



Advantage Compact Stainless ACS Actuator



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Advantage[®] Compact Stainless

The Advantage[®] Compact Stainless ACS is the latest addition to the process proven Advantage Actuator product line. Designed as a maintenance-free actuator, it is engineered to handle the most demanding requirements of the bioprocessing and pharmaceutical industries. The stainless steel construction of the ACS is suited for severe duty applications, such as SIP and high-cycle applications. It has been subjected to extensive life-cycle testing that far exceeds industry requirements.

The compact size of the ACS provides the utmost in design flexibility. It allows for space-saving system designs, further minimizing holdup volumes that are critical to increasing efficiency and saving time and money. Engineering improvements in the ACS offer a cost-effective alternative for clean-room use, lab environments and other critical applications. With a stainless steel exterior, the ACS is perfect for clean-room applications requiring both aesthetics and washdown compatibility.

All of this makes the ACS a versatile, feature-packed, cost-effective option for the demanding biopharm and food & beverage industries.

Type:

Piston Actuator

Size Range:

Inch	0.25 ¹	0.375 ¹	0.50 ¹	0.50	0.75	1.00	1.50	2.00
DN	8	10	15	15	20	25	40	50

¹Bio-Pure size.

Operating Modes:

Fail Close, Fail Open, Double-Acting

Max Service Pressure:

10 bar (150 psig)

See sizing charts on pages 7-9 for exact shutoff pressures

Max Service Temperature:

150° C (300° F)

Max Autoclave Temperature:

134° C (273° F)

Max Actuator Chamber Pressure:

6.2 bar (90 psig)

Corrosion Resistance:

Resists alcohol, chloride and most caustic washdowns



ACS Features

Universal Accessory Mount

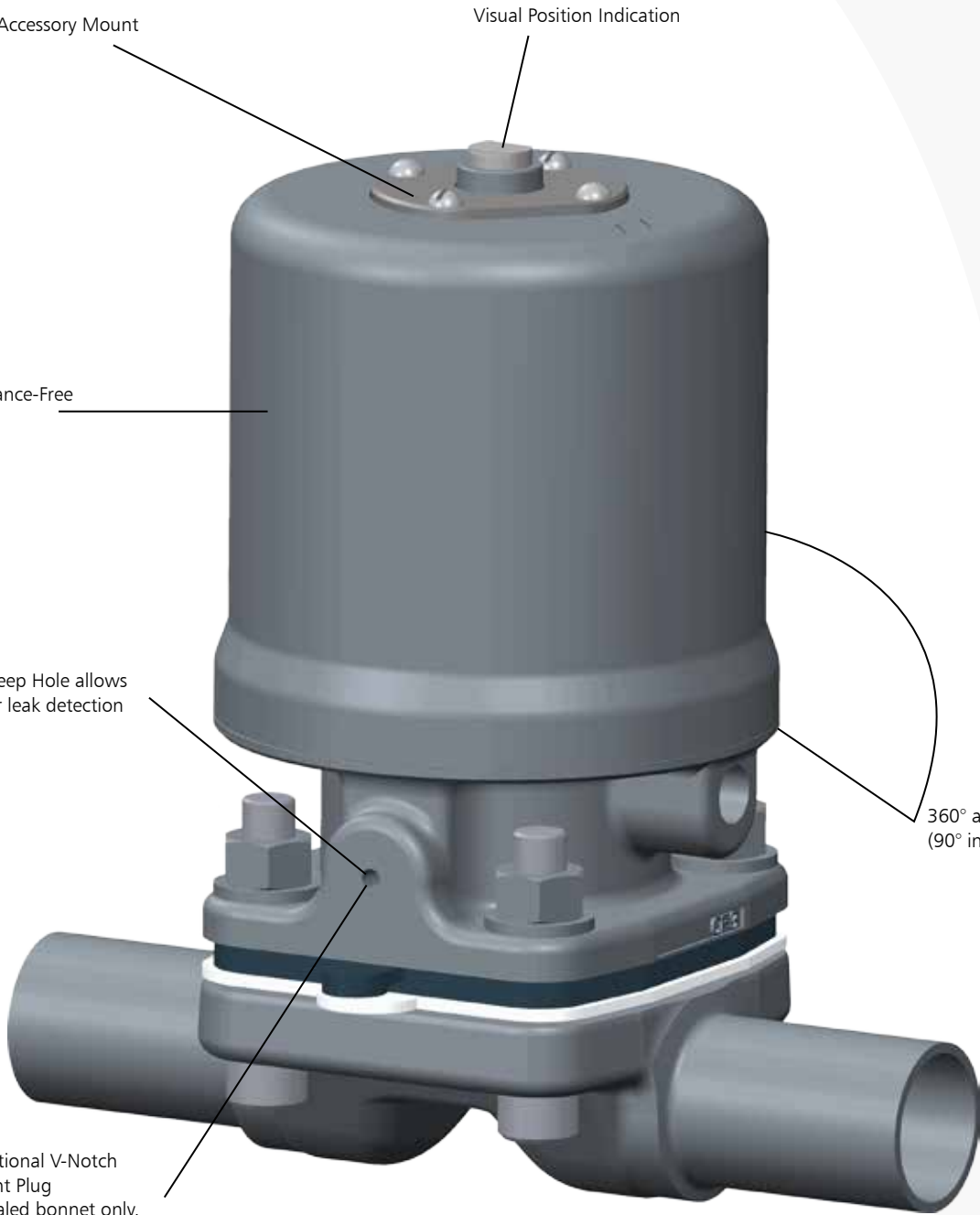
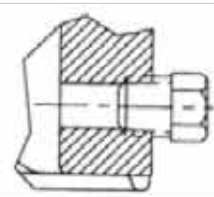
Visual Position Indication

