AQ Matic

AQ Matic

Finding Solutions
Building Partnerships

AquaMatic Control Valves have worldwide recognition for high-quality and value in the water treatment and air movement markets. A low initial purchase price and lower cost of operation during the life of the product increases the real value of the product.

The AquaMatic products are industry-proven and AQ Matic is committed to supplying the same genuine product provided by its predecessors. The AquaMatic product line has the reputation for durability and low life-cycle costs. AQ Matic's dedicated team of professionals provide after-market service and support, which is unparalleled in the industry. Additionally, our valves are simple to maintain, and easily serviced by your maintenance staff.

AquaMatic products are effective in a diverse array of applications. For instance, AQ Matic manufactures the valves, stagers, and controls that comprise water softener equipment, which is used to protect industrial boilers from scale build-up. Similarly, AQ Matic valves are used in Heatless Regenerative Air Driers to protect manufacturing facilities around the world from corrosion in pneumatic equipment.

Our deep-rooted commitment to customer satisfaction has resulted in numerous long-term relationships. We take pride in helping our customers succeed as their operations expand and diversify. We are continuously improving quality systems and procedures to ensure that AquaMatic valves and controllers are manufactured to the highest of quality standards.

AQ MATIC CAST IRON VALVES

V42 & VAV Series

AQ Matic V42 Series valves are constructed of cast iron or brass and designed for water applications. VAV Series valves are constructed of cast iron and designed for air applications. A separate control chamber protects the diaphragm from line fluid and extends cycle life. Reinforced diaphragm of Buna N or Viton* materials are pre-formed and stress relieved to maximize responsiveness and product life. The valve is highly serviceable even while in line. A variety of options are available such as spring-assist open, spring-assist closed, flow control limit stop, normally closed, poppet position indicator, and high temperature ethylene propylene or Viton* seals.

Operating Specifications

Pipe Size Inches	Pipe Size Millimeter	End Connectors (Female Thread)	Water Valve Model	Air Valve Model	Cv[1]	Kv[2]
3/4	20	NPT, BSPT	V42B	VAVB	11.4	9.8
1	25	NPT, BSPT	V42C	VAVC	12.8	11.1
1-1/4	32	NPT, BSPT	V42D	VAVD	26.5	22.9
1-1/2	40	NPT, BSPT	V42E	VAVE	32.5	28.1
2	50	NPT, BSPT	V42F	VAVF	56.0	48.4
2	50	NPT, BSPT	V42G	VAVG	68.0	58.8
2-1/2	65	NPT, BSPT	V42H	VAVH	84.0	72.7
3	80	NPT, BSPT	V42J	VAVJ	134	116
3	80	Flanged	V42J	VAVJ	134	116
4	100	Flanged	V42K	VAVK	275	238
6	150	Flanged	V42L	N/A	680	588

AQ MATIC STAINLESS STEEL VALVES

V46 Series

AQ Matic V46 Valves have the same operational characteristics and are constructed of 316 Stainless Steel material. These valves are available from 1 to 2-inch sizes, with either threaded or flanged ends. Flanged valves are rated for 150 psi (10 bar) and threaded valves are rated for 250 psi (17 bar). With all stainless steel internals and no internal threads, this series is ideal for corrosion resistant applications.

Operating Specifications

Pipe Size Inches	Pipe Size Millimeter, DN	Valve Model	Cv[1]	Kv[2]
1	25	V46C	14	12.1
1-1/2	40	V42E	33	28.5
2	50	V46F	54	47

*Viton® is a registered trademark of E.I. du Pont de Nemours and Company.

Cv[1] - Flowrate (Gal./Min.) of water at 60^0 F. at 1 P.S.I. pressure drop
Kv[2] - Flowrate (CU. $M.^3$/HR) of water at 15.5^0 C. at 1 BAR pressure drop

AQ MATIC STAGERS & EJECTORS

AQ Matic Stager Valves

AQ Matic Stager Valves are rotary valves with multiple ports for directing fluid flows to operate various diaphragm valves installed in a process system. AQ Matic stager internal parts are constructed of durable, non-corroding, self-lubricating materials for long, maintenance-free life.

Operating Specifications

Model Number	Body Material	Number of Ports	Typical Applications
48	Brass	6	Filters and Softners
51	Brass	8	Complex softner systems and sequential filter systems
58	PVC	16	Twin alternating systems and de-ionizers

AQ Matic Fluid Handling Products

AQ Matic 540 Series PVC Ejectors are available in 1/2 through 2-inch sizes with female NPT threads or female socket ends for US pipe. Specific applications are brine draw, acid draw, or caustic draw. This economical ejector is engineered to draw two parts of regenerant fluid for each three parts of water

Operating Specifications

Pipe Size Inches	Model Number
1/2	540
3/4	541
1	542
1-1/2	544
2	546

K53 Series

AQ Matic K53 Series Valves are designed for controlling the flow of most fluids including deionized water, salt solutions, and corrosive fluids such as acids and caustics. The rugged construction employs strong corrosion-resistant, glass-filled thermoplastic components. The Y-pattern design permits high flow with low pressure drop. Separate flow and control chambers provide positive closing without springs. Dual O-ring design and the cap is easily removed for maintenance purposes. True union end design with female socket weld connections provides easy installation and servicing.

