



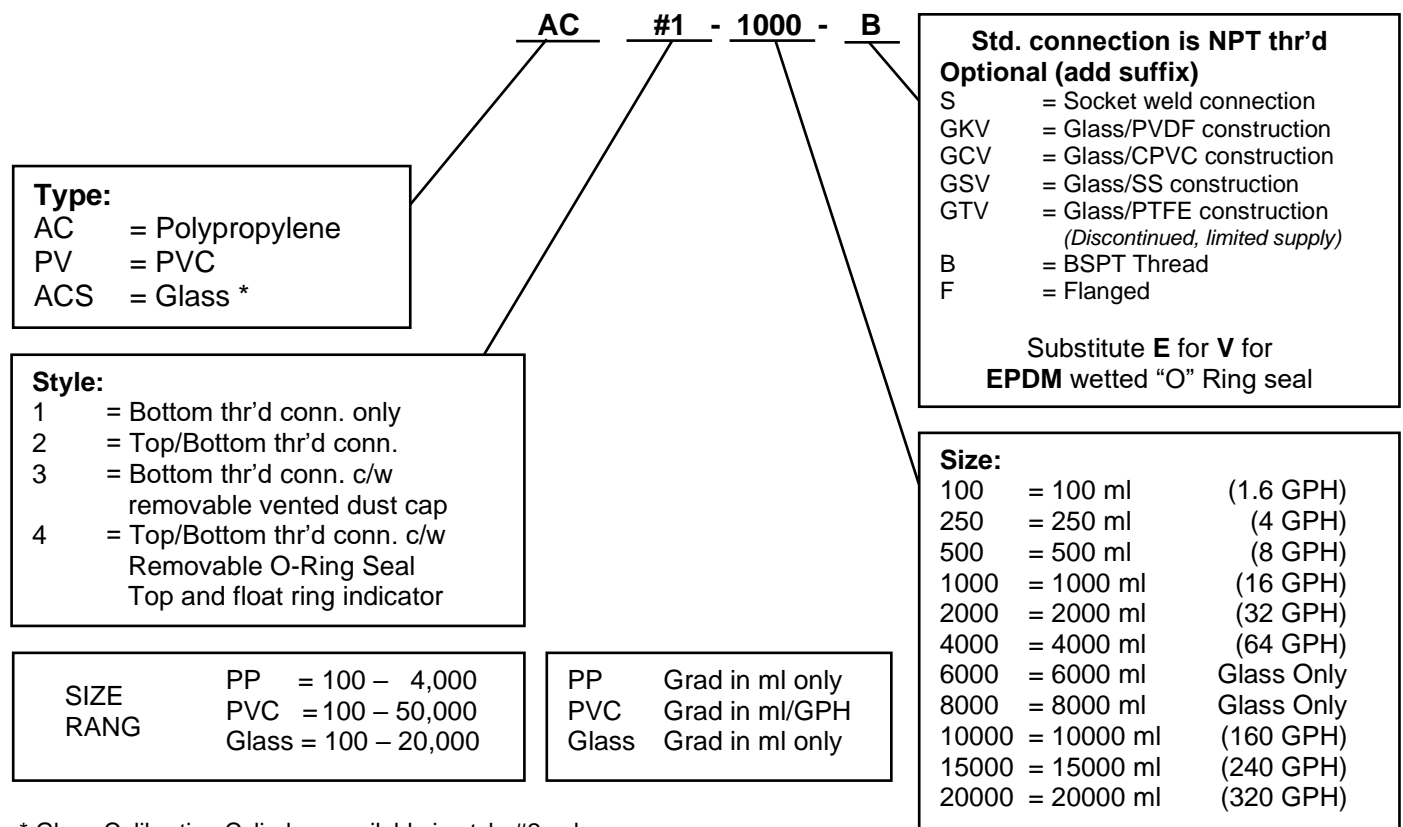
ACCUDRAW Calibration Cylinders

2025 US Price List

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e.g.: AC#1-1000-B



* Glass Calibration Cylinders available in style #2 only

Distributed by:

Manufactured by:



PRIMARY FLUID SYSTEMS INC. TEL (905) 333-8743
FAX (905) 333-8746

Toll Free 1-866-324-6422

www.eco-valve.com E-Mail: Sales@ecovalve.com



ACCUDRAW - Polypropylene

CODE A

MODEL AC# 1 - ____	Style	Price Each
100 ml	½" NPT bottom connection	\$ 66.00
250 ml	½" NPT bottom connection	\$ 72.00
500 ml	½" NPT bottom connection	\$ 84.00
1000 ml	½" NPT bottom connection	\$ 92.00
2000 ml	1" NPT bottom connection	\$ 163.00
4000 ml	1" NPT bottom connection	\$ 365.00

CODE A

MODEL AC# 2 - ____	Style	Price Each
100 ml	½" NPT bottom/top connection	\$ 110.00
250 ml	½" NPT bottom/top connection	\$ 116.00
500 ml	½" NPT bottom/top connection	\$ 126.00
1000 ml	½" NPT bottom/top connection	\$ 134.00
2000 ml	1" NPT bottom/top connection	\$ 239.00
4000 ml	1" NPT bottom/top connection	\$ 416.00

CODE A

MODEL AC# 3 - ____	Style	Price Each
100 ml	½" NPT bottom conn.c/w Dust Cap	\$ 107.00
250 ml	½" NPT bottom conn.c/w Dust Cap	\$ 110.00
500 ml	½" NPT bottom conn.c/w Dust Cap	\$ 121.00
1000 ml	½" NPT bottom conn.c/w Dust Cap	\$ 127.00
2000 ml	1" NPT bottom conn.c/w Dust Cap	\$ 229.00
4000 ml	1" NPT bottom conn.c/w Dust Cap	\$ 409.00

Optional Assemblies

Bottom connection PVC valve assembly for above includes:

- (2) PVC Sch 80 close nipples
- (1) PVC ball valve
- (1) PVC Sch 80 tee

CODE D

Part #	To Suit	Price Each
AC-1/2-ASSY	½" NPT connection size	\$ 25.00
AC-1-ASSY	1" NPT connection size	\$ 48.00

Pigtail air vent assembly for above includes:

- (12) inches of ⅜" poly tubing
- (2) tie wraps
- (1) poly compression fitting

CODE D

Part #	To Suit	Price Each
Pigtail-1/2	½" NPT connection size	\$ 12.00
Pigtail-1	1" NPT connection size	\$ 22.00

Optional Connections

CODE A

Connection Type	Material	Size	Price /per Flange
Flange	PP	½"	\$ 240.00
Flange	PP	1"	\$ 297.00

Standard ACCUDRAW polypropylene cylinders meet all accuracy requirements of ISO standard 6706 "Plastic Laboratory Ware-Graduated Cylinders"

