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The Original Aseptic Seat Valve

ARC Aseptic Remote-Controlled Valve with PTFE Diaphragm

PD 65143 US5 2001-12

Application

ARC is an air-operated aseptic seat valve with PTFE diaphragm. It is available as a shut-off or divert valve. The valve is suited for aseptic operating conditions such as high sterilization temperatures. ARC is characterized by excellent cleanability.

Working principle

ARC is operated by means of compressed air and can be supplied with or without spring return. Sterile stem sealing towards the atmosphere is ensured by a special designed PTFE/rubber diaphragm unit. The PTFE diaphragm does not allow stem travel outside the product zone.

Standard design

ARC is based on the SRC valve design. It consists of actuator, valve bonnet, stem with diaphragm unit and valve bodies. The divert version is a two-body design. The valve is assembled by means of clamps and a stem clip system for easy maintenance.

Actuator function

- Pneumatic downward movement, spring return (NO)
- Pneumatic upward movement, spring return (NC)
- Pneumatic upward and downward movement (A/A)

Other valves in the same basic design

- Sanitary Remote-Controlled valve, type SRC
- Sanitary Long-Stroke valve, type SRC-LS
- Sanitary Manual valve, type SMO
- Aseptic Remote-Controlled Valve with steel bellows, type ARC-SB

Expected lifetime of diaphragm unit under normal conditions (no pressure shocks or cativation)

Size/Type	Shut-off valve activations	Divert valve activations
1½"	25,000	10,000
2"	25,000	10,000
2½"	25,000	5,000
3"	5,000	5,000
4"	5,000	5,000

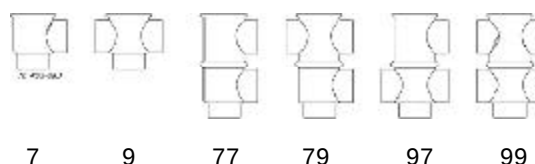
Note! Activating the valve without internal product pressure reduces lifetime of diaphragm unit.



Fig. 1. ARC with valve body combination 7

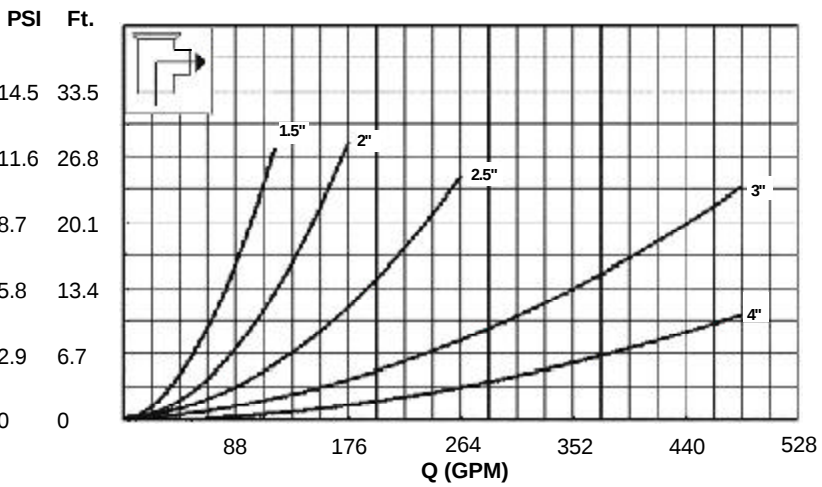
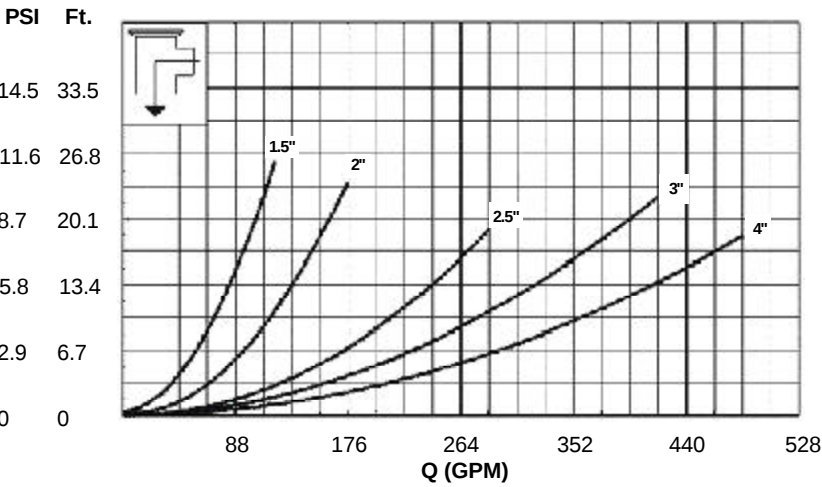
Fig. 2. ARC diaphragm stem seal

