APPLICATION

The Series 2027A is specifically designed as a high pressure dump valve for separators and other process vessels. The body screws directly into the vessel connection. This places the valve trim within the body inside the vessel which allows warm process fluid present to retard freezing of the inner valve members.

SPECIFICATIONS

Valve	Description:	**Series 2027A 2-Way High Pressure Pneumatically Operated No-Freeze Dump**	
Body	Flow Configuration:	Angle Pattern	
	Material:	AISI 1213 Carbon Stl CF 3.00 Hex	
	End Connection:	1.00 inch Female NPT	
		2.00 Inch Male NPT Vessel	
	Pressure Rating:	1500 PSIG @ -20 to 100^0 F	
		3000 PSIG Available on Request	
		4000 PSIG Available in Series 2028	
Bonnet	Maximum Temperature:	180^0 F	
	Closure Type:	Hammer Nut Union	
	Material:	Bonnet-	AISI 1018 Carbon Steel
		Hammer Nut-	Forged Steel ASTM A105
Seals	Seat/Body:	Buna N o-ring	(Opt.)
		Viton o-ring	(Std.)
	Body/Bonnet:	Buna N o-ring	(Opt.)
		Viton o-ring	(Std.)
	Bonnet/Valve Stem:	TVE V-Ring-Spring Loaded	(Lower High Pressure)
		Buna N o-ring	(Opt.)(Upper-Actuator Pressure)
		Viton o-ring	(Std.)
Trim	Orifice Size:	0.125, 0.250, 0.375 & 0.500 inch	
	Flow Characteristic:	Quick Opening	
	Flow Direction:	Lower to Upper Port	(Under Seat)
	Max Shutoff:	1500 PSIG	
	Max Leak Rate:	Per ANSI B16.104 Class IV	
	Trim Material:	Seat-	AISI 440c Stainless Steel (Std.)
			Tungsten Carbide (Opt.)
		Plug-	AISI 440c Stainless Steel (Opt.)
			Tungsten Carbide (Std.)
Actuator	Type:	Non-Adjustable Springs & Diaphragm	(Opt.)
		Adjustable Spring & Diaphragm	(Std.)
	Mode:	Reverse Acting	(Normally Closed)
		Direct Acting	(Normally Open)
	Size:	35 Sq. Inch Effective Area	
	Range:	0-35 PSIG	
	Supply Connection:	Screwed - 0.25 - 18 NPT	
	Max. Pressure:	50 PSIG	
	Material:	Housings/Plate/Fastener/Springs::	Low Carbon Steel
		Spring Retainer:	Aluminum Alloy
		Washer Bearings:	Alloy Steel

ASSEMBLY PROCEDURE

NO-FREEZE VALVE

A. Sub Assembly of Packing Gland

1. Install a lubricated O-ring (Item#14) into the top (threaded end) of the packing gland (Item#11).
2. Install on O-ring (Item#30) over the threaded end of the packing gland and another O-ring (Item#17) into the O-ring groove on the opposite end of packing gland.
3. Install the guide bushing (Item#12) into open end of the packing gland.
4. Install the Teflon packing kit (Item #9) into the opening of the packing gland making sure the thick retaining ring (Item#9A1) goes in first. Next install the Teflon packing (Item#9A2) with the thick end first and then the thin retaining ring/washer (Item#9A3) followed by the packing spring (Item#8).
5. While holding the assembled packing gland in one hand, take the stem (Item#6) in the other hand and insert it into the small hole on the packing gland, short thread end stem first. Work the stem through the packing gland by rotating them until it comes out the other end. Make sure not to damage the O-ring (Item#14) in the end of the packing gland when doing this.
6. Install the Travel Stop (Item#5) over the end of the stem with the wide flat end first.
7. Thread two jam nuts (Item#19) on to the end of the stem, all the way to the end of the thread. (Do not Tighten at this time.)
8. Place the stem guide (Item#4) over the end of the stem followed by a lock washer (Item#18).
9. Thread the plug (Item#1) onto the stem approximately four threads deep.
10. Back down the jam nuts (Item#19) until they are tightened all the way down against the stem guide (Item#4).
11. Ensure the stem is all the way up by placing the plug on a bench and pushing down on the packing gland.