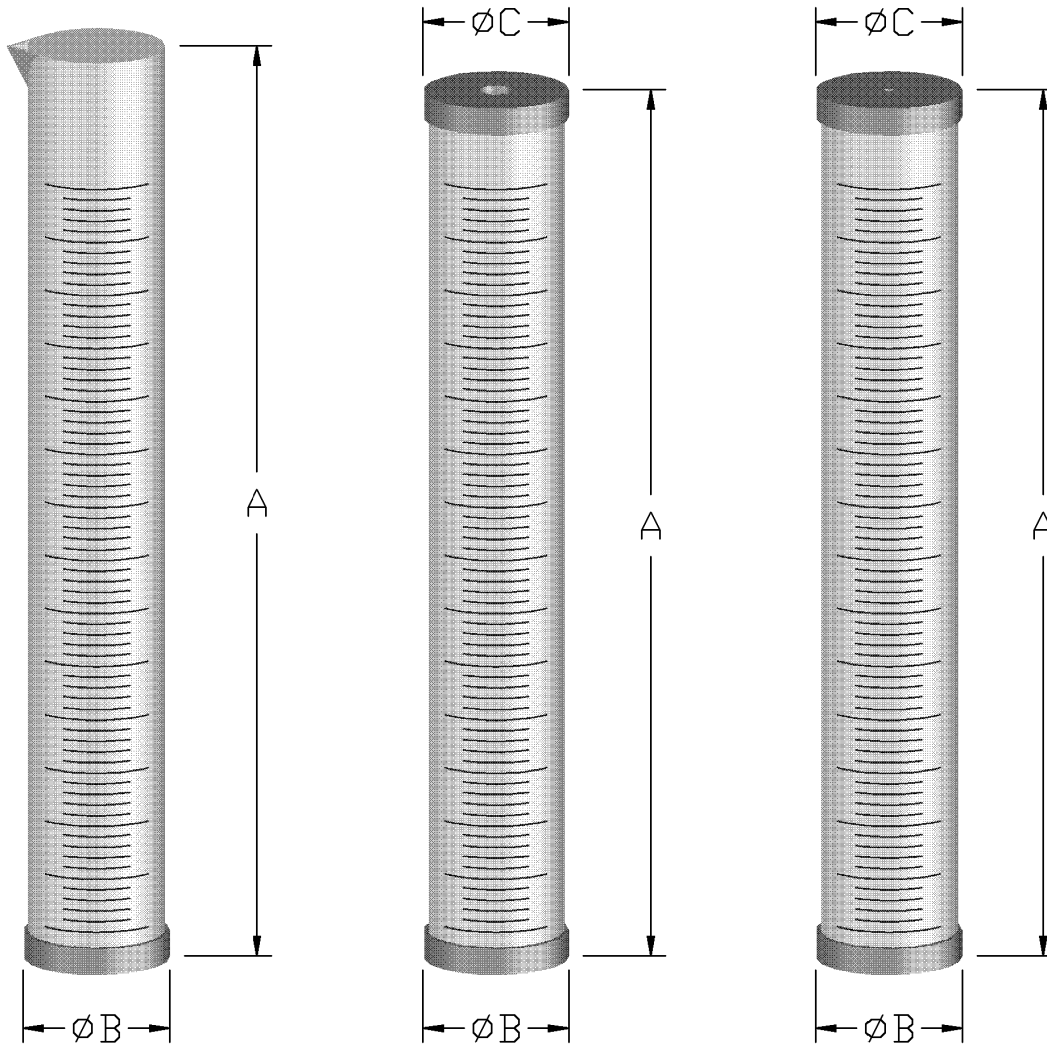
Calibration Certification available on all Cylinders
Volumetric Test and Report - List Adder \$63.00/per unit

ACCUDRAW®

AC#1

AC#2

AC#3



MODEL	SIZE (mL)	DIV (mL)	A (in.)	ØB (in.)	ØC (in.)	Connection
AC#1	100	1.0	9.88	1.38	N/A	1/2" (DN15)
	250	2.0	12.44	1.75		
	500	5.0	14.10	2.33		
	1000	10.0	17.19	2.63		1" (DN25)
	2000	20.0	20.88	3.38		
	4000	50.0	23.56	4.38		
AC#2 OR AC#3	100	1.0	9.25	1.38	1.38	1/2" (DN15)
	250	2.0	11.63	1.75	1.75	
	500	5.0	13.00	2.32	2.31	
	1000	10.0	16.50	2.69	2.69	1" (DN25)
	2000	20.0	19.50	3.38	3.50	
	4000	50.0	22.13	4.38	4.50	

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PRIMARY FLUID SYSTEMS INC.		
1050 Cooke Blvd., Burlington, Ontario L7T 4A8		
ACCUDRAW AC-SERIES CALIBRATION CYLINDERS (PP)		
DATE ISSUED: 23-JUN-09	SCALE: NTS	SHEET: 1 OF 1
PROJECT: ACCUDRAW AC-SERIES DRAWN BY: VW		
APPROVED BY:	DWG NO: ADV_AC_CALCYL1	REV: # 0

ACCUDRAW - PVC

CODE B

Model PV # 1-____	Style	Price Each
100 ml/1.6 gph	½" NPT bottom connection	\$ 51.00
250 ml/4 gph	½" NPT bottom connection	\$ 60.00
500 ml/8 gph	½" NPT bottom connection	\$ 68.00
1000 ml/16 gph	½" NPT bottom connection	\$ 72.00
2000 ml/32 gph	1" NPT bottom connection	\$ 139.00
4000 ml/64 gph	1" NPT bottom connection	\$ 252.00
10,000 ml/160 gph	2" NPT bottom connection	\$ 376.00
15,000 ml/240 gph	2" NPT bottom connection	\$ 561.00
20,000 ml/320 gph	2" NPT bottom connection	\$ 746.00

CODE B

Model PV # 2-____ and PV # 4-____	Style	Price Each
100 ml/1.6 gph	½" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 83.00
250 ml/4 gph	½" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 89.00
500 ml/8 gph	½" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 95.00
1000 ml/16 gph	½" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 100.00
2000 ml/32 gph	1" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 180.00
4000 ml/64 gph	1" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 297.00
10,000 ml/160 gph	2" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 431.00
15,000 ml/240 gph	2" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 650.00
20,000 ml/320 gph	2" NPT bottom/top connection PV #4 c/w removable Top w/PP float	\$ 860.00
30,000 ml/480 gph	2" NPT bottom/top connection PV #4 not available in this size	\$2,123.00
40,000 ml/640 gph	2" NPT bottom/top connection PV #4 not available in this size	\$2,831.00
50,000 ml/800 gph	2" NPT bottom/top connection PV #4 not available in this size	\$3,303.00

CODE B

Model PV # 3-____	Style	Price Each
100 ml/1.6 gph	½" NPT bottom conn.c/w Dust Cap	\$ 83.00
250 ml/4 gph	½" NPT bottom conn.c/w Dust Cap	\$ 85.00
500 ml/8 gph	½" NPT bottom conn.c/w Dust Cap	\$ 93.00
1000 ml/16 gph	½" NPT bottom conn.c/w Dust Cap	\$ 98.00
2000 ml/32 gph	1" NPT bottom conn.c/w Dust Cap	\$ 177.00
4000 ml/64 gph	1" NPT bottom conn.c/w Dust Cap	\$ 289.00
10,000 ml/160 gph	2" NPT bottom conn.c/w Dust Cap	\$ 423.00
15,000 ml/240 gph	2" NPT bottom conn.c/w Dust Cap	\$ 635.00
20,000 ml/320 gph	2" NPT bottom conn.c/w Dust Cap	\$ 845.00

Optional Assemblies

Note: Socket weld connections are available please contact factory

Bottom connection PVC valve assembly for above includes:

- (2) PVC Sch 80 close nipples
- (1) PVC ball valve
- (1) PVC Sch 80 tee

CODE D

Part #	To Suit	Price Each
AC-1/2-ASSY	½" NPT connection size	\$ 25.00
AC-1-ASSY	1" NPT connection size	\$ 48.00
AC-2-ASSY	2" NPT connection size	\$ 93.00

Pigtail air vent assembly for above includes:

