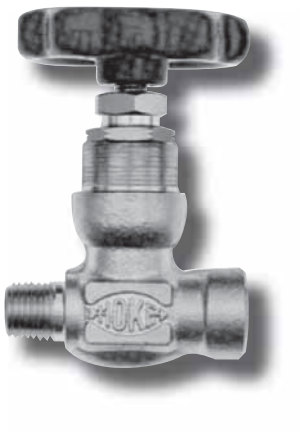
Formed Sampling Cylinders and Accessories

Index



sampling cylinders

HOKE Inc.
405 Centura Court • PO Box 4866 (29305) • Spartanburg, SC 29303
Phone (864) 574-7966 Fax (864) 587-5608
www.hoke.com • sales@hoke.com

Formed Sampling Cylinders & Accessories

Hoke Sampling Cylinders are designed and manufactured to stringent U.S. Department of Transportation (DOT) specifications to provide long performance life and maximum safety to the user.

These cylinders are fabricated from seamless tubing or pipe with increased wall thickness in the threaded area, which prevents expansion when valves are installed. Completely formed ends maximize strength and eliminate potential leak paths. Internal sandblasting removes surface imperfections and removes foreign particles.

Single- and double-ended cylinders are available as standard in a variety of capacities from 10 milliliters to 4 g "

Typical Applications

- Sampling hydrocarbons in refineries and petrochemical plants
- Grab sampling for chromatographic analysis
- Snubbers in reactor feed lines
- Surge accumulators in High Pressure Gas Systems
- High Vacuum Systems as experimental chambers and molecular sieves
- Chemical reaction vessels

Features & Benefits

- Choice of 12 different capacities from 10 mL through 4 gallons.
- Cylinder ends come in ⅛″, ¼″, ⅜″ and ½″ NPT female connections (depends on capacity).
- Standard cylinders are formed from seamless drawn 304 SS, 316 SS or Monel® pipe or tubing.
- Precision spinning operation eliminates internal pockets and provides easy flow of the sample.
- All models are internally sandblasted to remove surface imperfections and eliminate foreign particles.
- Single- and double-ended cylinders in most capacities are available as standard.
- Rugged wall thickness – extra strength around threads.
- Cylinders may be ordered with valves, relief devices, dip tubes, carrying handles, collar and flanges and end caps.
- The interior of Hoke cylinders are available with a special FEP lining which provides excellent lubricity and very low permeability. To order, add "TL" following the cylinder part number. Restek®, Silcosteel®, and Sulfinert® surface treatments available for many sizes. Consult factory.
- Special High Tolerance NPT Thread

formed sampling cylinders

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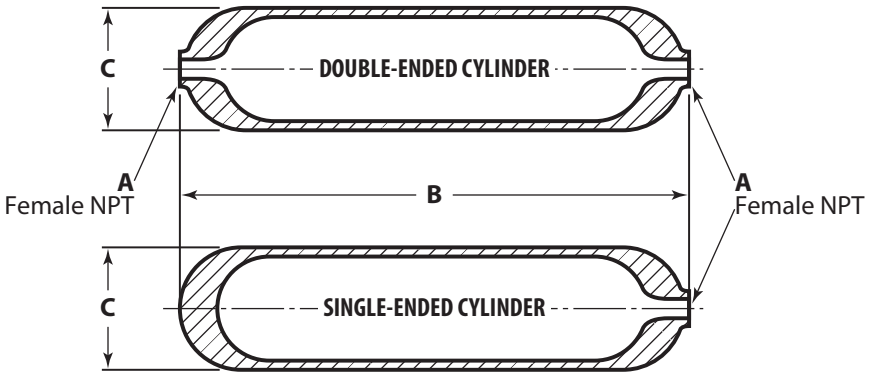
Formed Sampling Cylinders



Formed Cylinders: 316 Stainless Steel only
Pressure ratings up to 5000 psig can be supplied as a special. Consult the factory for quotation of any cylinder rated above 1800 psig.

When testing to ASME specifications is required, contact Hoke for quotation and specify maximum pressure and temperature

To learn more about DOT-rated Cylinders, please read Hoke *Spun Sampling Cylinders* catalog, Part #79006.

Other Materials
Cylinders manufactured from other materials are available. Contact Hoke for quotation.

Teflon®-lined Cylinders
The interior of Hoke cylinders are available with a special FEP lining which provides excellent lubricity and very low permeability. To order add "Teflon®-lined" following the cylinder part number.

How to Order
To order a Hoke Sampling Cylinder, specify the model number based on capacity required, single- or double-end connections and end connection size.

Dimensions & How to Order

PRESSURE RATING psig [bar]	INTERNAL VOLUME	A inch	ORDERING NUMBERS		DIMENSIONS inch [mm]		WEIGHT lb (kg)
			SINGLE ENDED	DOUBLE ENDED	LENGTH B	OUTSIDE DIAMETER C	
304 Stainless Steel, 400 psig [28 bar]							
400 [28]	1000 mL	½	*	8LD1000	10.5 [627]	3.5 [89]	4.5 [2.0]
	2250 mL	½	*	8LD2250	15.25 [387]	4.0 [102]	7.0 [3.0]
	3000 mL	½	*	8LD3000	19.5 [489]	4.0 [104]	8.4 [3.8]
	1 gal.	½	*	8LD1G	23.75 [603]	4.0 [104]	10.25 [4.6]
304 Stainless Steel, 1800 psig [124 bar]							
1800 [124]	75 mL	¼	4HS75	4HD75	5 [127]	1.5 [38]	0.75 [0.33]
	75 mL	⅜	6HS75	6HD75	5 [127]	1.5 [38]	0.75 [0.33]
	150 mL	¼	4HS150	4HD150	9 [229]	1.5 [38]	1.38 [0.61]
	150 mL	⅜	6HS150	6HD150	9 [229]	1.5 [38]	1.38 [0.61]
	300 mL	¼	4HS300	4HD300	9.75 [248]	2.0 [51]	2.0 [0.9]
	300 mL	⅜	6HS300	6HD300	9.75 [248]	2.0 [51]	2.0 [0.9]
	500 mL	¼	4HS500	4HD500	14.5 [368]	2.0 [51]	3.0 [1.4]
	500 mL	⅜	6HS500	6HD500	14.5 [368]	2.0 [51]	3.0 [1.4]
	1000 mL	½	8HS1000	8HD1000	11.0 [279]	3.5 [89]	7.25 [3.3]
	2250 mL	½	8HS2250	8HD2250	17 [432]	4.0 [102]	13.4 [6.0]
	3000 mL	½	8HS3000	8HD3000	22 [559]	4.0 [102]	16.75 [7.6]
	1 gal.	½	8HS1G	8HD1G	26.75 [679]	4.0 [102]	20.6 [9.3]
	2.5 gal.	½	—	8HD2½G	24.5 [622]	6.625 [168]	42.5 [19.9]
	4 gal.	½	—	8HD4G	36 [914]	6.625 [168]	61.5 [28]
316 Stainless Steel, 1800 psig [124 bar]							
1800 [124]	10 mL	⅛	2HSY10	2HDY10	4 [102]	0.625 [16]	0.125 [0.06]
	30 mL	¼	4HSY30	4HDY30	4.75 [121]	1.0 [25]	0.44 [0.20]
	75 mL	¼	—	4HDY75	4.75 [121]	1.5 [38]	0.75 [0.34]
	150 mL	¼	—	4HDY150	9 [229]	1.5 [38]	1.4 [0.6]
	300 mL	¼	—	4HDY300	9.5 [241]	2.0 [51]	2.0 [0.9]
	500 mL	¼	—	4HDY500	14.5 [368]	2.0 [51]	2.9 [1.3]
Monel®**							
5000 [345]	95 mL	¼	4HSM95	4HDM95	5.25 [133]	1 21/32 [42]	1.5 [0.7]
	150 mL	¼	4HSM150	4HDM150	6.5 [165]	1 29/32 [48]	2.4 [1.0]
	300 mL	¼	4HSM300	4HDM300	11.75 [298]	1 29/32 [48]	4.0 [1.8]
	500 mL	¼	4HSM500	4HDM500	19.5 [495]	1 29/32 [48]	6.13 [2.8]
3500 [241]	1000 mL	¼	4HSM1000	4HDM1000	11.5 [292]	3.5 [89]	11.4 [5.0]

