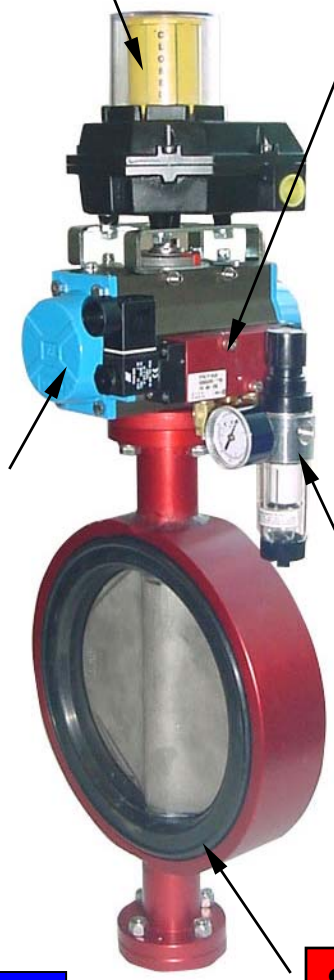
STJ-Z-4216 Zenon Cyclic Valve

SECTION C – LIMIT SWITCH

SECTION D – SOLENOID



SECTION B - ACTUATOR

SECTION E – FILTER/REG

SECTION F – REPAIR INSTRUCTIONS

SECTION A - VALVE

Operating, Maintenance and Installation Instructions

A

Valve Section

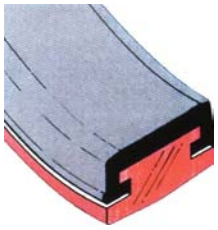
STJ-Z Zenon Cyclic Valve

Warranty on the performance and operation of all actuators and valves with an SO tracking system. The unique patented design offers external packing and seal replacement eliminating valve removal from the piping system. This design was formulated specifically for aeration/high cycle applications minimizing valve and actuator wear typically experienced in traditional designs.

Valve

External Roller Bearings: All valves incorporate external, recessed, sealed and lubricated roller bearings. This unique design provides full shaft support and eliminates frictional torque in the shaft journal. In addition, valve shafts do not contact the valve body journal, eliminating potential shaft to journal seizure that exists in typical butterfly valve designs when the media is exposed to shaft journals.

Valve Seats: All seats are high temperature Food Grade NSF Approved. These peroxide cured seats are designed to operate under sustained high temperature at 250°F for high cycle applications. Our standard seat and unique formula eliminates post curing and durometer instability. **Independent seat testing has successfully surpassed 3 million cycles on more aggressive applications**.



Discs: All discs are designed for maximum sealing capacities while minimizing seat wear based on the floating disc design and engineered tolerances between the disc and sealing surface.

Actuation: This hard-anodized rack and pinion actuator is covered by international insurance for customer safety. Dual external travel stops provide valve adjustment for the entire travel of the valve for the full open or closed position. The travel stops are never pressurized at anytime. Viton dynamic 'O' rings are standard for high cycle applications. Unique pinion design incorporates a flat key to prevent pinion blow-out (anti-blow out system). Low friction is obtained by means of self-lubricating piston guides on the full piston diameter and piston radius. The benefit is balanced internal forces with constant output torque of the actuator. In addition, low friction, self-lubricating guides are incorporated in the upper and lower pinion for extended high cycle applications. All hardware is 316 Stainless Steel and all actuators are lubricated for life. Actuator housings incorporate Namur mounting for limit switches and solenoids as standard.

+Maximum pressure is 120 PSIG with temperature ranges from -20ºC to 150ºC with the Viton seals as standard. Successfully tested at full load to 1,000,000 cycles. **Guaranteed for minimum 3 million cycles under load**.

Limit Switches - Rhodium TTL: The choice for reliable low power 24 VDC switching applications. Rhodium contacts have 80% less contact resistance than Tungsten TTL. Rated to 1A - 24VDC. **MTBF 1,000,000 cycles**.

Solenoid Coils: **Lifetime warranty**, with non-stick tapered Tee seals mechanically locked. Tested to 20 million cycles. Nitrile Seals.

Bi-directional tapered lip flexes to clean spool

STJ-Z Zenon Cyclic Valve

ZENON AERATION VALVES

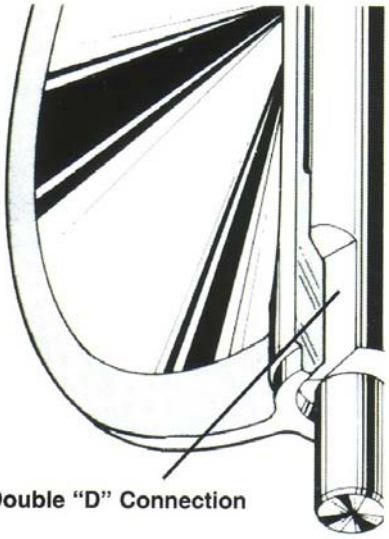
WATER TREATMENT AND SEWAGE TREATMENT APPLICATIONS

BLOWER INLET AND OUTLET

SUPERIOR PERFORMANCE ADVANTAGES

IT'S IN THE "SEAT"

SPECIFY PEROXIDE CURED SEATS

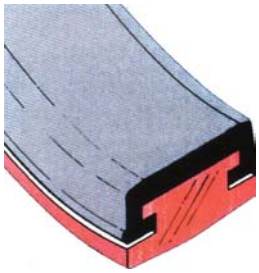


Double "D" Connection

• Extended temperature range (-40 to 250 F)

• Peroxide cured seats prevent post curing eliminating seat hardening, brittleness and high torque preventing premature valve replacement. Seat life is extended 3 times longer on blower inlet, outlet and entire aeration systems based on elastomer formulas.

• Reduced pressure ratings from full Vacuum to 50 psig with undercut discs, decreasing torques and increasing cycle life.



• The disc is spherically machined, hand polished for bubble-tight shut off, minimum torque, and extended seat life in dry air service. Specially machined discs are designed to reduced torque and prevent seat wear. The Double "D" internal disc & stem connection eliminates typical exposed disc to shaft connections from the media. This design has eliminated disc screws and taper pins, which cause leak paths, corrosion, and control failures.

• Body meets ANSI 125/150 (or BS 1OD&E, DIN 10, and JIS 10) drillings. Mechanically retained stem in the body is standard. Valve Shaft and body is isolated from the line media.

• Tongue-and-groove seat design and molded seat face o-ring is suitable for Weld-neck, Slip-on, and Vanstone flanges for full Automation Pressure or Vacuum applications without de-rating the valve.

STJ-Z Zenon Cyclic Valve

Quality
Established Century old product lines, proven design

STJZ High Cyclic Damper Valve

Service
Over 75 years of combined experience

Superior Performance and Design

The STJ Damper Valve is specially designed for high-speed, high cycle applications. The patented live loaded dual internal shaft seal feature and dual external roller bearings are contained in the valve body. This proven shaft and bearing design eliminates typical journal corrosion and internal bearings failure. This unique design eliminates valve removal, disruption to the operating system and costly maintenance. The dual thrust-bearing feature allows for installation of the valve and actuator in any orientation and the valve is fully bi-directional.

Models:

Model# STJ-W0***4***-4216-3-6-3-***063***-DA-R Aluminum (Anodized)

Model number includes complete assembly valve, Anodized aluminum actuator, 4-way NEMA 4, 120/60/1 Solenoid Valve and FSYB-5T20 Limit Switch Box containing proximity switches. All solenoid valves are fail open on electrical failure.

4	Depicts valve size and changes with valve size required
063	Indicates actuator size

Pressure Rating: Bubble Tight

- All valves are suitable for 15 PSIG bi-directional shut-off in the fully closed position.

Temperature Rating:

	Configuation	***Minimum***	***Maximum***	***Class***	***Body***
Disc	(Metal) 316SS	-40ºF	250ºF	B.T.	Wafer
Seat	EDPM				

Engineering Data:

- Wafer Construction
- Flange Drilling to suit ***ANSI/AWWA/B5/ODEE/DIN/JIS***
- High capacity flow construction P, fully closed 15 PSIG
- Thru Shaft design
- Bi-directional shut-off
- Dual thrust bearing
- Fixed Disc/Stem assembly internal drive
- Solid bodies and discs
- Low torque for smaller actuator sizing
- Direct mount actuation ISO 5211
- Face to face ISO 5752 (MSS-SP-67)(API)
- Replaceable bearing without removing the valve from service
- Full penetration welds
- Made in Canada
- External removeable bearings
- Corrosion proof shaft journal construction
- Patented packing design

Materials Of Construction:

Component	***Standard***	***Options***
Body	(wafer) Aluminum	Anodized / Epoxy Coated / Flanged
Disc	316SS	Bronze / Ductile Iron
Shaft	316SS	17-4PH / Hastalloy
Seat	EPDM	Viton / BUNA-N
Packing (Adjustable)	Dual Chevron / Delrin	
Internal Bearings	Mini-Roller (removable)	Permanent Grease Packed

STJ-Z Zenon Cyclic Valve

Quality
Established Century old product lines, proven design

STJZ High Cyclic Damper Valve

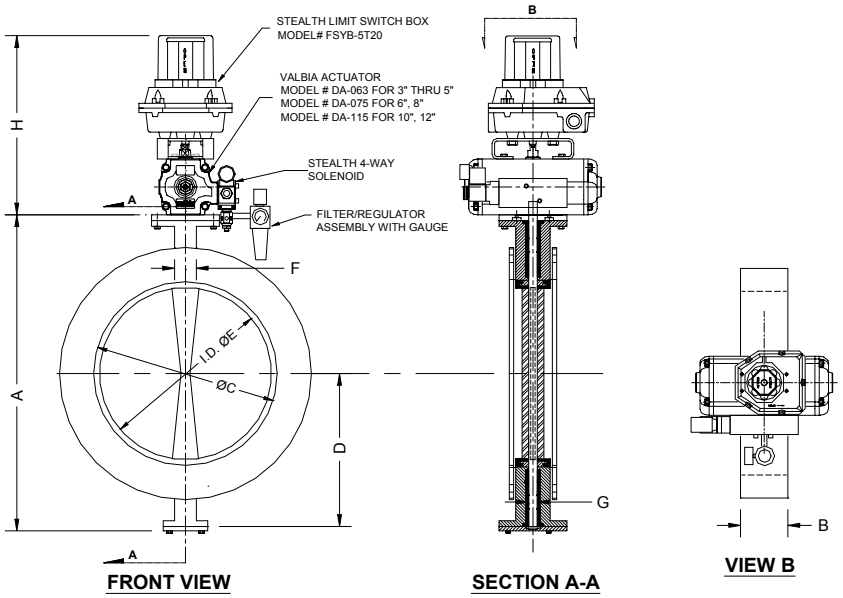
Service
Over 75 years of combined experience

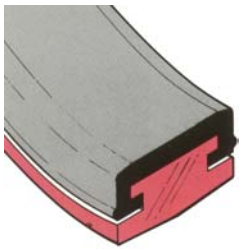
Valve Dimensions 3"- 24" (75mm - 600mm)

SIZE		A	B	C	D	E	F	G	H	BC	No. of Holes	Hole Dia.
mm	Inches											
75	3"	11.5	1.75	3.00	5.75	2.75	2.00	0.75	10.50	2.76	4.0	0.38
100	4"	12.5	2.00	4.02	6.25	3.77	2.00	0.75	10.50	2.76	4.0	0.38
125	5"	13.5	2.12	5.04	6.75	4.79	2.00	0.75	10.50	2.76	4.0	0.38
150	6"	14.5	2.12	6.06	7.25	5.81	2.00	0.75	10.50	2.76	4.0	0.38
200	8"	17.0	2.50	7.98	8.50	7.75	2.00	0.75	10.50	2.76	4.0	0.38
250	10"	21.5	2.50	10.02	10.75	9.75	2.37	1.25	11.50	4.02	4.0	0.38
300	12"	24.5	3.00	12.00	12.25	11.75	2.37	1.25	11.50	4.02	4.0	0.38
350	14"	26.5	3.00	13.25	13.25	13.25	2.37	1.25	11.50	4.02	4.0	0.56
400	16"	29.0	4.00	15.25	14.50	15.25	2.37	1.25	11.50	4.02	4.0	0.56
450	16"	30.5	4.25	17.25	15.25	17.25	2.50	1.50	11.50	4.02	4.0	0.56
500	20"	33.0	5.00	19.25	16.50	19.25	2.50	1.50	11.50	4.02	4.0	0.56
600	24"	37.5	5.94	23.25	18.75	23.25	2.75	1.62	11.50	4.02	4.0	0.56

Notes:

1. Valves to suit ANSI 150# Flanges
2. Face to face dimensions to API- interchangeable with high performance butterfly valves conforming to this standard
3. All valves are clockwise to close
4. All solenoids are energize to close full open
5. Product code numbers includes all components shown





Resilient Seat, Tongue and Groove Design
EPDM is Standard Material

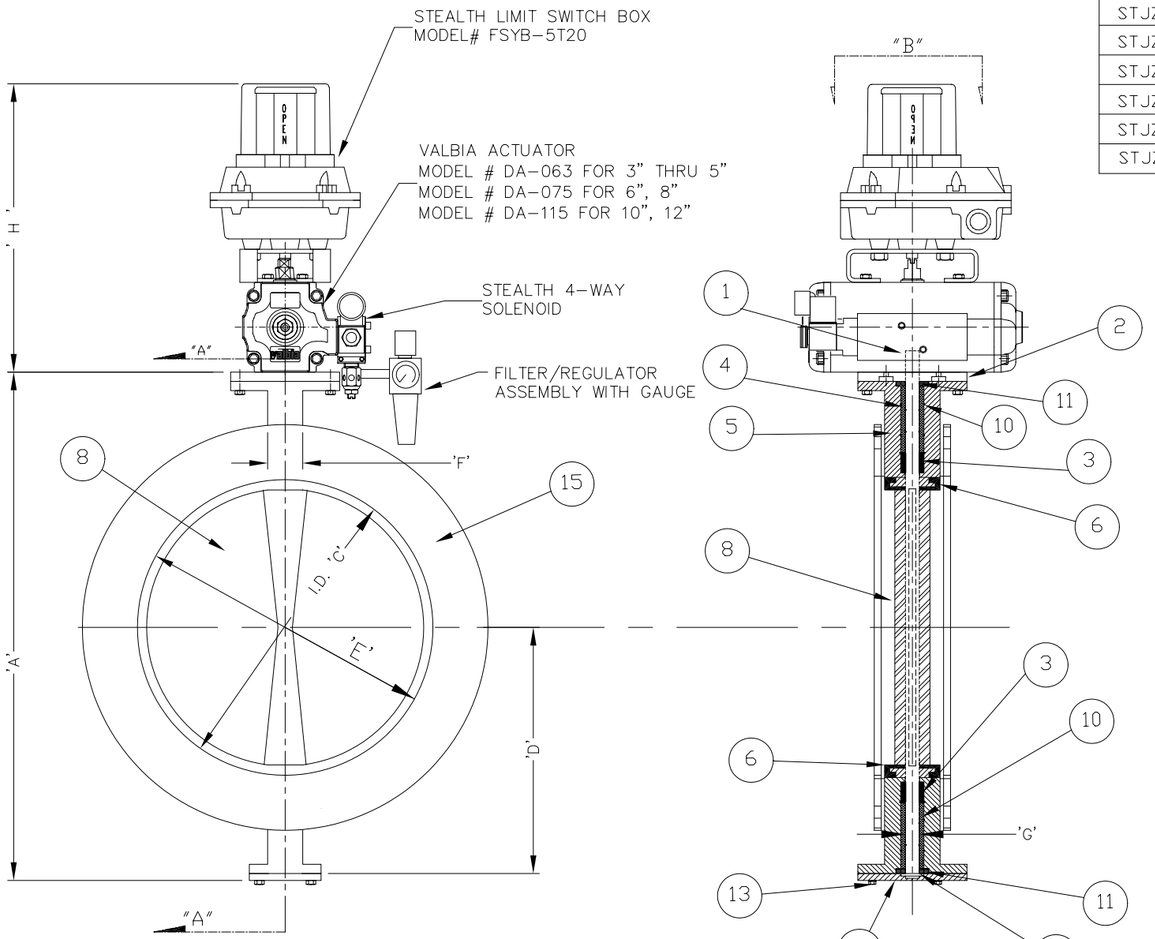
Cv Value - Valve Sizing co-efficient:

SIZE		Disc Position (Degrees)								
mm	Inches	90°	80°	70°	60°	50°	40°	30°	20°	10°
75	3"	461	364	267	154	96	61	35	15	1.76
100	4"	841	701	496	274	171	109	62	27	3.13
125	5"	1376	1146	775	428	268	170	98	43	5
150	6"	1850	1542	1025	567	354	225	129	56	6
200	8"	3316	2842	1862	1081	680	421	241	102	12
250	10"	5430	4525	2948	1710	1076	667	382	162	19
300	12"	8077	6731	4393	2563	1594	1005	555	235	27
350	14"	10538	8874	5939	3384	2149	1320	756	299	34
400	16"	13966	11761	7867	4483	2847	1749	1001	397	45
450	16"	17214	14496	10065	5736	3643	2237	1281	507	58
500	20"	22339	18812	12535	7144	4536	2786	1595	632	72
600	24"	32693	27718	17981	10421	6618	4064	2327	922	211

PRODUCT CODE	SIZE		DIMENSIONS A	B	C	D	E	F	G	H	J	TOP PLATE BC	Holes	Dia.
STJZ-W03-4216-3-6-3-063-DA-R	75mm	3"	11.5	1.75	3.00	5.75	2.75	2	0.75	0.25	9.85	2.76	4	0.38
STJZ-W04-4216-3-6-3-063-DA-R	100mm	4"	12.5	2.00	4.02	6.25	3.77	2	0.75	0.25	9.85	2.76	4	0.38
STJZ-W05-4216-3-6-3-063-DA-R	125mm	5"	13.5	2.12	5.04	6.75	4.79	2	0.75	0.38	9.85	2.76	4	0.38
STJZ-W06-4216-3-6-3-075-DA-R	150mm	6"	14.5	2.12	6.06	7.25	5.81	2	0.75	0.38	9.85	2.76	4	0.38
STJZ-W08-4216-3-6-3-075-DA-R	200mm	8"	17.0	2.50	7.98	8.50	7.75	2	0.75	0.38	9.85	2.76	4	0.38
STJZ-W10-4216-3-6-3-115-DA-R	250mm	10"	21.5	2.50	10.02	10.75	9.75	2.37	1.25	0.38	12.64	4.02	4	0.38
STJZ-W12-4216-3-6-3-115-DA-R	300mm	12"	24.5	3.00	12.00	12.25	11.75	2.37	1.25	0.38	12.64	4.02	4	0.38