- (12) inches of ¾" poly tubing
- (2) tie wraps
- (1) poly compression fitting

CODE D

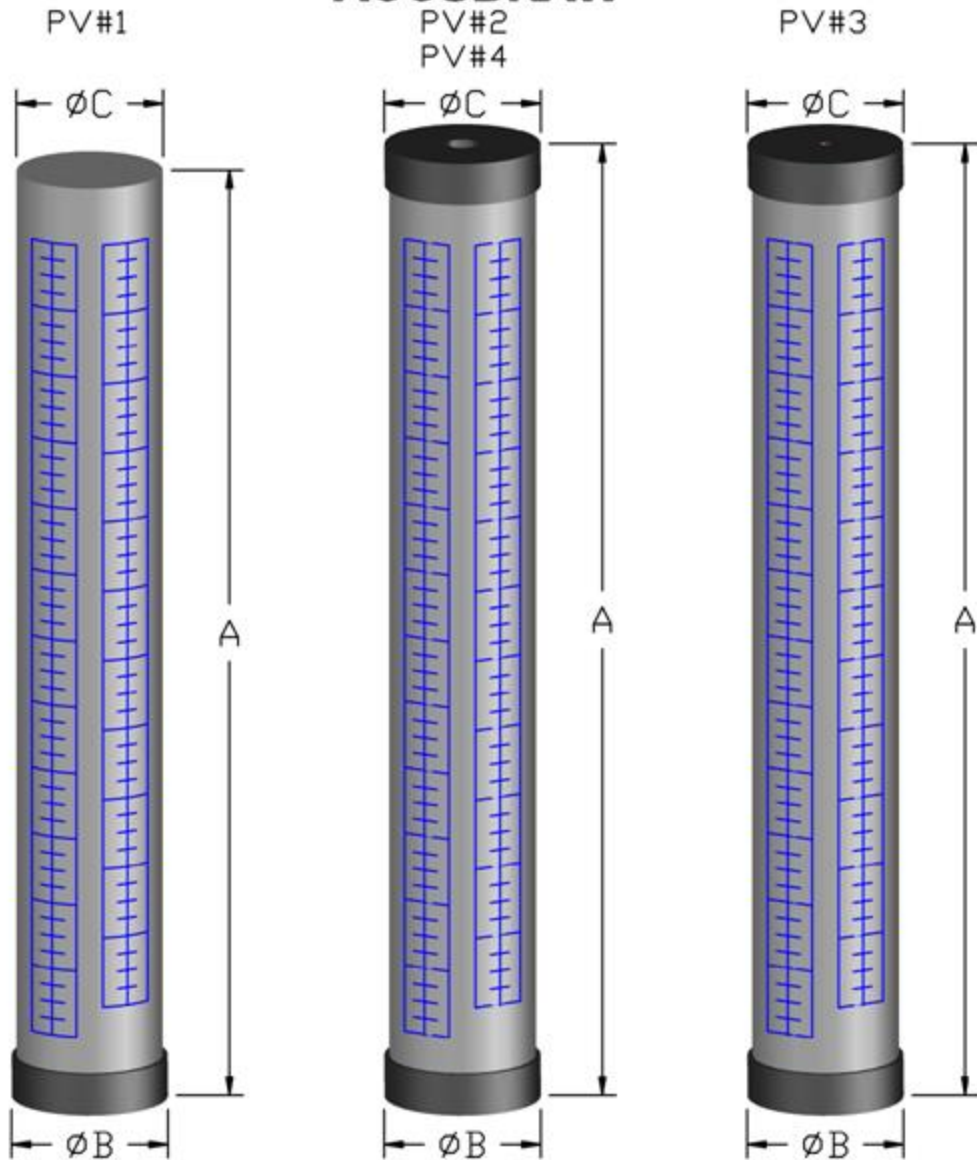
Part #	To Suit	Price Each
Pigtail-1/2	½" NPT connection size	\$ 12.00
Pigtail-1	1" NPT connection size	\$ 22.00

Optional Connections

CODE B

Connection Type	Material	Size	Price /per Flange
Flange	PVC	½"	\$ 107.00
Flange	PVC	1"	\$ 114.00
Flange	PVC	2"	\$ 173.00

ACCUDRAW®



MODEL	SIZE	ml(GPH)	DIV	ml(GPH)	A (in.)	ØB (in.)	ØC (in.)	Connection	Top Conn.	
PV#1	100	(1.60)	1.0	(0.02)	10.13	1.4	1.1	1/2" (DN 15)	OPEN	
	250	(4.00)	2.0	(0.05)	10.88	1.9	1.6			
	500	(8.00)	5.0	(0.05)	12.13	2.4	2.1			
	1000	(16.0)	10.0	(0.125)	16.13	2.8	2.5			
	2000	(32.0)	20.0	(0.25)	20.00	3.5	3.1	1" (DN 25)		
	4000	(64.0)	25.0	(0.25)	22.00	4.5	4.1			
	10000	(160)	200.0	(2.00)	22.50	6.9	6.5	2" (DN 50)		
	15000	(240)	200.0	(2.00)	32.50	6.9	6.5			
20000	(320)	200.0	(2.00)	42.50	6.9	6.5				
PV#2 & PV#4	100	(1.60)	1.0	(0.02)	10.50	1.4	1.4	1/2" (DN 15)	1/2" (DN 15)	
	250	(4.00)	2.0	(0.05)	11.25	1.9	1.9			
	500	(8.00)	5.0	(0.05)	12.50	2.4	2.4			
	1000	(16.0)	10.0	(0.125)	16.50	2.8	2.8			
	2000	(32.0)	20.0	(0.25)	20.50	3.5	3.5	1" (DN 25)	1" (DN 25)	
	4000	(64.0)	25.0	(0.25)	22.50	4.5	4.5			
	10000	(160)	200.0	(2.00)	23.00	6.9	6.9	2" (DN 50)	2" (DN 50)	
	15000	(240)	200.0	(2.00)	33.00	6.9	6.9			
20000	(320)	200.0	(2.00)	43.00	6.9	6.9				
PV#2	30000	(480)	200.0	(2.00)	39.00	9.1	9.1			
	40000	(640)	200.0	(2.00)	50.00	9.1	9.1			
	50000	(800)	200.0	(2.00)	62.00	9.1	9.1			
PV#3	100	(1.60)	1.0	(0.02)	10.50	1.4	1.4	1/2" (DN 15)	DUST CAP	
	250	(4.00)	2.0	(0.05)	11.25	1.9	1.9			
	500	(8.00)	5.0	(0.05)	12.50	2.4	2.4			
	1000	(16.0)	10.0	(0.125)	16.50	2.8	2.8			
	2000	(32.0)	20.0	(0.25)	20.50	3.5	3.5	1" (DN 25)		
	4000	(64.0)	25.0	(0.25)	22.50	4.5	4.5			
	10000	(160)	200.0	(2.00)	23.00	6.9	6.9	2" (DN 50)		
	15000	(240)	200.0	(2.00)	33.00	6.9	6.9			
20000	(320)	200.0	(2.00)	43.00	6.9	6.9				

NOTE:
PV#4 CALIBRATION CYLINDERS HAVE
REMOVABLE TOP CAPS.

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PRIMARY FLUID SYSTEMS INC.

1000 Cooke Blvd., Burlington, Ontario L7T 4A8

ACCUDRAW PV-SERIES
CALIBRATION CYLINDERS (PVC)

DATE DRAWN: JULY-29-2014 SCALE: NTS SHEET: 1 OF 1
TOLERANCE: +/- 0.025" DRAWN BY: NEAL YODIN
APPROVED BY: _____ CHECKED BY: _____ SVS NO: ADV_PV_CALCYLI REV: 0

ACCUDRAW Custom Calibration Cylinders

The following custom cylinders are now kept in stock in limited quantities.

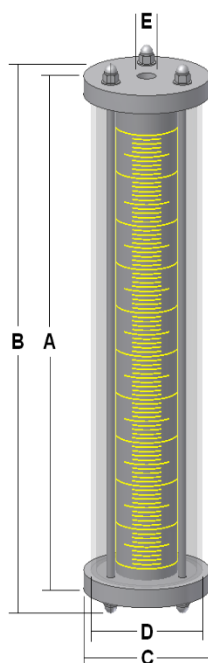
Glass cylinder with prominent blue markings in ml graduations, mounted between $\frac{3}{4}$ " thick **PVDF flanges** and viton "O" ring seals, with a polycarbonate outer shield all bolted together with stainless steel rods.