* *For single-ended applications, order double-ended cylinder with plug part number 502B.*
** *Standard models are non-DOT rated*

Cylinders Accessories & Valves

Collars, Flanges, Caps, Carrying Handles

To enable the user to safely transport pressurized samples, Hoke offers a variety of collar and flange assemblies, protective end caps and carrying handles. Collars can only be assembled at the Hoke factory.

Other accessories can come completely assembled to a cylinder or may be ordered for field installation.

To order, specify the cylinder part number followed by the part number of the accessory.

Carrying Handles, Valve Protection End Caps

ORDER BY CATALOG PART NUMBER			CYLINDER NUMBER		DIMENSIONS	
COLLAR & FLANGE ASSY. #	END CAP PART #	CARRYING HANDLE KIT PART #	HIGH PRESSURE	LOW PRESSURE	A OUTSIDE DIAMETER	B
81744–1	3107	80228–1	4HD300 6HD300 4HD500	4HD300 6HD300 4HD500	2 in 51 mm	6⅝ in 168 mm
81744–1	3107	80228–1	6HD500	6HD500	2 in 51mm	6⅝ in 168 mm
80226–1	3107	80229–1	8HD1000	8HD1000	3½ in 89mm	6⅝ in 168 mm
80227–1	3107	80230–1	8HD2250	8HD2250	4 in 102mm	6⅝ in 168 mm
80227–1	3107	80230–1	8HD3000	8HD3000	4 in 102 mm	6⅝ in 168 mm
80227–1	3107	80230–1	8HD1G	8HD1G	4 in 102 mm	6⅝ in 168 mm
81533–1	3107	80350–1	8HD2½GF	—	6⅝ in 168 mm	6⅝ in 168 mm
81533–1	3107	80350–1	8HD4GF	—	8 in 203 mm	6⅝ in 168 mm
1756	3107	80228–1	4HDM150	—	1²⁹⁄₃₂ in 48 mm	6⅝ in 168 mm
1756	3107	80228–1	4HDM300	—	1²⁹⁄₃₂ in 48 mm	6⅝ in 168 mm
1756	3107	80228–1	4HDM500	—	1²⁹⁄₃₂ in 48 mm	6⅝ in 168 mm

All angle pattern valves shown in this catalog can be used with protective end caps. The globe pattern valves 3752M4Y2 shown on page 10 are the only globe pattern valves which can be used with protective end caps.

Dip Tubes

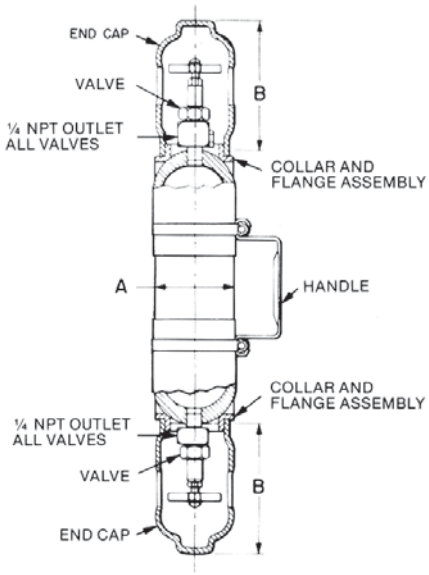
Dip tubes provide a vapor space of the specified volume in cylinders containing liquefied gases, allowing the liquid to expand as the temperature increases. Without adequate vapor space, a small temperature increase can cause the liquid to expand, increasing the pressure dramatically.

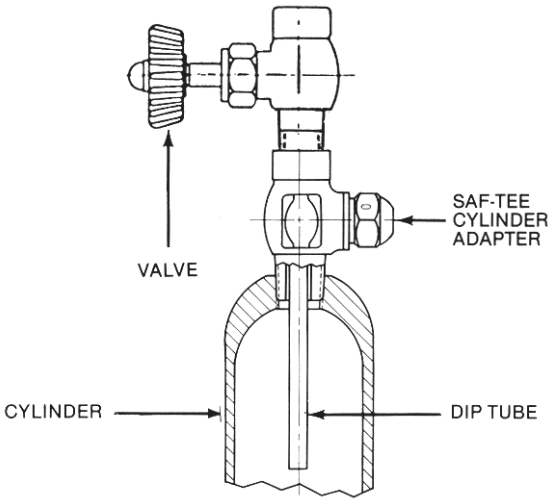
Refer to local regulations and other appropriate guidelines for safe cylinder filling limits for your application.

Dip tubes may be ordered in outages of 10, 20 and 30% to provide a respective filled capacity of 90, 80 or 70%. A 30% outage tube would "dip" into a cylinder to a point equivalent to the liquid level of a cylinder filled to 70% of its capacity. Dip tubes in other outages can also be ordered, contact the factory.

To ensure leak-tight performance, dip tubes must be properly welded to a fitting, valve, or relief device.

When ordering dip tubes on valves without cylinders, the cylinder model number or capacity must be identified.

