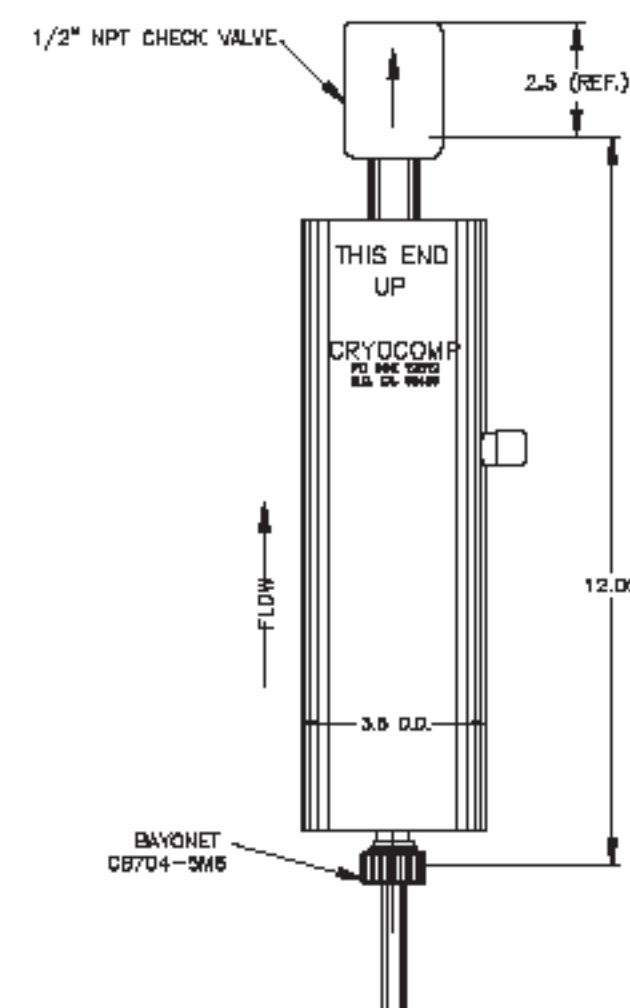
Cryo Vents (Vapor Vents)

- 150 PSIG MAWP, 225 PSIG Proof Pressure.
- Use In Liquid Nitrogen Service Only.
- Capacity: Approx. 1000 BTU/hr.
- Cryo Vent Should Be Located At The High Point Of The Piping System.
- Install In Vertical Position Only.
- Check Valve on Top.
- Mechanical Float-Valve, No Electrical or Pneumatic Source Required.
- Model K2041: 1/2" NPT Connection Fitting.
- Model K2042: 1/2" x 6" CBT Bayonet Fitting.



K2041

*Vacuum Insulated
Liquid Level Keepfull w/ 1/2" Male
Pipe Connection*



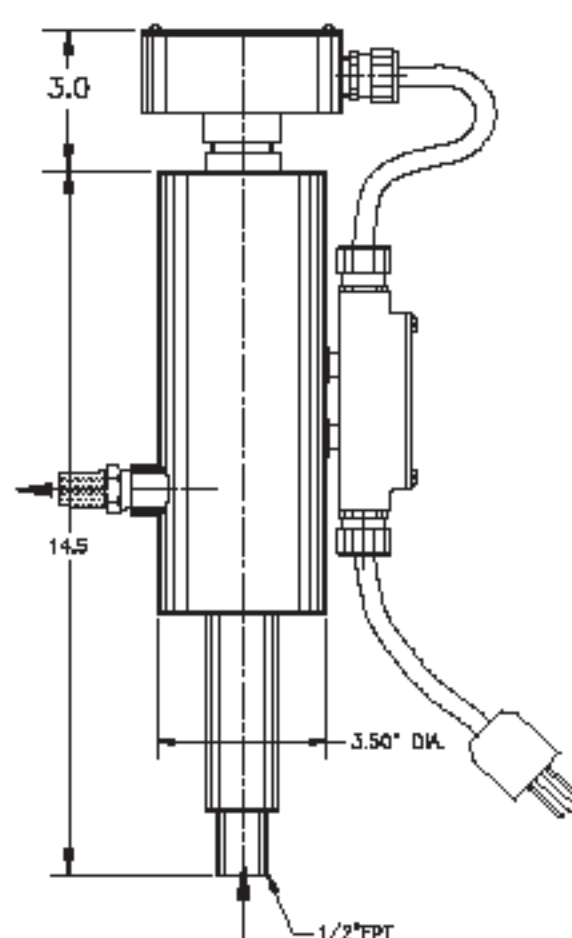
K2042

*Vacuum Insulated
Liquid Level Keepfull w/ 1/2" Male
Bayonet Connection Mating*

Vapor Vent Heaters

- 375 or 500 Watts Models.
- 110 VAC or 220 VAC Options.
- 1/2" FPT Inlet and Outlet.
- Over Temp Switch Included.
- Line Cord Provided.

To Avoid Injury: Cryocomp strongly recommends the H-100-HS Heater Guard be purchased and installed with a Vapor Vent Heater.



H1300

375-Watts Vapor Vent Heater / 110 VAC

H1300-220

375-Watts Vapor Vent Heater / 220 VAC

H1500

500-Watts Vapor Vent Heater / 110 VAC

H1500-220

500-Watts Vapor Vent Heater / 220 VAC

Installation Notes

The purpose of a cryo vent (also called keepfull and vapor vent and a host of other names) is to vent vapor and keep liquid close to the point of use/outlet. Cryo Vents discharge boil-off gas and maintain liquid at some place in the system usually far away from the liquid supply. These devices must be vertical, above the pipe section and should be installed at a high point where gas would gather in the system.