Operating Specifications

Pipe Size Inches	Pipe Size Millimeter, DN	Valve Model	Cv[1]	Kv[2]
1	25	K531	18.0	15.6
1-1/2	40	K534	46.0	39.8
2	50	K535	84.0	72.6
3	80	K537	200.0	173.0

K52 & K55 Series

AQ Matic K52 and K55 Series Valves provide the time proven advantages of the Y-pattern design for pipe sizes from 1/2 through 3-inches. The body and cap are molded in strong, glass-filled thermoplastic and the diaphragm is made of durable Buna N or Viton* materials. Various pipe end connections are available for your system design. Other AQ Matic Composite valve options include spring-assist open, spring-assist close, flow control limit stop, poppet position indicator, Viton* seals, butyl seals, and normally closed. K55 Series include an isolated bonnet feature which physically seperates the flow and control chambers. The K55 Series Valves also offer a fail-safe spring closed option.

Operating Specifications

Pipe Size Inches	Pipe Size Millimeter, DN	K52 Valve Model	K55 Valve Model	Cv[1]	Kv[2]
1/2	15	K520	K550	4.0	3.5
1	25	K521	K551	15.0	13.0
1-1/2 – 2	40 – 50	K524	K554	38.0	32.8
2-1/2 – 3	65 – 80	K526	N/A	100.0	86.5

K52

K55

962 Stager Controls

AQ Matic 962 Stager Controls combine an AQ Matic stager with an electronic control, mounted and pre-wired in a NEMA-rated enclosure

962 Series Controls provide sophisticated, demand-based water conditioning. Time-based and/or external signal initiation is also available as a standard feature. This fully programmable series of controls provide the ability to fine-tune operations to meet the application requirements.

Operating Specifications

Controls	Model Number	Description
Single Unit Controls Typical Softners and Filters	E948	962 Control w/model 48, 6-port stager
More Complex Softners and Filters	E951	962 Control w/model 51, 8-port stager
Multiple Unit Controls Twin-Alternating Softners and Filters (w/Timed Brine Switch Output)	E958-TB	962 Control w/model 58-TB, 16-port stager
Twin-Alternating Softners	E958-TA	962 Control w/model 58-TA 16-port stager
Sequential Filters (Backwash Only)	E948	962 Control w/model 48, 6-port stager
2-Unit Sequential Filters (Backwash & Rinse)	E951	962 Control w/model 51, 8-port stager
3- or 4-Unit Sequential Filters	E958	962 Control w/model 58, 16-port stager

NXT Stager Controls

AQ Matic NXT Stager Controls feature full function programming with the capability to link multiple stagers. Options include 3-way universal solenoid valve pre-installed and auxiliary micro switch cam with signal in service or backwash.

Operating Specifications

System #	System Description	Stagers	Type
4	Single Unit	1	Time Clock: No Meter, Immediate: One Meter, Delayed: One Meter, Remote: No Meter
5	Interlocked	2,3,4	Immediate: All Meters, Remote: No Meter
6	Series	2,3,4	Immediate: One Meter, Delayed: One Meter, Remote: No Meter,
7	Alternating	2	Immediate: One Meter, Remote: No Meter
9	Alternating	2,3,4	Immediate: All Meters, Remote: No Meter
14	Demand Flow	2,3,4	Immediate: All Meters

Easy Nest Kits

The AQ Matic Easy Nest Kit outperforms large multiport valves in many ways: greater application flexibility, improved flow rate performance, and significant cost savings. AQ Matic makes it easy to specify, quote, and build a superior system. Our Easy Nest Kits simplify a valve nest down to only two part numbers (valving and stager controller). Now all you need to do is determine the tank size, flowrate, and piping size. At the heart of the system is the industry-proven AquaMatic Diaphragm Valve, first introduced over 45 years ago.

Open the door to a whole new spectrum of tank sizes you may have never tried before. AQ Matic Valves and Easy Nest Kits give you opportunity to seek new business that will result in a new level of success.

Performance Range (Single Tank Systems)

Service Flow Rates	80 to 1300 gpm (18 to 295 m^3/h) per tank
Backwash Flow Rates (Softners)	35 to 392 gpm (8 to 89 m^3/h)
Backwash Flow Rates Filters	35 to 1200 gpm (18 to 272 m^3/h)
Sytem Sizes	36" to 120" Diameter Tanks

AQ MATIC Easy Nest Kits

Configurations

Systems

Single Tank Softners	4 Position
Multi-Tank Softners	2, 3, and 4 Tank, Parallel; 2 Tank Alternating Softners
SIngle Tank Filters	3 Positions
Multi-Tank Filters	2, 3, and 4 Tank, Sequential

Controls

Electronic	Demand and TIme Clock (Battery Back-up)
Programmable Regeneration Range	0 - 255 Minutes Regeneration (Each Cycle)
Stager Valves	6, 8, and 16 ports

Piping

Valve Body (Cast Iron)	3/4"- 3" Female Thread NPT, BSP, JIS; 3"- 6" Flanged
Valve Body (Noryl - Plastic)	1"-3" Union, Female Solvent Weld; 2"-3" Female Solvent Weld or Flange
Injectors	1/2"-2" Female NPT Thread, Solvent Weld
Stager Tubing	1/4" Poly Tubing

Operating Specifications

Valve Body	Cast Iron or Glass-filled Noryl
Diaphragm	Buna N/Polyamide
Injector	PVC
Control Enclosures (Electronic)	NEMA 4X Fiberglass
Operating Pressure	20 to 120 psi (1.38 to 8.27 bar)
Operating Temperature	35^0 to 120^0F (2^0 to 38^0C)
Operating Voltages	115v, 50/60 Hz 220v 50/60 Hz

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1018192 REV F MAY17

AQUAMATIC®

METAL DIAPHRAGM VALVES

VERSATILE DESIGN FOR A WIDE VARIETY OF APPLICATIONS

MADE IN THE USA OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

The unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

Larger diaphragm area compared to seat area permits drip-tight closing without any springs