Valve body combinations

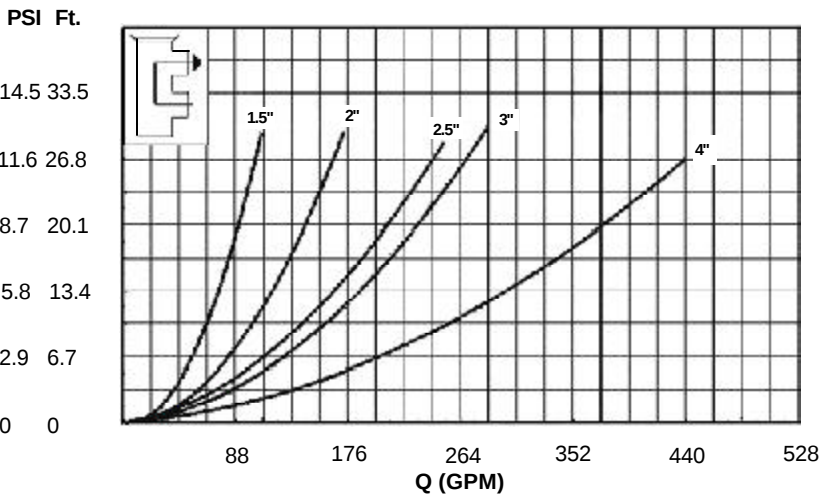


Pressure Drop/Capacity Diagrams

Shut-off Valve

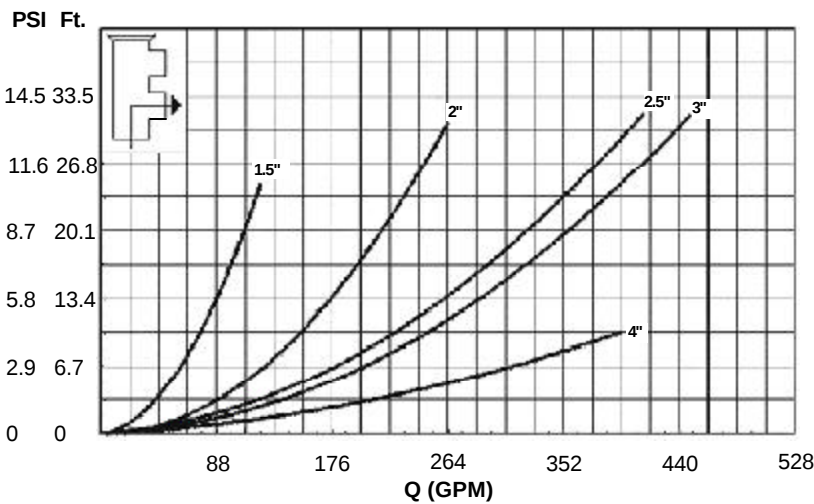
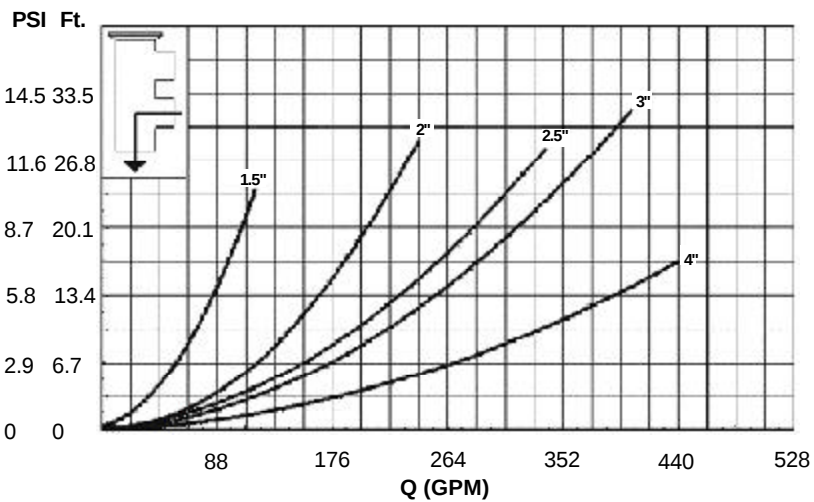
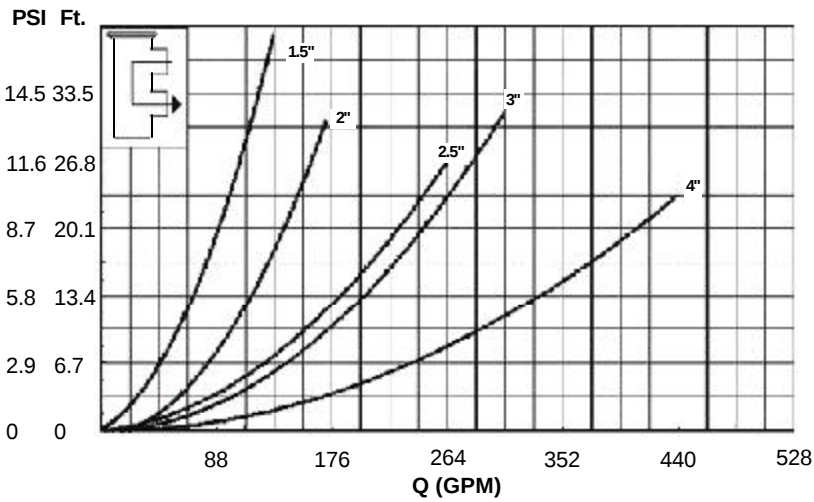


Divert Valve



Pressure Drop/Capacity Diagrams

Divert Valve (continued)

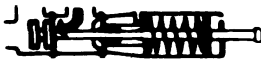
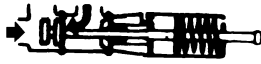
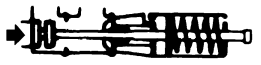


Pressure Data for ARC

Actuator Type/Function

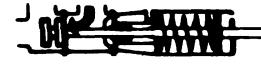
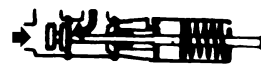
- 10 Air to lower, spring return (NO-lower seat)
- 20 Air to raise, spring return (NC-lower seat)
- 30 Air to raise and lower (A/A)
- 60 Three-positions (NO-lower seat)
- 70 Three-position (NC-lower seat)

Table 1: Standard valves - maximum static pressure in PSI without leakage, valve seat fully closed

Actuator / Valve body combination and direction of pressure	Air Pressure PSI	Actuator type/function	Valve Size				
			1.5-inch	2-inch	2.5-inch	3-inch	4-inch
 Spring to Open		10 (NO) 60 (NO)	145	145	145	145	116
 Air to Close	72 87	10 (NO) 60 (NO)	100 145	58 80	44 58	58 87	36 58
 Air to Open	72 87	20 (NC) 70 (NC)	145 145	145 145	145 145	145 145	87 138
 Spring to Close		20 (NC) 70 (NC)	100	58	36	72	50

➡ = actual product pressure

Table 2: Valves with reinforced spring or larger actuator - maximum static pressure in PSI without leakage, valve seat fully closed