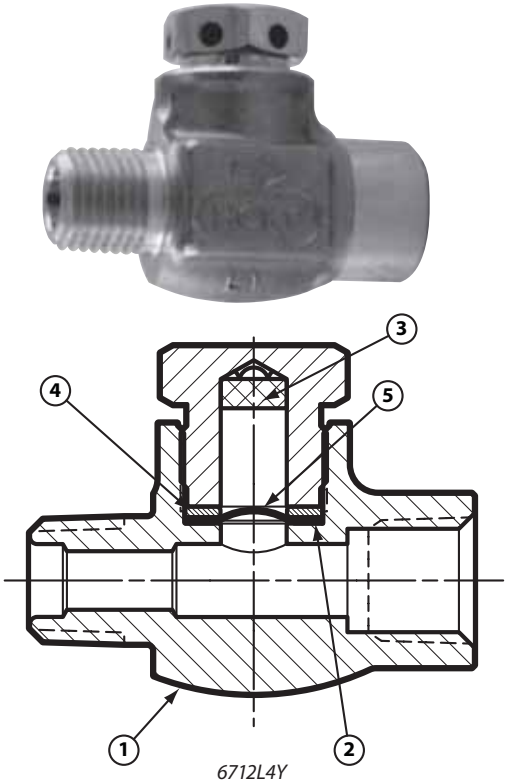




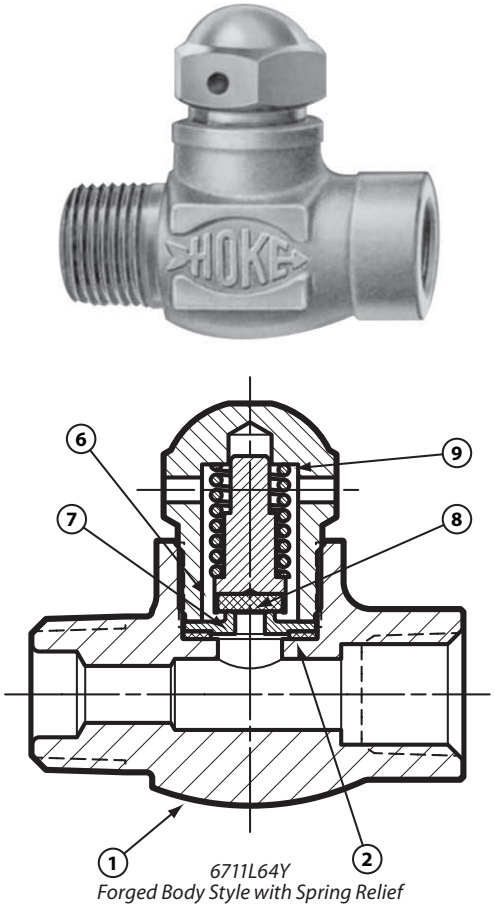
Typical Dip Tube Installation

Cylinder Accessories & Valves

Safety Relief Devices



6712L4Y
Forged Body Style with Rupture Disc



6711L64Y
Forged Body Style with Spring Relief

Saf-tee™ relief devices can be used with Hoke sampling cylinders as an inexpensive safety device or as a pipe size adapter for connecting valves in the make-up of cylinder assemblies.

Two basic models are available to satisfy most pressure ranges. Spring relief models are recommended for applications where re-closure is required.

Rupture Disc models are supplied with a pre-bulged rupture disc which provides excellent resistance to a broad range of hold-down plug and rupture disc to prevent damage due to torque transmission during assembly. A safety screen minimizes fragment release through the plug vents. The maximum operating system pressure should be limited to 80% of the nominal rating of the rupture disc for static operating pressure and ambient temperature. It should be limited to 70% if pressure pulsations occur or used at elevated temperature. The burst tolerance is within the ASME code guidelines.

Technical Data	
OPERATING TEMPERATURE RANGE:	–20° F to +250° F (–29° C to +121° C)

Materials of Construction

KEY	DESCRIPTION	RUPTURE DISC MODELS	SPRING RELIEF MODELS
1	Body	316SS	316SS
2	Gasket	PCTFE	PCTFE
3	Safety Screen	316SS	—
4	Slip Ring	316SS	—
5	Rupture Disc	Inconel	—
6	Seat Holder	303SS	303SS
7	Seat Ring	316SS	316SS
8	Seat	Viton®	Viton®
9	Spring	18-8SS	6712L4Y

Rupture Disc Models

INLET NPT MALE	OUTLET NPT FEMALE	ORDER BY NUMBER	ADD CODE LETTER	REPLACEMENT RUPTURE DISC KIT
¼	¼	6712L4Y	D – 1400-1600 psi	SP6712K1
⅜	¼	6712L64Y	G – 1800-2000 psi	SP6712K2
			E* – 2600-3000 psi	SP6712K3
			F – 3500-4100 psi	SP6712K4**
			H – 5400-6200 psi	SP6712K5**

* *Normally supplied with DOT 3E-1800 and DOT 3A-1800*
** *Special order only. Please contact Hoke for details.*

Rupture Disc Kits

Replacement rupture disc kits include rupture disc, safety screen, slip ring, gasket and instruction sheet.

Spring Relief Models

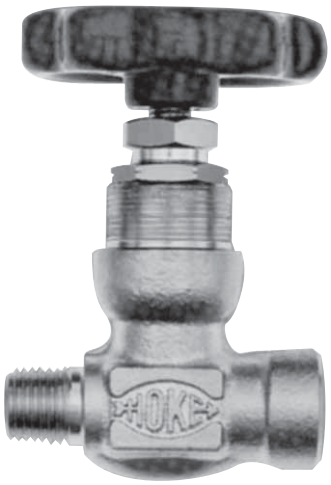
INLET NPT MALE	OUTLET NPT FEMALE	ORDER BY NUMBER	ADD CODE LETTER
¼	¼	6711L4Y	C – 350-400 psi
⅜	¼	6711L64Y	D* – 540-600 psi

Ordering Instructions

1. Determine whether the relief range you require is served by a spring relief or a rupture disc model.
2. Order by part number, followed by code of the desired range. For example: No. 6712L4Y.
3. Replacement rupture disc kits may be ordered by part number shown in the rupture disc model chart.