Maintenance-Free Actuator

Weep Hole allows for leak detection

360° air port orientation
(90° increments)

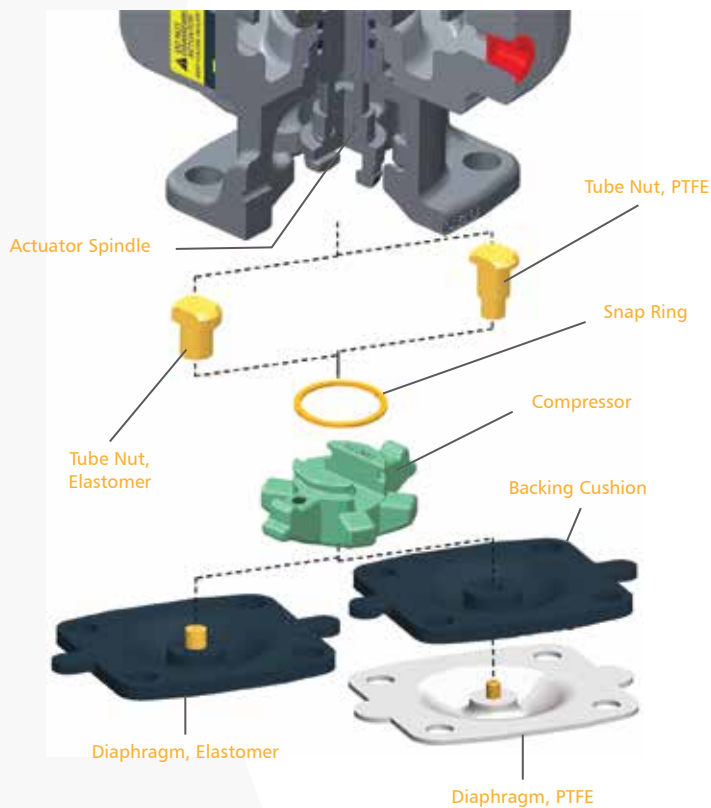
Optional V-Notch Vent Plug
(sealed bonnet only,
NPT thread not shown)