All components can be serviced while the valve is in-line

Separate flow and control chambers permit positive closing without springs

Adaptable to a wide variety of control devices

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Cast iron, brass, stainless steel and nitrile elastomer components, for an unparalleled service

Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators, which minimizes initial investment and maintenance costs

3/4"- 3" threaded [NPT or BSP]

3"- 4" flange drilled in accordance with ASA16.1 class 125, or BSP4504

Handles liquid and gases

OPTIONS

Spring-assist closed

Spring-assist open

Flow Control Limit Stop

Position indicator

Seal and diaphragm materials for special applications†

TYPICAL APPLICATIONS

Agricultural Irrigation

Air Control Systems

Air Dryers

Car Wash Systems

Centrifugal Separators

Cooling Towers

Dust Suppression

Fuel Handling

Laundry Equipment

Level Control Systems

Hydraulic Machinery

Nitrogen Handling

Plastic Molding

Process Water Systems

Pump Controls

Sand Blasting

Street Cleaning Vehicles

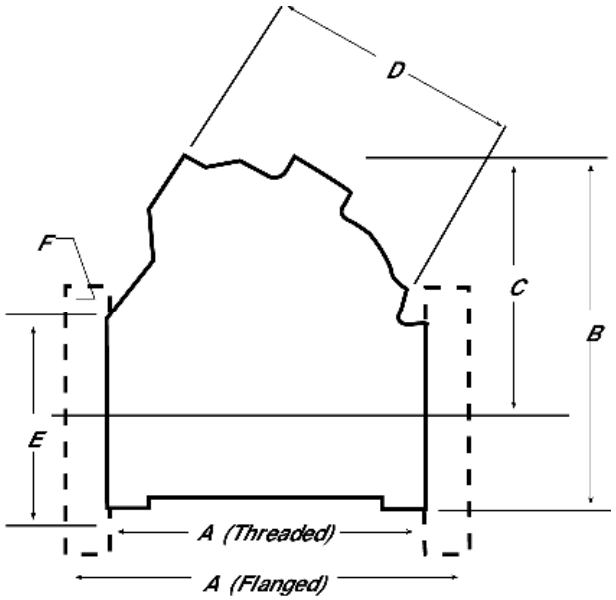
Vacuum Control Systems

IAPMO R&T ® Certified by IAPMO R&T to NSF/ANSI 61 and NSF/ANSI 372 for lead free compliance.

DIMENSIONS

MODEL #		ENDS	PIPE SIZE	Cv*	DIMENSIONS (APPROXIMATE)					
420 SERIES	VAV SERIES				A	B	C	D	E[1]	F[2]
V42B	VAVB	Threaded	3/4"	11.4	3.69" (94 mm)	4.25" (108 mm)	3.75" (95 mm)	2.75" (70 mm)	–	–
V42C	VAVC	Threaded	1"	12.8	3.69" (94 mm)	4.25" (108 mm)	3.75" (95 mm)	2.75" (70 mm)	–	–
V42D	N/A	Threaded	1-1/4"	26.5	4.75" (121 mm)	5.37" (137 mm)	4.00" (102 mm)	3.50" (89 mm)	–	–
V42E	VAVE	Threaded	1-1/2"	32.5	4.75" (121 mm)	5.37" (137 mm)	4.00" (102 mm)	3.50" (89 mm)	–	–
V42F	VAVF	Threaded	2"	56	6.62" (168 mm)	7.25" (184 mm)	5.37" (137 mm)	4.87" (124 mm)	–	–
V42G	VAVG	Threaded	2"	68	7.37" (187 mm)	8.00" (203 mm)	5.75" (146 mm)	5.50" (140 mm)	–	–
V42H	VAVH	Threaded	2-1/2"	84	7.37" (187 mm)	8.00" (203 mm)	5.75" (146 mm)	5.50" (140 mm)	–	–
V42J	VAVJ	Threaded	3"	134	9.00" (229 mm)	9.75" (248 mm)	6.75" (171 mm)	7.25" (184 mm)	–	–
V42J	VAVJ	Flanged	3"	134	10.62" (270 mm)	10.75" (273 mm)	7.00" (178 mm)	7.25" (184 mm)	6.00" (152 mm)	0.75" (19 mm)
V42K	VAVK	Flanged	4"	275	11.75" (298 mm)	14.75" (375 mm)	10.00" (254 mm)	8.75" (222 mm)	7.50" (191 mm)	0.75" (19 mm)
V42L	N/A	Flanged	6"	680	17.00" (432 mm)	19.00" (483 mm)	13.50" (343 mm)	15.75" (402 mm)	9.50" (241 mm)	0.87" (22 mm)

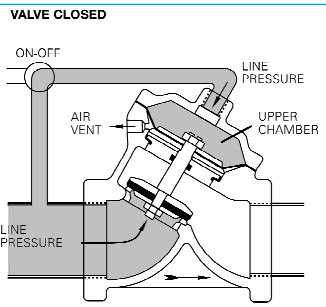
*Cv = Flow rate in gpm of water at 60°F @ 1psi pressure drop
(1) Bolt circle diameter for ASTM flange [ISO/Metric flanges also available]
(2) Bolt hole diameter for ASTM flange [ISO/Metric flanges also available]



PRINCIPLES OF OPERATION

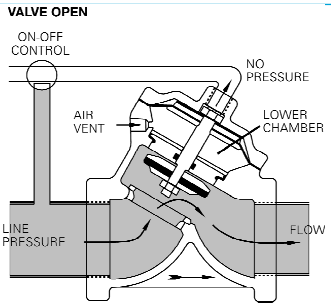
DRIP-TIGHT CLOSING

Closure is obtained by directing line pressure or equivalent independent pressure into the upper chamber. This pressure on the large diaphragm area causes thevalvedisctoseal against theseat.