Cylinder Valves

1700 Series Heavy Duty Cylinder Valves



1711L4Y

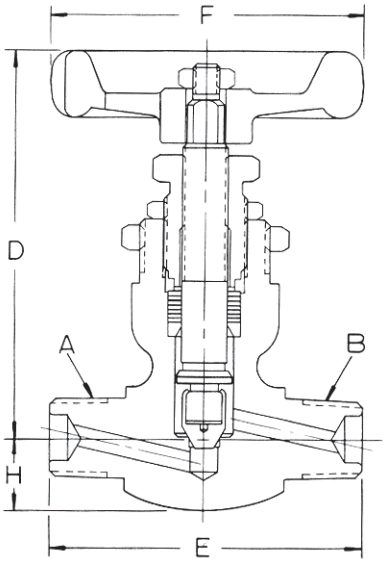
Heavy duty compact line of 316 stainless steel and Monel® forged body globe pattern valves features an integral bonnet suitable for ¼″ and ⅜″ NPT ended cylinders.

Features

- Dyna-Pak packing provides a leak-tight seal with low operating torque
- Packing below stem threads prevents fluid from contacting threads
- Non-rotating hardened 17-4PH stainless steel or replaceable PCTFE stem tip prevents galling and extends valve life
- Hardened 450 stainless steel or Monel® combination packing nut and thread gland for long stem thread cycle life
- Lock-nut secures packing nut, preventing accidental removal
- Flat wrench pads on body for easy valve installation
- Integral stem backstop for added safety

Technical Data	
MAXIMUM OPERATING PRESSURE	6000 psig [414 barg]
TEMPERATURE RANGE	–65° F to +450° F [–54° C to +232° C] (metal stem tip) –20° F to +250° F [–29° C to +121° C] (PCTFE stem tip)
ORIFICE SIZE	0.187
Cv FACTOR	0.45

Materials of Constructions			
DESCRIPTION		316SS Valves	Monel® Valves
BODY		316SS	Monel®
STEM		316SS	Monel®
STEM TIP	SOFT	PCTFE	PCTFE
	HARD	17-4 PHSS	Monel®
DYNA-PAK PACKING		TFE/316SS Wafers	TFE/Monel® Wafers
HANDLE		Aluminum	Aluminum



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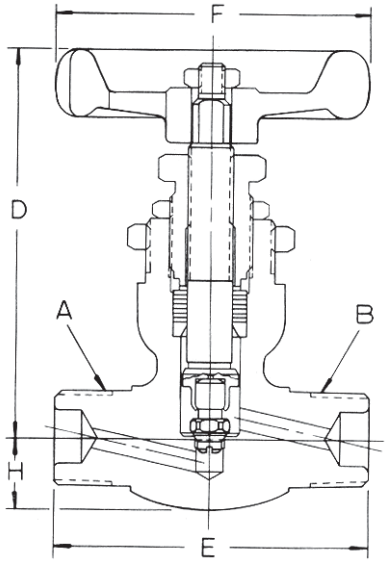


1751[ ]

Dimensions & How to Order 1700 Series Globe Pattern Valves

BASIC MATERIAL	STEM TIP	END CONNECTIONS		ORDERING NUMBER	DIMENSIONS inch (mm)			
		INLET A	OUTLET B		D	E	F	H
316 SS	Metal	¼ NPT Male	¼ NPT Male	1711M4Y	3 (76)	2 3/16 (56)	2 1/8 (54)	7/16 (12)
	Metal	¼ NPT Male	¼ NPT Female	1711L4Y	3 (76)	2 1/8 (54)	2 1/8 (54)	7/16 (12)
	PCTFE	⅜ NPT Male	⅜ NPT Male	1751M6Y	3 (76)	2 3/16 (56)	1 7/8 (48)	7/16 (12)
Monel®	Metal	¼ NPT Male	¼ NPT Male	1711M4M	3 (76)	2 3/16 (56)	2 1/8 (54)	7/16 (12)
	PCTFE	¼ NPT Male	¼ NPT Male	1751M4M	3 (76)	2 3/16 (56)	2 3/16 (56)	7/16 (12)

Dimensions are for reference only and are subject to change

Cylinder Valves

1900 Series Cylinder Valves

1935L64Y

This durable line of angle pattern valves features a low profile shrouded handle which protects the valve against damage. Dyna-Pak TFE wafer packing provides a leak tight seal with low operating torque even at 6000 psi (414 bar) pressure.

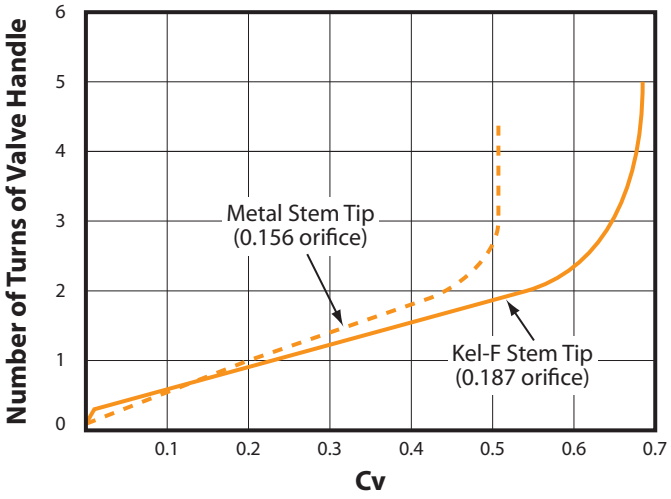
Features

- 316SS or Monel construction
- Low profile aluminum shrouded stem handle protects stem against damage
- Dyna-Pak packing provides leak tight seal with low operating torque
- Packing below the stem threads prevents process fluid from contacting stem threads
- Non-rotating hardened 17-4PH stainless steel or replaceable PCTFE stem tip prevents galling and extends valve life
- Hardened 450 stainless steel combination packing nut and thread gland for long stem thread cycle life
- Integral stem backseat provides added safety and prevents accidental removal of stem
- Variety of end connections satisfy most cylinder valve applications
- Bonnet lock prevents accidental removal of threaded bonnet
- Angle flow pattern
- Lock-nut secures packing nut against accidental removal
- Flat wrench pads on body for easy valve installation
- Integral stem backstop for added safety

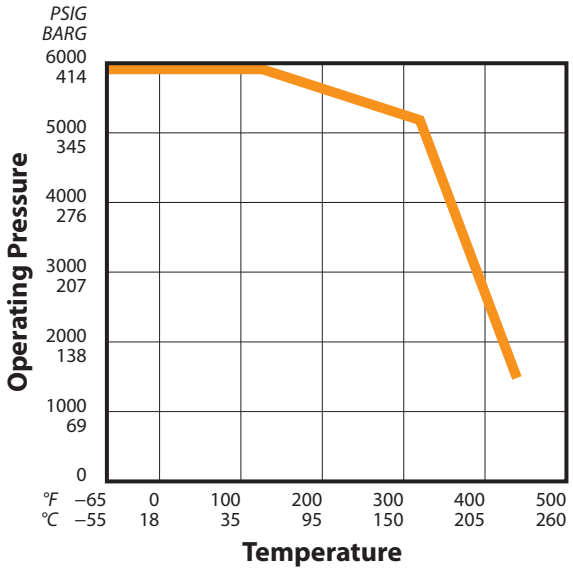
Technical Data	
MAXIMUM OPERATING PRESSURE	6000 psig (414 bar)
OPERATING TEMPERATURE RANGE	–65° F to +450° F [–54° C to +232° C] (metal stem tip) –20° F to +250° F [–29° C to +121° C] (PCTFE stem tip)
ORIFICE	Metal Stem Tip - 0.156 PCTFE Stem Tip - 0.187
CV FACTOR	Metal Stem Tip - 0.42 PCTFE Stem Tip - 0.63