Compressor Design

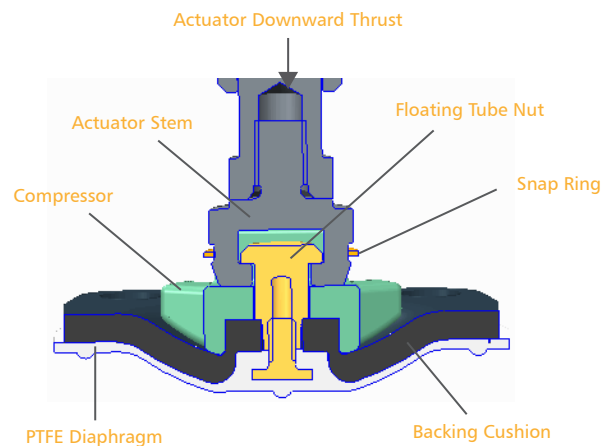
Diaphragms (0.5-2.0 in)

- Modular compressor design allows quick changeover between PTFE and elastomer diaphragms. Changeover kit makes quick diaphragm changes possible.
- Diaphragm changeover kit contains a compressor nut that receives either elastomer or PTFE diaphragm types. Kits for 0.5" (DN15) and 0.75" (DN20) include compressors for PTFE and elastomer diaphragms.
- No need to disassemble the actuator.
- Downward force is applied to compressor by the actuator stem and it bypasses the tube nut to eliminate point load. Compressor, in turn presses diaphragm over weir area of valve body. Compatible with all Pure-Flo diaphragm types.



Bio-Pure Diaphragm Installation (0.25-0.5 in)

Bio-Pure diaphragm installation is simplified by utilizing the bayonet diaphragm connection. The diaphragm is inserted into the compressor and turned 90°. The bayonet design provides float to eliminate point loading on PTFE diaphragms.



Automation and Control

The Advantage Compact Stainless actuator is complemented by all currently available Pure-Flo switch packages and positioners. This actuator accepts all ITT switch packages as well as third-party switch packages.¹

The Value Switch Package (VSP/VSP+) is shown mounted to a stainless steel actuator for reference.

¹SP2 not available for Bio-Pure sizes.

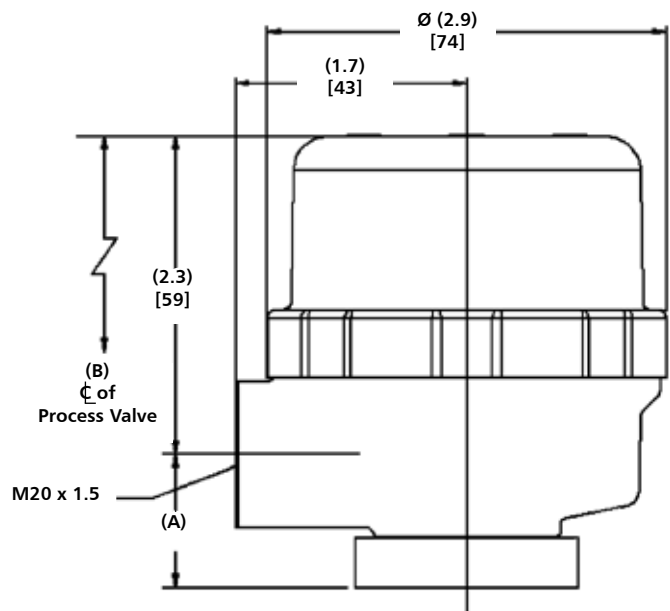
Note: Switch packages are not autoclavable.