Model ACS # 2-___ GKV	Style	Price Each
100 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 557.00
250 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 615.00
500 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 824.00
1000 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$1,178.00
2000 ml	1" Thr'd connection top/bottom	\$1,381.00
4000 ml	1" Thr'd connection top/bottom	\$2,196.00
6000 ml	2" Thr'd connection top/bottom	\$4,015.00
8000 ml	2" Thr'd connection top/bottom	\$4,680.00
10000 ml	2" Thr'd connection top/bottom	\$5,089.00
20000 ml	2" Thr'd connection top/bottom	\$6,877.00

Options available (may affect price and delivery)
Different type or size of thread connection
Different "O" ring material of construction

Model ACS#2-XXX-GKV
Glass Calibration Cylinders

Note: Replace XXX in model # with Size ml



SIZE ml	DIV ml	A Inches	B Inches	C Inches	D Inches	E Thread
100	1.00	10.00	11.00	3.00	2.50	$\frac{1}{2}$ " FNPT
250	2.00	12.75	13.50	3.50	3.00	$\frac{1}{2}$ " FNPT
500	5.00	14.50	15.50	4.00	3.50	$\frac{1}{2}$ " FNPT
1000	10.00	16.75	17.75	4.75	4.25	$\frac{1}{2}$ " FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.128	21.16	8.00	7.50	2" FNPT
8000	50.00	24.628	25.66	8.00	7.50	2" FNPT
10000	50.00	30.128	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Dimensions subject to change without notice

Optional Connection			CODE C
Connection Type	Material	Size	Price /per Flange
Flange	PVDF	$\frac{1}{2}$ "	\$ 349.00
Flange	PVDF	1"	\$ 631.00
Flange	PVDF	2"	\$1,296.00

The above is a suggested US List Price
Standard delivery is stock to 3 weeks
F.O.B. Burlington, Ont.
Payable in US Funds
Terms: Net 30 days **firm**
Prices subject to change without notice
See page 16 for Terms

ACCUDRAW Custom Calibration Cylinders

The following custom cylinders are now kept in stock in limited quantities.

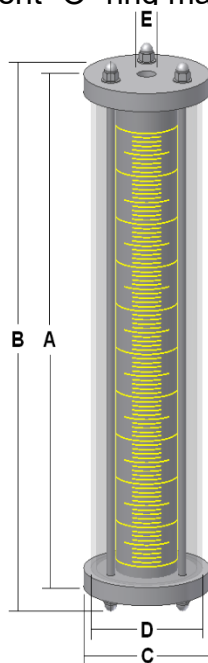
Glass cylinder with prominent blue markings in ml graduations, mounted between $\frac{3}{4}$ " thick **CPVC (Corzan) flanges** and viton "O" ring seals, with a polycarbonate outer shield all bolted together with stainless steel rods.

Model ACS # 2-___ GCV	Style	Price Each
100 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 416.00
250 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 459.00
500 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 563.00
1000 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 768.00
2000 ml	1" Thr'd connection top/bottom	\$1,024.00
4000 ml	1" Thr'd connection top/bottom	\$1,200.00
6000 ml	2" Thr'd connection top/bottom	\$2,541.00
8000 ml	2" Thr'd connection top/bottom	\$3,344.00
10000 ml	2" Thr'd connection top/bottom	\$3,699.00
20000 ml	2" Thr'd connection top/bottom	\$5,419.00

Options available (may affect price and delivery)
Different type or size of thread connection
Different "O" ring material of construction

Model ACS#2-XXX-GCV
Glass Calibration Cylinders

Note: Replace XXX in model # with Size ml



SIZE ml	DIV ml	A Inches	B Inches	C Inches	D Inches	E Thread
100	1.00	10.00	11.00	3.00	2.50	$\frac{1}{2}$ " FNPT
250	2.00	12.75	13.50	3.50	3.00	$\frac{1}{2}$ " FNPT
500	5.00	14.50	15.50	4.00	3.50	$\frac{1}{2}$ " FNPT
1000	10.00	16.75	17.75	4.75	4.25	$\frac{1}{2}$ " FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.128	21.16	8.00	7.50	2" FNPT
8000	50.00	24.628	25.66	8.00	7.50	2" FNPT
10000	50.00	30.128	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Dimensions subject to change without notice

Optional Connection			CODE C
Connection Type	Material	Size	Price /per Flange
Flange	CPVC (Corzan)	$\frac{1}{2}$ "	\$ 140.00
Flange	CPVC (Corzan)	1"	\$ 153.00
Flange	CPVC (Corzan)	2"	\$ 210.00

The above is a suggested US List Price
Standard delivery is stock to 3 weeks
F.O.B. Burlington, Ont.
Payable in US Funds
Terms: Net 30 days **firm**
Prices subject to change without notice
See page 16 for Terms

ACCUDRAW Custom Calibration Cylinders

The following custom cylinders are now kept in stock in limited quantities.

Glass cylinder with prominent blue markings in ml graduations, mounted between ½" thick **316 Stainless Steel flanges** and viton "O" ring seals, with a polycarbonate outer shield all bolted together with stainless steel rods.

Model ACS # 2-___ GSV	Style	Price Each
100 ml	½" Thr'd connection top/bottom	\$ 563.00
250 ml	½" Thr'd connection top/bottom	\$ 607.00
500 ml	½" Thr'd connection top/bottom	\$ 704.00
1000 ml	½" Thr'd connection top/bottom	\$ 909.00
2000 ml	1" Thr'd connection top/bottom	\$1,105.00
4000 ml	1" Thr'd connection top/bottom	\$1,764.00
6000 ml	2" Thr'd connection top/bottom	\$3,212.00
8000 ml	2" Thr'd connection top/bottom	\$3,882.00
10000 ml	2" Thr'd connection top/bottom	\$4,283.00
20000 ml	2" Thr'd connection top/bottom	\$7,159.00

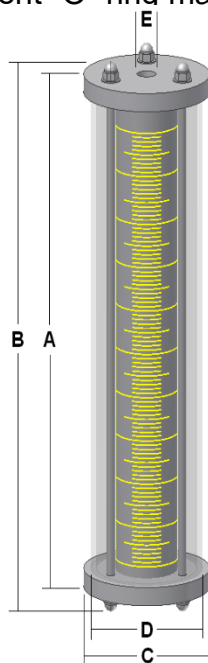
Options available (may affect price and delivery)

Different type or size of thread connection

Different "O" ring material of construction

Model ACS#2-XXX-GSV
Glass Calibration Cylinders

Note: Replace XXX in model # with Size ml



SIZE ml	DIV ml	A Inches	B Inches	C Inches	D Inches	E Thread
100	1.00	10.00	11.00	3.00	2.50	½" FNPT
250	2.00	12.75	13.50	3.50	3.00	½" FNPT
500	5.00	14.50	15.50	4.00	3.50	½" FNPT
1000	10.00	16.75	17.75	4.75	4.25	½" FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.128	21.16	8.00	7.50	2" FNPT
8000	50.00	24.628	25.66	8.00	7.50	2" FNPT
10000	50.00	30.128	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Dimensions subject to change without notice

Optional Connection			CODE C
Connection Type	Material	Size	Price /per Flange
Flange	316 S/S	½"	\$ 373.00
Flange	316 S/S	1"	\$ 433.00
Flange	316 S/S	2"	\$ 842.00

The above is a suggested US List Price

Standard delivery is stock to 3 weeks

F.O.B. Burlington, Ont.