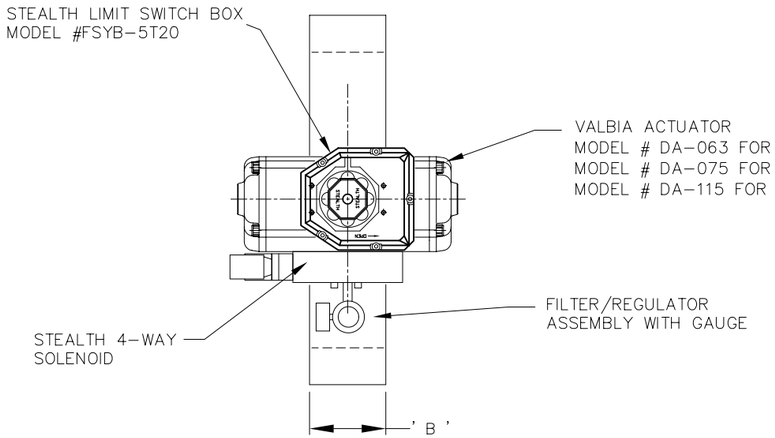
NOTES

1. VALVES TO SUIT ANSI 150 FLANGES
2. FACE TO FACE DIMENSIONS TO API-609 INTERCHANGEABLE WITH HIGH PERFORMANCE BUTTERFLY VALVES CONFORMING TO THIS STANDARD.
3. ALL VALVES ARE CLOCKWISE TO CLOSE.
4. ALL SOLENOIDS ARE ENERGIZE TO CLOSE FAIL OPEN
5. PRODUCT CODE NUMBER INCLUDES ALL COMPONENTS SHOWN



DO NOT COPY / PROPRIETARY INFORMATION TO ZENON

SECTION "A-A"



VIEW "B"

△P: 10 PSIG

TABLE 1 BELOW SHOWS DIFFERENCES BETWEEN ORIGINAL SS VERSION

TABLE 1	
SIZE	B DIMENSION DIFFERENCE
3"	− 0.28
4"	− 0.03
5"	− 0.11
6"	− 0.11
8"	0.10
10"	− 0.25
12"	− 0.08

ITEM No.	NAME	QTY	MATERIAL	REMARKS
1	SHAFT	1	316SS	
2	MOUNTING PLATE	1	ALUMINUM	
3	PACKING	1	CHEVRON	
4	BUSHING	1	DELRIN	
5	HUB	2	ALUMINUM	
6	SEAT	1	EPDM	
7	.	1	.	
8	DISC	1	316SS	
9	.	1	.	
10	BUSHING	1	DELRIN	
11	ROLLER BEARING	1	PRE-LUBRICATED	
12	HUB COVER	1	ALUMINUM	
13	MOUNTING BOLTS	1	316SS	
14	RETAINING CLIP	1	316SS	
15	BODY	1	ALUMINUM	

No.	DATE	ERN
6		
5		
4		
3		
2		
1	,	,
RFP		

REVISIONS

DRAWN BY DAN D.
DATE 9/29/03
CHECKED BY Bruce James
DATE -
APPROVED BY Bruce James
DATE -

TOLERANCES (Except as Noted)
DECIMAL ±.005
FRACTIONAL ±.015
ANGULAR ±1/2°
FINISH 125 AARH
FILLETS & RADII .031
BREAK SHARP EDGES

STEALTH INTERNATIONAL INC
www.stealthvalve.com

ZENON CYCLIC DAMPER VALVE
ALUMINUM WAFER STYLE

CUSTOMER .
PO#: .
SO#: .
DO NOT SCALE
SCALE N.T.S
DRAWING No. STJZ-W-4216-3-6-3-R
REV 0

STJ-Z-4216 Zenon Cyclic Valve

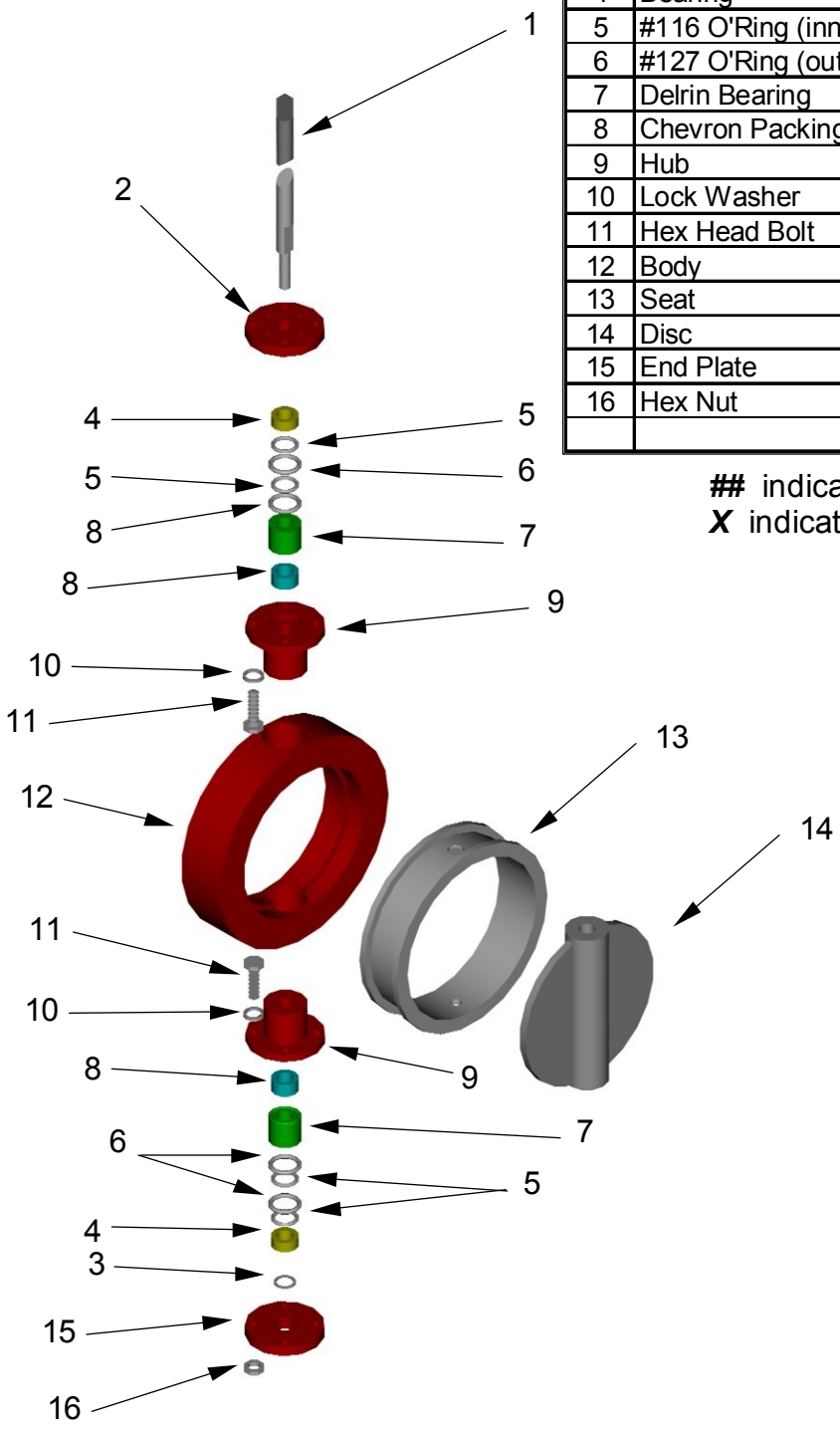
Valve Parts Break Down

BACK

NO.	Part Name	Material	QTY	Part Number
1	Shaft	Stainless Steel	1	STJZ-SH001-**##**-SS
2	Actuator Mtg Plate	Aluminum	1	STJZ-AP002-**##**-AL
3	C-Clip	Stainless Steel	1	STJZ-CC003-**##**-SS
4	Bearing	Stainless Steel	2	STJZ-BE004-**##**-SS
5	#116 O'Ring (inner)	Buna-N	4	STJZ-OR005-**##**-BU
6	#127 O'Ring (outer)	Buna-N	4	STJZ-OR006-**##**-BU
7	Delrin Bearing	Delrin	2	STJZ-DB007-**##**-DE
8	Chevron Packing		2	STJZ-CP008-**##**-
9	Hub	Aluminum	2	STJZ-HU009-**##**-AL
10	Lock Washer	Stainless Steel	8	STJZ-LW010-**##**-SS
11	Hex Head Bolt	Stainless Steel	8	STJZ-HB011-**##**-SS
12	Body	Aluminum	1	STJZ-B***X***012-**##**-AL
13	Seat	EPDM	1	STJZ-SE013-**##**-EP
14	Disc	Stainless Steel	1	STJZ-DI014-**##**-SS
15	End Plate	Aluminum	1	STJZ-EP015-**##**-AL
16	Hex Nut	Stainless Steel	4	STJZ-HN016-**##**-SS

indicates Valve size: i.e. 3” Valve = 03

X indicates Wafer or Lug Style Valve: i.e. **W** = Wafer
F = Flanged



B

Actuator Section

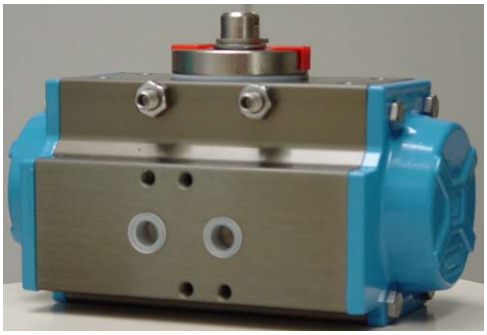
Pneumatic Rotary Actuators DA/SR

VALBIA ISO 9001 CERTIFIED

FEATURES

Twin Rack and Pinion Design
- Constant Torque Output
- Compact Design
- Balanced Internal Forces
- Robust Design For Long Life

Extruded Aluminum Body
- Hard Coat Anodized
- Smooth Surface Finish for Minimum Friction
- Optional Epoxy Coated or Nickel Plated
- End Caps are Die Cast Aluminum Polyester Coated



Nickel Plated Pinion
- Blowout Proof
- Optional in Stainless Steel

Die Cast Aluminum Pistons
- Constant Torque Output
- Optional Nickel Plating

Piston Guides in PTFE / Graphite
- Large Contact Area
- Self-Lubricating, Long Life

Spring Return Model SR
- Zinc Phosphate Steel Springs
- High Resistance and Reliable
- Long S.S. Bolts for safe End cap Removal

External Travel Stops
- Open or Closed Positions

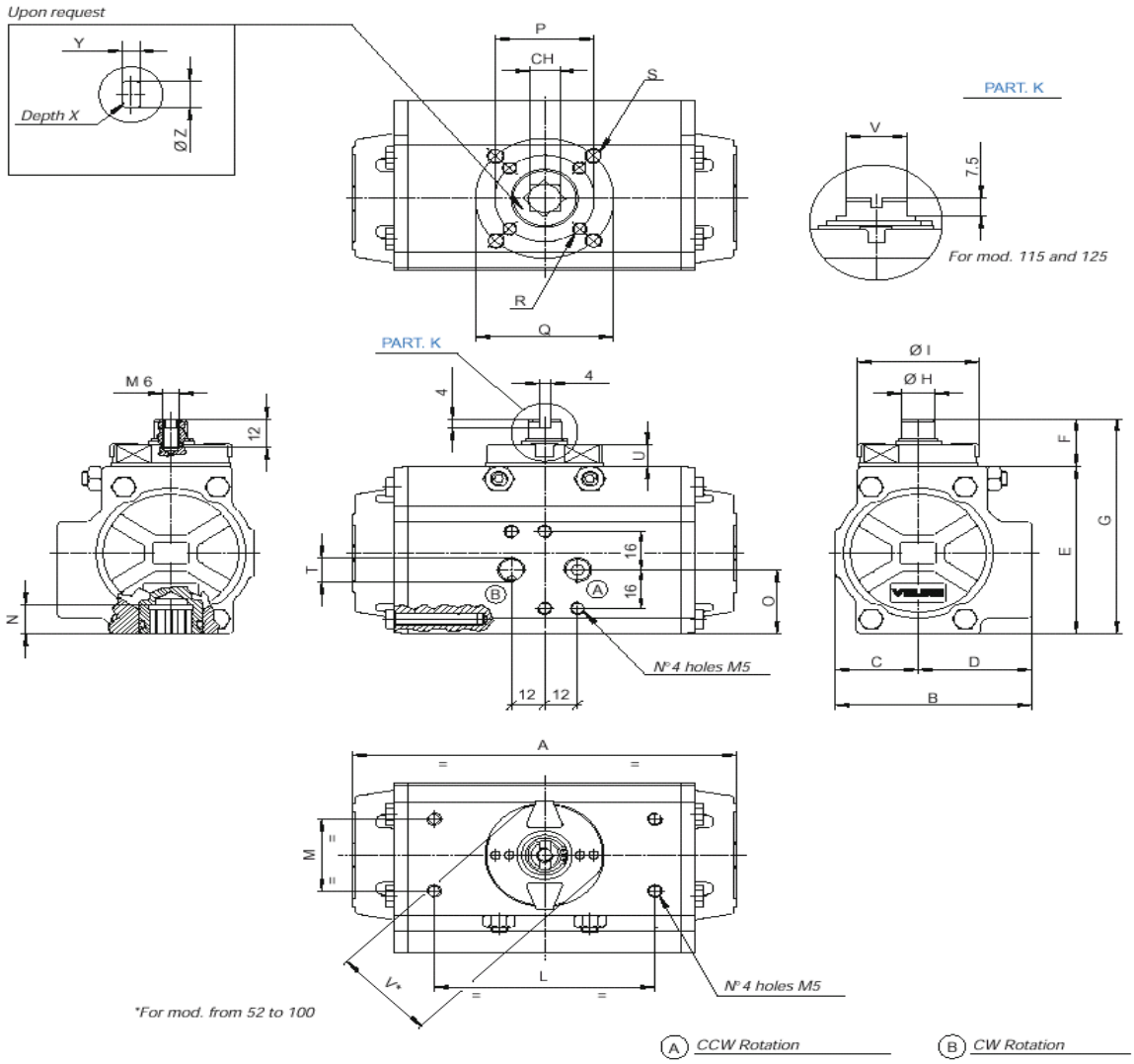
Maximum Working Pressure and Temperature
- 150 psi for models 32 to 200
- 115 psi for Model 270
- Clean dry filtered air is required
- -20°C to +85°C with NBR Standard Seals
- -20°C to +150°C with Optional Viton Seals

Interfaces to ISO 5211, DIN 3337, and Namur Specifications
- Direct Mount to Ball or Butterfly Valves
- Namur Drilling for Solenoid and Positioner Mounting

Pneumatic Rotary Actuators

DA/SR

DIMENSIONS MODEL 52-125



MOD	ISO 5211		CH	A	B	C	D	E	F	G	OH	OI	L	M	N	O	P	Q	R	S	T ISO 7/1	U	V	OZ	Y	X
52	F03** - F05	IN	0.43	5.49	2.80	1.18	1.61	2.74	0.79	3.52	0.47	1.73	3.15	1.18	0.47	1.04	1.42	1.97	10-24 UNC 28x0.29	1/4-20 UNC 28x0.35	1/8"	0.31	1.50	0.56	0.43	0.47
		MM	11	139.5	71	30	41	69.5	20	89.5	12	44	80	30	12	26.5	36	50	M5X7.5	M6X9	1/8"	8	38	14.1	11	12
63	F05 - F07	IN	0.55	6.38	3.17	1.40	1.77	3.17	0.79	3.96	0.58	1.97	3.15	1.18	0.63	1.08	1.97	2.76	1/4-20 UNC 28x0.31	5/16-18 UNC 28x0.47	1/8"	0.31	1.61	0.71	0.55	0.63
		MM	14	162	80.5	35.5	45	80.5	20	100.5	14.8	50	80	30	16	27.5	50	70	M6X8	M8X12	1/8"	8	41	18.1	14	16
75	F05 - F07	IN	0.67	8.15	3.72	1.65	2.07	3.82	0.79	4.61	0.71	2.48	3.15	1.18	0.75	1.38	1.97	2.76	1/4-20 UNC 28x0.31	5/16-18 UNC 28x0.47	1/8"	0.35	1.97	0.87	0.67	0.75
		MM	17	207	94.5	42	52.5	97	20	117	18	63	80	30	19	35	50	70	M6X8	M8X12	1/8"	9	50	22.2	17	19
85	F05 - F07	IN	0.67	9.35	4.17	1.87	2.30	4.27	0.79	5.06	0.79	2.48	3.15	1.18	0.75	1.65	1.97	2.76	1/4-20 UNC 28x0.31	5/16-18 UNC 28x0.47	1/8"	0.35	1.97	0.87	0.67	1.18
		MM	17	237.5	106	47.5	58.5	108.5	20	128.5	20	63	80	30	19	42	50	70	M6X8	M8X12	1/8"	9	50	22.2	17	30
100	F07 - F10	IN	0.67	10.69	4.84	2.17	2.68	4.78	0.79	5.57	0.79	2.48	3.15	1.18	0.81	1.97	2.76	4.02	5/16-18 UNC 28x0.31	3/8-18 UNC 28x0.55	1/4"	0.35	1.97	0.87	0.67	1.18
		MM	17	271.5	123	55	68	121.5	20	141.5	20	63	80	30	20.5	50	70	102	M8X8	M10X14	1/4"	9	50	22.2	17	30
115	F07 - F10	IN	0.87	12.91	5.39	2.52	2.87	5.57	1.18	6.75	1.26	3.39	5.12	1.18	0.94	1.97	2.76	4.02	5/16-18 UNC 28x0.47	3/8-18 UNC 28x0.59	1/4"	0.57	0.87	1.11	0.87	1.54
		MM	22	328	137	64	73	141.5	30	171.5	32	86	130	30	24	50	70	102	M8X12	M10X15	1/4"	14.5	22	28.2	22	39
125	F07 - F10	IN	0.87	14.41	5.83	2.68	3.15	6.04	1.18	7.22	1.26	3.39	5.12	1.18	0.94	2.40	2.76	4.02	5/16-18 UNC 28x0.47	3/8-18 UNC 28x0.59	1/4"	0.57	0.87	1.11	0.87	1.54
		MM	22	366	148	68	80	153.5	30	183.5	32	86	130	30	24	61	70	102	M8X12	M10X15	1/4"	14.5	22	28.2	22	39