VSP Switch Pack Mounting Dimensions

Valve Size		A		B	
Inch	DN	in	mm	in	mm
BP	BP	1.00	25,4	7.39	187,7
0.50	15	1.00	25,4	7.83	198,9
0.75	20	1.00	25,4	8.82	224,0
1.00	25	1.00	25,4	9.28	235,7
1.50	40	1.50	38,1	13.45	341,6
2.00	50	1.50	38,1	14.07	357,4



Actuator with VSP



VSP+



SP2

Identification

Identification

An identification label on actuator indicates:

- Serial number
- Valve size
- Model number
- Mode of operation
- Maximum actuator chamber pressure rating

Engineered Valves LLC

S/N XXXXXX-XXX-XXX

Size - Model #

Max Actuator 90 PSI (6.2 Bar)

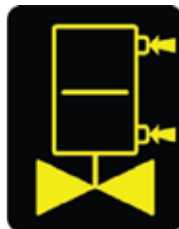
Separate label on actuator indicates the mode of operation:



Fail Close 90#



Fail Open



Double-Acting

Advantage[®] Compact Stainless

Approximate Maximum Chamber Volume

Valve Size		Fail Close		Fail Open		Double Acting		Double Acting	
		Lower Chamber		Upper Chamber		Lower Chamber		Upper Chamber	
Inch	DN	in ³	cm ³	in ³	cm ³	in ³	cm ³	in ³	cm ³
BP	BP	1.08	17,7	1.6	26,2	1.48	24,2	1.6	26,2
0.50	15	3.0	49,2	5.2	84,5	1.9	31,9	5.0	82,5
0.75	20	5.9	97,3	10.9	178,1	6.4	104,6	9.2	151,2
1.00	25	6.8	111,1	10.9	177,9	7.3	119,0	9.2	151,1
1.50	40	18.6	305,0	59.6	977,1	18.6	305,0	62.3	1020,9
2.00	50	22.0	361,3	59.6	977,1	23.4	384,3	62.1	1018,3

Valve Stroke

Valve Size	Approx. Stroke
BP	0.16"
BP	4,1 mm
0.50"	0.25"
DN 15	6,4 mm
0.75"	.38"
DN 20	9,7 mm
1.00"	0.5"
DN 25	12,7 mm
1.50"	0.81"
DN 40	20,6 mm
2.00"	1.12"
DN 50	28,4 mm

Actuator Weights (Including Actuator & Forged Body)

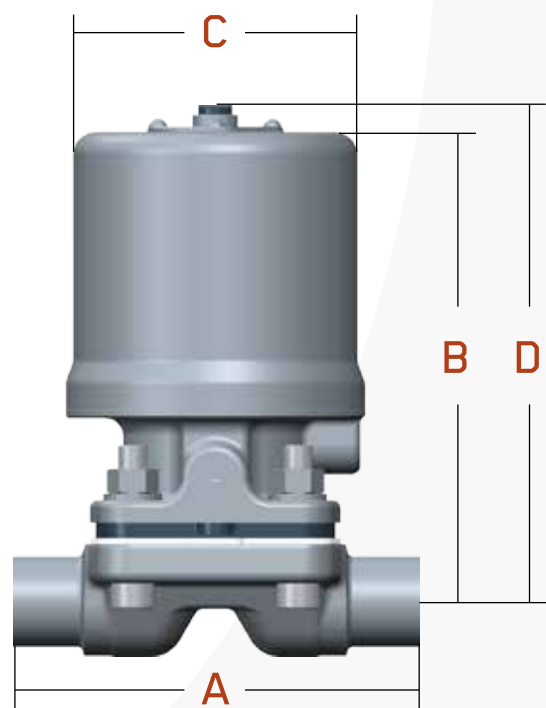
Valve Size		Fail Close		Fail Open		Double Acting	
Inch	DN	Lbs.	Kg	Lbs.	Kg	Lbs.	Kg
BP	BP	1.5	0,7	1.5	0,7	1.5	0,7
0.50	15	2.9	1,3	2.6	1,2	2.8	1,3
0.75	20	4.4	2,0	3.9	1,8	4.2	1,9
1.00	25	5.6	2,5	4.7	2,1	5.0	2,3
1.50	40	17.6	8,0	13.6	6,2	14.2	6,4
2.00	50	20.2	9,2	15.9	7,2	17.0	7,7

Actuator Weights (Less Body & Diaphragm)