Materials of Construction			
DESCRIPTION		316SS VALVES	MONEL VALVES
Body		316SS	Monel®
Stem		316SS	Monel®
Stem Tip	Soft	PCTFE	PCTFE
	Hard	17-4 PHSS	Monel®
Packing (Dyna-Pak)		TFE/316SS Wafers	TFE/Monel® Wafers
Handle		Aluminum	Aluminum

Handle Turns vs Cv

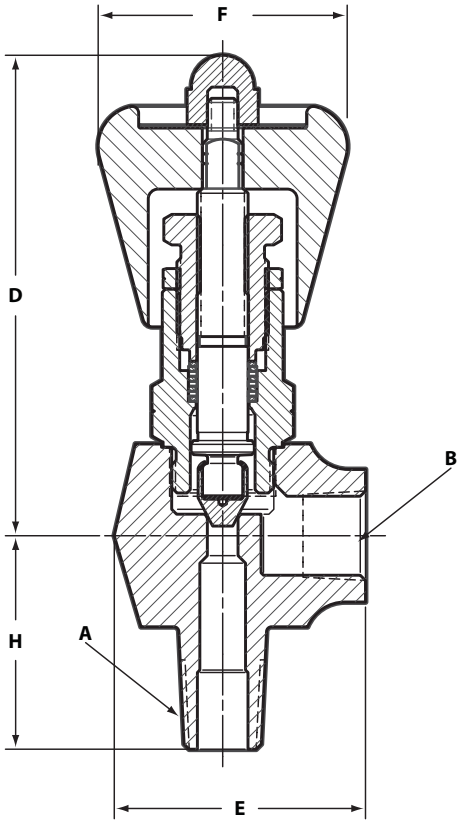


Pressure Temperature Curve

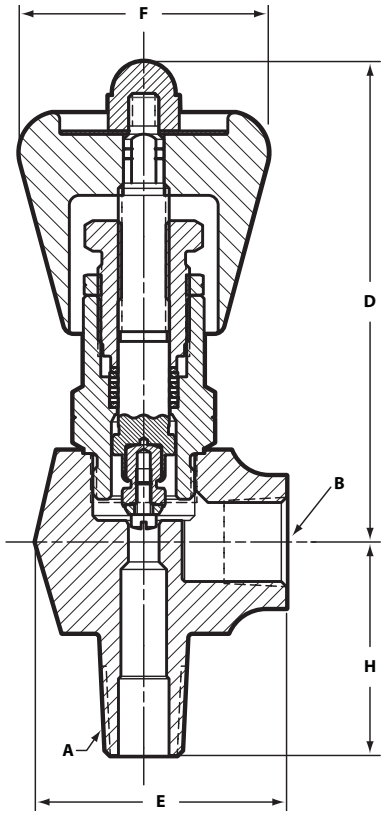


Cylinder Valves

1900 Series Cylinder Valves



1925L[ ]Y



1965L[ ]

Dimensions & How to Order 1900 Series Angle Pattern Valves

BASIC MATERIAL	STEM TIP	END CONNECTIONS		ORDERING NUMBER	DIMENSIONS, IN. [MM]			
		INLET A	OUTLET B		D	E	F	H
316 SS	Metal	¼ NPT Male	¼ NPT Female	1925L4Y	3 3/16 [81]	1½ [38]	1¾ [44]	1 5/16 [33]
	PCTFE	¼ NPT Male	¼ NPT Female	1965L4Y	3 3/16 [81]	1½ [38]	1¾ [44]	1 5/16 [33]
	Metal	⅜ NGT Male*	¼ NPT Female	1925L64Y	3 3/16 [81]	1½ [38]	1¾ [44]	1⅜ [35]
	PCTFE	⅜ NGT Male*	¼ NPT Female	1965L64Y	3 3/16 [81]	1½ [38]	1¾ [44]	1⅜ [35]
Monel	PCTFE	¼ NPT Male	¼ NPT Female	1965L4M	3 3/16 [81]	1½ [38]	1¾ [44]	1 5/16 [33]

* *NGT Male Ended Valves: Screw thread standard per Federal Services Handbook H-28, section 9. These threads allow longer thread engagement into the cylinder.*

Dimensions are for reference only and are subject to change

Cylinder Valves

2400 Series ½˝ Cylinder Valves

2464L84Y
with rupture disc

2400 Series 316 stainless steel, forged body angle pattern valves, come with a union bonnet for increased safety and ease of maintenance.

Available with pressure rupture discs or spring relief devices as an integral part of the valve.

Features

- Forged body union bonnet design for ease of maintenance and maximum reliability
- Non-rotating hardened 17-4PH stainless steel tip prevents galling and extends valve life
- Dyna-Pak packing below stem threads prevents lubricant washout & contamination of process fluids
- Stem backseat provides added safety
- Available with integral rupture disc or spring relief

Technical Data	
MAXIMUM OPERATING PRESSURE	5000 psig [345 barg]
TEMPERATURE RANGE	Metal stem tip: –40° F to +350° F (–40° C to +177° C) TFE stem tip: –20° F to +250° F (–29° C to +121° C) All burst discs & spring relief devices: –20° F to +250° F (–29° C to +121° C)
ORIFICE SIZE	0.312
Cv FACTOR	2.2

Materials of Constructions	
BODY & BONNET	316SS
STEM	17-4PH
THREAD GLAND	416SS
PACKING NUT	303SS
RING GLAND	303SS