** Upon request F04

Pneumatic Rotary Actuators

DA/SR

TORQUE CHART SPRING RETURN

				AIR SUPPLY psi.															
MODEL	SET	SPRING TORQUE POUNDS/INCH		40		50		60		70		80		90		100		115	
		TORQUE OUTPUT SPRING RETURN ACTUATORS POUNDS / INCH																	
		0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0	0^0	90^0
		MMD	MMC	MAD	MAC	MAD	MAC	MAD	MAC	MAD	MAC	MAD	MAC	MAD	MAC	MAD	MAC	MAD	MAC
SR52	1	38	64	51	23	73	45	101	75										
	2	48	81			61	23	90	56	115	84								
	3	51	87					87	51	113	79	135	100	157	121				
	4	62	104					76	33	103	62	124	83	146	103	172	131		
	5	75	127							90	41	111	60	132	80	159	109	194	144
SR63	1	66	116	95	40	134	77	182	131										
	2	78	136			122	57	171	113	218	163								
	3	94	164					156	81	203	134	241	169	279	205				
	4	105	184					145	63	193	117	230	151	268	187	315	237		
	5	132	232							167	71	203	103	241	137	289	190	349	250
SR75	1	116	212	174	66	243	131	330	230										
	2	135	249			222	90	311	192	394	283								
	3	164	300					283	139	367	233	436	297	505	362				
	4	183	337					264	103	349	199	417	261	486	325	568	415		
	5	232	425							304	115	370	174	438	235	522	330	633	439
SR85	1	177	304	247	108	346	201	472	342										
	2	203	342			321	165	450	309	569	437								
	3	252	436					399	209	521	343	620	435	709	519				
	4	278	475					377	176	501	313	598	403	688	486	817	625		
	5	354	607							431	188	526	273	613	352	746	498	905	654
SR100	1	271	481	397	165	555	313	753	535										
	2	312	562			502	218	705	449	895	656								
	3	386	680					645	339	840	554	995	698	1133	827				
	4	427	761					598	253	795	473	949	614	1086	741	1294	965		
	5	542	960							696	291	845	424	979	545	1192	779	1443	1027
SR115	1	450	808	656	273	915	517	1244	885										
	2	497	932			841	363	1177	747	1489	1088								
	3	651	1150					1061	558	1381	912	1638	1150	1856	1353				
	4	699	1274					994	420	1318	783	1573	1016	1789	1215	2144	1597		
	5	900	1617							1148	478	1396	700	1606	888	1970	1286	2383	1695
SR125	1	592	1036	842	353	1179	669	1602	1143										
	2	677	1196			1084	494	1517	986	1922	1426								
	3	845	1474					1362	711	1777	1170	2109	1478	2399	1749				
	4	930	1635					1277	553	1698	1022	2027	1324	2314	1590	2765	2075		
	5	1183	2073							1474	619	1794	905	2074	1158	2536	1664	3071	2192
SR160	1	885	1345	1953	1445	2645	2116												
	2	1301	1991			2167	1373	3049	2334										
	3	1531	2336			1902	977	2810	1977	3648	2871								
	4	1770	2841					2563	1456	3418	2384	4084	3009						
	5	2230	3327							2973	1914	3622	2521	4284	3149	5127	4046		
	6	2655	4186									3196	1660	3845	2261	4708	3200	5790	4273
SR200	1	1540	2168	3789	3096	5096	4374												
	2	2186	3150			4354	3245	5978	4980										
	3	2637	3752			3835	2553	5511	4358	7066	5990								
	4	3124	4699					5008	3378	6596	5075	7848	6267						
	5	3726	5327							6015	4469	7244	5637	8505	6848	10061	8483		
	6	4664	6867									6303	4092	7534	5255	9137	6966	11168	8984
SR270	1	4469	6973	7802	5039	10782	7904	14474	11883										
	2	5363	8372	6816	3496	9755	6296	13549	10436										
	3	6257	9761	5830	1963	8727	4699	12624	8999	16243	12859								
	4	7150	11159	4843	420	7700	3092	11700	7553	15380	11509	18296	14275						
	5	8044	12549			6673	1495	10775	6115	14517	10168	17400	12881	20333	15673				
	6	8938	13947					9850	4669	13654	8818	16503	11478	19408	14226				
	7	9832	15336					8926	3232	12791	7476	15606	10085	18483	12789	22146	16723		
	8	10735	16735					7992	1785	11919	6126	14701	8682	17550	11343	21256	15345	25969	20021

Pneumatic Rotary Actuators

DA/SR

TECHNICAL DETAILS

SPRING CHART				
SET	EXTERNAL SPRING	CENTRAL SPRING	INTERNAL SPRING	VALID FOR MOD. 160 AND 200
01	-	2	-	
02	2	-	-	
03	1	2	-	
04	2	-	2	
05	2	2	-	
06	2	2	2	

SPRING CHART			
SET	EXTERNAL SPRING	INTERNAL SPRING	VALID FROM MOD. 52 TO 125
01	1	1	
02	2	-	
03	1	2	
04	2	1	
05	2	2	

PRETENSIONED CHART		
SET	NO. OF SPRINGS PER SIDE	VALID FOR MODEL 270
01	2/3	
02	3/3	
03	3/4	
04	4/4	
05	4/5	
06	5/5	
07	5/6	
08	6/6	

TIME IN SECONDS											
MODEL	32	52	63	75	85	100	115	125	160	200	270
D.A. CCW ROTATION	0.03	0.03	0.06	0.12	0.2	0.3	0.53	0.83	1.15	1.74	4.5
D.A. CW ROTATION	0.03	0.04	0.08	0.12	0.19	0.27	0.47	0.66	1.1	1.7	4.5
S.R. CCW ROTATION	-	0.09	0.14	0.22	0.31	0.44	0.83	1.08	1.75	2.38	4.5
S.R.CW ROTATION	-	0.09	0.14	0.22	0.33	0.46	0.78	0.9	1.34	2.19	6.2
DETERMINED WITH AN AIR SUPPLY OF 90PSI											

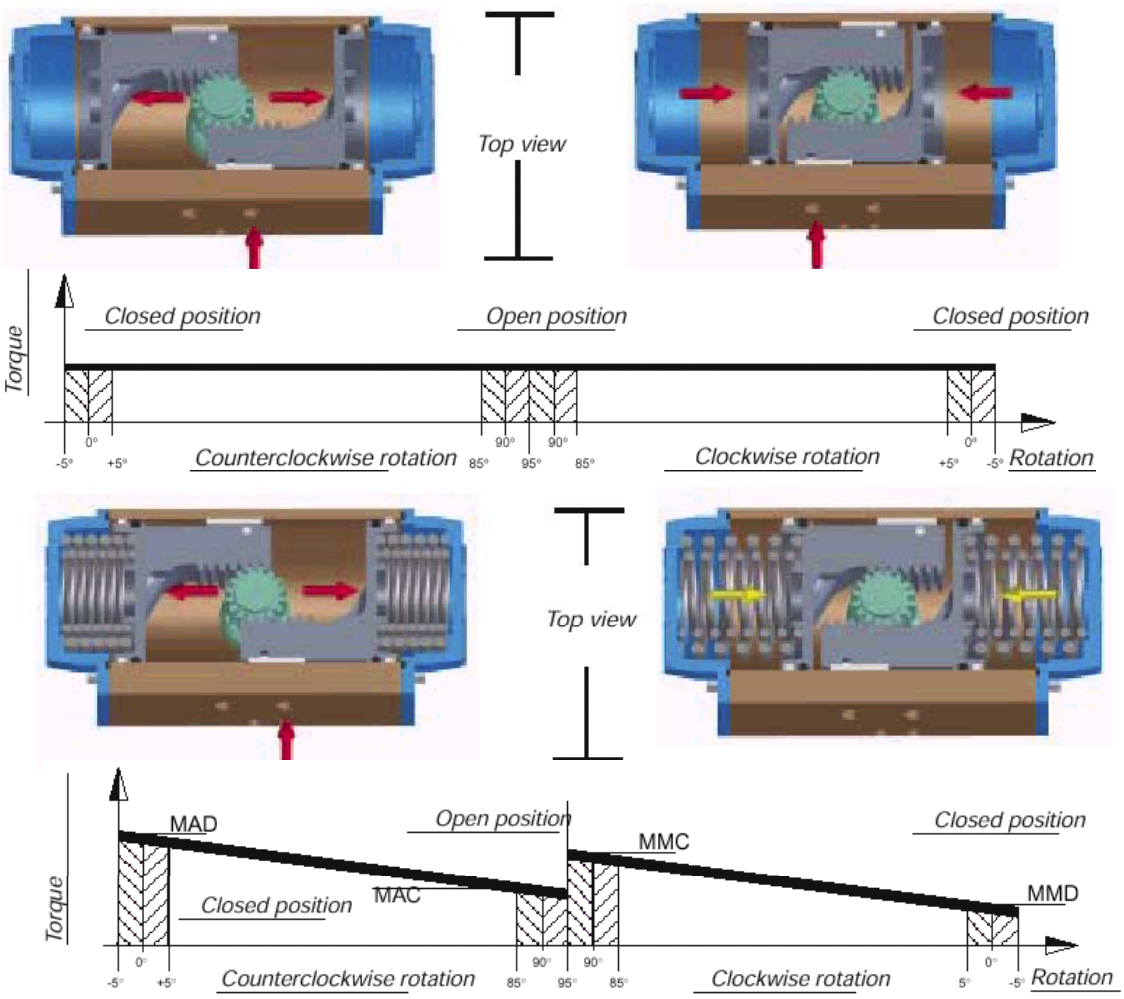
WEIGHT CHART LBS.											
MODEL	32	52	63	75	85	100	115	125	160	200	270
D.A. 90°	1.05	2.31	3.3	5.61	7.48	11.1	17.6	22	42.9	72.2	157.3
S.R. 90°	-	2.64	3.96	7.04	9.46	14.4	23.32	29.48	53.6	111.1	193.6

ACTUATOR AIR CONSUMPTION IN CU./IN.											
MODEL	32	52	63	75	85	100	115	125	160	200	270
D.A. S.R CCW ROTATION	2.32	6.1	6.7	22	31.1	48.2	78.7	99.5	220	348.1	915.3
D.A. CW ROTATION	1.7	8.24	14	26.8	39.1	61	104.4	134.9	290.6	599.7	1086.2
S.R.CW ROTATION	-	7.08	11.6	22	32.3	48.8	83	108.6	215.1	462.5	945.8

Pneumatic Rotary Actuators

DA/SR

TORQUE CHART SPRING RETURN

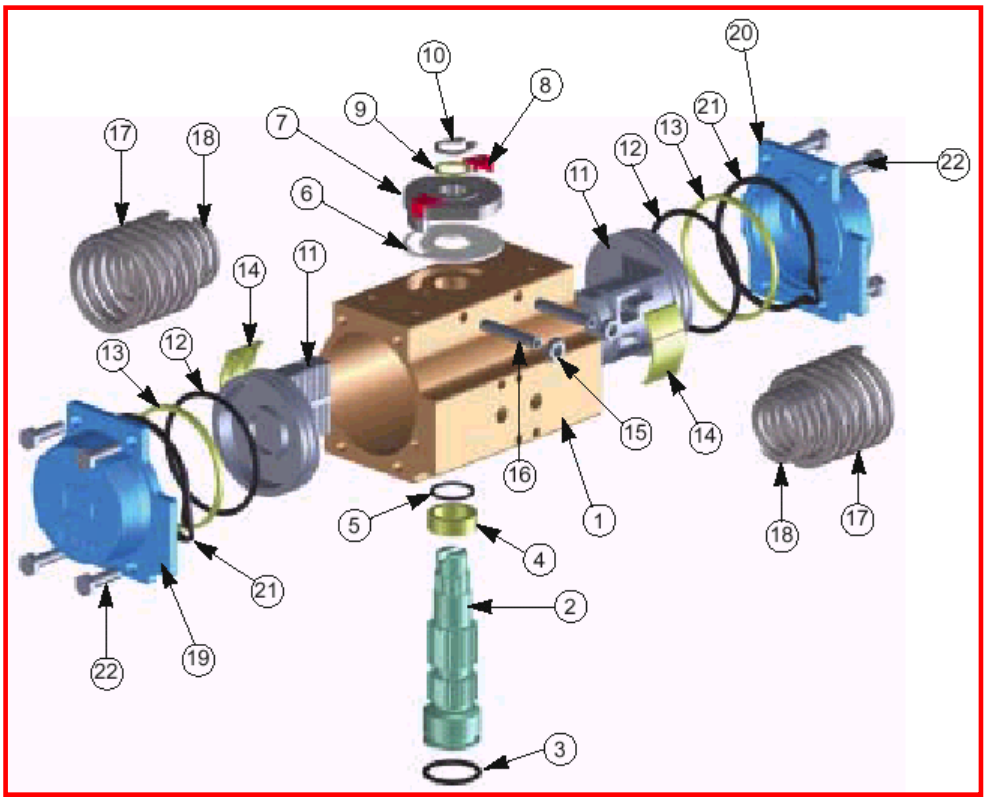


DOUBLE ACTING ACTUATOR TORQUE OUTPUT POUNDS / INCH								
PSI	40	50	60	70	80	90	100	115
MODEL	TORQUE OUTPUT POUNDS / INCH							
32	34	43	55	64	71	82	87	101
52	93	117	140	162	186	210	233	268
63	165	206	247	289	330	371	412	474
75	297	371	446	519	594	668	742	854
85	423	528	635	740	846	952	1.057	1.217
100	667	834	1000	1167	1334	1501	1668	1918
115	1099	1373	1648	1923	2197	2472	2746	3158
125	1424	1780	2136	2491	2848	3204	3560	4093
160	2930	3662	4394	5127	5859	6591	7324	8422
200	5488	6966	8239	9612	10981	12359	13732	15792
270	12734	15919	19097	22284	25469	28654	31832	36611

Pneumatic Rotary Actuators

DA/SR

MATERIALS OF CONSTRUCTION MODEL 52-125



Item	Description	Material	Treatment	QT'Y DA	QT'Y SR
1	Body	Extruded alluminium	Hard anodized	1	1
2	Anti-blowout pinion	Steel	Nickel plated	1	1
● 3	Lower pinion O-ring	NBR		1	1
● 4	Pinion spacer ring	POM		1	1
● 5	Top pinion O-ring	NBR		1	1
● 6	Cam spacer ring	POM		1	1
7	Camma / Cam	Stainless steel		1	1
8	Position indicator	Nylon		2	2
9	Pinion washer	Stainless steel		1	1
**10	Pinion snap ring	Steel	Nickel plated	1	1
11	Piston	Die cast alluminium		2	2
● 12	Piston o-ring	NBR		2	2
● 13	Antifriction ring	POM		2	2
● 14	Piston thrust block	POM		2	2
15	Stop bolt retaining nut	Stainless steel		2	2
16	Stop bolt	Stainless steel		2	2
17	External spring	Steel	Zinc-phosphate	0	See spring setting
18	Internal spring	Steel	Zinc-phosphate	0	
19	Left end	Die cast alluminium	Zinc-phosphate	1	1
20	Right end cap	Die cast alluminium	Zinc-phosphate	1	1
21	End cap seats	NBR		2	2
22	End cap fixing screw	Stainless steel		8	8

● **Parts subject to wear** ****Reinforced series DIN 471**

Note: the numbers in parenthesis are referred to page 3 of this instruction manual

VALBIA supplies a range of pneumatic rotary actuators, ¼ turn, RACK and PINION TYPE, in double acting and spring return versions.

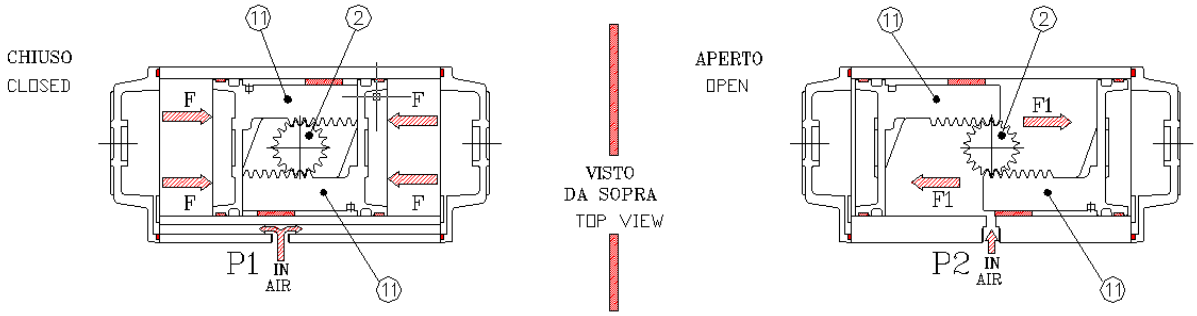
1 Main characteristics

- **MAXIMUM AIR SUPPLY**: **8 bar**
- **SUPPLY**: dry air (STANDARD). Special executions with other fluids or gases possible if compatible with actuator materials.
- **TEMPERATURE**: from -20°C to +85°C for standard version with NBR seals
  from -20°C to +150°C for HIGH TEMP version (Viton seals)
  from – 40° C to + 85 °C for LOW TEMP version
- **ROTATION**: 90° stroke with regulation +/-5° for open and closed position (double adjustment). Upon request full stroke regulation 0°/ 90°.
- **LUBRICATION**: during assembly, for the actuator life.

2 Operation principle

VALBIA actuator transforms the linear motion of the pistons (11), due to the thrust effected by the pressure on the surface area, to a rotary motion (90°std) of the pinion (2).

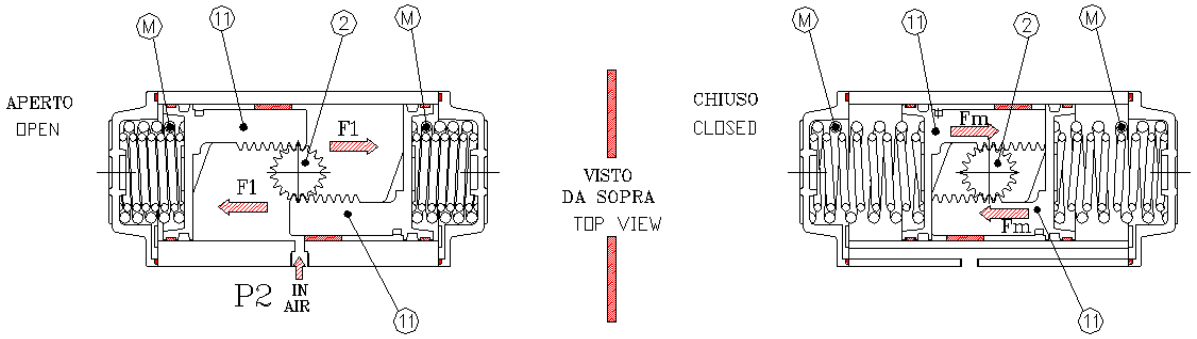
2.1 Double acting



Pressurising port **P1**, the external chambers fill up and the action of the pressure on the pistons (11) surface creates a force (**F**) which pushes them closed to the pinion, generating a torque with **CLOCKWISE ROTATION**.

When the pistons (11) are closed to the pinion, pressurising air port **P2**, the internal chamber fills up and the action of the pressure on the pistons surface creates a force (**F1**) which pushes them closed to the end caps, generating a torque with **COUNTERCLOCKWISE ROTATION.**

2.2 Spring return



When the pistons (**11**) are closed to the pinion, pressurizing air port **P2**, the internal chamber fill up and the action of the pressure on the pistons surface creates a force (**F1**) which pushes them closed to the end caps, generating a torque with **COUNTERCLOCKWISE ROTATION.**

In this position the springs are compressed. By de-pressurizing air port **P2**, the springs (**M**) start the unfolding phase creating a force (**Fm**) which pushes the pistons (**11**) closed to the pinion, generating a torque with **CLOCKWISE ROTATION**.

3 Storage

For applications where the actuator is not put into immediate service, it is recommended that the actuator be kept in clean and dry location with ample protection from the environments. The original packing box supplied by **VALBIA** helps in optimizing the storage.

For a long storage period we recommend to effect periodically a complete cycling, pressurizing the chambers.

The actuators have two air ports which should be plugged during storage to avoid any intrusion.

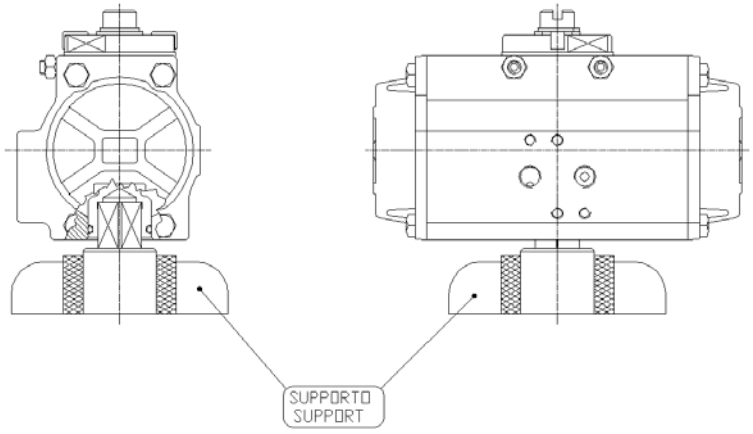
4 Maintenance

The lubrication effected by **VALBIA** during the assembly and the self lubricating material used in the guides, guarantees during normal working conditions, **1.000.000 cycles of the actuator**.