FULL OPEN OPERATION

When the closing pressure in the upper chamberisrelieved by ventingthepilotline,the valve opens positively, by linepressure onthedisc.

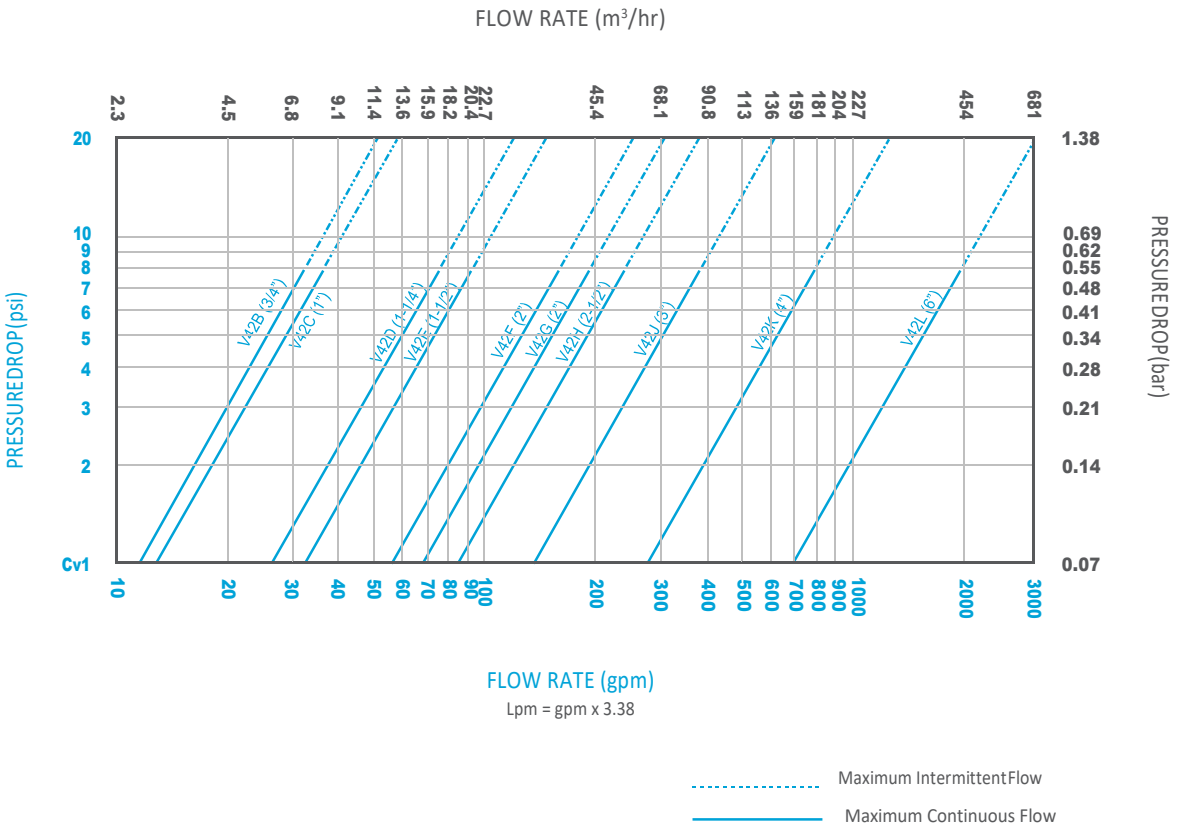


OPERATING SPECIFICATIONS

MaxPressure	125 psi (8.6 bar)
MaxTemperature†	140°F (60°C)
	250°F (120°C) (optional)

†IAPMO R&T NSF/ANSI 61 and NSF/ANSI 372 certifications are limited to restrictions below.
Other options were not tested for certification:
Cold water applications below 73°F (23°C).
Normally Open valves.
Buna-N seal material (seal option #0).

PERFORMANCE DATA



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V42 SERIES METAL DIAPHRAGM VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** V 4 2 - - -

PIPE SIZE (B thru L std)

B = 3/4" (20mm)	G = 2" (50mm - V426)
C = 1" (25mm)	H = 2-1/2" (63mm)
D = 1-1/4" (32mm)	J = 3" (75 or 80mm)
E = 1-1/2" (40mm)	K = 4" (100mm)
F = 2" (50mm - V425)	L = 6" (150mm)

BODY SIZE (ref only)

1 = 1"	7 = 3"
4 = 1-1/2"	8 = 4"
5 = 2"	9 = 6"
6 = 2-1/2"	

END CONNECTIONS (0 std for V421, V424, V425, V426 & V427; 3 std for V428 & V429)
(BSP threads not available on Brass valves)

0 = Female N.P.T.
1 = Female B.S.P.T. (Tapered)
3 = Flanged, A.S.T.M.
4 = Flanged, I.S.O. (Not valid on V429 valves)
5 = Grooved Per ANSI/AWWA C606 (see note 4)

BODY & CAP MATERIAL (0 std [opt 1 not available with flanged bodies])

0 = Cast Iron - RED primer
1 = Cast Brass
D = Cast Iron - painted BLUE

VALVE OPTIONS (00 std [SAO not available on V429]; [NC not valid with solenoid or float configurations])