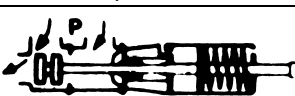
Actuator / Valve body combination and direction of pressure	Air Pressure PSI	Actuator type/function	Reinforced Spring					Larger Actuator		
			1.5-inch	2-inch	2.5-inch	3-inch	4-inch	1.5-inch	2-inch	2.5-inch
 Spring to Open		10 (NO) 60 (NO)	145	145	145	145	116	130	130	87
 Air to Close	72 87	10 (NO) 60 (NO)	29 29	0 29	0 14	0 14	0 14	145	123	87
 Air to Open	72 87	20 (NC) 70 (NC)	29 145	29 145	29 145	0 145	0 137	145	145	145
 Spring to Close		20 (NC)	130	79	50	101	65	145	130	87

➡ = actual product pressure

Pressure Data for ARC (continued)

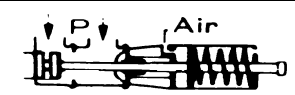
-  Maximum pressure in PSI for ARC standard valves.
-  Maximum pressure in PSI for ARC with reinforced spring.
-  Maximum pressure in PSI for ARC with larger actuator.

Table 3: The valve is in the closing phase. Approximate maximum pressure at which the valve plug can close by means of the spring or air pressure

Actuator / Valve body combination and direction of pressure	Actuator type/function	Valve Size				
		1.5-inch	2-inch	2.5-inch	3-inch	4-inch
 Spring to Close	20 (NC)	<u>45</u>  <u>70</u>	<u>58</u>  <u>97</u>	<u>69</u>  <u>100</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>
	70 (NC)	 <u>107</u>	 <u>122</u>	 <u>139</u>		
 Air to Close (87 PSI)	10 (NO)	<u>67</u>  <u>29</u>	<u>78</u>  <u>36</u>	<u>94</u>  <u>42</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>
	60 (NO)	 <u>123</u>	 <u>130</u>	 <u>136</u>		

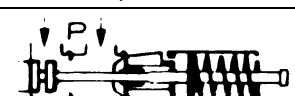
 = actual product pressure

Table 4: Standard valves - Approximate static pressure in PSI against which the valve plug can open by means of the spring or air pressure

Actuator / Valve body combination and direction of pressure	Actuator type/function	Valve Size				
		1.5-inch	2-inch	2.5-inch	3-inch	4-inch
 Spring to Open	10 (NO)	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>
	60 (NO)	 <u>145</u>	 <u>145</u>	 <u>145</u>		
 Air to Close (87 PSI)	10 (NO)	<u>138</u>  <u>109</u>	<u>80</u>  <u>109</u>	<u>65</u>  <u>80</u>	<u>145</u>  <u>145</u>	<u>138</u>  <u>145</u>
	60 (NO)	 <u>145</u>	 <u>145</u>	 <u>145</u>		
 Air to Open (87 PSI)	20 (NC)	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>137</u>  <u>145</u>
	70 (NC)	 <u>145</u>	 <u>145</u>	 <u>145</u>		
 Spring to Close	20 (NC)	<u>145</u>  <u>87</u>	<u>145</u>  <u>87</u>	<u>116</u>  <u>72</u>	<u>145</u>  <u>123</u>	<u>130</u>  <u>87</u>
	70 (NC)	 <u>145</u>	 <u>145</u>	 <u>145</u>		

 = actual product pressure

Table 5: The valve is closed - at these liquid pressures, the valve will open

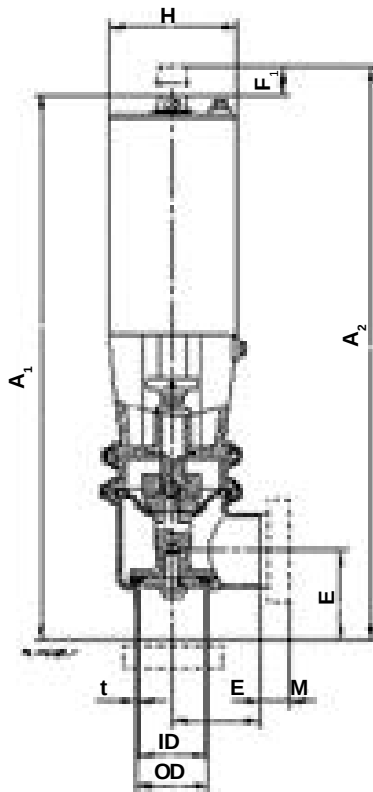
Actuator / Valve body combination and direction of pressure	Actuator type/function	Valve Size				
		1.5-inch	2-inch	2.5-inch	3-inch	4-inch
 Spring to Close	20 (NC)	<u>85</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>
	70 (NC)	 <u>145</u>	 <u>145</u>	 <u>145</u>		
 Air to Close (87 PSI)	10 (NO)	<u>116</u>  <u>50</u>	<u>145</u>  <u>123</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>	<u>145</u>  <u>145</u>
	60 (NO)	 <u>145</u>	 <u>145</u>	 <u>145</u>		