Payable in US Funds

Terms: Net 30 days **firm**

Prices subject to change without notice

See page 16 for Terms

ACCUDRAW Custom Calibration Cylinders

The following custom cylinders are now kept in stock in limited quantities.

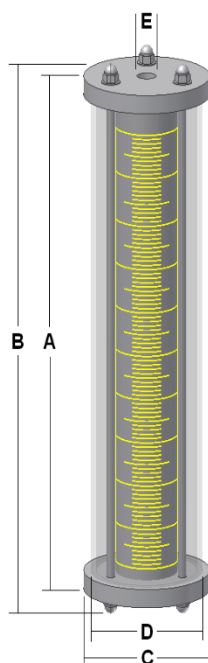
Glass cylinder with prominent blue markings in ml graduations, mounted between $\frac{3}{4}$ " thick **PTFE-Based flanges** and viton "O" ring seals, with a polycarbonate outer shield all bolted together with stainless steel rods. **Material has been discontinued; limited supply is still available.**

		CODE C
Model ACS # 2-___ GTV	Style	Price Each
100 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 731.00
250 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 933.00
500 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$ 999.00
1000 ml	$\frac{1}{2}$ " Thr'd connection top/bottom	\$1,327.00
2000 ml	1" Thr'd connection top/bottom	\$1,686.00
4000 ml	1" Thr'd connection top/bottom	\$2,856.00
6000 ml	2" Thr'd connection top/bottom	\$3,747.00
8000 ml	2" Thr'd connection top/bottom	\$3,874.00
10000 ml	2" Thr'd connection top/bottom	\$4,001.00
20000 ml	2" Thr'd connection top/bottom	Call Factory

Options available (may affect price and delivery)
Different type or size of thread connection
Different "O" ring material of construction

Model ACS#2-XXX-GTV
Glass Calibration Cylinders

Note: Replace XXX in model # with Size ml



SIZE ml	DIV ml	A Inches	B Inches	C Inches	D Inches	E Thread
100	1.00	10.00	11.00	3.00	2.50	$\frac{1}{2}$ " FNPT
250	2.00	12.75	13.50	3.50	3.00	$\frac{1}{2}$ " FNPT
500	5.00	14.50	15.50	4.00	3.50	$\frac{1}{2}$ " FNPT
1000	10.00	16.75	17.75	4.75	4.25	$\frac{1}{2}$ " FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.128	21.16	8.00	7.50	2" FNPT
8000	50.00	24.628	25.66	8.00	7.50	2" FNPT
10000	50.00	30.128	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Dimensions subject to change without notice

Optional Connection

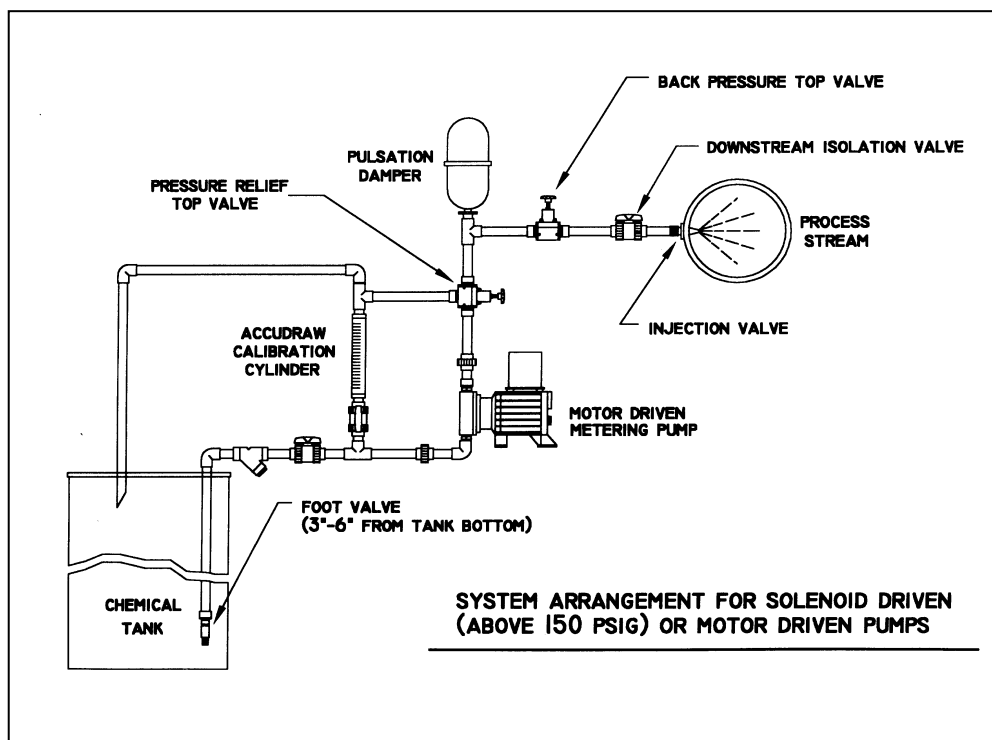
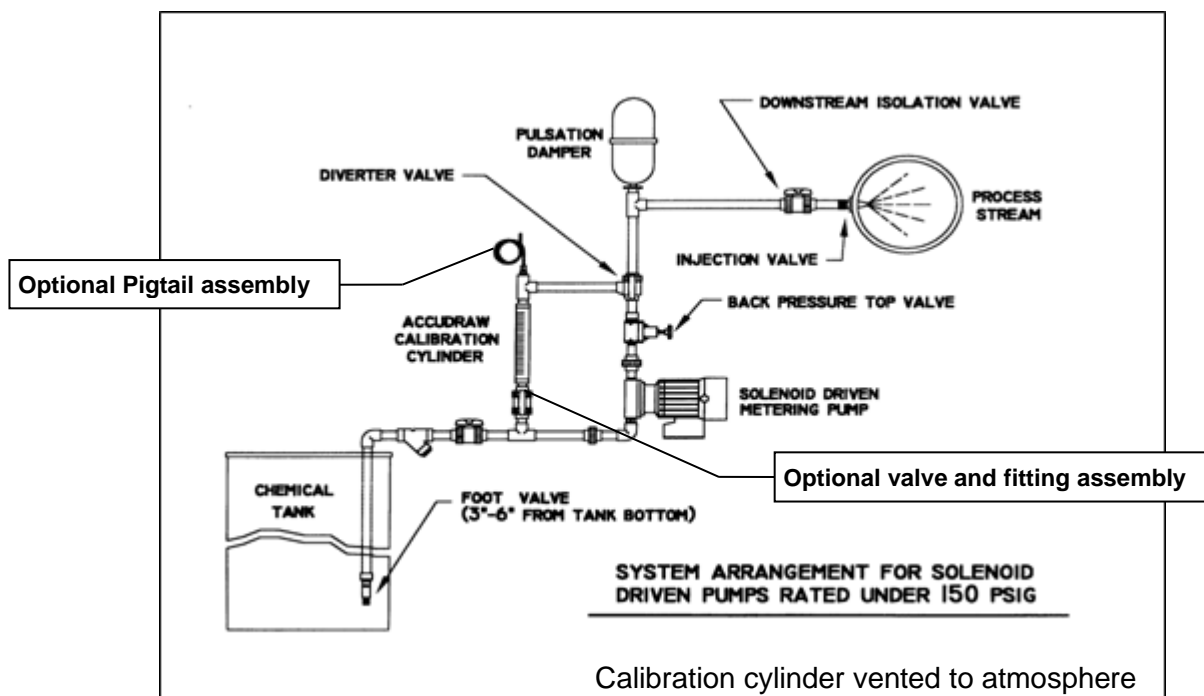
CODE C

Connection Type	Material	Size	Price /per Flange
Flange	PTFE	$\frac{1}{2}$ "	Consult Factory
Flange	PTFE	$\frac{3}{4}$ "	Consult Factory
Flange	PTFE	1"	Consult Factory

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Terms: Net 30 days **firm**
Prices subject to change without notice
See page 16 for Terms

Typical Installations

The installations below are typical installation examples only. Consult your Engineering Department for the appropriate installation of your application or call the factory for advice.