00 = NO	11 = NO, LS, SAO	30 = NC
01 = NO, SAO	21 = NO, PI, SAO	32 = NC, SAC
02 = NO, SAC		40 = NC, LS
10 = NO, LS		SX = Special Valve **

SEAL MATERIALS (0 std) (Option 5 not valid for NC valves or solenoid EO or EC valves)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEALS	STATIC SEALS	KIT SERIES	Max Temp
0	Buna-N	Buna-N	Buna-N	Buna-N	RA	150° (65°C)
1	Buna-N	EP	EP	EP	RAE	200° (93°C)
2	Fluoroelast.	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAV	250° (121°C)
4	Fluoroelast.	EP	EP	EP	RAEFV	200° (93°C)
5	Buna-N	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAVFB	200° (93°C)
7	Buna-N	Hycar	Buna-N	Buna-N	RAJH	150° (65°C)

INTERNAL PARTS

0 = Brass and Stainless Steel

DRILL & TAP BOSSES (0 std [1/4" NPT std for all sizes]) (See notes 1 & 2)

0 = None	4 = Boss #4	8 = Bosses #2,4
1 = Boss #1	5 = Bosses #1,2,3,4	A = Bosses #2,3
2 = Boss #2	6 = Bosses #1,2	
3 = Boss #3	7 = Bosses #1,3	

SOLENOID or FLOAT OPTIONS (0 std) (Options 1 thru 5 and A thru X are not valid with NC valves)

0 = None — See valve options # -3

Solenoid Options
1 = Energize to Open (EO)
2 = Energize to Close (EC)
3 = Independent Pressure (IP)
4 = EO w/ Dry Drain
5 = EC w/ Dry Drain

Float Options	Closed If	Close By	Open By
A = 3000 Float	High	Pilot Press.	Vent
B = 3010 Float	High	Pilot Press.	Pilot Press.
C = 3011 Float	Low	Pilot Press.	Vent
D = 3012 Float	Low	Pilot Press.	Pilot Press.
E = 3010B Brine Float	High	Pilot Press.	Pilot Press.
X = Replacement Valve Only (Includes Shaft Spacer)			

SOLENOID or FLOAT FEATURES (0 std)

0 = None

Solenoid Option Features
1 = 115V/60 HZ, NEMA 1
2 = 220V/50 HZ, NEMA 1
3 = 24V/60 HZ, NEMA 1
A = 24VDC

Float Option Features
0 = 36" Brass Float Rod
N = 54" Brass Float Rod
X = Less Float & Rod

*** To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a 3/4" NPT Cast Iron Valve Model V421 with Normally Closed and Spring Assist Closed Options is designated as a V42B-0032-00000.**

**** A special valve will have a custom drawing number (_ _ _ _ _ _ _)**
and the item number format is (V42?-??SX-_ _ _ _ _)
where the last 5 numbers (Far Right) are the last five digits of the drawing number.

Valve Option Notes:

1. **Bosses #1, 2, 3, & 4, are always drilled and tapped on V429 and does not need to be specified in part no.**
2. **Bosses needing to be drilled and tapped for solenoid or floats do not need to be specified in part no.**
3. **Float Options not available for Valve size 425 thru 429.**
4. **Grooved End option only available on 2" 425 Cast Iron valves.**

REV.	ECO. NO.	DESCRIPTION	BY/DATE
M	1144	Updated solenoid options per Aug 5, 2014 communication	JJJ
N	1405	REMOVED ASH PAINT OPTION "C"	JJJ
P	1501	Corrected Solenoid Options	JJJ
Q	1778	ADDDED OPTION 5 (END CONNECTORS	MM 11/4/2020

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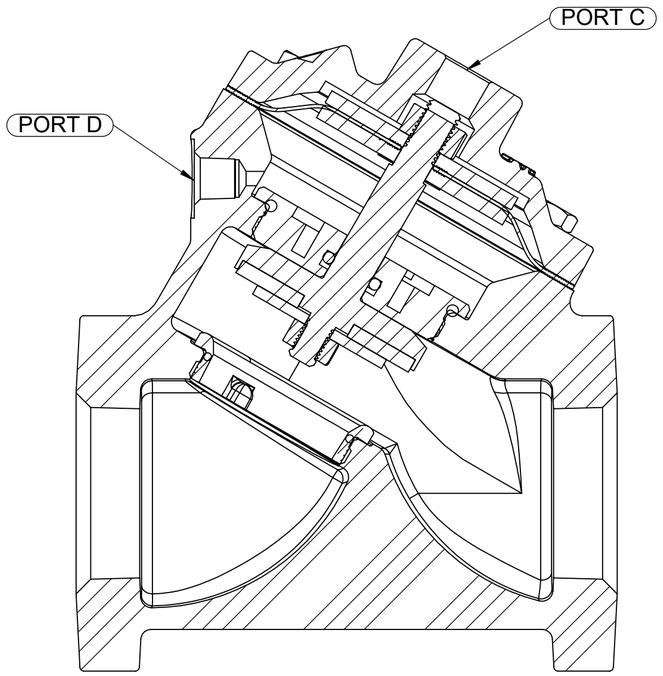
42987 REV Q 2020