During abnormal working conditions, where it is intended to proceed in replacing worn parts (seals), we recommend replacing the guides as well, to ensure ideal working conditions.

5 Disassembly

1. disconnect pneumatic and electric supplies from the actuator.
2. remove any accessory which could be damaged;
3. remove the actuator from the valve (taking a note for correct re-assembly);
4. place the actuator on a support with the same male drive of the pinion female connection, in order to execute easily the steps following



5. before starting the disassembly, **verify** by the stamps on the body if the actuator is double acting (DA) or spring return (SR);

For DOUBLE acting actuator

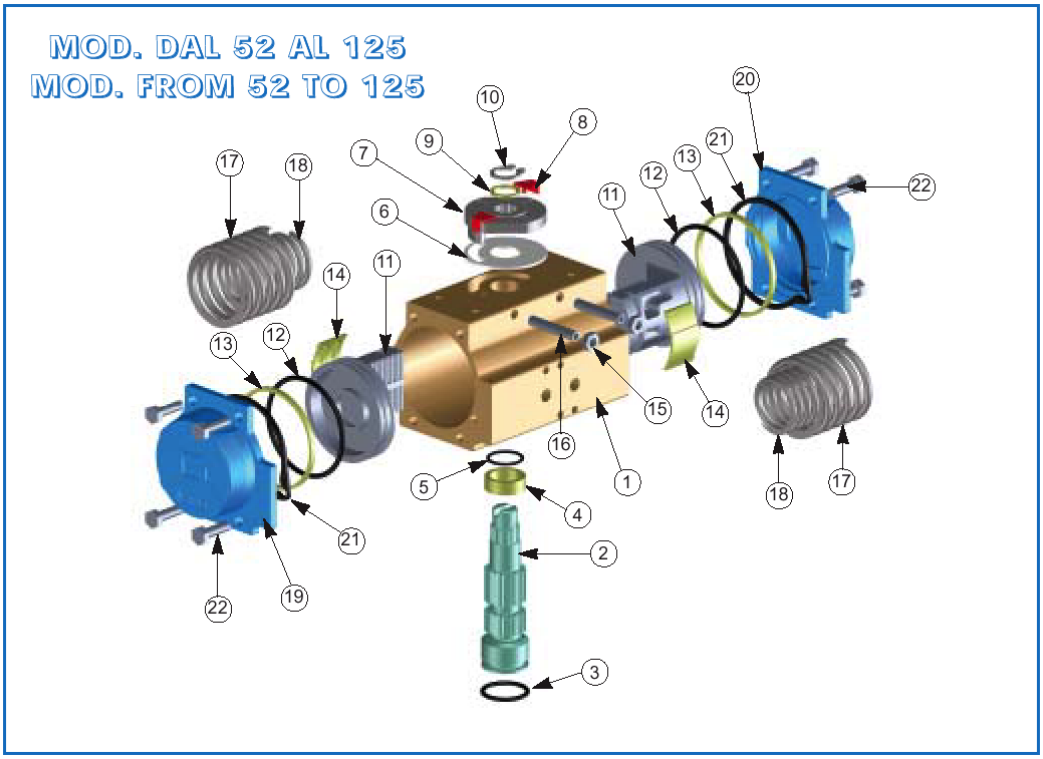
6. remove slowly and diagonally the end cap screws (**22**) from each end cap (**19-20**);

For SPRING return actuator

7. diagonally remove, slowly and partially, the screws (**22**) from each end cap (**19-20**). **N.B.** length of the screws permit the springs to be de-compressed fully

8. Remove the end caps (**19-20**)
9. Remove snap ring (**10**) from its place on the pinion (**2**);
10. Remove pinion washer (**9**);
11. Remove the cam (**7**) and spacer ring (**6**)
12. Rotate the actuator body (**1**) in a clockwise direction respect to the pinion (**2**) so that the pistons move towards body ends. Now it is possible to remove the two pistons.
13. Remove pinion (**2**) carefully from the body (**1**).

6 Actuator parts



POSIZ. *Item*	DESCRIZIONE *Description*	MATERIALE *Material*	TRATTAMENTO *Treatment*	Q.TA' *DA*	Q.TA' *SR*
1	Corpo / *Body*	Alluminio estruso / *Extruded alluminium*	Ossidato duro / *Hard anodized*	1	1
2	Pignone antiespulsione / *Anti-blowout pinion*	Acciaio / *Steel*	Nichelato / *Nickel plated*	1	1
• 3	O-ring inf. pignone / *Lower pinion O-ring*	NBR		1	1
• 4	Anello distanziale pignone / *Pinion spacer ring*	POM		1	1
• 5	O-ring sup. pignone / *Top pinion O-ring*	NBR		1	1
• 6	Anello distanziale camma / *Cam spacer ring*	POM		1	1
7	Camma / *Cam*	Acciaio inox / *Stainless steel*		1	1
8	Indicatore di posizione / *Position indicator*	Nylon		2	2
9	Rondella pignone / *Pinion washer*	Acciaio inox / *Stainless steel*		1	1
**10	Seeger pignone / *Pinion snap ring*	Acciaio / *Steel*	Nichelato / *Nickel plated*	1	1
11	Pistone / *Piston*	Alluminio pressofuso / *Die cast alluminium*		2	2
• 12	O-ring pistone / *Piston o-ring*	NBR		2	2
• 13	Anello antifrizione / *Antifriction ring*	POM		2	2
• 14	Pattino reggispinta pistone / *Piston thrust block*	POM		2	2
15	Dado di bloccaggio reg. / *Stop bolt retaining nut*	Acciaio inox / *Stainless steel*		2	2
16	Grano di regolazione / *Stop bolt*	Acciaio inox / *Stainless steel*		2	2
17	Molla esterna / *External spring*	Acciaio / *Steel*	Fosfatata / *Zinc-phosphate*	0	Vedi set molle *See spring setting*
18	Molla interna / *Internal spring*	Acciaio / *Steel*	Fosfatata / *Zinc-phosphate*	0	
19	Tappo sinistro / *Left end*	Alluminio pressofuso / *Die cast alluminium*	Verniciato / *Painted*	1	1
20	Tappo destro / *Right end cap*	Alluminio pressofuso / *Die cast alluminium*	Verniciato / *Painted*	1	1
21	Guarnizioni Tappi / *End cap seats*	NBR		2	2
22	Vite di serraggio tappi / *End cap fixing screw*	Acciaio inox / *Stainless steel*		8	8

• Particolari soggetti ad usura / *Parts subject to wear* ** Serie rinforzata DIN 471 - UNI 7436 / *Reinforced series DIN 471 - UNI 7436*

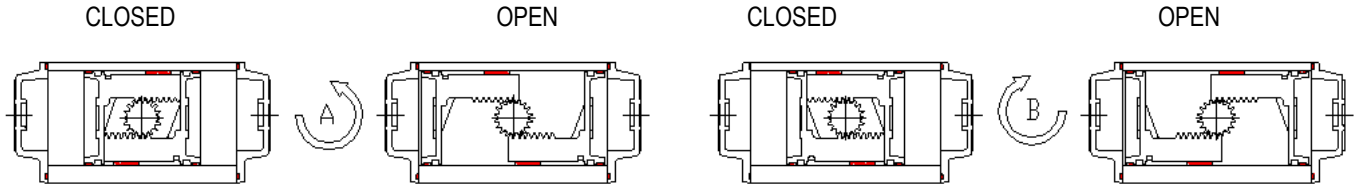
SET DI MOLLE / SPRING SETTING

set	Molla esterna/ External spring	Molla interna/ Internal spring	Alim. Aria/ Air supply (bar)
01	1	1	2,5 – 3
02	2	-	3 – 4
03	1	2	4 – 5
04	2	1	5 – 5,5
05	2	2	5,5 – 6

7 Assembly

1. clean the components before proceeding with the assembly;
2. grease lightly the internal chamber of the body (**1**) and the seals on the pistons. We suggest the use of grease like TRIBOSTAR 1 EP "KLUBER".
3. introduce carefully the pinion (**2**) into the body(**1**) so that the two pinion flats surfaces are parallel to the axis of the body
4. insert the pistons (pre assembled and greased) into the body as shown here below;

ASSEMBLY POSSIBILITIES – TOP VIEW

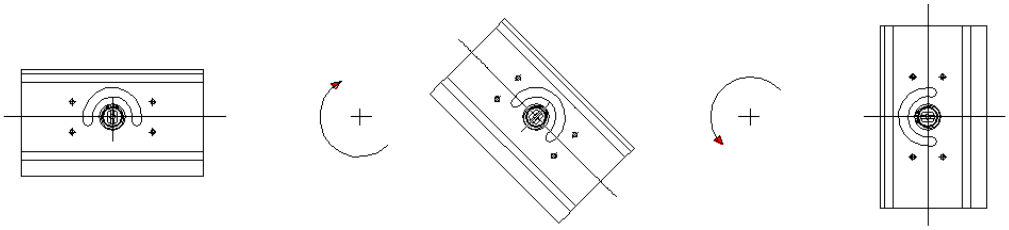


COUNTERCLOCKWISE ROTATION (Standard)

CLOCKWISE ROTATION (Reversed pistons)

5. push the pistons (**11**) into the body (**1**) until the pistons teeth are stopped by the teeth of the pinion (**2**);
6. keeping a soft pressure with the hands on the pistons (**11**) rotate the body (**1**) in clockwise rotation in respect to the pinion (**2**) until feeling two clicks, when the pistons engage with the pinion (**2**);
7. now rotate the body **(1**) in counterclockwise rotation and verify that at the end of the rotation the two pinion flats surfaces are about 7° rotated to the axis of the body.

N.B. correct assembly gives symmetric stroke of the pistons, verifiable by measuring their equal distance from each end face of the body.



8. Assemble the cam spacer ring (**6**) and the cam (**7**).
9. Assemble the pinion washer (**9**) and insert the snap ring (**10**) in its place on the pinion (**2**)
   NB: use snap rings with reinforced thickness DIN 471 – UNI 7436
10. Proceed making the adjustment of the stroke, acting on adjusting screws (**16**), fixing then their position securing the nuts (**15**)

For double acting actuator

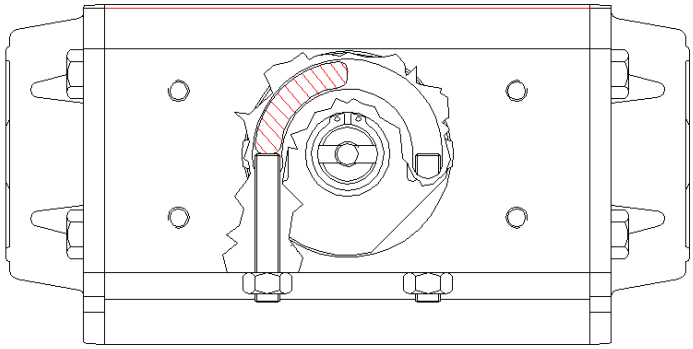
11. Assemble the end caps (**19-20**) and assemble the screws (**22**) diagonally

For spring return actuator

11 Insert the spring set (**M**) in the body (**1**), putting them in the piston recess (11), then assemble the end cap (19) on the springs, centering it in the recess.
N.B.: pistons must be in CLOSED position.
Partially assemble the screws (**22**) diagonally, compressing uniformly the springs until end cap (**19**) is completely closed.

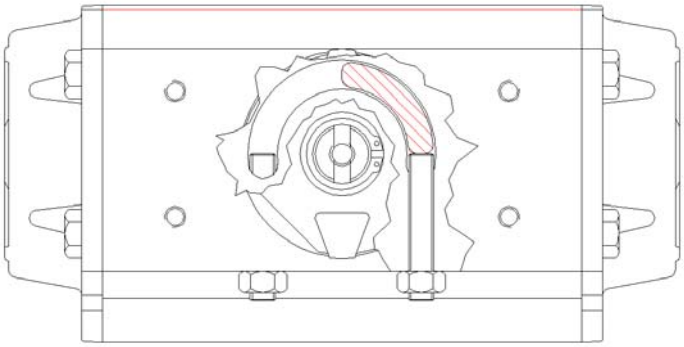
12. repeat the operation on the other size;
13. operate the actuator to verify the correct functioning before re-installing it.

8 Stroke adjustment



By adjusting **LEFT** stop bolt it will be adjusted

Open position (Standard version)
Closed position (reversed pistons version)



By adjusting **RIGHT** stop bolt it will be adjusted

Closed position (Standard version)
Open position (reversed pistons version)

8.1 Stroke adjustment procedure (when pistons are in open position)

- Remove air supply or move the pistons to the closed position
- Adjust the corresponding stop bolt
- Move the pistons to the open position and verify the new adjustment
- Repeat this operation until desired adjustment is achieved.

8.2 Stroke adjustment procedure (when pistons are in closed position)

- Remove air supply or move the pistons to open position (necessary for SR)
- Adjust the corresponding stop bolt
- Move the pistons to the closed position and verify the new adjustment
- Repeat this operation until desired adjustment is achieved.

Limit Switch Box Section

C

Moniteur

WATCHMAN - VPT

BACK

Intelligent Part Number System

F	M	Y	B	-	5	1	2	0
Series	*Cover*	*Moniteur*	*Bearing*		*Shaft*	*Switch*	*Quantity*	*Conduit*

Base unit includes:
Black / Yellow indicator
Aluminum Enclosure
(2) ½" NPT conduit entries
2 SPDT 15A mechanical switches
Bronze bearings
Low profile NAMUR shaft

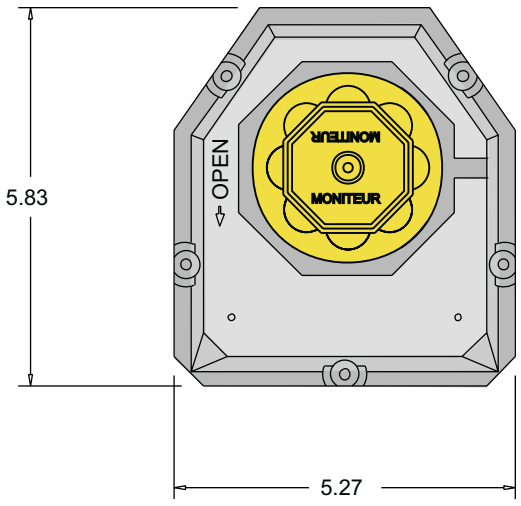
Description	Code
Series: Watchman	F
Cover	
Moniteur	M
Flat Cover	F
Moniteur	
No Indicator	N
Black / Yellow	Y
3-Way Path O,T, F	O,T, F
4-Way Path	S
180 degree T port	1
120 degree	3
Green / White	G
Red / White	R
Blue / White	B
Green / Red	A
Red / Green	C
0-100%	P

Description	Code
Bearing	
303 Stainless Steel	S
Shaft	
Standard 303 SS	1
Standard 316 SS	3
NAMUR 303 SS	5
NAMUR 316 SS	7
Long NAMUR 303 SS	E
Switch Type (2 switches)	
Cherry 15A	
SPDT Mechanical	1
Tungsten TTL 3A	
SPDT Non-Contact	2
Prism Gold Plated 1A	
SPDT Mechanical	3
ITW 10A	
DPDT Mechanical	4

Description	Code
Rhodium TTL 1A	
SPDT Non-Contact	T
Bifurcated TTL	
SPST Non-Contact	B
P&F NJ2-V3 NAMUR	
Inductive Sensor	8
Moniteur NEO-X 0.3A	
NO Sensor	A
Switch Quantity	1-4
Conduit	
(2) ½" F NPT	0
(3) ½" F NPT	6
(1) ½" F + (1) ½" M NPT	8
Options	
Current 4 - 20mA	- 420
Resistive 0 - 1k	- 1K
High Temperature	-T1

Dimensions

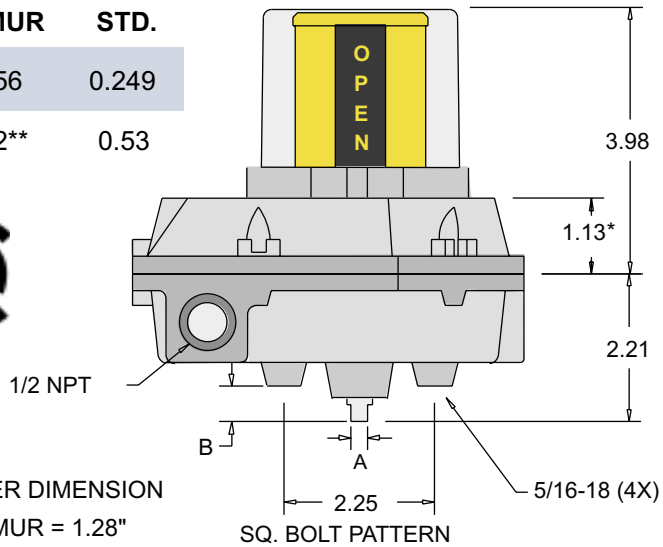
Top View



	NAMUR	STD.
A	0.156	0.249
B	0.62**	0.53

* - FLAT COVER DIMENSION
** - LONG NAMUR = 1.28"

Side View



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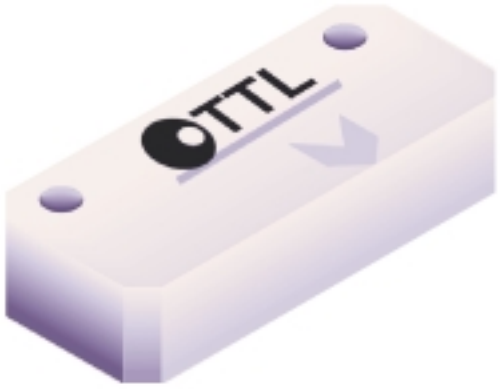
BACK

TTL Non-Contact Switches



The Moniteur TTL sensing system is an advanced and reliable method of position monitoring developed for today's sophisticated process control systems. The highest quality reed-type switching elements available are enclosed and encapsulated in a flexible moisture-proof bedding compound, protecting them from contaminants and shock to 38g. Switching elements are actuated with neodymium magnets sealed in their cams to protect and prevent dislodgement and subsequent system failure. An internal stainless steel Loc-Ring is employed to prevent vertical shaft motion from corrupting output signals. Many different switching elements are available, each meeting different user needs.

Applications

* Areas with corrosive or humid environments that could corrode exposed contacts
* Critical position monitoring applications requiring reliability and higher cycle life
* Explosion-proof environments. Moniteur *Sentinel* series is UL listed and CSA** approved for Class I, Division 2 - Groups A, B, Class 1, Division 1 Groups C, D and Class II, Division 1, Groups E, F, G.
* Nonincendive (Class 1, Division 2) environments. Article 501-3 (b) of the NEC (National Electric Code) permits the use of general purpose enclosures (such as the Moniteur *Watchman* or *Survivor* Series) in Class 1, Division 2 locations when the current interrupting contacts are sealed within a hermetically sealed chamber.
* Intrinsically safe environments. TTL switches are passive devices and can be used in Intrinsically Safe applications with an approved current and voltage-limiting barrier.