ACCUDRAW[®] Polypropylene Cylinder Calibration Instructions

Note: Before starting the calibration procedure below, ensure that the pump is primed and void of any trapped air.

Using the ml scale: (scale is based on volume pumped, over any given time)

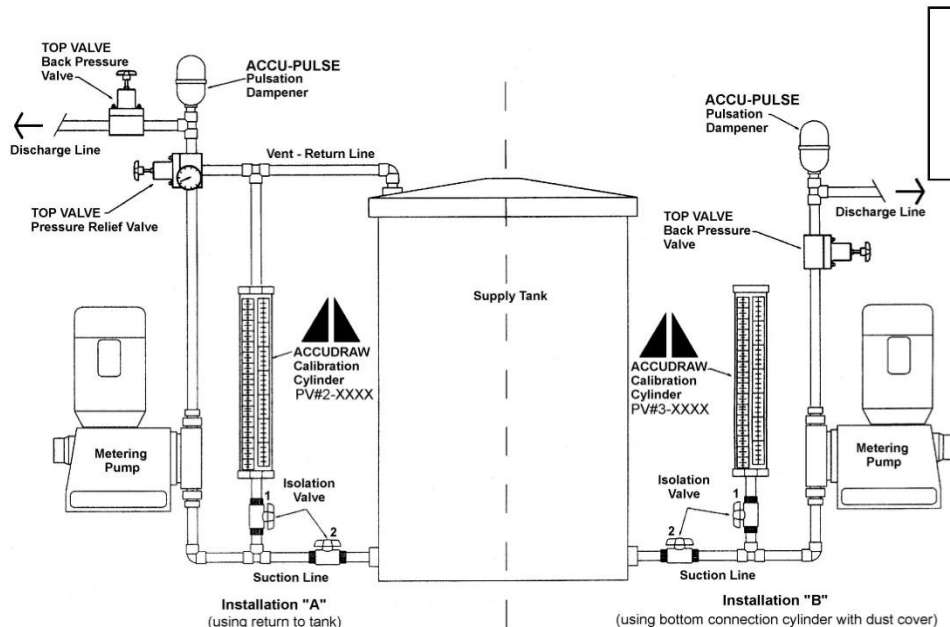
1. Fill the calibration cylinder to the top mark with the liquid to be dispensed. This can be accomplished by manually filling the cylinder, or, if the feed tank level is higher than the cylinder, by opening the isolation valve below the cylinder and back filling the cylinder.
2. Using a stop watch, measure the volume dispensed in 60 seconds.
3. Multiply the measured volume by 60 to find your ml per hour volume.
4. Adjust the pump volume control, higher or lower to meet with your desired output.
5. Repeat above steps 4 through 8 until your desired output is met.

Caution: Never leave unattended when back filling the cylinder.

2. With the calibration cylinder full of the liquid to be dispensed, start the metering pump and operate at 100% output until all air is removed from both suction lines and pump head.
3. Shut pump "OFF".
4. With calibration cylinder full, close isolation Valve (#2) from supply tank, and open isolation valve (#1) below cylinder.
5. Start the pump.

If you wish to shorten the time of dispensing for calibration by one half (1/2) or one quarter (1/4), you must multiply the volume by the same number used to divide the time by to determine ml per minute or hour.

e.g. 100 ml in 60 seconds equals
50 ml X 2 in 30 seconds or
25 ml X 4 in 15 seconds



Conversion Factors

1ml = 1 cc
1000 ml = 1 liter
ml/sec x 60 = ml/min
1 US gal/min x 0.063 = liters/sec
1 US gal = 3.786 liters

Caution:
Do not use as a Pressure Vessel



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ACCUDRAW® PVC Calibration Instructions

Note: Before starting either of the calibration procedures below, ensure that the pump is primed and void of any trapped air.

Using the USGPH scale: (scale is based on time, in one (1) minute volume discharge)

1. Fill the calibration to the top "0" mark on the USGPH scale.
2. Close isolation valve (#2) from supply tank, open isolation valve (#1) below cylinder and start the pump.
3. Use a stopwatch to measure the time of one (1) minute (60 seconds) and record the volume dispensed by the metering pump, using the draw down scale.
4. Adjust the pump volume control higher or lower to meet with your desired output.
5. Repeat above steps 1 through 4, until the desired output is met.
6. Divide the measured USGPH number by 60 to determine the **USGPM volume**, if required.

If you wish to shorten the time of dispensing for calibration by one half (1/2) or one quarter (1/4), you must multiply the measured volume by the same number used to divide the time by.

e.g. 10 USGPH in 1 minute equals
5 USGPH X 2 in 30 seconds or
2.5 USGPH X 4 in 15 seconds

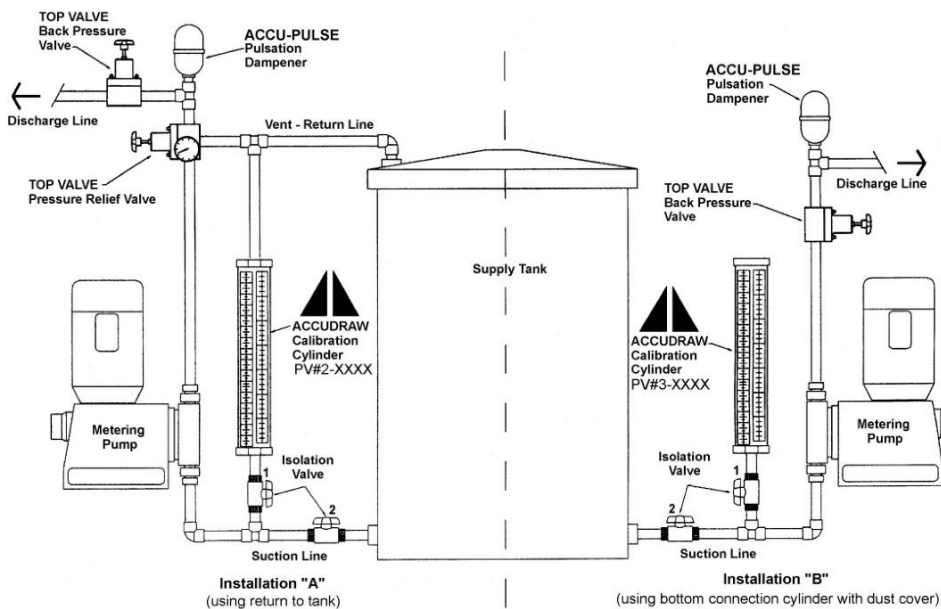
Using the ml scale: (scale is based on volume pumped, over any given time)

1. Fill the calibration cylinder to the top "0" mark on the ml scale.
2. Close isolation valve (#2) from supply tank, open isolation valve (#1) below cylinder and start the pump.
3. Use a stopwatch to measure the time it takes to pump down a given volume (ml) in 60 seconds.
4. Multiply the volume by 60 to determine the **ml per hour** volume, if required.
5. Adjust the pump volume control higher or lower to meet with your desired output.
6. Repeat above steps 1 through 5, until the desired output is met.