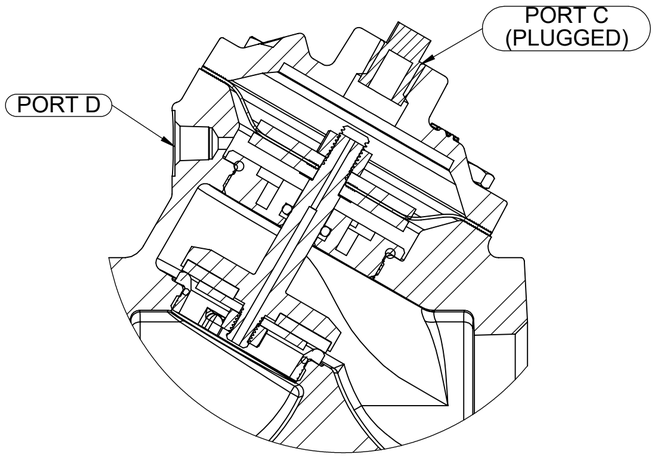
DIAPHRAGM VALVE INFORMATION - STANDARD MODEL

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1429	C	INITIAL RELEASE	09/21/01	VKP
1815	D	TRANSFER TO AQ TEMPLATE	01/06/21	KJB



NORMALLY OPEN

LINE PRESSURE/FLOW AGAINST THE VALVE SEATING DISC WILL OPEN THE VALVE. CONROL PRESSURE APPLIED TO THE TOP OF THE DIAPHRAGM (PORT "C") WILL CLOSE THE VALVE.

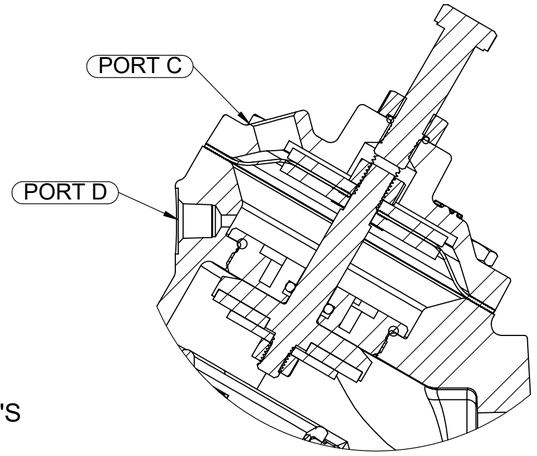


NORMALLY CLOSED

LINE PRESSURE AGAINST THE DISC, TRANSFERRED THRU THE VALVE'S HOLLOW SHAFT TO THE TOP OF THE DIAPHRAGM, WILL CLOSE THE VALVE. CONTROL PRESSURE AT PORT "D" WILL OPEN THE VALVE. ADDITION OF "SPRING ASSIST CLOSED" FEATURE IS RECOMMENDED FOR THE FOLLOWING CONDITIONS:

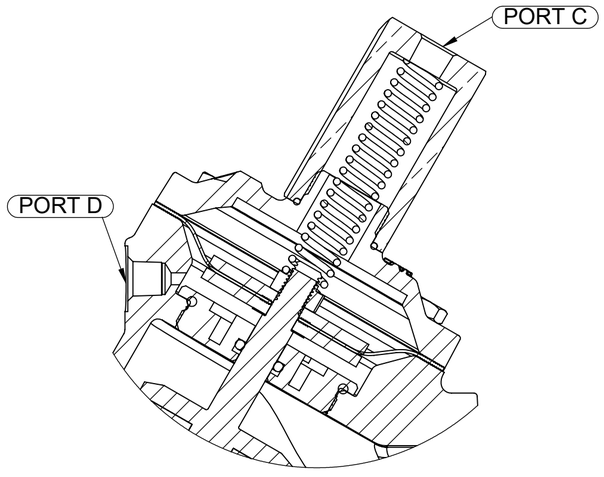
1. LOW PRESSURE AND/OR FLOW.
2. VALVE DISCHARGES TO ATMOSPHERE

NORMALLY CLOSED VALVES NOT RECOMMENDED FOR LINE MEDIA CONTAINING SOLIDS, HIGH TEMPERATURES, OR OTHER CONDITIONS WHICH MAY DAMAGE THE DIAPHRAGM.



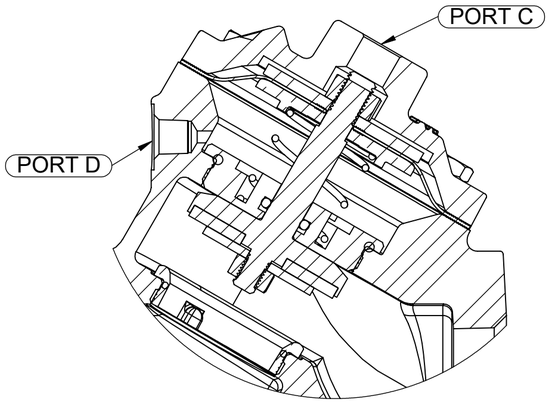
LIMIT STOP

INCLUDES AN ADJUSTMENT SCREW WHICH LIMITS THE VALVE STROKE. MAY BE USED TO CONTROL FLOW RATE, HOWEVER, FLOW RATE WILL VARY WITH CHANGES IN PRESSURE.



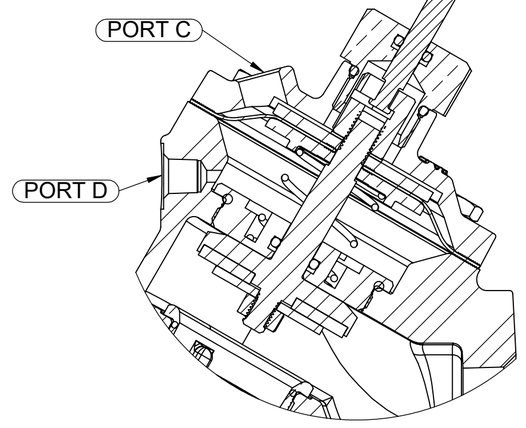
SPRING ASSIST CLOSED

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE CLOSURE IN THE ABSENCE OF LINE AND CONTROL PRESSURES.