2466L84Y
with spring relief

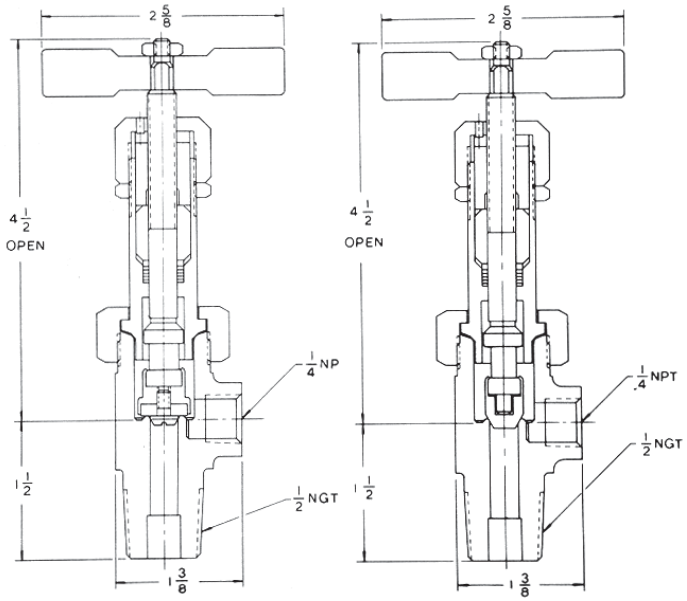
2462L84Y

Cylinder Valves

Valves with Rupture Discs

INLET	OUTLET	ORDER BY PART NUMBER TEFLON® PACKING TEFLON® STEM TIP	ORDER BY PART NUMBER TEFLON® PACKING METAL STEM TIP	ADD CODE LETTER	RUPTURE DISC KITS
½ NGT Male	¼ NPT Female	2464L84Y	2424L84Y	**D** 1400–1600 psi	SP6712K1
				G 1800–2000 psi	SP6712K2
				E* 2600–3000 psi	SP6712K3
				F 3500–4100 psi	SP6712K4**
				H 5400–6200 psi	SP6712K5**

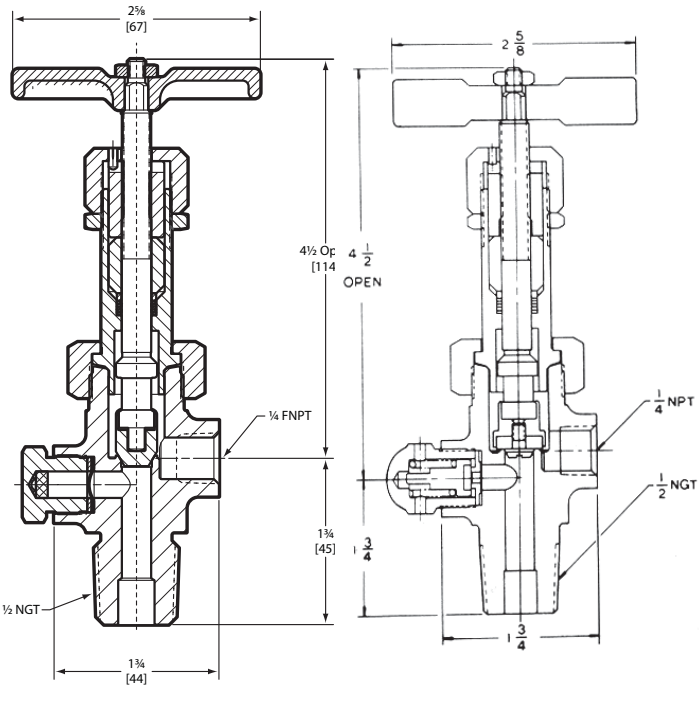
* *Normally supplied with DOT 3E-1800 and DOT 3A-1800*
** *Special order only. Please contact Hoke factory.*



2462L84Y *2422L84Y*

Valves without Relief Devices

INLET	OUTLET	ORDER BY PART NUMBER TEFLON® PACKING TEFLON® STEM TIP	ORDER BY PART NUMBER TEFLON® PACKING METAL STEM TIP
½ NGT Male	¼ NPT Female	2462L84Y	2422L84Y



2424L84Y *2466L84Y*

Valves with Spring Relief Devices

INLET	OUTLET	ORDER BY PART NUMBER TEFLON® PACKING TEFLON® STEM TIP	ORDER BY PART NUMBER TEFLON® PACKING METAL STEM TIP	ADD CODE LETTER
½ NGT Male	¼ NPT Female	2466L84Y	2426L84Y	**C** 350–400 psi
				D* 540–600 psi

* *Normally supplied with DOT 38-400*

Ordering Instructions for Valves with Relief Devices

1. Determine whether the relief range you require is served by a spring relief or a rupture disc model.
2. Order by part number, followed by code of the desired range. For example: No. 2424L84YD.

Cylinder Valves

3700 & 3800 Series Cylinder Valves

***Angle** 3802L4Y*

***Globe** 3752M4Y1*

The 3700 & 3800 Series forged body cylinder valves are supplied in stainless steel for cylinders with ⅛" through ⅜" NPT threads.

Features

- Compact size for restricted areas
- Dyna-Pak packing provides a leak-tight seal and low operating torque
- Integral bonnet design
- Ergonomic black ABS plastic handle
- Flat wrench pads on body for easy valve installation
- Replaceable PCTFE stem tip or integral metal stem tip
- Choice of 303 or 316 stainless steel construction
- Globe or angle flow patterns
- 3752M4Y[ ] Series are designed for use with cylinder protective caps and collars on 300 and 500 mL size cylinders. Low profile and extended end allows the valve and handwheel to clear the cap and cylinder collar

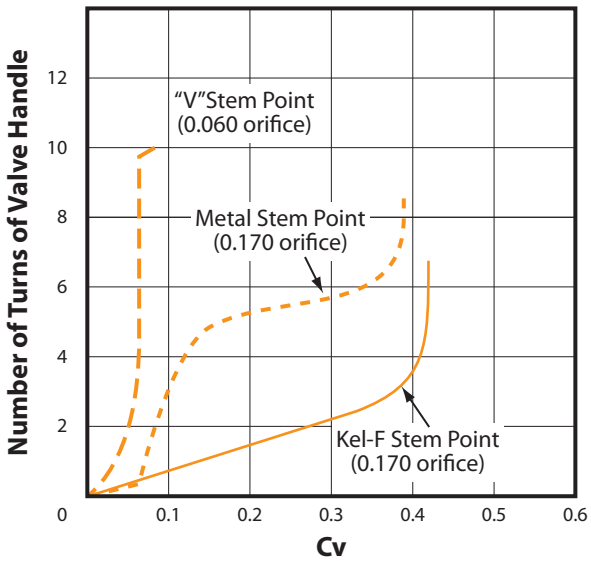
Technical Data	
MAXIMUM OPERATING PRESSURE:	5000 psig (345 bar)
TEMPERATURE RANGE:	–65° F to +450° F (metal stem tip) –20° F to +250° F (PCTFE stem tip)
ORIFICE SIZES:	0.060, 0.170, 0.219
Cv FACTOR:	0.07 to 0.55