TTL Switching Elements Available

TUNGSTEN TTL - The choice for high power AC and DC switching applications. Durable tungsten contacts handle up to 3A - 120VAC / 2A - 24VDC. TUNGSTEN TTL HV switches can handle 100 W at voltages up to 500 VAC or VDC. MTBF for both is 800,000 cycles.

RHODIUM TTL - The choice for reliable low power 24 VDC switching applications. Rhodium contacts have 80% less contact resistance than Tungsten TTL. Rated to 1A - 24VDC. MTBF 1,000,000 cycles.

BIFURCATED TTL - Premium Bifurcated SPST contacts with “wiping action” assure outstanding reliability for ultra low power / voltage applications (10mA @ 5 VDC minimum). MTBF 2,000,000 cycles.

KRYSTAL TTL - Rhodium TTL contacts combined with LED set lights make switch setting easier in the field. Rated to 0.3A - 120 VAC / 0.3A - 24 VDC. MTBF 1,000,000 cycles.

Specifications - TTL Switches

Switch Type	AC Rating	DC Rating	Contacts	Form	MTBF (cycles)
TUNGSTEN TTL	3A - 120V	2A - 24V	SPDT	C	800,000
RHODIUM TTL	1A - 120V	1A - 24V	SPDT	C	1,000,000
BIFURCATED TTL	2A - 120V	2A - 24V	SPST	A	2,000,000
KRYSTAL TTL	0.3A - 120V	0.3A - 24V	SPDT	C	1,000,000

** Rhodium TTL only

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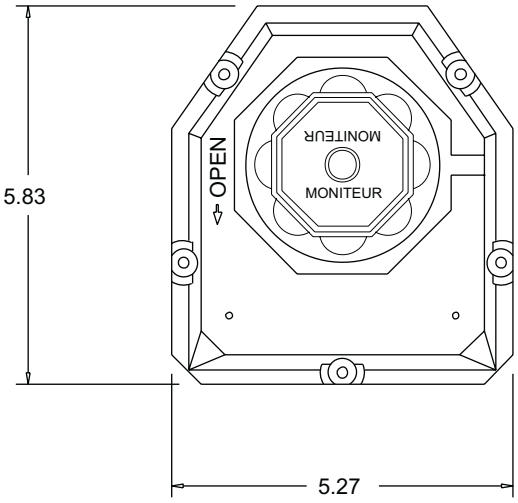
WATCHMAN VPT

BACK

Dimensions

Top View

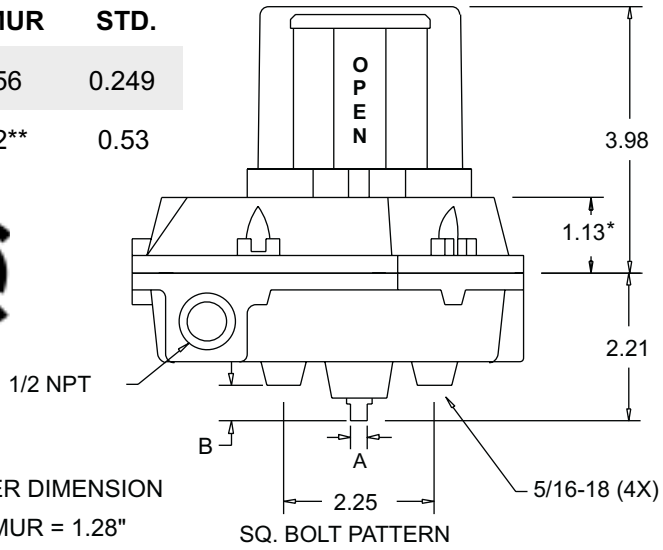


	NAMUR	STD.
A	0.156	0.249
B	0.62**	0.53

* - FLAT COVER DIMENSION

** - LONG NAMUR = 1.28"

Side View



General Specifications

Nema Rating	4,4x
Housing / Cover	Aluminum
Indicator Cover	Ektar
Seals	BUNA-N
Fasteners	Stainless Steel
Terminal Points	8
Weight	3.0 lbs.
Operating Temp.	-40° F to 175° F
Agency Approvals	CSA

How To Specify

Valve position transmitter shall be Moniteur model _____. Enclosure shall be aluminum with a polyurethane coating and rated Nema 4, 4x. Visual indicator shall have 100% display change, 360° visibility and full set point adjustability. Indicator cover shall be free of decals or paint and sealed with an O-ring. Enclosure shall have captive cover bolts. Enclosure shall be attached to the housing with an internal stainless steel locking ring, environmentally protected with an O-ring. The switch/sensor type shall be _____. All switches and terminals must be enclosed and marked for identification. Terminal strip must be angle-mounted for easier installation.

Intelligent Part Numbering System - *place your part number in the boxes below*

F				-				
Series	Cover	Moniteur	Bearing		Shaft	Switch	Quantity	Conduit

Description	Code
Series: Watchman	F
Cover	
With Moniteur	M
Flat Cover (No Moniteur)	F
Moniteur	
No Indicator	N
Black / Yellow	Y
3-Way Path O, T, F	O, T, F
4-Way Path	S
180 degree T-port	1
120 degree	3
180 degree L-port	5
Green / White	G
Red / White	R
Blue / White	B
Green / Red	A
Red / Green	C
0-100%	P

Description	Code
Bearing	
Bronze	B
303 Stainless Steel	S
Shaft	
Standard 303 SS	1
Standard 316 SS	3
NAMUR 303 SS	5
NAMUR 316 SS	7
Long NAMUR 303 SS	E
Switch Type	
Cherry 15A	
SPDT Mechanical	1
Tungsten TTL 3A	
SPDT Non-Contact	2
Prism Gold Plated 1A	
SPDT Mechanical	3
ITW 10A	
DPDT Mechanical	4

Description	Code
Rhodium TTL 1A	
SPDT Non-Contact	T
Bifurcated TTL	
SPST Non-Contact	B
P&F NJ2-V3 NAMUR	
Inductive Sensor	8
Moniteur NAMUR	
Inductive Sensor	M
Switch Quantity	1-4
Conduit	
(2) ½" F NPT	0
(3) ½" F NPT	6
(1) ½" F NPT + (1) ½" M NPT	8
Output (add suffix to part number)	
Current 4 - 20mA	- 420
Resistive 0 - 1k	- 1K

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INSTALLATION - ADJUSTING THE VISUAL INDICATOR

1. Mount the valve position transmitter to the valve or actuator with the correct mounting bracket.
2. Determine the true valve position and compare the Moniteur's Indication with the true valve position. If the Moniteur display is synchronized, proceed to Step 12. If it is not, continue to Step 3.
3. Remove the clear Moniteur cover by turning it counter-clockwise to disengage the detent and then lift it off. Determine the level of adjustment that needs to be made. If only a small adjustment is necessary (less than 20 degrees in either direction), proceed to step 4. If a larger adjustment is required, such as 45, 90 or 135 degrees from default, proceed to step 7.
4. Remove the Moniteur Visual Indicator by lifting it upward off the shaft and the Infinite Adjusting Ring. Loosen screws B and C shown in fig.1 (do not remove screws). The Infinite adjusting ring should rotate freely over the enclosure cover of the Valve Position Transmitter.
5. Return the Moniteur Indicator to the output shaft. As it slides down along the shaft, be sure that the Moniteur Indicator's base engages the Infinite Adjusting Ring on pins “E”. (fig.1)
6. Rotate the Moniteur Indicator by applying a light rotational force to the vertical vanes to synchronize it with the true valve position. Once aligned, proceed to Step 9. If further adjustment is necessary, you will need to continue with Step 7.
7. Remove the Moniteur Visual Indicator by lifting it upward off the shaft and the Infinite Adjusting Ring. Remove screws B and C from the Infinite Adjusting Ring. Rotate the setting ring and match the number on the plastic ring with the number cast into the enclosure, according to the following requirements:
   90 - 90: as shipped from the factory - shipped as “Open”.
   45 - 45: “Open” is 45 degrees CCW in travel from default.
   135 - 135: “Open” is 45 degrees CW in travel from default.
   180 - 180: “Open” is 90 degrees CW or CCW from default. (This is the setting to switch default indication from Open to Closed.)
   Return screws B and C to their appropriate threaded holes, but do not tighten them completely. Now return the Moniteur Indicator to the output shaft. Be sure that the Indicator's base engages the infinite adjusting ring on pins “E”. (fig.1)
8. Rotate the Moniteur Indicator by applying a light rotational force to the vertical vanes to further synchronize the Indicator with the true valve position.
9. Remove the Moniteur Indicator, being careful not to rotate the Infinite Adjustment Ring. Hold Ring stationary and tighten screws B and C.

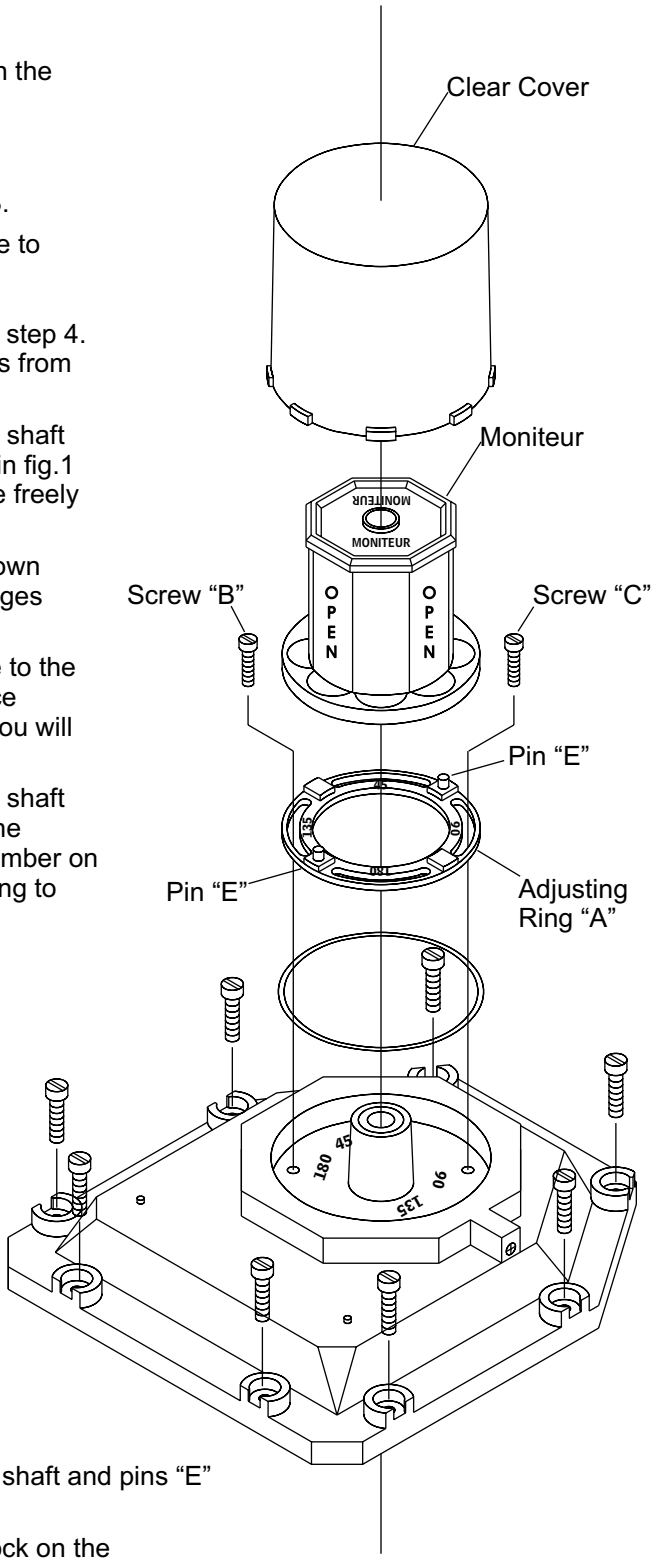

Fig. 1

10. Return the Moniteur Indicator being certain that both the output shaft and pins “E” of the Infinite Adjusting Ring are engaged.
11. Return the clear Moniteur cover by inserting it into the breach lock on the enclosure cover and turning it Clock-wise until the unit engages the detent.
12. Cycle the valve to the opposite extremity. If the Moniteur Indicator is displaying the correct valve position, installation is complete. If not, it is probably because the actuator is not moving exactly 90 degrees. Adjust the stroke of the actuator so that it is rotating 90 degrees and the Moniteur Indicator will indicate the correct valve position. Installation is now complete.

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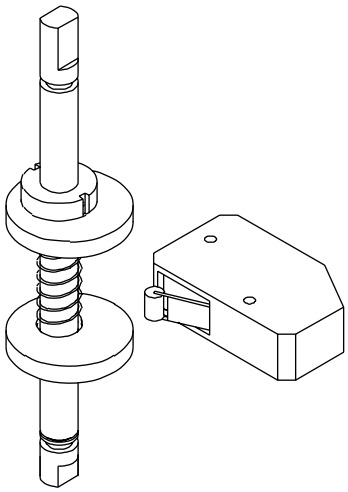
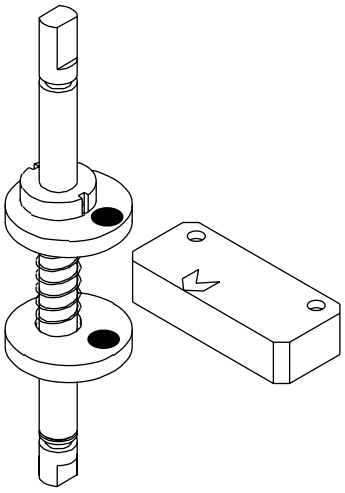
WARNING: To prevent the possibility of personal injury or property damage, turn off electrical power before inspection, adjustment, or removal of the valve position transmitter.

INSTALLATION - SETTING MECHANICAL SWITCHES (Switch Types 1, 3 and 4)



1. Remove VPT cover from the housing by loosening the screws holding the housing and cover assembly together.
2. Move the valve or valve actuator assembly to a position where one or more of the switches will be required to operate noting the direction of VPT shaft rotation.
3. Determine which switch is to be set and lift or depress the corresponding cam as required. Rotate the cam in the direction of shaft rotation until the cam engages the switch and closes the normally open contact for SPDT and DPDT switches.
4. Repeat Steps 2 and 3 until all of the switches are set.
5. Replace the VPT cover and tighten the screws. To ensure that the shaft alignment is secured, bring all of the screws in contact with the cover and then tighten them in stages moving from one screw to its diagonal counterpart.

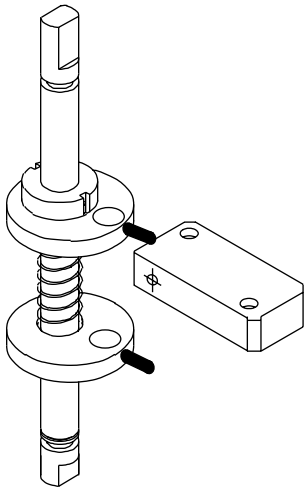


INSTALLATION - SETTING TTL MAGNETIC SWITCHES (Switch Types 2, T and B)

NOTE: To properly set switches, an ohm meter or equivalent devices will be required.

1. Remove VPT cover from the housing by loosening the screws holding the housing and cover assembly together.
2. Move the valve or valve actuator assembly to a position where one or more of the switches will be required to operate noting the direction of VPT shaft rotation.
3. Determine which switch is to be set and lift or depress the corresponding cam as required. Using the arrow only as a guide, rotate the cam in the direction of shaft rotation until the circle on the cam and the arrow on the switch are aligned with each other. IMPORTANT - To be sure the normally open contact is now closed, you must use an ohm meter or equivalent device to check the setting.
4. Repeat Steps 2 and 3 until all of the switches are set.
5. Replace the VPT cover and tighten the screws. To ensure that the shaft alignment is secured, bring all of the screws in contact with the cover and then tighten them in stages moving from one screw to its diagonal counterpart.

INSTALLATION - SETTING INDUCTIVE SENSORS (Switch Types 8, K and M)



NOTE: To properly set sensors, an appropriate sensor tester will be required.

1. Remove VPT cover from the housing by loosening the screws holding the housing and cover assembly together.
2. Move the valve or valve actuator assembly to a position where one or more of the sensors will be required to operate noting the direction of VPT shaft rotation.
3. Determine which switch is to be set and lift or depress the corresponding cam as required. Using the target area only as a guide, rotate the cam in the direction of shaft rotation until the pin on the cam and the target area on the sensor are aligned with each other. If the sensor has an LED, it should light now. IMPORTANT - To be sure the sensor is now actuated you must use an appropriate sensor tester.
4. Repeat Steps 2 and 3 until all of the sensors are set.
5. Replace the VPT cover and tighten the screws. To ensure that the shaft alignment is secured, bring all of the screws in contact with the cover and then tighten them in stages moving from one screw to its diagonal counterpart.

CAUTION: Always check that the electrical load is within the range stated on the nameplate. Failure to remain within electrical ratings may result in damage to or premature failure of the electrical switches or sensors.

ELECTRICAL SPECIFICATIONS

MECH.

Code	Switch Type	AC Rating	DC Rating	Form
1	Cherry - SPDT	15A - 250V	2.5A - 24V	C
3	Prism Gold Plated - SPDT	1A - 120V	1A - 24V	C
4	ITW - DPDT	10A - 250V	7A - 24V	CC

TTL

Code	Switch Type	AC Rating	DC Rating	Form
2	Tungsten TTL - SPDT	3A - 120V	2A - 24V	C
E	Tungsten TTL HV - SPDT	0.4A - 240V	0.4A - 240 V	C
7	Rhodium TTL - SPST	1A - 120V	1A - 24V	A
T	Rhodium TTL - SPDT	1A - 120V	1A - 24V	C
L	Krystal TTL - SPDT	0.3A - 120V	0.3A - 24V	C
B	Bifurcated TTL - SPST	3A - 120V	2A - 24V	A

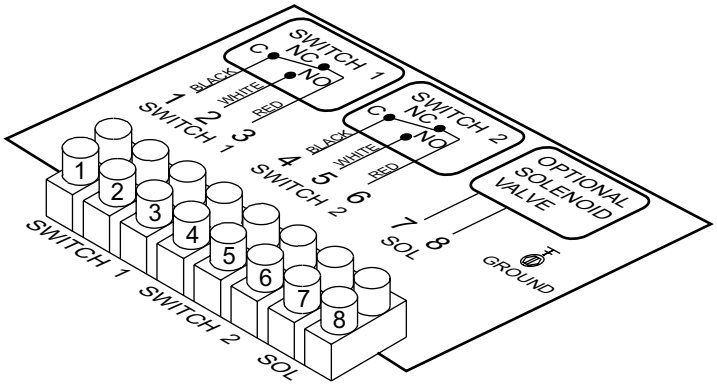
INDUCTIVE

Code	Sensor	Supply Voltage	Load Current / Target Absent	Load Current / Target Present	Operation
8	P & F NJ2-V3	5-25 VDC	< 1 mA	3 - 15 mA	NAMUR
K	P & F NBB3-V3-Z4	5-60 VDC	< 0.7 mA	4 - 100 mA	PNP
M	Moniteur NAMUR	5-25 VDC	< 1 mA	3 - 15 mA	NAMUR

WARNING: All Inductive Sensors must be connected with the appropriate PLC, microprocessor or relay load. Otherwise, damage can result to the sensors. Check the sensor installation sheet included in the box.