If you wish to shorten the time of dispensing for calibration by one half (1/2) or one quarter (1/4), you must multiply the volume by the same number used to divide the time by to determine ml per minute or hour.

e.g. 100 ml in 60 seconds equals
50 ml X 2 in 30 seconds or
25 ml X 4 in 15 seconds

Typical Installations ("A" and "B")



Conversion Factors

1 ml = 1 cc
1000 ml = 1 liter
ml/sec x 60 = ml/min
1 US gal/min x 0.063 = liters/sec
1 US gal = 3.786 liters

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ACCUDRAW®

Glass Cylinder Calibration Instructions

Note: Before starting the calibration procedure below, ensure that the pump is primed and void of any trapped air.

Using the ml scale: (scale is based on volume pumped, over any given time)

1. Fill the calibration cylinder to the top mark with the liquid to be dispensed. This can be accomplished by manually filling the cylinder, or, if the feed tank level is higher than the cylinder, by opening the isolation valve below the cylinder and back filling the cylinder.
6. Using a stop watch, measure the volume dispensed in 60 seconds.
7. Multiply the measured volume by 60 to find your ml per hour volume.
8. Adjust the pump volume control, higher or lower to meet with your desired output.
9. Repeat above steps 4 through 8 until your desired output is met.

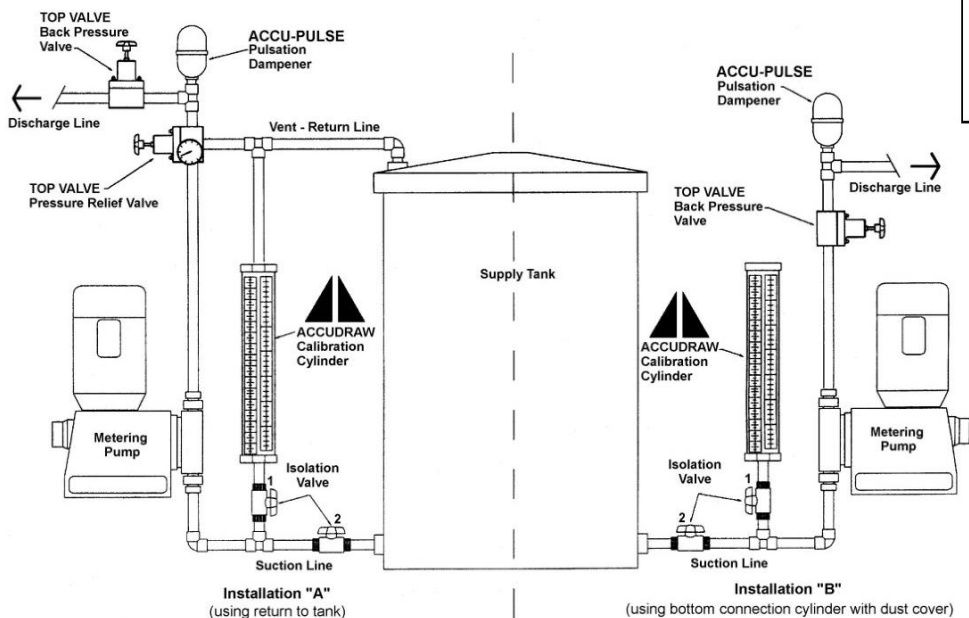
Caution: Never leave unattended when back filling the cylinder.

2. With the calibration cylinder full of the liquid to be dispensed, start the metering pump and operate at 100% output until all air is removed from both suction lines and pump head.
3. Shut pump "OFF".
4. With calibration cylinder full, close isolation Valve (#2) from supply tank, and open isolation valve (#1) below cylinder.
5. Start the pump.

If you wish to shorten the time of dispensing for calibration by one half (1/2) or one quarter (1/4), you must multiply the volume by the same number used to divide the time by to determine ml per minute or hour.

e.g. 100 ml in 60 seconds equals
50 ml X 2 in 30 seconds or
25 ml X 4 in 15 seconds

Typical Installations ("A" and "B")



Conversion Factors

1ml = 1 cc
1000 ml = 1 liter
ml/sec x 60 = ml/min
1 US gal/min x 0.063 = liters/sec
1 US gal = 3.786 liters

Caution:

Do not use as a Pressure Vessel



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Metering Pump Accessories Save \$\$\$\$

Prevent unsafe and inefficient systems by design.

ACCUDRAW Calibration Cylinders



PVC

Glass

Poly

- PVC, glass, polypropylene
- translucent, chemical resistant
- coloured graduations and lettering
- threaded or socket connections
- standard sizes 100 ml to 20,000 ml

Custom built in other sizes and materials.

TOP VALVE Back Pressure/Pressure Relief



- long life diaphragm
- range of 0 – 150 PSIG
- air release, optional gauge port
- PVC, CPVC, PVDF, PTFE, polypropylene, stainless, Alloy 20 and Hastelloy C
- 7 sizes 1/4" – 2" NPT
- colour coded handles indicate size

Designed to enhance the accuracy and safety of your metering pumps.

ACCU-PULSE

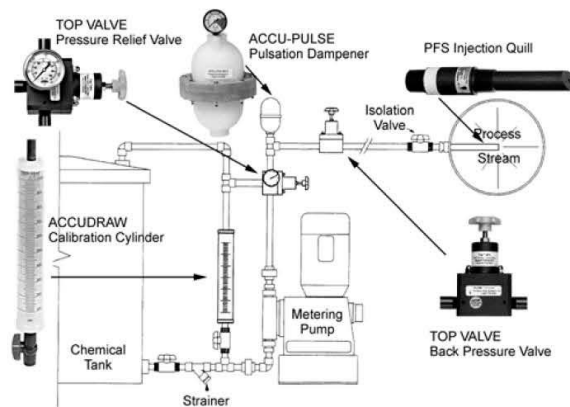
Pulsation Dampeners



Designed to remove pulsating flows from positive displacement pumps.

- increase system efficiency and pump life
- decrease maintenance and costs
- protect pipes, meters, valves and instrumentation from pulsation and vibration
- ensure meter accuracy, longevity and repeatability
- prevent foaming and splashing
- extensive range of materials and sizes
- lightweight, compact design

Typical Metering Pump System



AutoCad drawings available from our web site.

Visit www.primaryfluid.com

PFS Injection Quills



Designed to inject chemical into the center stream of process.

- provides for a more homogenous mix in the pipeline
 - built-in checks to prevent back siphoning
 - 2 sizes 6" and 8" length
 - 1/2" or 3/4" NPT, BSPT or Flg'd Conn.
 - PVC, CPVC, PVDF, polypropylene, Stainless, Hastelloy C & Titanium
 - pressure to 3000 PSIG
 - temperature to 260°C (500°F)
- Custom built in other sizes and materials.**

Accu-Vent



Designed to automatically vent gases and vapours.

- vents gases and vapors released from Sodium Hypochlorite, Sulfuric Acid & Hydrogen Peroxide
- CPVC (Corzan) and Viton corrosion resistant wetted materials of construction
- specially designed float material automatically vents built up gases on system start up and under working pressure
- standard 1/2" or 3/4" NPT threaded connections or optional socket weld
- available in other materials

PFS Corporation Stops



Designed to inject chemical into the center stream of process.

- isolation valve allows for ease of maintenance
 - available in 6 materials of construction
 - wetted components have comparable or greater chemical resistance than quill construction material
 - standard and custom lengths available
 - connection in NPT, metric or flanged
- Custom built in other sizes & materials.**



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Optimizing Metering Pump Application Accessories Save \$\$\$

By Dave Walker, General Manager, Primary Fluid Systems Inc.

During these times of economic constraint and increasingly stringent environmental and occupational health and safety regulations, it becomes imperative that applications requiring the dispensing and metering of expensive and hazardous chemicals be accomplished with the utmost accuracy, care and control.

For typical applications, when excess chemical is dispensed into the service, addition of another chemical is required to offset this action, resulting in increased expense. Conversely, if enough chemical is not dispensed into the process, the batch may be unsatisfactory for use and discarded and the processing repeated at further expense. Environmental and safety concerns are also important considerations.