Materials of Construction

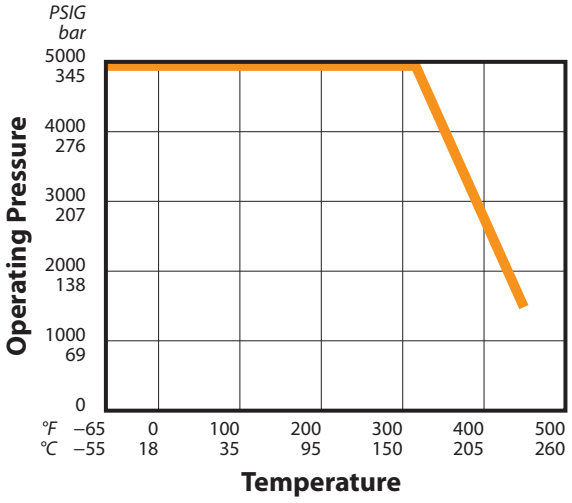
DESCRIPTION	303SS VALVES	316SS VALVES
Body	303SS	316SS
Stem	316SS	316SS
Stem Tip (Softseat)	PCTFE	PCTFE
Dyna-Pak Packing	Teflon®/316SS	Teflon®/316SS
Handle*	ABS	ABS

* *303 stainless steel metal handle is provided on models 3752M4Y[ ]*

Handle Turns vs. Cv

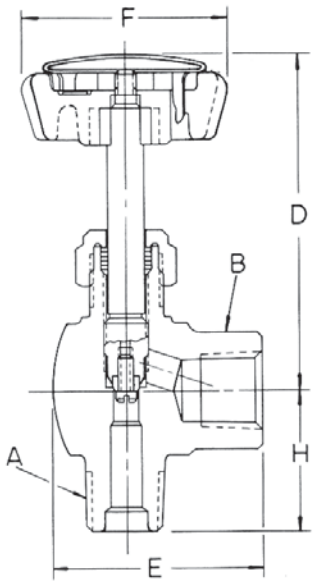


Pressure-Temperature Curve

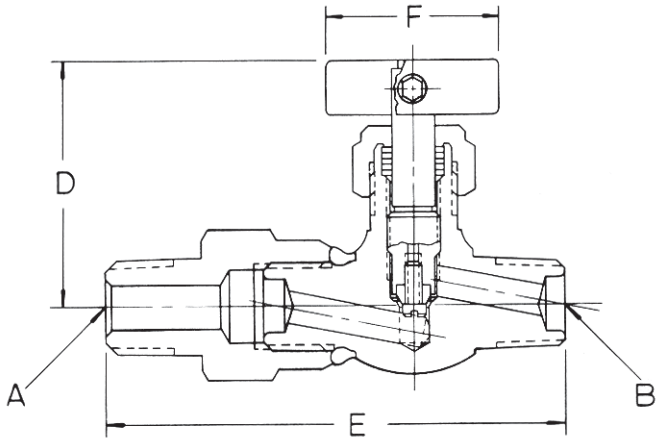


Cylinder Valves

3700 & 3800 Series Cylinder Valves



***Angle** 3862L64Y*



***Globe** 3752M4Y1*

Dimenions & How to Order 3700 & 3800 Series Cylinder Valves

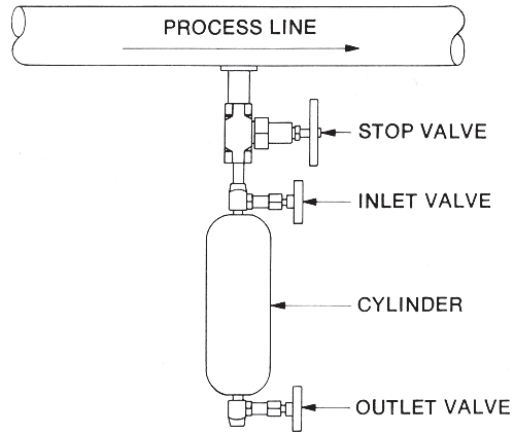
BASIC MATERIAL	CV	STEM TIP	END CONNECTIONS		ORDERING NUMBER	DIMENSIONS inch [mm]			
			INLET A	OUTLET B		D	E	F	H
Globe Pattern Orifice Size 0.060									
316 SS	0.07	Metal V-stem	¼ NPT Male	¼ NPT Male	3732M4Y	2 3/16 [56]	1¾ [44]	1 7/16 [36]	25/64 [10]
Globe Pattern Orifice Size 0.170									
303 SS	0.35	PCTFE	¼ NPT Male	¼ NPT Male	3752M4S	2⅛ [54]	2 [51]	1 7/16 [36]	⅜ [10]
		PCTFE	¼ NPT Male	¼ NPT Female	3852L4S	2 11/16 [68]	1⅞ [48]	1 27/64 [36]	½ [13]
316 SS	0.35	Metal	¼ NPT Male	¼ Gyrolok	3712H4Y	2⅛ [54]	1⅞ [48]	1 7/16 [36]	⅜ [10]
		PCTFE	¼ NPT Male	¼ Gyrolok	3752H4Y	2⅛ [54]	1⅞ [48]	1 7/16 [36]	⅜ [10]
		Metal	¼ NPT Male	¼ NPT Male	3712M4Y	2⅛ [54]	2 [51]	1 7/16 [36]	⅜ [10]
		PCTFE	¼ NPT Male	¼ NPT Male	3752M4Y	2⅛ [54]	2 [51]	1 7/16 [36]	⅜ [10]
		PCTFE	¼ NPT Male	¼ NPT Male	3752M4Y2*	1 3/16 [46]	2¾ [70]	1 [25]	—
		PCTFE	⅜ NPT Male	⅜ NPT Male	3852M6Y	2 3/16 [71]	1⅞ [48]	1⅞ [48]	½ [13]
		PCTFE	½ NPT Male	¼ NPT Male	3752M4Y1*	1 3/16 [46]	3 [76]	1 [25]	—
Globe Pattern Orifice Size 0.219									
316 SS	0.55	Metal	⅜ NPT Male	⅜ NPT Male	3812M6Y	2 25/32 [71]	2 9/16 [65]	1⅞ [48]	31/64 [12]
Angle Pattern Orifice Size 0.170									
316 SS	0.5	Metal	¼ NPT Male	¼ Gyrolok	3722H4Y	2⅛ [54]	1 19/32 [40]	1 7/16 [36]	⅞ [22]
		Metal	¼ NPT Male	¼ NPT Female	3802L4Y	2 11/16 [68]	1 27/64 [36]	1 7/16 [36]	31/32 [25]
		PCTFE	¼ NPT Male	¼ NPT Female	3862L4Y	2 11/16 [68]	1 27/64 [36]	1 7/16 [36]	31/32 [25]
		Metal	⅜ NPT Male	¼ NPT Female	3802L64Y	2 11/16 [68]	1 27/64 [36]	1 7/16 [36]	31/32 [25]
		PCTFE	⅜ NPT Male	¼ NPT Female	3862L64Y	2 11/16 [68]	1 7/16 [36]	1 7/16 [36]	1 [25]