WIRING OF VALVE POSITION TRANSMITTER

1. Remove VPT cover from the housing by loosening the screws. Holding the housing and cover assembly together, lift the cover from the housing.
2. Follow the wiring diagram located inside the cover of the VPT. Be sure to secure all the appropriate connections including the ground. The diagram at left relates the wiring diagram to the terminal block.
3. Replace the VPT cover and tighten the screws. To ensure that the shaft alignment mechanism functions properly, bring all of the screws in contact with the cover and then tighten them in stages moving from one screw to its diagonal counterpart.



TERMINAL BLOCK AND WIRING DIAGRAM

WARNING (FOR ENCLOSURE TYPES 4, 4x, 7 and 9 ONLY) - To prevent fire or explosion, use only with a seal fitting within 18 inches of the position transmitter enclosure.

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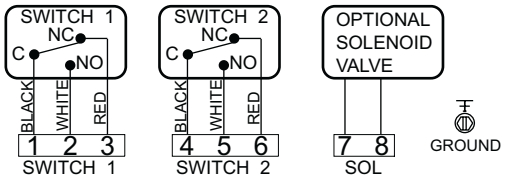
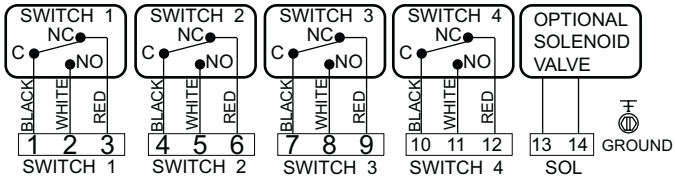
BACK

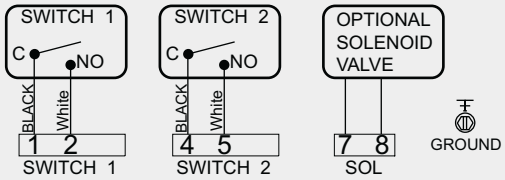
Wiring Diagrams



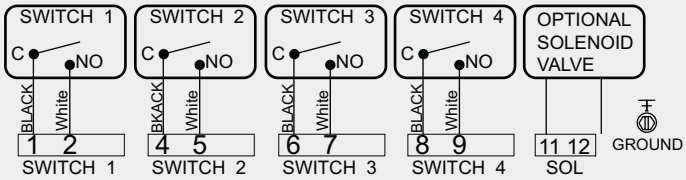
2 SPDT switches (Form C)
Cherry Mechanical
Tungsten TTL
Rhodium TTL



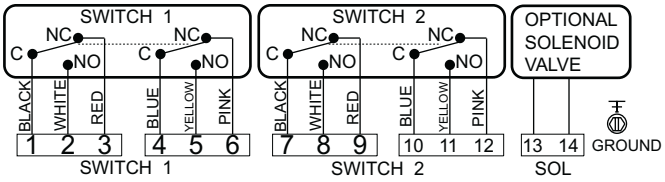
4 SPDT switches (Form C)
Cherry Mechanical
Tungsten TTL
Rhodium TTL



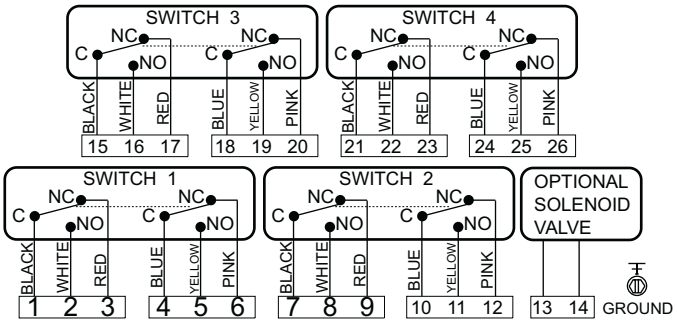
2 SPST switches (Form A)
Bifurcated TTL



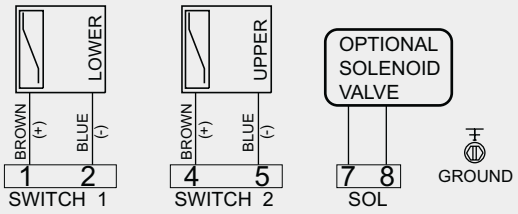
4 SPST switches (Form A)
Bifurcated TTL



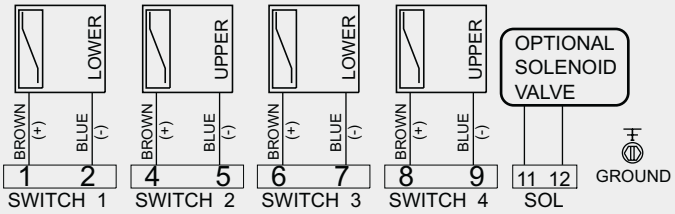
2 DPDT switches (Form ZZ)
ITW



4 DPDT switches (Form ZZ)
ITW



2 - 2-wire Inductive Sensors
any type



4 - 2-wire Inductive Sensors
any type

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Form W1-0798

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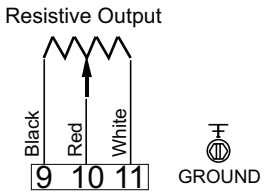
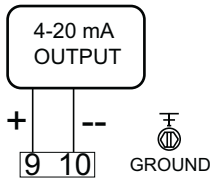
Wiring Diagrams

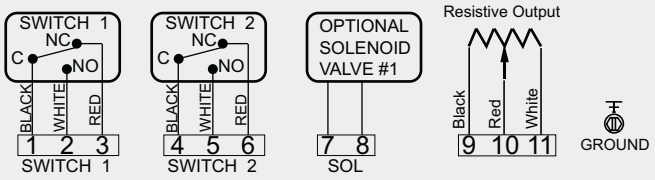
BACK



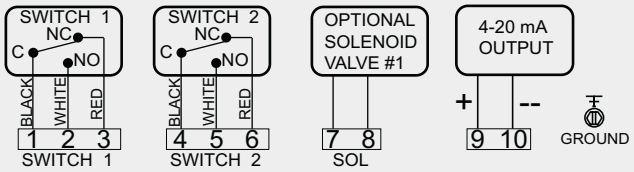
Resistive Output
0 - 1000 ohm
0 - 50 ohm



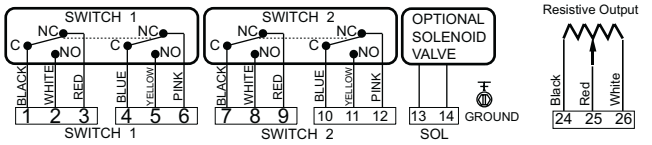
Current Output
4 - 20 mA



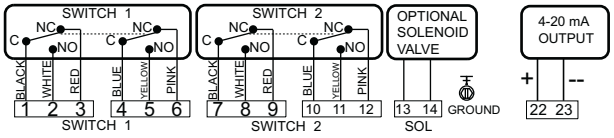
2 SPDT switches (Form C)
with Resistive Output
Cherry Mechanical
Tungsten TTL
Rhodium TTL



2 SPDT switches (Form C)
with Current Output
Cherry Mechanical
Tungsten TTL
Rhodium TTL



2 DPDT switches (Form ZZ)
with Resistive Output
ITW



2 DPDT switches (Form ZZ)
with Current Output
ITW

for additional wiring diagrams for products not listed here, please contact Moniteur

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BACK

NEMA Enclosure Ratings

Type 1 - General Purpose - Indoor
The enclosure prevents accidental contact of personnel with the enclosed equipment and against falling dirt.

Type 2 - Drip-Proof - Indoor
The enclosure protects against limited amounts of falling liquid and dirt

Type 3 - Dust-tight, rain-tight and sleet resistant
The enclosure protects against windblown dust, rain, sleet and external ice formation

Type 3R - Dust-tight, rain-tight and sleet resistant
Same as type 3 except not dust-tight

Type 3S - Dust-tight, rain-tight and sleet resistant
Same as type 3 but provides for operatioof external mechanism when ice-laden

Type 4 - Watertight and Dust-tight
The enclosure protects against windblown dust and rain, splashing water and hose directed water

Type 4X - Watertight, Dust-tight, Corrosion Resistant
Same as type 4 except also corrosion resistant

Type 5 - Dust-tight - Indoor
Protects against dust and falling dirt

Type 6 - Submersible, water-tight, and dust-tight
Protects against water entry during occasional submersion to a limited depth

Type 6P - Submersible, water-tight, and dust-tight
Same as Type 6 except for prolonged submersion

Type 7 - Class I, Indoor hazardous locations - Explosion-proof
May be classified Groups A, B, C or D depending on specific design as defined by the NEC

Type 8 - Class I, Indoor or outdoor hazardous locations - Oil-immesed equipment
May be classified Groups A, B, C or D depending on specific design as defined by the NEC

Type 9 - Class II, Indoor hazardous locations - Explosion-proof
May be classified Groups E, F or G depending on specific design as defined by the NEC

Type 10 - Mining Enforcement Safety Administration - Explosion-proof
For use in mines with atmospheres containing methane or natural gas, with or without coal dust

Type 11 - Corrosion resistant and drip-proof - Oil immersion - Indoor
Enclosure provides, by oil immersion, protection against the corrosive effects of liquids and gases

Type 12 - Dust-tight and Drip-tight - Indoor
Protects against dust, falling dirt, and dripping non-corrosive liquids

Type 12K - Dust-tight and Drip-tight - Indoor
Same as Type 12 except that enclosures have knockouts

Type 13 - Oil tight and Dust-tight - Indoor
Protects against dust, spraying of water, oil and non-corrosive coolant

NEMA

MONITEUR DEVICES INCORPORATED
36 Commerce Road, Cedar Grove, NJ 07009 Tel. (973) 857-1600 Fax (973) 857-7289
www.moniteurdevices.com

Moniteur

BACK

Clear EKTAR Cover

Moniteur Devices manufacturers its Moniteur clear covers from Eastman Kodak's Ektar grade of Copolyesters. Combined with its high chemical resistance and excellent impact strength, the Ektar clear cover provides the necessary protection from corrosive environments and caustic washdowns. With an extra tough construction, the cover resists horizontal and vertical impacts. Combined with an O-ring seal, the Moniteur is an excellent opponent to the elements and your plant environment.

PHYSICAL PROPERTIES

UV Resistance	**Yes**
Clarity	**Yes**
Tensile Strength	**6,400 psi**
Izod Impact Strength, Notched @73 F	**> 16**
Heat Deflection Temperature @264psi	**151 F**

Chemical Stability @ 23 C

REAGENT	OBSERVATION
Benzyl Alcohol	No Visible Effect
Chlorox Bleach, 5% Solution	No Visible Effect
Ethanol	No Visible Effect
Gasoline, regular	No Visible Effect
Heptane	No Visible Effect
Hydraulic Fluid	No Visible Effect
Methanol	No Visible Effect
Methyl Cellosolve	No Visible Effect
Methyl Isobutyl Carbinol	No Visible Effect
Motor Oil, 10-30 Wt.	No Visible Effect
Transmission Fluid	No Visible Effect
20% Sulfuric Acid	No Visible Effect
10% Sodium Hydroxide	No Visible Effect

Ektar is a registered trademark of Eastman Chemical
Chart provided courtesy of Eastman Chemical

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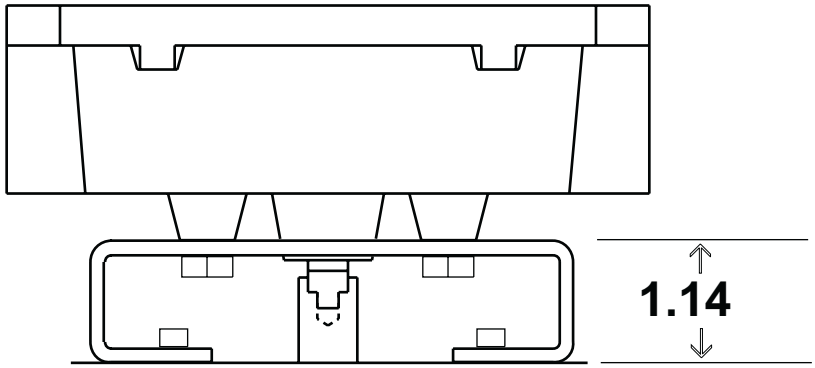
Direct Mounting To Namur Standard Actuators



The NAMUR standard

The process industry's requirement for interchangeable mounting hardware dimensions has been addressed with the NAMUR mounting specifications, developed by NAMUR (the Standards committee of Measurement and Control in Europe). These mounting specifications govern accessory and solenoid valve mounting procedures. More and more, actuators for automated valves are built to these NAMUR standards. This allows accessories such as limit switches, solenoid valves, and mounting hardware to mount to any NAMUR standard actuator. Moniteur Devices offers an output shaft for their complete line of VPTs designed to directly interface (without a transition coupler) with the NAMUR standard accessory mounting pattern *at no extra cost.*

Benefits

- Direct shaft to shaft contact, eliminating the need for a transition coupler
- Reduction of shaft play and backlash
- Lower profile of VPTs
- Standardization of mounting hardware
- Self-aligning design

Options

- A full range of bracket kits in plated and stainless steel, and engineered resin.
- Standard NAMUR output shaft length (1.77")

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Solenoid Section

D

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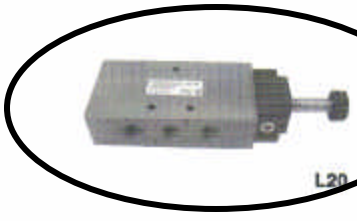
Phone: 905-845-4500
Fax: 905-845-4505

WEATHER-PROOF SOLENOID MODELS

L07



L20

SINGLE SOLENOID

L45

L65

DOUBLE SOLENOID

MODEL NUMBERS

SERIES	PORT SIZE	Cv (l/min)	5/2		5/3			BODY MATERIAL	SEAL MATERIAL	Kg (LB)
			SINGLE	DOUBLE	BLOCK	EXHAUST	PRESSURE			
L07	1/8	0.7 (690)	L0702AAWR*	L0702ABWW*	L0702CBWDW*	L0702DBWDW*	L0702EBWDW*	ALUMINUM	NBR	.3 (.6)
	1/4		L0703AAWR*	L0703ABWW*	L0703CBWDW*	L0703DBWDW*	L0703EBWDW*			
L20	1/4	1.8 (1770)	L2003AAWR*	L2003ABWW*	L2003CBWDW*	L2003DBWDW*	L2003EBWDW*	ALUMINUM	NBR	.5 (.9)
	3/8	2.0 (1970)	L2004AAWR*	L2004ABWW*	L2004CBWDW*	L2004DBWDW*	L2004EBWDW*			
L45	1/2	4.5 (4430)	L4505AAWR*	L4505ABWW*	L4505CBWDW*	L4505DBWDW*	L4505EBWDW*	ALUMINUM	NBR	.9 (1.9)
L65	3/4	9.0 (8860)	L6506BAWR*	L6506BBWW*	L6506CBWDW*	L6506DBWDW*	L6506EBWDW*	ALUMINUM	NBR	1.86 (4.1)
	1	9.5 (9360)	L6507BAWR*	L6507BBWW*	L6507CBWDW*	L6507DBWDW*	L6507EBWDW*			

*Coils sold separately. Refer to Electrical Section for selection.

BACK

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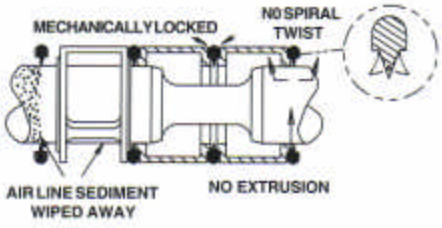
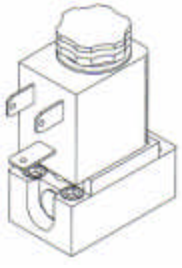
DESIGN FEATURES





VALVES

- Proven design with 10+ years OEM experience.
- Options available to meet your requirements: Nema 7, stainless steel, manual override configurations.

TAPERED TEE-SEAL ..... Eats Dirt

- Bi-directional tapered Tee-Seal flexes to clean spool. Eliminates Monday morning sticking problems.
- Tested tough and proven reliable according to SAE specifications: Rust and water injected every 864,000 cycles for 20 million cycles.

SOLENOID ... Guaranteed Against Burnout

- Three-way pilot uses full air line pressure to shift the valve.
- Pilot is internally supplied when the pressure at port 1 is 35 to 150 PSIG (240 to 1030 kPa).
- Coil is hermetically sealed as an integral watertight molded unit.
- Intrinsically-safe and explosion-proof versions available.

PRODUCTS CERTIFIED TO INCLUDE:

- CSA - (C22 NO. 139)
- UL - (STD 429)
- PTB - (EExmIIT5) (EExiaIICT6)
- CE - (73/23/EEC), (89/336/EEC)

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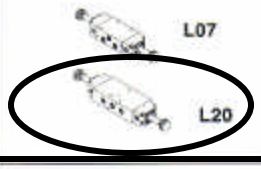
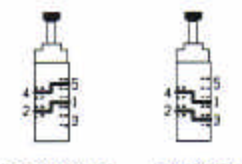
SPECIFICATIONS

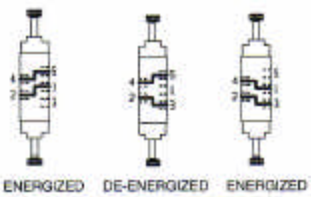
VALVE OPERATION



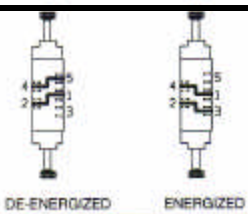
5/3 BLOCK - 4 way 3 position blocked center valves operate like 5/2 double valves except shift when a maintained signal is applied to either 1-2 or 1-4. Valves reset to center position when signal is removed with all ports blocked.



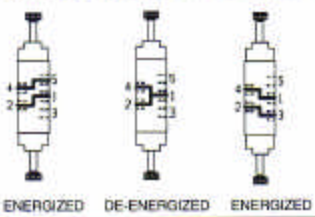
5/2 SINGLE - 4 way 2 position single operator valves shift, apply pressure from port 1 to 4, and exhaust pressure from port 2 to 3 when a maintained signal is applied to operator 1-4. Valves reset, apply pressure from port 1 to 2, exhaust pressure from port 4 to 5 when the signal is removed.



5/3 EXHAUST - 4 way 3 position exhaust center valves operate like 5/2 double valves except shift when a maintained signal is applied to either 1-2 or 1-4. Valves reset to center position when signal is removed with port 2 open to 3, port 4 open to 5, and port 1 blocked.



5/2 DOUBLE - 4 way 2 position double operator valves shift, apply pressure from port 1 to 4, and exhaust pressure from 2 to 3 when a momentary signal is applied to operator 1-4. Valves shift, apply presure from port 1 to 2, and exhaust pressure from 4 to 5 when a momentary signal is applied to operator 1-2.



5/3 PRESURE - 4 way 3 position pressure center valves operate like 5/2 double valves except shift when a maintained signal is applied to either 1-2 or 1-4. Valves reset to center position when signal is removed with port 1 open to ports 2 and 4, and ports 3 and 5 are blocked.