 = actual product pressure

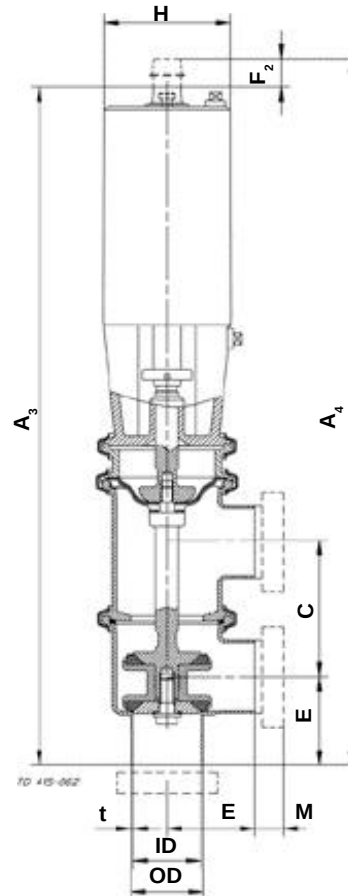
Dimensions (inches)

Size	1.5-inch	2-inch	2.5-inch	3-inch	4-inch
A ₁	14.60	15.00	16.34	18.98	21.81
A ₂	15.07	15.47	16.81	19.76	22.59
A ₃	17.40	18.70	20.71	24.06	27.72
A ₄	7.99	19.45	21.61	24.96	28.62
C	3.11	3.70	4.45	5.08	6.42
OD	1.50	2.00	2.50	3.00	4.00
ID	1.37	1.87	2.37	2.83	3.84
t	0.063	0.063	0.063	0.078	0.078
E	1.81	2.44	3.23	3.43	5.28
F ₁	0/47	0.47	0.47	0.78	0.78
F ₂	0.59	0.75	0.90	0.90	0.90
H	3.43	3.43	3.43	5.24	5.24
M/GC-Clamp	0.83	0.83	0.83	0.83	0.83
Weight (lbs.)					
Shut-off Valve	13.2	14.3	15.4	29.7	31.9
Divert Valve	14.3	15.4	16.5	37.4	38.5

Figure 3. Dimensions



a. Shut-off valve



b. Divert valve

Materials

Product wetted steel parts	Stainless steel AISI 316L
Other steel parts	Stainless steel AISI 304
Finish	Polished Ra 32 microinches
Product wetted seals	EPDM, PTFE
Other seals	NBR, EPDM

Technical data

Pressure range	0-116 psi (0-8 bar)
Temperature range	15°F to 285°F (EPDM)
Optimum process conditions	>7 psi (0.5 bar), >68°F
Max. sterilization temperature (steam - short time)	302°F/55 psi (3.8 bar)
Air pressure	72-116 psi (5-8 bar)

Note! Vacuum is not recommended in aseptic applications.

Options

Equipment

- Alternative connections (Tri-Clamp® is standard)
- Control & Indication
- Damper against water hammer
- Actuator with stronger spring
- Larger actuator for valve size 1½" - 2½"
- Two-step or three-position actuator
- Tangential side port valve

Ordering

Please state the following when ordering:

- Connections if not welding ends
- Size
- Valve body combination
- Actuator function, NO, NC or A/A
- Options

Materials grades

- Product wetted seals of Nitrile (NBR) or fluorinated rubber (FPM)

Tools

- Service tool for actuator



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