B. Sub Assembly of Top Housing

1. Place assembled packing gland into a vise with the plug facing down and the threaded end if the packing gland protruding above the vice.
2. Place a hammer nut (Item#10) over top of and onto the packing gland. Make sure that the flat surface below the threads of the packing gland is not obstructed. Adjust packing gland in vice if necessary.
3. Thread the lower housing (Item#20) onto the top of the packing gland and tighten.
4. Place the bearing washer (Item#23) onto the stem and then roll an O-ring (Item#29) over the threads of the stem and down onto the bearing washer.
5. Install the diaphragm (Item#21), the diaphragm plate (Item#24), the lower spring retainer (Item#25) followed by a lock washer (Item#33) and two regular hex nuts (Items#34).
6. Tighten down the hex nuts and place a spring (Item#26) over the lower spring retainer on the diaphragm plate. Place an upper spring retainer (Item #27) on the top of the spring.
7. Take the upper housing (Item#22) and place it over top of the spring onto the lower housing. The diaphragm should be sandwiched between the two housings. Align the holes of the two housings and the diaphragm making sure that the ¼ NPT holes on both housing line up.
8. Take 12 bolts (Item#31) and insert them into the holes on the housing. Tighten 12 nuts (Item#32) onto the 12 bolts using an air gun.
9. Install jam nut (Item#36) onto adjusting screw (Item#35) and install adjusting screw into the top of the top housing (Item#22). Do not tighten down adjusting screw.
10. Thread the indicator (Item#28) into the ¼" NPT hole in the top housing.
11. Remove the top housing sub-assembly from the vice.

C. Installation of Top Housing To Valve Body

1. Place Valve Body (Item#3) into a vice.
2. Take the seat (Item#2) and install lubricated O-rings (Item #13, #15&#16) in their appropriate grooves on the seat.
3. Press the cage (Item #7) onto the beveled side of the seat until the cage stops. The seat should be pressed in evenly (not crooked) and should be in the opening opposite the end with the side holes.
4. Gently lower the top housing sub-assembly into the valve body until it comes to rest. Be careful not to damage the seating surface of the plug or the seat. Orient the top housing so that the ¼" NPT holes in the housing are to the west of the 1" NPT hole in the body (assuming the 1" NPT hole is north).
5. Apply instrument air to the lower housing (no more than 50 psi) and push the packing gland all the way down into the body. Screw the hammer nut all the way down and hammer on hammer nut until the top housing subassembly is tight. This will seat the top housing into the body.
6. Remove the instrument air from the lower housing.

PREVENTIVE MAINTENANCE

Valve Body:

- Under normal conditions the body should last years. However, harsh process conditions such as corrosive or erosive fluids, or high-pressure drops, can greatly reduce valve life. Inspect body whenever actuator is removed.

Valve Seat & Plug:

- Check every six (6) months if in normal service (i.e. no sand or abrasives and a low pressure drop). If in severe service such as high pressure drop or abrasive fluid, check every 60 days.

Stem Packing:

- Under normal conditions, check packing yearly. However, frequent valve cycling will require the packing to be replaced more often.

Actuator:

- Check diaphragm yearly. Replacement of o-rings will depend on frequency of valve cycling; check at least once per year.

General Inspection:

Whenever performing maintenance, always inspect the general condition of all exposed parts for signs of damage, wear and corrosion.

MAXIMUM DIFFERENTIAL PRESSURES - REVERSE ACTUATORS

NOTES:

1. Maximum differential pressure = P1 - P2 where P2 = 0 psig.
2. Maximum differential pressure cannot exceed maximum body pressure rating.

		ADJUSTABLE ACTUATORS	**NON-ADJUSTABLE ACTUATORS**			
		9AA 1 ADJ. SPRING	9BA2 2 LIGHT SPRINGS	9BB2 2 HEAVY SPRINGS	9BA4 4 LIGHT SPRINGS	9BB4 4 HEAVY SPRINGS
ORIFICE SIZE (INCHES)	FLOW DIRECTION	30 PSIG SUPPLY	20 PSIG SUPPLY	35 PSIG SUPPLY	20 PSIG SUPPLY	35 PSIG SUPPLY
0.250 & 0.375	UNDER SEAT	3000 PSI	400 PSI	900 PSI	1100 PSI	2400 PSI
	OVER SEAT	3000 PSI	3000 PSI	3000 PSI	3000 PSI	3000 PSI
0.500	UNDER SEAT	1800 PSI	250 PSI	580 PSI	700 PSI	1300 PSI
	OVER SEAT	3000 PSI	3000 PSI	3000 PSI	3000 PSI	3000 PSI