OPERATING TEMPERATURES	SOLENOID PILOT OPERATED	TREATED BUNA-N SEALS (TREATED NBR, Standard)	FLUOROELASTOMER SEALS (FKM, Option A)
	Standard	-30°C to +52°C (-20°F to +125°F)	-30°C to +52°C (-20°F to +125°F)
	High Temp Coil (Option T)	-30°C to +82°C (-20°F to +180°F)	-30°C to +82°C (-20°F to +180°F)

OPERATING PRESSURES	SOLENOID PILOT OPERATED	INLET PORT	EXTERNAL PILOT PORT
	Standard 2 Position	240 - 1030 kPa (35 - 150 PSIG)	Not Required
	Standard 3 Position	345 - 1030 kPa (50 - 150 PSIG)	Not Required
	External Pilot (Option B)	Vacuum - 240 kPa (Vacuum - 35 PSIG)	240 - 1030 kPa (35 - 150 PSIG)

FILTRATION AND LUBRICATION

Lubrication of Automatic Valve products is not required but is recommended to maximize service life. Oils should be compatible with seal material, have an ISO 32 viscosity, and have an aniline range of 82°C (180°F) and 99°C (210°F). Refer to Maintenance section of catalog for recommended lubricants.

Filter to 50 microns or better.
For temperatures below 40°F, air must be dry to prevent formation of ice.

MODEL NUMBER CHART

L20	0	3	C	B	Y	D	Y	-AA	A

SERIES	BODY TYPE	PORT SIZE		FUNCTION		BODY DESIGN		OPERATOR 1		CENTER OPERATOR		OPERATOR 2		VOLTAGE		OPTIONS	
L07	0	INLINE	2	1/8	A	4 WAY 2 POSITION	A	SINGLE	A	AIR PILOT	D	3 POSITION SPRING	A	AIR PILOT	AA	110/50, 120/60	A	FLUOROELASTOMER SEALS
			3	1/4	B	4 WAY 2 POSITION METAL	B	DOUBLE	F	HAND LEVER - LINE			C	3 POSITION SPRING MANUAL	AB	220/50, 240/60, 125VDC	B	EXTERNAL PILOT CONNECTION
L20			3	1/4	C	4 WAY 3 POSITION BLOCK			G	HAND LEVER - MANIFOLD			M	2 POSITON DETENT MANUAL	DA	22/50, 24/60, 12VDC	D	DUSTPROOF
			4	3/8					I	PALM BUTTON			N	3 POSITION DETENT MANUAL			S	STAINLESS STEEL BODY (L20-1/4"/L45 ONLY)
L45			5	1/2	D	4 WAY 3 POSITION EXHAUST			J	CAM			R	2 POSITON SPRING	DB	24VDC		
									K	FOOT PEDAL			V	INTRINSICALLY-SAFE SOLENOID	DBL	24VDC LOW WATT - (Y)		
L65			6	3/4	E	4 WAY 3 POSITION PRESSURE			L	FOOT TREADLE			W	WEATHER-PROOF SOLENOID				
			7	1					V	INTRINSICALLY-SAFE SOLENOID			Y	EXPLOSION-PROOF SOLENOID				
									W	WEATHER-PROOF SOLENOID								
									Y	EXPLOSION-PROOF SOLENOID								

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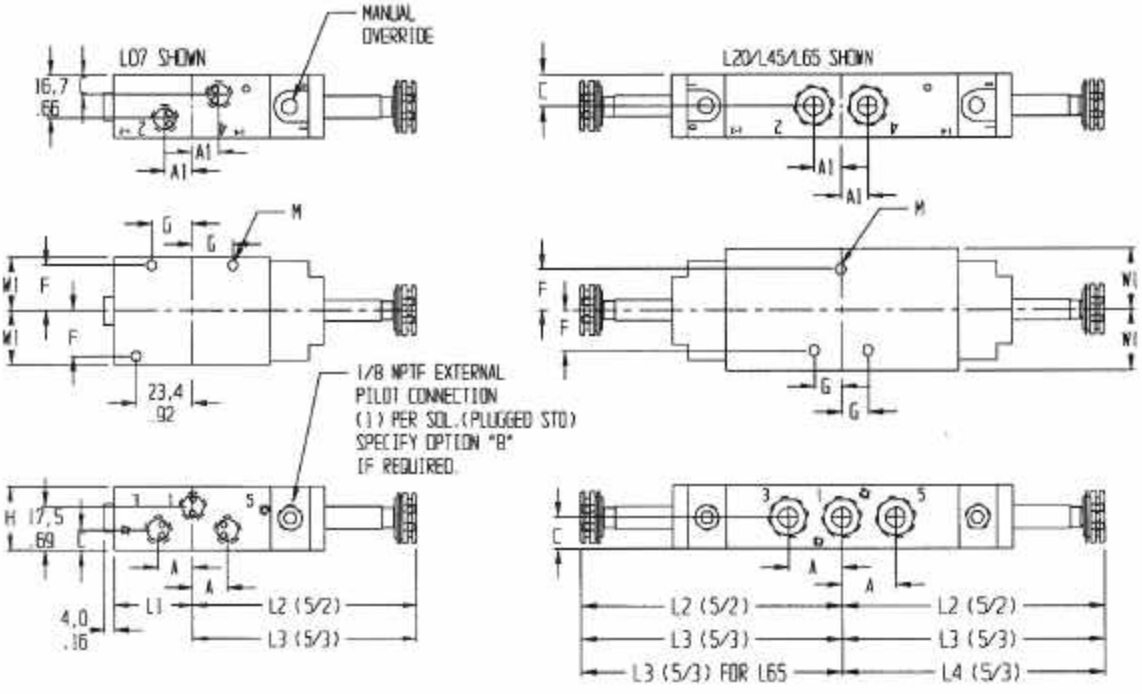
DIMENSIONAL INFORMATION



SERIES	A	A1	C	F	G	H	L1	L2	L3	L4	M	W1
L07	14,3 .56	7,9 .31	7,9 .31	18,3 .72	16,9 .66	25,4 1.00	32,3 1.27	92,7 3.65	92,7 3.65	-	4,0 .16	21,0 .83
L20	22,2 .88	11,1 .44	12,7 .50	16,1 .64	10,9 .43	25,4 1.00	48,2 1.90	108 4.25	108 4.25	-	4,4 .17	24,6 .97
L45	31,8 1.25	15,9 .63	15,9 .63	23,8 .94	15,1 .59	31,8 1.25	69,0 2.72	137 5.38	137 5.38	-	6,7 .27	31,8 1.25
L65	50,8 2.00	25,4 1.00	28,6 1.12	23,4 .92	25,4 1.00	57,2 2.25	117 4.61	175 6.88	175 6.88	219 8.63	9,14 .35	36,5 1.44

Units of Measure: Top - mm, Bottom - inches

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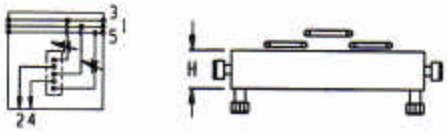
ACCESSORIES

SANDWICH FLOW CONTROL



SERIES	MODEL NUMBER	DIMENSION H	WGT Kg (LB)
L07	B7106-005	12,7 .50	.06 (.14)
L20	B8022-005	12,7 .50	.09 (.19)

Units of Measure: Top - mm, Bottom - inches

FEATURES

- Restricts air flow from port 2 to port 3 and from port 4 to port 5.
- Mounts between valve and sub-base or between valve and single pressure regulator.
- Vibration proof metering control.

OPTIONS

(LISTED AT THE END OF THE MODEL NUMBER IN ALPHA-NUMERIC ORDER)

A - FLUOROELASTOMER SEALS

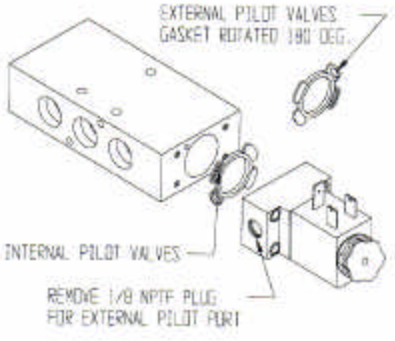
For applications where fluid media or ambient conditions are not compatible with nitrile seals. Note: Fluorocarbon seals do not increase the effective temperature range of the valve. For high temperature applications, consult the factory.

B - EXTERNAL PILOT

For solenoid applications when the pressure to port is less than 35 PSIG (2 BAR). See example below for field conversion.

FIELD CONVERSION

- Remove solenoid and cap from valve body.
- Rotate gasket 180 degrees so that the internal pilot hole in the valve body is covered by the gasket.
- Reassemble the gasket, cap and solenoid to the valve body. Make sure gasket completely covers internal pilot hole before tightening screws.
- Remove the 1/8 NPTF pipe plug from the cap and make the external pilot connection.



D - DUSTPROOF

For applications in extremely dusty and contaminated environments. Standard vent ports are plugged. Operators breathe through the exhaust ports via flats on the end of the spools.

S - STAINLESS STEEL

Stainless steel body, all other external parts corrosive resistant; for corrosive environment applications.

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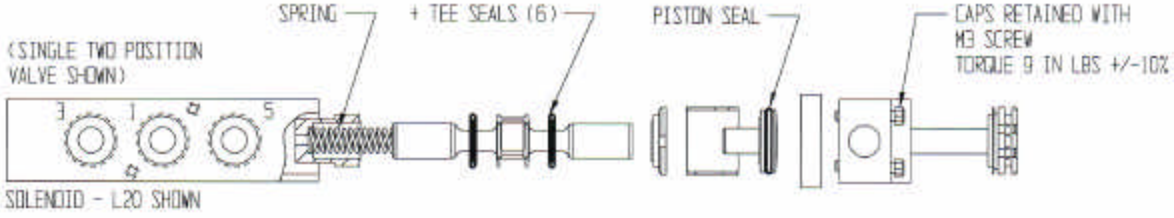
SERVICE KIT INFORMATION



+Lubrication of Automatic Valve products is not required but is recommeded to maximize service life. Oils should be compatible with seal material, have an ISO 32 or lighter viscosity, and have an aniline point between 82°C (180°F) and 99°C (210°F). Refer to Maintenance section of catalog for recommended lubricants.

MODEL NUMBERS

SERIES	FUNCTION			
	SINGLE		DOUBLE	
	PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
L07	K-L07-SGL K-L07-SGL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (1) Spring (1)	K-L07-DBL K-L07-DBL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (2)
L20	K-L20-SGL K-L20-SGL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (1) Spring (1)	K-L20-DBL K-L20-DBL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (2)
L45	K-L45-SGL K-L45-SGL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal Spring (1)	K-L45-DBL K-L45-DBL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (2)
L65	K-L65-SGL K-L65-SGL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (1) Spring (1)	K-L65-DBL K-L65-DBL-A (Fluoroelastomer)	Tee Seals (6) Piston Seal (2)

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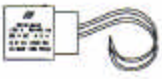
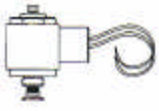
ELECTRICAL INFORMATION

DESCRIPTION		WHEN THE 8TH CHARACTER OF MODEL NUMBER IS:	INSTRUCTIONS	COIL PART NUMBER ** = VOLTAGE
NEMA 4X WITH DIN 43650 CONNECTION		W	Order coil separately (specify voltage code from below)	7019-9**
NEMA 4X WITH 18" LEADS		W	Order coil separately (specify voltage code from below)	7019-9**G
NEMA 4X 1/2" CONDUIT WITH 30" LEADS		W	Order coil separately (specify voltage code from below)	7019-9**C 7019-9**CT (high temperature 82°C maximum)
EXPLOSION-PROOF 1/2" CONDUIT WITH 24" LEADS [NEMA: 4, 4X, 7C, 7D, 9E, 9F & 9G. UL: CLASS I, DIV. 2 GROUPS A & B; CLASS I, DIV. 1, GROUPS C & D; CLASS II, DIV. 1, GROUPS E, F, & G; TEMP CODE T3C (160° C).]		Y	Coil included (for coil other than low wattage, specify voltage code from below)	A6848-**F A6848-DBLF (low wattage)
INTRINSICALLY-SAFE WITH STRAIN RELIEF (EEx ia IICT6)		V	Coil included (24VDC only)	A7106-374

VOLTAGE +/- 10 %	** CODE	CURRENT (AMPS) INRUSH W	INRUSH Y	INRUSH V	HOLDING W	HOLDING Y	HOLDING V	RESISTANCE (OHMS @ 20° C) W	RESISTANCE Y	RESISTANCE V	POWER (WATTS) W	POWER Y	POWER V
22/50 24/60	DA	.40	.55	-	.40	.32	-	31	19	-	4.8	6	-
110/50 120/60	AA	.08	.13	-	.06	.06	-	840	475	-	4.8	6	-
220/50 240/60	AB	.04	.05	-	.03	.03	-	3400	2000	-	6.0	6	-
12 VDC	DA	.40	-	-	.40	.60	-	31	19	-	4.8	7	-
24 VDC	DB	.20	-	.03	.20	.30	.03	121	75	275	4.8	7	2.1
24 VDC	DBL	-	-	-	-	.07	-	-	320	-	-	1.8	-
125 VDC	AB	.04	-	-	.04	.06	-	3400	2000	-	4.8	7	-

DIN 43650 CONNECTORS					
TYPE	Strain Relief Without Cord	1/2" Conduit Without Cord	Molded With 6' Cord	Strain Relief With Light: 100-240 AC 48-120 DC	Strain Relief With Light: 6-48 AC/DC
PART NUMBER	7020-001	7039-001	7020-006	7020-AA	7020-DB

DIN 43650 CONNECTORS	
TYPE	Strain Relief With Light + 6' Cord: 100-240 AC 48-120 DC / 6-48 AC/DC
PART NUMBER	A7094-006 / A7094-007

Filter/Regulator Section

E

BACK

ORDERING INFORMATION

MINIATURE

Ports NPTF	Automatic Drain Filt/Reg	Manual Drain Filt/Reg	Rated Air Flow SCFM (Liter/Sec)	Dimensions (max) Inches (cm) A	B	C	Depth	Std. Product Weight
1/8	CFDR55-1	CFR55-1	10 (4.70)					
	CFDR56-1	CFR56-1		1 5/8 (4.13)	3 5/8 (9.21)	2 9/16 (6.51)	1 5/8 (4.13)	7 oz .20 kg
1/4	CFDR55-2	CFR55-2	20 (9.40)					
	CFDR56-2	CFR56-2						

SENTRY MODULAR (Miniature)

No Port	CFDR10	CFR10	30 (14.15)	1 5/8 (4.13)	3 5/8 (9.21)	2 5/8 (6.67)	1 25/32 (4.52)	5 oz .15 kg
1/8	CFDR10-1	CFR10-1		3 (7.62)				8.5 oz .24 kg
1/4	CFDR10-2	CFR10-2						

Models below have instant fittings for tubing.

1/4	CFDR10-04	CFR10-04	30 (14.15)	3 (7.62)	3 5/8 (9.21)	2 5/8 (6.67)	1 25/32 (4.52)	8.2 oz .23 kg
3/8	CFDR10-06	CFR10-06						
4mm*	CFDR10-M4	CFR10-M4						
6mm	CFDR10-M6	CFR10-M6		3 1/2 (8.89)				
8mm*	CFDR10-M8	CFR10-M8						
10mm	CFDR10-M10	CFR10-M10						

*4mm=5/32 8mm=5/16. For diaphragm regulator substitute 11 for 10 in model number of Sentry Regulators.
Max. Temp. 125° F (51.7° C)

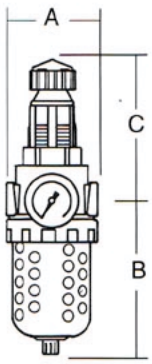
GUARDSMAN MODULAR (Intermediate Size)

1/4	CFDR60-2	CFR60-2	45 (21.24)	2 21/32 (6.75)	4 9/16 (11.58)	3 9/32 (8.33)	2 3/8 (6.03)	23 oz .65 kg
3/8	CFDR60-3	CFR60-3	65 (30.65)					
1/2	CFDR60-4	CFR60-4	75 (35.35)					

Max. Temp. 125° F (51.7° C)

VANGUARD MODULAR (Full Size)

1/4	CFDR100-2	CFR100-2	45 (21.24)					
3/8	CFDR100-3	CFR100-3	80 (37.75)	3 1/2 (8.89)	5 3/4 (14.60)	5 3/4 (14.60)	3 1/2 (8.89)	40 oz 1.15 kg.
1/2	CFDR100-4	CFR100-4	120 (56.63)					
3/4	CFDR100-6	CFR100-6	140 (66.07)					

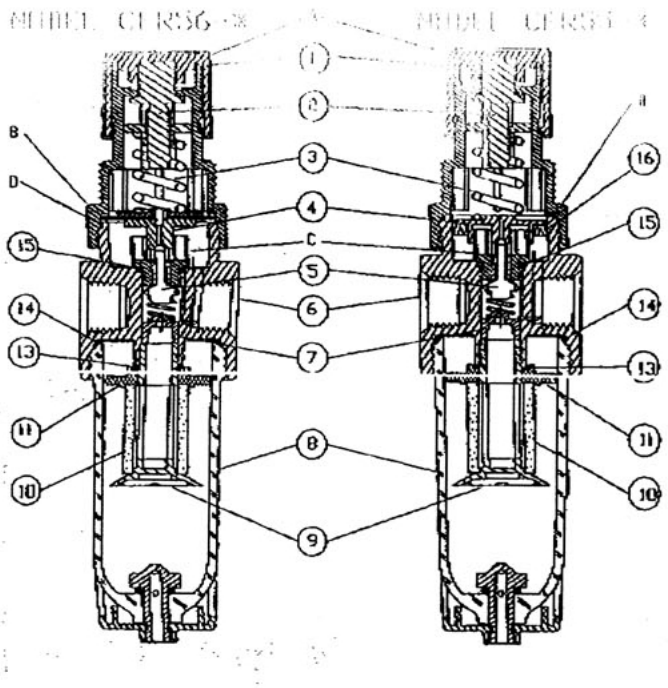


OPTIONS	Prefix	Suffix
Metal bowl (Vanguard thru 1" has sight gauge as std)	B	
5 Micrometer Filter Element (Sintered Bronze)		E5
20 Micrometer Filter Element (Sintered Bronze)		E4
40 Micrometer Filter Element (Sintered Bronze)		E3
Less Drain (1/4 NPT Female Port at Drain)		LDC
BSP (Whitworth threads)		W
Less Gauge		NG
No Gauge, No Port		NGG (Series CFDR55, 56 and 10)
No Port		NP (Series CFDR55, 56 and 10)

NOTES:

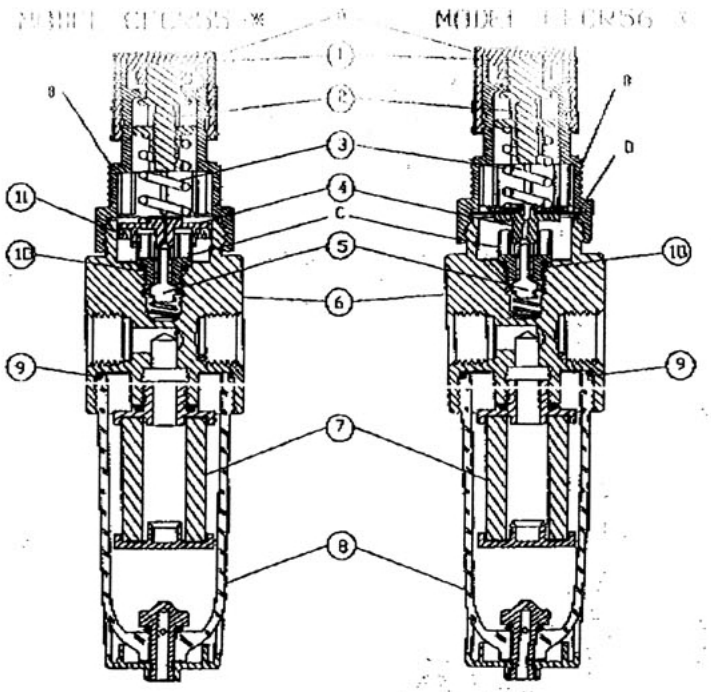
AIR FLOW RATINGS: 5 psi (.35 bar) pressure drop at 100 psi (6.9 bar) supply pressure.
OPERATING PRESSURES: 150 psi (10.3 bar) at 125° F (51.7° C) for plastic bowls.
200 psi (13.8 bar) at 175° F (79° C) for metal bowls.
Bowl guards standard for Guardsman and Vanguard products with plastic bowls.
See literature pages for other product options. Add suffix options in alphabetical order, starting with Filters, then Regulators.