Valve Size		Fail Close		Fail Open		Double Acting	
Inch	DN	Lbs.	Kg	Lbs.	Kg	Lbs.	Kg
BP	BP	1.2	0,55	1.2	0,55	1.2	0,55
0.50	15	2.4	1,1	2.1	1,0	2.3	1,0
0.75	20	3.5	1,6	3.0	1,4	3.3	1,5
1.00	25	4.0	1,8	3.1	1,4	3.4	1,5
1.50	40	14.3	6,5	10.3	4,6	10.9	4,9
2.00	50	14.8	6,7	10.5	4,8	11.6	5,3

Dimensional Data with Forged Body

Valve Size		A		B		C		D	
Inch	DN	in	mm	in	mm	in	mm	in	mm
BP	BP	3.5	89	3.55	90,2	1.75	44,5	3.9	99,1
0.50	15	5.12	130	4.24	107,7	2.62	66,5	4.49	114,0
0.75	20	5.5	140	5.18	131,6	3.12	79,2	5.56	141,2
1.00	25	5.88	149	5.44	138,2	3.12	79,2	5.94	150,9
1.50	40	7	178	9.05	229,9	4.62	117,3	9.86	250,4
2.00	50	7.62	194	9.47	240,5	4.62	117,3	10.59	269,0



Fail Close Actuator Sizing

Fail Close Actuators - Air-To-Open, Spring-To-Close (Reverse Acting)														
	Actuator and Spring Package	Maximum Line Pressure (psig)												Air pressure required to open for full stroke at 0 psi line pressure
		Valve Size												
		100% Δ P						0% Δ P						
		BP	.5"	.75"	1"	1.5"	2"	BP	.5"	.75"	1"	1.5"	2"	
Elastomer Diaphragm	ACS26 (60#)	150					125							58
	ACS2 (90#)	150					150							84
	ACS2 (90#)		150	150	150	150	150		150	120	130	130	75	90
PTFE Diaphragm	ACS26 (60#)	150					100							60
	ACS2 (90#)	150					150							84
	ACS2 (90#)		150	150	150	150	150		150	80	80	90	70	90

Fail Close Actuators - Air-To-Open, Spring-To-Close (Reverse Acting)														
	Actuator and Spring Package	Maximum Line Pressure (psig)												Air pressure required to open for full stroke at 0 psi line pressure
		Valve Size												
		100% Δ P						0% Δ P						
		BP	DN15	DN20	DN25	DN40	DN50	BP	DN15	DN20	DN25	DN40	DN50	
Elastomer Diaphragm	ACS26 (60#)	10,34					8,62							4,00
	ACS2 (90#)	10,34					10,34							5,79
	ACS2 (90#)		10,34	10,34	10,34	10,34	10,34		10,34	8,27	8,96	8,96	5,17	6,21
PTFE Diaphragm	ACS26 (60#)	10,34					6,89							4,14
	ACS2 (90#)	10,34					10,34							5,79
	ACS2 (90#)		10,34	10,34	10,34	10,34	10,34		10,34	5,52	5,52	6,21	4,83	6,21

Fail Open Actuator Sizing

Air Pressure Required to Close (psig)													
	Size	BP		.5"		.75"		1"		1.5"		2"	
	Actuator	ACS1		ACS1		ACS1		ACS1		ACS1		ACS1	
Elastomer Diaphragm	Line Pressure	% ΔP											
		100	0	100	0	100	0	100	0	100	0	100	0
	20	46	43	38	45	38	55	28	40	36	40	40	45
	40	49	48	40	50	42	60	32	45	38	44	45	50
	60	52	52	44	55	46	65	36	55	42	48	50	60
	80	54	57	48	60	50	70	40	60	44	52	56	70
	100	57	61	50	65	52	75	45	70	48	56	60	75
	125	60	67	54	70	60	85	50	75	50	60	64	80
	150	63	72	58	75	68	-	55	85	52	65	68	-
PTFE Diaphragm	20	72	61	46	66	55	55	50	55	45	52	48	50
	40	75	66	50	68	58	60	55	60	50	56	50	60
	60	77	70	52	72	60	65	60	65	55	60	56	70
	80	79	74	56	76	65	70	65	70	60	64	64	80
	100	81	78	60	82	68	75	70	80	64	68	70	90
	125	84	83	64	86	74	80	75	-	68	72	76	-
	150	86	88	68	-	80	85	80	-	72	76	82	-