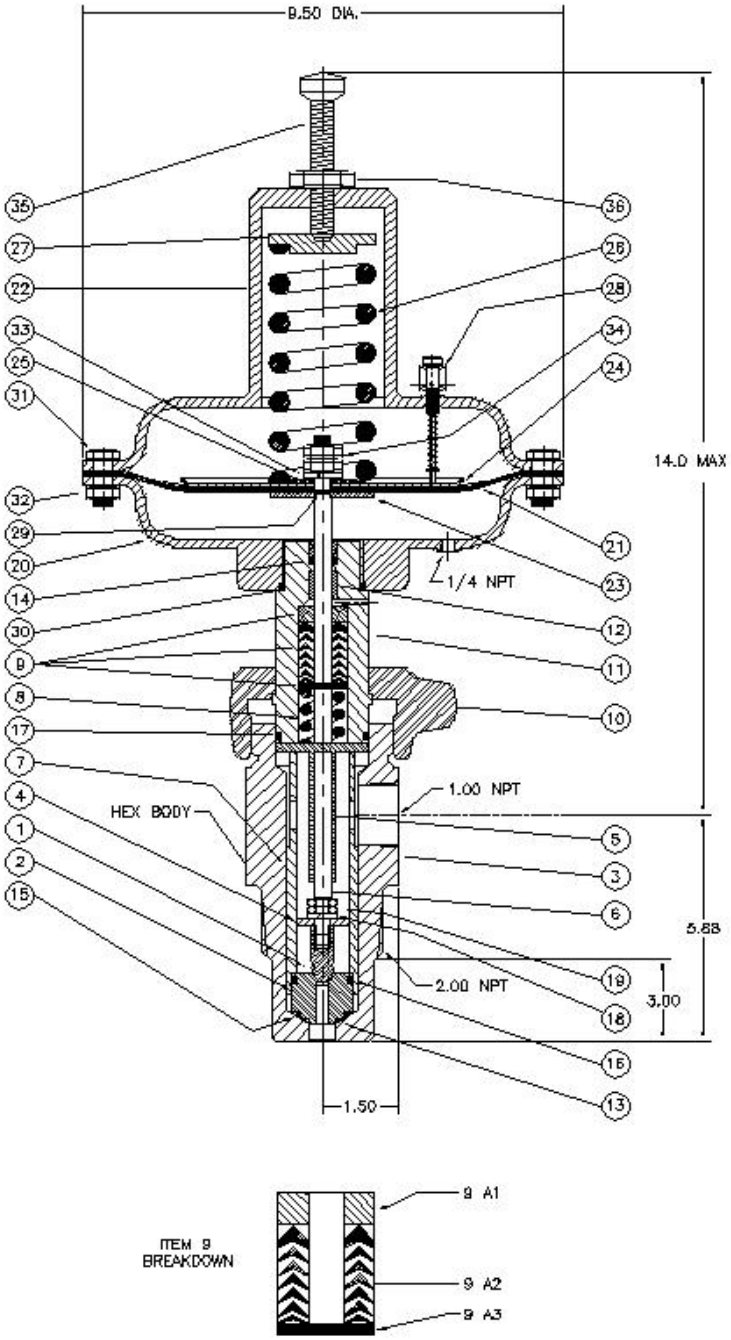
* Numbers shown in above table over 1500 PSI are for 3000 PSI W.P. Body only