SPRING ASSIST OPEN

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE OPENING IN THE ABSENCE OF LINE AND CONTROL PRESSURES.



POSITION INDICATOR

INDICATOR ROD IS ATTACHED TO MAIN VALVE STEM TO SHOW POSITION OF VALVE.
ONLY AVAILABLE WITH SPRING ASSIST OPEN OPTION.

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

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CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN VKP	09/21/01
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION
V42 SERIES CONFIGURATIONS & BASIC INFORMATION

SIZE	DWG NO.	REV.
C	1078117	D

SCALE	SOLIDWORKS FORMAT	SHEET 1 OF 2

DIAPHRAGM VALVE INFORMATION - STANDARD MODEL

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF ALL CHANGES.		

SERIES	PIPE SIZE	SEAT DIAMETER IN. / CM.	SEAT AREA SQ. IN. / SQ. CM.	DIAPHRAGM AREA SQ. IN. / SQ. CM.	TOTAL STROKE IN. / CM.	DIAPHRAGM CHAMBER (VOLUME) CU. IN. / CU. CM.	Cv*	Kv**	FLOW RATE @ 10 FT./SEC. (3 M./SEC.) NOTE 1 GAL/MIN / CU M/HR	FLOW RATE @ 20 FT./SEC. (6 M./SEC.) NOTE 2 GAL/MIN / CU M/HR	PRESSURE DROP @ 10 FT./SEC. (3 M./SEC.) NOTE 1 P.S.I. / bar	PRESSURE DROP @ 20 FT./SEC. (6 M./SEC.) NOTE 2 P.S.I. / bar
V42B	3/4"	0.97 / 2.5	0.74 / 4.8	2.10 / 13.0	0.47 / 1.2	2.06 / 33.8	11.4	9.8	23 / 5	46 / 10	4.1 / 0.3	16.3 / 1.12
V42C	1"	0.97 / 2.5	0.74 / 4.8	2.10 / 13.0	0.47 / 1.2	2.06 / 33.8	12.8	11.0	23 / 5	46 / 10	3.2 / 0.22	13.0 / 0.9
V42D	1 1/4"	1.34 / 3.4	1.41 / 9.1	6.49 / 41.9	0.61 / 1.5	5.20 / 85.2	26.5	23	44 / 10	88 / 20	2.8 / 0.2	11.0 / 0.7
V42E	1 1/2"	1.34 / 3.4	1.41 / 9.1	6.49 / 41.9	0.61 / 1.5	5.20 / 85.2	32.5	28	44 / 10	88 / 20	1.8 / 0.12	7.3 / 0.5
V42F	2" (425)	2.02 / 5.1	3.20 / 20.6	11.04 / 71.2	0.70 / 1.8	10.50 / 172.1	56	48	100 / 23	200 / 46	3.2 / 0.22	12.7 / 0.87
V42G	2" (426)	2.31 / 5.9	4.19 / 27.0	15.03 / 97.0	0.99 / 2.5	16.34 / 267.8	68	59	130 / 29	260 / 58	3.7 / 0.25	14.7 / 1.01
V42H	2 1/2"	2.31 / 5.9	4.19 / 27.0	15.03 / 97.0	0.99 / 2.5	16.34 / 267.8	84	72	130 / 29	260 / 58	2.4 / 0.16	9.7 / 0.67
V42J	3"	2.96 / 7.5	6.88 / 44.4	22.69 / 146.4	1.05 / 2.7	32.80 / 537.6	134	116	214 / 49	428 / 98	2.6 / 0.18	10.2 / 0.7
V42K	4"	3.84 / 9.7	11.58 / 74.7	33.82 / 218.2	1.92 / 4.9	78.83 / 1292.0	275	238	360 / 83	720 / 166	1.7 / 0.12	6.9 / 0.47
V42L	6"	6.06 / 15.4	28.84 / 186.1	120.28 / 776.0	1.70 / 4.3	296.52 / 4860.0	680	588	899 / 204	1798 / 408	1.8 / 0.12	7.0 / 0.5

* Cv - FLOWRATE (GAL./MIN.) OF WATER AT 60°F. AT 1 P.S.I PRESSURE DROP

**Kv - FLOWRATE (CU. M./HR.) OF WATER AT 15.5°C. AT 1 BAR PRESSURE DROP

NOTE 1: MAXIMUM CONTINUOUS VELOCITY THROUGH THE VALVE.

NOTE 2: MAXIMUM CONTINUOUS VELOCITY. EXTENDED SERVICE AT THIS VELOCITY MAY CAUSE CAVITATION

TO DETERMINE FLOWRATE AT ANY GIVEN PRESSURE DROP, THE FOLLOWING FORMULAS CAN BE USED.

FOR WATER AND LIQUIDS:

$$Q = \frac{Cv\sqrt{\Delta P}}{\sqrt{e}}$$

FOR AIR AND GAS:

WHEN P2<.5P1

$$Q = \frac{CFM\sqrt{e}}{.5P1}$$

WHEN P2>.5P1

$$Q = \frac{CFM\sqrt{e}}{\sqrt{\Delta P\ P2}}$$

Q - FLOWRATE IN GAL./MIN.
ΔP - PRESSURE DROP (LB./SQ. IN.)
e - SPECIFIC GRAVITY (WATER = 1.00)

CFM - CU. FT./MIN. FLOW
e - SPECIFIC GRAVITY (AIR = 1.00)
P1 - INLET PRESSURE (LB./SQ. IN.)
P2 - OUTLET PRESSURE (LB./SQ. IN.)