BACK



KEY	DESCRIPTION	PART KIT, SALES ASSEMBLY CFCR56	CFCR56	CFCR56/CFCR96
1	DOME KIT	KA10R-02	KA10R-02	KA10R-02
2	ADJ. SCREW ASSEMBLY	A33-75	A33-75	A33-75
3	SPRING KIT	KV33-104	KV33-104	KV33-104
4	PISTON/DIAPHRAGM KIT	KA10R-07	KA10R-09	KA10R-09/KA10R-07
5	VALVE KIT	KAA33-09M	KAA33-09M	KAA33-09N
6	BODY	33-262-*	33-262-*	33-262-*
7	SPRING REST	10C-02	10C-02	10C-02
8	BOWL ASSEMBLY	PA10F-130	PA10F-130	PA10F0-130
9	STEM	10F-03	10F-03	10F-03
10	ELEMENT**	130-27	130-27	130-27
11	BAFFLE	10F-02	10F-02	10F-02
12	AUTOMATIC INT. DRAIN	———	———	050
13	O'RING	103-95	103-95	103-95
14	O'RING	KX406-23	KX406-23	KX406-23
15	O'RING	KV35-20	KV35-20	KV35-20
16	U-CUP	———	406-41	406-41

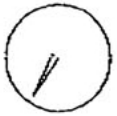
* = SPECIFY 1/8" OR 1/4" PIPE PORTS
** = ORDER KIT KA130-27 FOR CFR'S THAT HAVE A ONE PIECE ELEMENT ASSEMBLY. THESE ASSEMBLIES WERE USED IN CFR'S THAT WERE ORDERED BEFORE DECEMBER 1989.

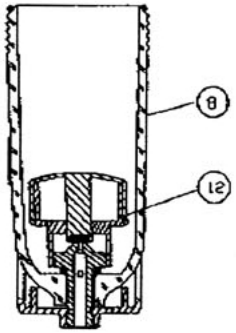


KEY	DESCRIPTION	PART KIT, SALES ASSEMBLY CFCR55	CFCR56
1	DOME KIT	KA10R-02	KA10R-02
2	ADJ. SCREW ASSEMBLY	A33-75	A33-75
3	SPRING KIT	KV33-104	KV33-104
4	DIAPHRAGM/PISTON ASS'Y	KA10R-08	KA10R-07
5	VALVE KIT	KAA33-09M	KAA33-09M
6	BODY	33-386-*	33-386-*
7	CARTRIDGE ASSEMBLY	A10F-09	A10F-09
8	BOWL ASSEMBLY	PA10F-130	PA10F-130
9	O'RING	KX406-23	KX406-23
10	O'RING	KV35-20	KV35-20
11	U-CUP	406-41	———
12	AUTOMATIC INT. DRAIN	———	———

* = SPECIFY 1/8" OR 1/4" PIPE PORTS

70MDD		60MDD		30MDD	
0-160 PSI	0-10.9 BAR	0-60 PSI	0-4 BAR	0-30 PSI	0-2 BAR





OPTIONS

PROFIX	DESCRIPTION
B	METAL BOWL

SUFFIX	DESCRIPTION
NG	NO GAGE PORTS
L	LIGHT SPRING 0-50 PSI (0-3.4 BAR) PART #33-104L
L15	LIGHT SPRING 0-15 PSI (0-1 BAR) PART #33-113
L30	LIGHT SPRING 0-30 PSI (0-2 BAR) PART #33-114
P	PANEL MOUNT W/ 7/8 HOLE REQUIRED. PANEL THICKNESS UP TO 0.32" PART #10R-26
W	BRITISH BSP THREADS
D	CONSTANT BLEED DRAIN FOR COALESCENT CFR'S

INSTALLATION:

Unit should be installed downstream of conventional 5 micrometer filter element to extend the life of the coalescent cartridge. The cartridge #7 should be replaced when the pressure differential across the cartridge reaches 8 to 10 psid (0.55 to 0.69 bar). The sump once should be drained when liquid level reaches the bottom of the cartridge or an automatic drain filter should be used.

Pressure regulators reduce the supply air pressure to the required operating pressure by spring #2 loading on diaphragm assembly #4 (or piston assembly). Reduced operating pressure is sensed by diaphragm (piston assembly), which opens and closes valve #5 to maintain set pressure with flow thru regulator. Overpressure is relieved when pressure on the diaphragm (piston assy) exceeds the spring loading on the diaphragm (piston assy).

ADJUSTMENT:

Clockwise turning of adjustment knob "A" will increase secondary pressure. Push down on adjusting knob to lock. If air supply is kept clean, regulator should provide long periods of uninterrupted service. Erratic operation or loss of regulation is usually due to dirt or a leaking seat.

MAINTENANCE:

Replace the cartridge assembly by shutting off the air pressure and removing the bowl assembly #8, and unscrewing the cartridge assembly #7. Be sure the o'ring is seated when the new cartridge assembly is installed. Cartridge should be installed hand tight.

REGULATOR REPAIR INSTRUCTIONS:

To repair regulator, shut off air supply, reduce spring load to zero by adjusting knob counterclockwise. The dome "D" can be removed by unscrewing it counterclockwise. The diaphragm (piston assy) can then be removed. The supply valve can be removed by unscrewing valve seat "C". If the regulator cannot be repaired by cleaning, the operating parts should be replaced. The valve seat should be torqued to 3-5 in-lbs. The clamping washer "D" should be between the diaphragm and the dome. The dome should be torqued to 40-50 in-lbs.

INSTALLATION:

Install unit as near as possible to the device it is to serve. Filters separate water and heavier solids by the centrifuging action of the baffle #11. Water and heavier solids are trapped in the bowl by stem #9. Solids too light to be removed by centrifugal force are retained by filter element #10. Water is discharged by automatic internal drain (AID) incorporated in the PA10FD-130 bowl assembly. The AID is operated whenever pressure fluctuations occur in the bowl assembly PA10FD-130. The manual drain assembly is operated by pushing up on the bottom of bowl assembly PA10F-130.

The regulator reduces supply air pressure to the required operating pressure by spring #3 loading on diaphragm assembly #4 (or piston assembly). Reduced operating pressure is sensed by diaphragm (piston assembly), which opens and closes valve #5. To maintain set pressure with flow thru the regulator, overpressure is relieved when pressure on the diaphragm (piston assy) exceeds the spring loading on the diaphragm (piston assy).

ADJUSTMENT:

Clockwise turning of adjustment knob "A" will increase secondary pressure. Push down on adjusting knob to lock. If air supply is kept clean, regulator should provide long periods of uninterrupted service. Erratic operation or loss of regulation is usually due to dirt or a leaking seat.

FILTER MAINTENANCE:

To clean or service the unit, shut off air pressure and disassemble unit. Remove bowl assembly #8 by turning counterclockwise. To remove the filter element #10, insert a screwdriver in the slot located at the bottom of stem #9. Turn stem counterclockwise until it is free of the body #6. Do not clean element in cleaning agents. Replacement is recommended. Plastic bowls may be cleaned with soap and water or kerosene.

To service the AID, disassemble and clean. Order D50 for replacement or order PA10F4-130 for new bowl assembly with AID installed.

REGULATOR REPAIR INSTRUCTIONS:

To repair regulator, shut off air supply, reduce spring load to zero by adjusting knob counterclockwise. The diaphragm (piston assy) can then be removed. The supply valve can be removed by unscrewing valve seat "C". If the regulator cannot be repaired by cleaning, the operating parts should be replaced. See parts list. When the regulator is reassembled, make sure all seals are correctly located. The u-cup #16 must be generously lubricated with Parker O'ring Lube upon reassembly. The valve seat should be torqued to 3-5 in-lbs. The clamping washer "D" should be between the diaphragm and the dome. The dome should be torqued to 40-50 in-lbs.

CAUTION:

Plastic bowls may deteriorate and fail if exposed to paint thinners and removers, certain degreasing fluids & synthetic cleaning solvents and chemicals such as: Acetone, Ethyl Acetate, Ethylene Dichloride, Ketones or any fluids which contain these chemicals. The bowls can be damaged by contact with Phosphate Ester or other synthetic lubricants.

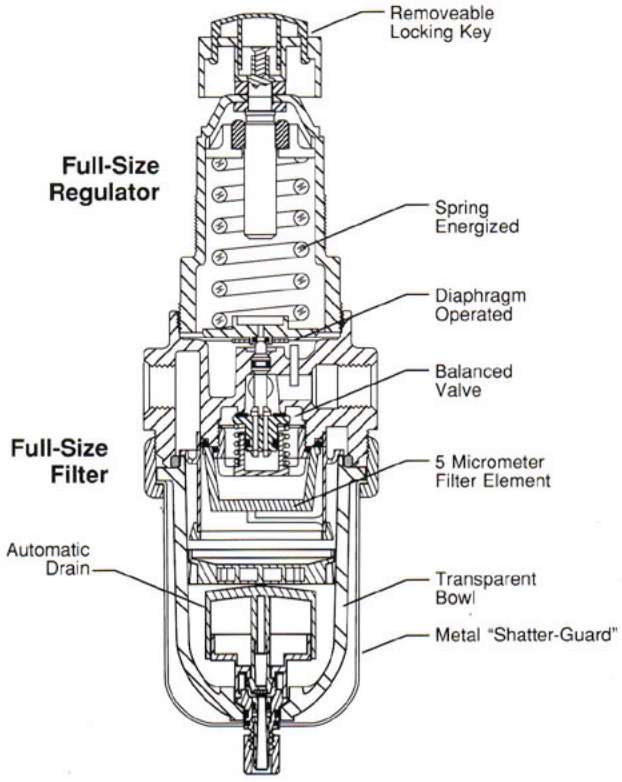
Use only original equipment o'rings in contact with bowl. Standard o'ring will cause bowl to crack.

TITLE	DRAWN BY	CK BY	SCALE	DWG NO
	NET 10/12/89		FULL	A781

BACK

INTEGRAL FILTER/REGULATORS
with Gauges

Vanguard Series CFDR100



INTEGRAL FILTER/REGULATORS

These units have essentially the same performance characteristics and features of individual filters and regulators, but provide economy of size and a lower cost.They are particularly useful where horizontal space is limited.

Reliable, internal, automatic drains are available for all sizes and series. Gauge and two regulator gauge ports are standard. Self-relieving regulators are standard; non-relieving models are optional.

Other options include regulating springs for various pressure ranges, metal bowls, mounting brackets, optional filter elements and BSP (British Whitworth) pipe threads.

VANGUARD Series

M/P's *Full-Size* models are available in 1/4" through 3/4" pipe sizes. Filters are available with either the recommended internal, or external, Hydro-Jector drains. Regulators are diaphragm operated. Locking key adjustment is standard. All sizes may be modularly connected to lubricators, or other components.

GUARDSMAN Series

Intermediate-Size units provide high-capacity performance at lower cost. Regulators are piston operated. Combination is available with 1/4", 3/8" and 1/2" pipe threads. Also suitable for modular connectors.

SENTRY Modular Miniature Series

Modular styling. Molded from corrosion-resistant materials. Filter has excellent water removal capability. Available with either piston or diaphragm regulator. Pipe threads are 1/8" or 1/4". Also available with a choice of six sizes of instant tube fittings.

MINIATURE Series

Built to the same performance standards as the Sentry Series, but non-modular and lower in cost. Pipe sizes are 1/8" and 1/4".

Repair Section

F

Zenon STJ-Z-4216 Cyclic Valve
Repair Instructions

Operation Instruction Maintenance Manual
Metal Seated / Resilient Seated Damper Valves

General: Please read all these instructions prior to proceeding with disassembly. These instructions refer to 3D Parts Breakdown and general arrangement drawing No. STJZ-WA-4216-3-6-3-R for all sizes.

Disassembly

Electrical: Disconnect the DIN connector from the coil. **DO NOT remove the coil from the solenoid post while energized. This will burn out the coil.**

With the DIN connector removed, check if the valve has failed open or closed. The valve must be in the closed position for removal if the valve has failed open, use the solenoid manual override button to close the valve. Depress the red override on the solenoid and rotate clockwise to lock into position.

Once the disc is closed and override locked, shut off the air and remove the air supply. (Double acting units only)

With the electrical and air supply removed, remove the actuator. Ensure the shaft adapter remains in the actuator bore or on the valve shaft.

Shaft Removal and Seat Replacement: To remove the seat, Item No. 13 from the base of the valve, remove cap Part No. 15 from the valve shaft end. From the shaft end pull the shaft from the valve Part No. 12. Push the disc through the seat. Remove the seat from the tongue & grove body. NOTE: THE LARGER SEAT HOLE IS AT THE TOP OF THE BODY.

Bearings & Seals: Remove the chevron packing from the upper and lower journals. Follow shaft removal instructions in seat replacement above for seat removal. With the shaft removed, remove the upper and lower shaft bearings Part No. 4. Pull out the Delrin Bearings in the top & bottom shaft journals Part No. 7. Bearings can be replaced without valve removal. Remove the actuator mounting plate and c-clip base cover plate part No. 2 and the upper and lower bearings.

Valve Assembly: Clean the body and shaft journals of any foreign debris. Hold the new seat with the larger hole facing the actuator-mounting flange. Fold the seat in half and insert into the body with the smaller hole at the bottom of the body.

Ensure the seat fits into the tongue & grove on both sides. Line up the upper and lower shaft hole with the seat and body and ensure the larger seat hole is closest to the actuator-mounting flange.

Zenon STJ-Z-4216 Cyclic Valve

Repair Instructions

Lubricate the primary seat flats of the seat lightly with water. Insert the disc into the seat (ensure the double-D drive is facing the bottom of the valve). Line up the disc holes with the seat and body journal holes. Insert the new v-type packing and Delrin bearings into the upper and lower journal. The **smaller** Delrin bushing and packing must be assembled in the lower valve journal.

Carefully insert the smaller diameter of the shaft into the top of the valve and through the disc. The parallel flats line up with the internal drive of the disc. With the shaft in place, insert the roller bearings. Replace the retaining clip part No. 3 on the shaft end for shaft retention. Replace the lower journal retaining thrust plate.

Place the disc inside the valve body. Do not fully close the disc in the seat. When mounting between flanges, the disc should be located just inside the face to face the body for flange insertion clearance.

Place the valve between the flanges. Open the valve disc and check for pipe clearance. Leave the disc in the open position. During the tightening of the flange bolts, install the actuator with the disc and actuator in the open position. Attach the airline then the solenoid DIN connector.

Check all fittings and hardware. Cycle the valve to ensure the actuator mounting plate is secure and does not rotate.

STJ-Z-4216 Zenon Cyclic Valve

Appendix A - Available Spare Parts

Model #STJZ-4216 c/w Valbia DA-063, DA-075 or DA-115

Recommended Spare Parts Information

Description	Item No.	Part No.	Recommended		Included in Kit	
			Yes	No	Yes	No
Valve Parts (only)	**Isometric Dwg No.**					
Valve Seat	13	STJZ-SE013-**##**-EP	●		●	
Valve Disc	14	STJZ-DI014-**##**-SS		●		●
Valve Shaft	1	STJZ-SH001-**##**-SS		●		●
Valve Roller Bearing	4	STJZ-BE004-**##**-SS		●		●
Valve Chevron Packing	8	STJZ-CP008-**##**-		●		●
Valve Delrin/Seal	7	STJZ-DB007-**##**-DE		●		●
Valve Shaft Clip	3	STJZ-CC003-**##**-SS		●		●
Spare Parts						
Section A - Spare Valve Assembly						
Wafer Style	Size					
Valve - Wafer Style, Alum	3	STJZ-WA03-4216-3-6-3		●		●
Valve - Wafer Style, Alum	4	STJZ-WA04-4216-3-6-3		●		●
Valve - Wafer Style, Alum	5	STJZ-WA05-4216-3-6-3		●		●
Valve - Wafer Style, Alum	6	STJZ-WA06-4216-3-6-3		●		●
Valve - Wafer Style, Alum	8	STJZ-WA08-4216-3-6-3		●		●
Valve - Wafer Style, Alum	10	STJZ-WA10-4216-3-6-3		●		●
Valve - Wafer Style, Alum	12	STJZ-WA12-4216-3-6-3		●		●
Flange Style						
Valve - Flange Style, Alum	3	STJZ-FA03-4216-3-6-3		●		●
Valve - Flange Style, Alum	4	STJZ-FA04-4216-3-6-3		●		●
Valve - Flange Style, Alum	5	STJZ-FA05-4216-3-6-3		●		●
Valve - Flange Style, Alum	6	STJZ-FA06-4216-3-6-3		●		●
Valve - Flange Style, Alum	8	STJZ-FA08-4216-3-6-3		●		●
Valve - Flange Style, Alum	10	STJZ-FA10-4216-3-6-3		●		●
Valve - Flange Style, Alum	12	STJZ-FA12-4216-3-6-3		●		●
Section B - Actuator parts						
O Ring, seal kit & piston guide		STJZ-V###-SK	●		●	
Spare Actuator						
Double Acting Act.	for Valves 3"-5"	DA-063		●		●
Double Acting Act.	for Valves 6" & 8"	DA-075		●		●
Double Acting Act.	for Valves 10" & 12"	DA-115		●		●

See Pricing Sheets Separately - Appendix B

STJ-Z-4216 Zenon Cyclic Valve

Appendix A - Available Spare Parts

Model #STJZ-4216 c/w Valbia DA-063, DA-075 or DA-115

Recommended Spare Parts Information

Description	Item No.	Part No.	Recommended		Included in Kit	
			Yes	No	Yes	No
Section C - Switch Box						
Clear Cover		MONITEUR-COVER		●		●
Indicator		MONITEUR-BY		●		●
Switches Rhodium TTL		RHODIUM-TTL		●		●
Complete Limit Switch Box		FSYB-5T20		●		●
Section D - Solenoid						
Coil		7919-9AA		●		●
Block		L2003AAWRAA-BLOCK		●		●
Spool & Tee Seals		KL20-SGL / KL20-SGLA (Fluoroelastomer)		●		●
Din Connector		7039-001		●		●
Complete Solenoid Ass.		L2003AAWRAA		●		●
Section E - Filter/Regulator *						
Mini Filter/Regulator Combo		STJZ-CFR55-2		●		●
Gauge		STJZ-70MDD		●		●

* Replace Complete Filter/Regulator assembly or Gauge only, no spare parts available.

See Pricing Sheets Separately - Appendix B