The following is a general outline covering typical metering pump applications, and the accessory items that have been developed to help enhance the performance of your metering pump, for the optimum control of chemical being used.

Electronic & Motor Driven Metering Pumps

Whether diaphragm or piston style, these pumps generally incorporate check valves as the mechanical source to isolate the flow of the chemical, at each stroke of the diaphragm or piston. The response time of the check valve assemblies, enabling them to reseal at the end and beginning of each stroke is essential to the performance and continuous accuracy of the metering pump.

Back Pressure Control Valves

Many metering pump applications dispense to atmospheric conditions or into a process with less than 20 psig pressure and more typically, into a process with erratic system pressure. These applications require back pressure to ensure a constant pressure for the discharge check assembly on the metering pump to work properly.

It is crucial that a back pressure control valve such as **TOP VALVE** be installed in the discharge piping of the pump to ensure a constant pressure for the discharge check assembly to work under. This allows for the repeatability of a constant fluid discharge per stroke, and accuracy desired. **TOP VALVE** back pressure valves automatically provide *anti-siphon* protection and are available in a wide range of sizes and materials of construction.

Calibration of Metering Pumps

Typically, metering pumps are used without proper calibration. The manufacturer provides a performance curve detailing the general discharge capacities of the pump. These curves are normally derived under controlled conditions, using water as the testing fluid. Given the large variety of chemicals available, with varying viscosities and specific gravities, and the wide differences in suction conditions on the pump and discharge piping, it is only reasonable that each application needs to be calibrated individually. Calibration must be repeated from time to time due to wear and vibration in the system.

CLEARVIEW calibration cylinders are available in PVC, polypropylene and glass construction in standard sizes from 100 ml to 20000 ml. They provide an excellent way to periodically check the performance and accuracy of your metering pump.

Pulsation Dampeners

Pulsation is another typical problem with most metering pumps, and in some cases cannot be tolerated by the application. **ACCU-PULSE** pulsation dampeners are available in a variety of sizes and material for such situations and help remove a high degree of pulsing and surging in the line. They only work if installed properly, in the right order in the line, and with the right pressure bladder to offset the incoming pulsing. It is important that the directions supplied by the manufacturer regarding recommended set pressure and location of the dampener be adhered to.

Strainers

A strainer on the suction feed line is generally overlooked and can contribute to the proper operation, life, and accuracy of the components downstream.

Small bits of debris find their way into supply tanks and will foul the function

of the check assemblies, imbed themselves in the diaphragm or score the piston and cause premature failure of the pump. If the pump allows this debris further downstream, you may see failure of the back pressure valve or pulsation dampener or more typically, the injection valve will get fouled and fail.

The strainer should always be installed, periodically checked and cleaned. This will give a large pay back by ensuring the uninterrupted service and longer life of vital and more expensive components downstream.

Inline Pressure Relief Valves

When using motor driven pumps or solenoid pumps capable of higher pressures than your line is designed for (i.e 150 psig), an inline pressure relief valve such as **TOP VALVE** must be installed to protect the line from overpressure and possible splitting which could cause uncontrolled discharge of hazardous chemical into the area.

Always install the pressure relief valve in the line closest to the discharge of the pump and ensure that there are no isolation valves or components capable of closing the discharge line off prior to the relief valve.

TOP VALVE pressure relief valves are available in a wide range of materials and sizes with adjustable pressure settings.

Safe Line Maintenance

When installing a metering pump system, install as many unions in the line as possible to allow for ease of maintenance and repair of the various components used. This can easily be accomplished with the use of true union valves, which also serve the purpose of isolating valves.

When handling hazardous chemicals and indeed any chemicals, always remember to design your piping system with a way to drain off the chemical and vent any built up pressure before service begins. This will prevent most of the spillage and reduce potential hazard in the workplace. Tee off the discharge of the pump at the lowest point back to tank or install an inline pressure relief valve such as **TOP VALVE** that has the ability of venting back to the feed tank or calibration cylinder when set at "0" psig.

Foot Valves

When drawing from a chemical feed tank, using suction lift to the pump, always install a foot valve on the end of the suction line and ensure it is kept a minimum of 3 to 6 inches from the bottom of the supply tank. This will reduce the possibilities of picking up any solids from the feed tank that may foul your system. Try to keep the suction lift to a minimum and follow the instructions regarding suction lift supplied by the pump manufacturer.

Injection Valves

A check valve, normally spring loaded is used for the purpose of isolating your discharge chemical line from your process line. Most metering pump manufacturers supply a standard injection valve with their pump. This valve should be utilized and installed at the point of injection and have an isolation valve in close proximity. There are all types of injection valves available to accommodate the various requirements of injection needed, dependent on the process pipeline size and volume.

PFS Injection Quills ensure that the chemical is fully dispersed into the center of the process line and provide for a more homogenous mix in the pipeline. A built-in check helps prevent back siphoning.

Conclusion

Properly designed, installed, and maintained metering pump applications should provide dependable and accurate service with minimal downtime. In order to minimize maintenance and system problems, and optimize the efficient use of chemicals, a modest investment in the suggested accessories is recommended.

If you have any questions regarding application installation or applications that are a problem and/or continuous expense, please contact our office for some free and friendly consultation.

TERMS AND CONDITIONS

Minimum order for stocking distributors is \$300.00 net cost.

Minimum order for resale or OEM is \$100.00 net cost.

Special Terms are as follows:

Net 30 days from date of invoice

All outstanding invoices will have a 2% service charge applied from 60 days on and every 30 days thereafter. The account will also be put on hold, until payment, including service charge is received.

All shipments are based on F.O.B. our Plant. Delivery on standard valves is 2-3 days (dependent on size of order and availability of components from stock.) All taxes are extra.

Restocking charge is 20%.

All goods to be returned for warranty inspection will require a R.G.A. # that can be obtained from our office. Goods to be shipped prepaid to our plant. This includes goods being returned for restocking.

Prices subject to change without notice.

LIMITED WARRANTY

Primary Fluid Systems Inc. (Primary) warrants its products against defects in workmanship or materials for one (1) year under normal use. Three-(3) year available when application card is completed and returned to factory.

Primary's obligations and liabilities under this warranty shall be limited to replacement of the product, or a refund of an amount not to exceed the purchase price of the product(s) to which such warranty claim is made. Repairs or replacements are made subject to our inspection of the returned product(s). Primary's decision of one of these alternatives shall be the buyer's exclusive remedy.

This warranty does not extend to damage by corrosion or other decomposition by chemical action. Primary does not warrant damages caused by (a) improper use of the product, (b) unauthorized modification or attachment to product, (c) misuse, abuse, accident or negligent handling or installation of product, or (e) alterations or repairs made by purchaser.

The materials of construction offered are recommendations subject in all cases to acceptance by purchaser. These recommendations do not constitute guarantee against corrosion or decomposition but are based on previous experience and best available information of the industry.

Statements and instructions set forth herein are based on the best information and practices known to Primary, but it should not be assumed that every acceptable safety procedure is contained herein. Of necessity, Primary cannot guarantee that actions in accordance with such statements and instructions will result in the complete elimination of hazards and it assumes no liability for accidents that may occur.

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In no event will Primary be liable for indirect, special, incidental, economic, covert, or consequential damages arising out of the use or inability to use the product, including without limitation, damages or costs relating to the loss of profits, business and good will even if advised of the possibility of such damages. In no event shall Primary's liability exceed the amount paid by you for the product.

The warranty and remedies set forth herein are exclusive and in lieu of all others, oral or written, express or implied. No Primary dealer, distributor, agent, or employee is authorized to make any modification or addition to this warranty. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.