Air Pressure Required to Close													
	Size	BP		DN15		DN20		DN25		DN40		DN50	
	Actuator	ACS1		ACS1		ACS1		ACS1		ACS1		ACS1	
Elastomer Diaphragm	Line Pressure	% ΔP											
		100	0	100	0	100	0	100	0	100	0	100	0
	1,38	3,17	2,96	2,62	3,10	2,62	3,79	1,93	2,76	2,48	2,76	2,76	3,10
	2,76	3,38	3,31	2,21	3,45	2,70	4,14	2,21	3,10	2,62	3,03	3,10	3,45
	4,14	3,59	3,59	3,03	3,79	3,17	4,48	2,48	3,79	2,90	3,31	3,45	4,14
	5,52	3,72	3,93	3,31	4,14	3,45	4,83	2,76	4,14	3,03	3,56	3,86	4,83
	6,89	3,93	4,21	3,45	4,48	3,59	5,17	3,10	4,83	3,31	3,86	4,14	5,17
	8,62	4,14	4,62	3,72	4,83	4,14	5,86	3,45	5,17	3,45	4,13	4,41	5,52
	10,34	4,34	4,96	4,00	5,17	4,70	-	3,79	5,86	3,59	4,48	4,69	-
PTFE Diaphragm	1,38	4,96	4,21	3,17	4,55	3,79	3,79	3,45	3,79	3,10	3,59	3,31	3,45
	2,76	5,17	4,55	3,45	4,70	4,00	4,14	3,79	4,14	3,45	3,86	3,45	4,14
	4,14	5,31	4,83	3,59	4,97	4,14	4,48	4,14	4,48	3,79	4,14	3,86	4,83
	5,52	5,45	5,10	3,86	5,24	4,48	4,83	4,48	4,83	4,14	4,41	4,41	5,52
	6,89	5,58	5,38	4,14	5,65	4,69	5,17	4,83	5,52	4,41	4,69	4,83	6,21
	8,62	5,79	5,72	4,41	5,93	5,10	5,52	5,17	-	4,69	4,97	5,24	-
	10,34	5,93	6,07	4,70	-	5,52	5,86	5,52	-	4,96	5,24	5,65	-

Double Acting Actuator Sizing

Air Pressure Required to Close (psig)													
	Size	BP		.5"		.75"		1"		1.5"		2"	
	Actuator	ACS3		ACS3		ACS3		ACS3		ACS3		ACS3	
Elastomer Diaphragm	Line Pressure	% ΔP											
		100	0	100	0	100	0	100	0	100	0	100	0
	20	21	15	24	30	18	25	12	20	16	20	22	40
	40	24	20	26	35	20	30	16	25	20	25	26	45
	60	27	24	28	40	24	35	20	35	24	30	30	50
	80	29	29	32	45	26	40	24	40	28	35	35	55
	100	32	33	34	50	30	50	28	50	32	40	40	60
	125	35	39	38	55	34	55	36	55	36	45	45	70
	150	38	44	42	60	38	60	44	65	40	50	50	80
PTFE Diaphragm	20	47	36	34	36	28	30	25	35	25	34	35	40
	40	50	41	36	40	34	35	35	40	30	38	40	50
	60	52	45	40	46	38	40	45	50	35	42	50	60
	80	54	49	42	50	40	45	50	55	40	46	55	70
	100	56	53	44	54	42	50	55	60	45	50	60	80
	125	59	58	46	58	44	55	60	70	50	55	64	90
	150	61	63	48	62	46	60	65	80	55	62	68	-