TROUBLE DIAGNOSIS

SYMPTOMS	*PROBLEM*	*CORRECTIVE PROCEDURE*
Valve leaks in the closed position.	Obstruction between seat and plug or seat and plug are worn.	Vent process pressure from valve. Apply supply air to actuator raising plug from seat. Loosen hammer nut and remove actuator and trim assembly from body. Inspect. If trim is worn, restore by lapping with a suitable compound or replace.
Valve leaks - Flow under plug and normally closed valve. Plug and seat are in good condition.	Pressure drop too great for actuator.	NON-ADJUSTABLE ACTUATOR - Check table following for maximum allowable pressure drop for the particular actuator spring combination. ADJUSTABLE ACTUATOR - Check table following for maximum allowable pressure drop. If pressure drop is within the maximum allowable, decrease spring compression with adjusting screw on top of valve.
Valve will not open - Flow over plug and normally closed valve.	Pressure drop too great for actuator.	NON-ADJUSTABLE ACTUATOR - Check table following for maximum allowable pressure drop for the particular actuator spring combination. ADJUSTABLE ACTUATOR - Check table following for maximum allowable pressure drop. If pressure drop is within the maximum allowable, decrease spring compression with adjusting screw on top of valve.
Diaphragm housing leaks air from breather plug.	Worn out diaphragm or hex nuts securing diaphragm plates have loosened.	Vent actuator supply pressure, release spring compression with adjusting screw and remove upper diaphragm housing. Inspect. Replace diaphragm or tighten hex nuts as required.
Actuator supply air leaks from packing plug weep hole.	Inner valve stem o-ring is worn.	Vent process pressure from valve. Apply supply air to actuator raising plug from seat. Loosen hammer nut and remove actuator and trim assembly from body. Vent supply air from actuator. Remove upper diaphragm housing, disassemble and remove valve stem from packing plug. Inspect o-ring. Remove and replace as required.
Process fluid leaks from packing plug weep hole.	Valve stem packing is worn.	Follow procedure for stem o-ring replacement above. After stem removal, remove all packing components (washer, spring, and retainer) and stem packing. Inspect packing by fitting packing v-rings onto valve stem. Replace packing if rings slide freely on stem.

EFFECTIVE OCT. 03, 2001
REVISION: D

No 9 Reverse Actuator



ITEM NO.	COMM. CODE	MATERIAL	VALVE PART DESCRIPTION	QTY
1	490202A118 490202A102	316 SST/CARB 316 SST/CARB	PLUG VALVE O.O.1/4 X 3/8 PLUG VALVE O.O. 1/2	1
2	490202A103 490202A119 490202A113	316 SST 316 SST 316 SST	SEAT VALVE .25 SEAT VALVE .38 SEAT VALVE .50	1
3	490202A122	C1040 CSTL	BODY SCREWED NPT 1.00 X 2.00	1
4	490202A105	304 SST	GUIDE STEM	1
5	490202A100	1015 MT	STOP TRAVEL	1
6	490202A116	303 SST	STEM VALVE	1
7	490202A104	1015 MT	CAGE VALVE	1
8	490222A109	INCONEL	SPRING PACKING	1
A	490222A165		KIT PACKING SST INC.	1
*9 A1	490222A113	316 SST	RETAINER UPPER	1
*9 A2	490222A112	TEFLON	PACKING	1
A3	490222A180	316 SST	RETAINER LOWER	1
10	490222A110	1040 CSTL	NUT HAMMER	1
11	490222A114	A696	BONNET	1
12	490222A164	TEFLON	BUSHING GUIDE	1
*13	490222E212	VITON	O-RING SEAT LOWER	1
*14	490222A132	VITON	O-RING STEM VALVE	1
*15	490101A153	VITON	O-RING SEAT MIDDLE	1
*16	490202A115	VITON	O-RING SEAT UPPER	1
*17	490222A130	VITON	O-RING PLUG PACKING	1
18	490222A119	CSTL	WASHER LOCK 0.38	1
19	490222A118	Gr. 5	NUT HEX JAM 3/8-24	2
	NO. 9 ACTUATOR		ACTUATOR PARTS DESCRIPTION	
20	490222A145	CSTL	HOUSING DIAPHRAGM LOWER	1
*21	490222A126	NEO/NYLON	DIAPHRAGM ACTUATOR (VITON OPT)	1
22	490222A163	CSTL	HOUSING DIAPHRAGM UPPER REV.	1
23	490202A121	CSTL	WASHER BEARING	1
24	490202A120	CSTL	PLATE DIAPHRAGM	1
25	490222A179	CSTL	RETAINER SPRING LOWER	1
26	490222A117	CSTL	SPRING ACTUATOR 3-15	1
27	490222A122	CSTL	RETAINER SPRING UPPER	1
28	490222A123	316 SST	INDICATOR/VENT TRAVEL	1
*29	490101A152	VITON	O-RING DIAPHRAGM	1
*30	490222A131	VITON	O-RING HOUSING	1
31	490222A183	Gr. 5	SCREW CAP HEX 3/8-16 X 1.00"	12
32	490222A182	Gr. 5	NUT HEX REG. 3/8-16	12
33	490202A126	CSTL	WASHER LOCK 0.31	1
34	490202A124	Gr. 5	NUT HEX REG. 5/16-24	2
35	490222A185	Gr. 5	SCREW ADJUSTING 1/2-13 X 3.00	1
36	490222A184	Gr. 5	NUT HEX JAM 1/2-13	1

* Recommended Spare Parts

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