* *Models 3752M4Y[ ] are designed for use with cylinder protective caps and collars on 300 and 500 ml. cylinders.*

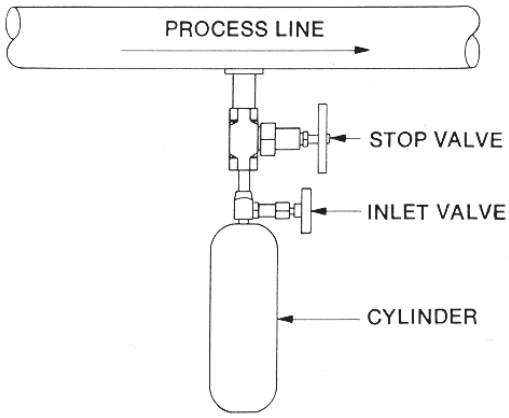
Dimensions are for reference only and are subject to change

Formed Sampling Cylinders

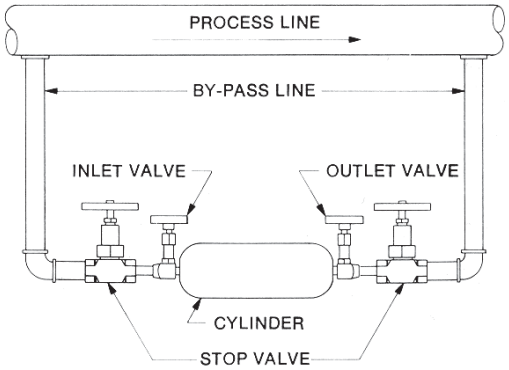
How to Collect Samples from Process Lines



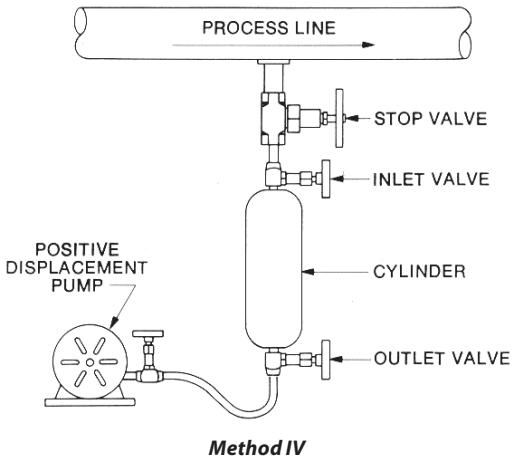
Method I



Method II



Method III



Method IV

It is often difficult to obtain pure samples of process fluids for laboratory analysis. To insure accuracy and safety of your sample, DOT regulations, elimination of contaminates, cost and simplicity of operation must be considered.

Here are four methods of collecting samples which we as manufacturers and suppliers of sampling cylinders and valves have seen successfully used.

Method I: Water Displacement

1. Use a double-ended Hoke cylinder (either the LD or HD styles depending upon pressure requirements) with sufficient capacity and equip it with suitable Hoke valves.
2. Fill the cylinder with water so that all contaminates in the cylinder are removed by displacement.
3. Attach cylinder to process line and open process line stop valve.
4. Open both valves on sampling cylinder, the inlet valve wider than the outlet and allow the process fluid to displace the water in cylinder.
5. When cylinder is filled (this is indicated when process fluid begins flowing out cylinder outlet valve), close outlet valve and then both inlet and stop valves and remove cylinder from process line.
6. Transport cylinder to laboratory and bleed off samples as required.

Method II: Evacuate Cylinder by Vacuum

1. Use either a double or single ended cylinder with valves, preferably packless type. Helium leak tested to insure leak tightness.
2. Evacuate the cylinder to remove contaminates.
3. Attach cylinder to process line.
4. Open inlet valve and draw off desired sample.
5. Close valve and remove cylinder from process line.
6. Draw samples from cylinder as required on mass spectrometer.

Method III: In Line By-pass of Process Line

1. Establish by-pass line or parallel line to main process line with facilities to insert sampling cylinder.
2. Insert double-ended cylinder in by-pass line.
3. Open both inlet and outlet cylinder valves wide and allow process fluid to flow through by-pass line and cylinder.
4. Permit flow to continue running until accurate sample is established.
5. Close valves and remove cylinder from process line.
6. Draw sample from cylinder when required.

Method IV: Positive Displacement

1. Use a double-ended cylinder equipped with suitable valves.
2. Attach one end of the cylinder to the process line and the other to a positive displacement pump which draws uniformly over a period of time.
3. Open process line and cylinder valves and begin drawing off a uniform sample over an established period of time.
4. When time period is completed, close valves and remove cylinder from process line.
5. Sample gathered is an example of fluid passed through process line over a given period.

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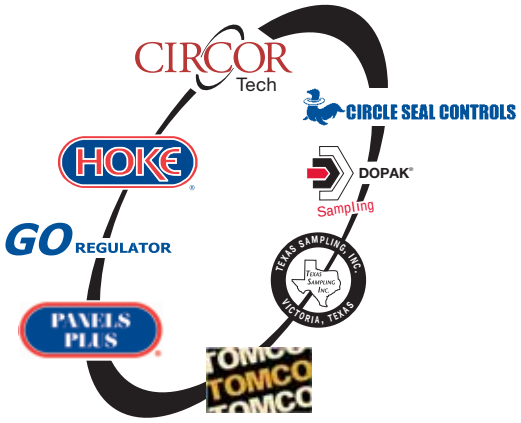

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CIRCOR Instrumentation Technologies

CIRCOR Instrumentation Technologies (CIT) is a product group of CIRCOR International (NYSE: CIR), specializing in fluid process control solutions with orifice sizes typically up to 1″. Our main product lines include ball, needle, packless, diaphragm, solenoid, and metering valves, pressure regulators, quick couplers, Gyrolok® compression tube fittings, and fully integrated sampling systems.

CIT markets primarily to the petrochemical, refining, power generation, food and beverage, semiconductor, and pharmaceutical industries, and to OEM's. CIT separates itself from the competition by offering highly engineered components manufactured to exacting standards and a variety of custom options.

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