Air Pressure Required to Close													
	Size	BP		DN15		DN20		DN25		DN40		DN50	
	Actuator	ACS3		ACS3		ACS3		ACS3		ACS3		ACS3	
Elastomer Diaphragm	Line Pressure	% ΔP											
		100	0	100	0	100	0	100	0	100	0	100	0
	1,38	1,45	1,03	1,65	2,07	1,24	1,72	0,83	1,38	1,10	1,38	1,52	2,76
	2,76	1,65	1,38	1,79	2,41	1,38	2,07	1,10	1,72	1,38	1,72	1,79	3,10
	4,14	1,86	1,65	1,93	2,75	1,65	2,41	1,38	2,41	1,65	2,07	2,07	3,45
	5,52	2,00	2,00	2,21	3,10	1,79	2,76	1,65	2,76	1,93	2,41	2,41	3,79
	6,89	2,21	2,28	2,34	3,45	2,07	3,45	1,93	3,45	2,21	2,76	2,76	4,14
	8,62	2,41	2,69	2,62	3,79	2,34	3,79	2,48	3,79	2,48	3,10	3,10	4,83
	10,34	2,62	3,03	2,90	4,14	2,62	4,14	3,03	4,48	2,76	3,45	3,45	5,52
PTFE Diaphragm	1,38	3,24	2,48	2,34	2,48	1,93	2,07	1,72	2,41	1,72	2,34	2,41	2,76
	2,76	3,45	2,83	2,48	2,76	2,34	2,41	2,41	2,76	2,07	2,62	2,76	3,45
	4,14	3,59	3,10	2,76	3,17	2,62	2,76	3,10	3,45	2,41	2,90	3,45	4,14
	5,52	3,72	3,38	2,90	3,45	2,76	3,10	3,45	3,79	2,76	3,17	3,79	4,83
	6,89	3,86	3,65	3,03	3,72	2,90	3,45	3,79	4,14	3,10	3,45	4,14	5,52
	8,62	4,07	4,00	3,17	4,00	3,03	3,79	4,14	4,83	3,45	3,79	4,41	6,21
	10,34	4,21	4,34	3,31	4,28	3,17	4,14	4,48	5,52	3,79	4,28	4,69	-

How to Order

Actuated Bonnets

Code	Description
ACS1	Fail Open
ACS2	Fail Close With 90# Spring
ACS26	Fail Close With 60# Spring (Bio-Pure only)
ACS3	Double-Acting
ACS1S	Fail Open (Sealed Bonnet) ¹
ACS2S	Fail Close with 90# Spring (Sealed Bonnet) ¹
ACS3S	Double-Acting (Sealed Bonnet) ¹

Adjustable Opening Stop

AOS	Adjustable Opening Stop (internal)
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Note: See PFORD brochure for complete figure number definitions.
 1 Not available with Bio-Pure

Example With Valve

0.5" body with Tri-clamp ends 25 μ -in. ID, electropolish ID and OD, modified PTFE diaphragm with EPDM backing cushion, Advantage Compact Stainless actuator.

Figure Number: .5-F-419-6-0-3-TME-ACS2

Main Valve	Configuration Example	.5	F	419	6	0	3	TME	ACS2
	Valve Size	.5							
	Body Type		F						
	Body Ends			419					
	Mechanical Polish - Interior				6				
	Mechanical Polish - Exterior					0			
	Electropolish						3		
	Diaphragm							TME	
	Actuator								ACS2

Example without Valve

0.5" Advantage[®] Compact Stainless actuator with no valve and no diaphragm.

Figure Number: .5-N-PN-ACS2

Main Valve	Configuration Example	.5	N	PN	ACS2
	Valve Size	.5			
	Body Type		N		
	Diaphragm			PN	
	Actuator				ACS2

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Engineered Valves

33 Centerville Road
Lancaster, PA 17603
Tel: +1 (800) 787-3561
Tel: +1 (717) 509-2200
Fax: +1 (800) 239-9402

ITT Industries Ltd.
Weycroft Avenue, Millwey Rise Industrial Estate
Axminster, EX13 5HU
United Kingdom
Tel: +44 1297-639100
Fax: +44 1297-630476