THE DATA PRESENTED HERE IS BELIEVED TO BE RELIABLE AND OFFERED AS SUGGESTION ONLY. ACTUAL RESULTS MAY VARY DEPENDING UPON APPLICATION

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THIRD ANGLE PROJECTION

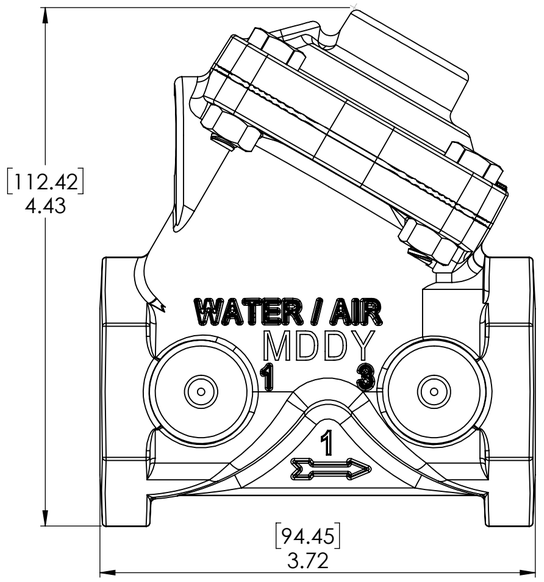
APPROVALS	DATE
DRAWN VKP	09/21/01
CHECKED BY	
APPROVED	

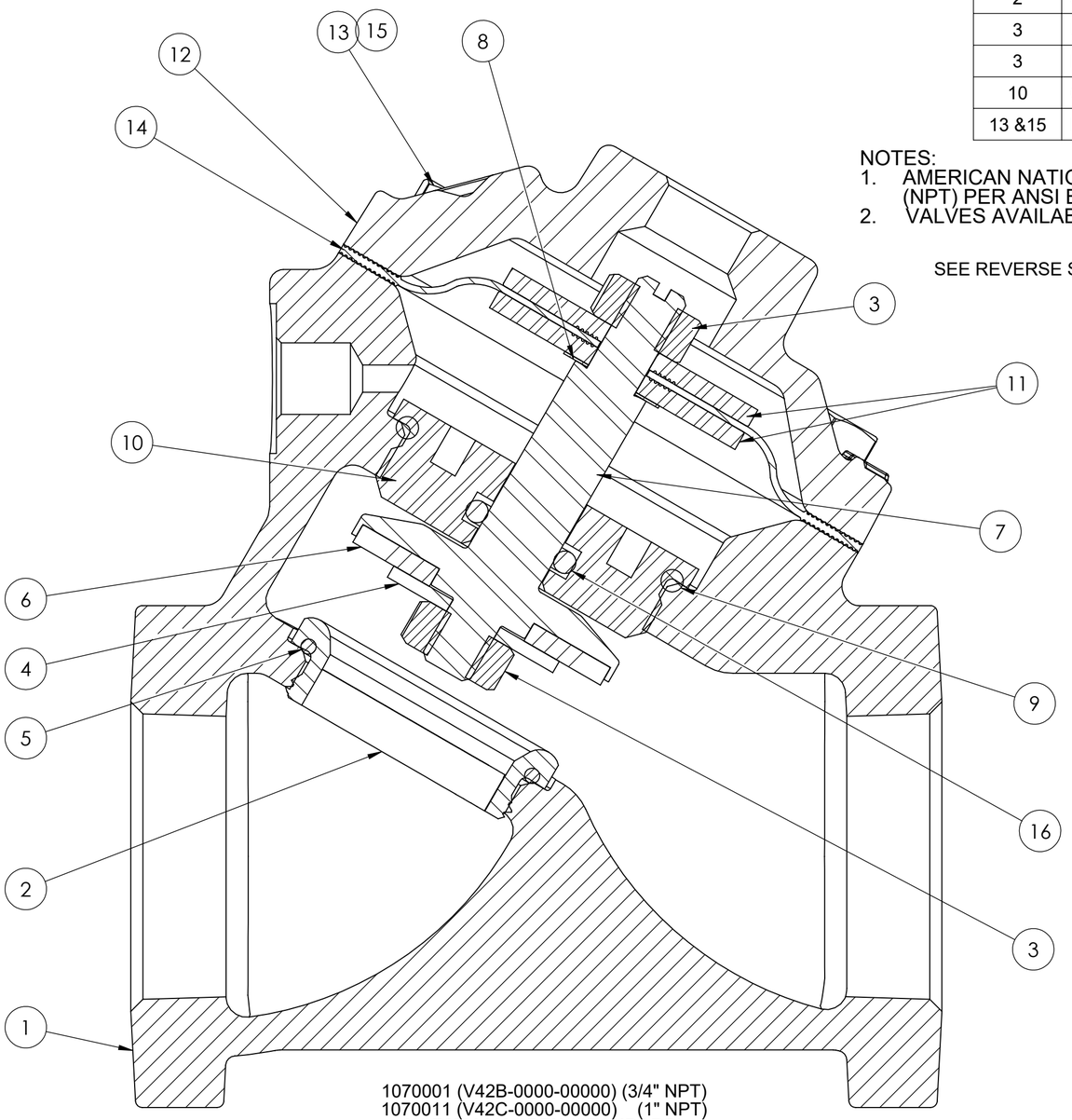
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: V42 SERIES CONFIGURATIONS & BASIC INFORMATION

SIZE C | DWG NO. 1078117 | REV. D

SCALE | SOLIDWORKS FORMAT | SHEET 2 OF 2





1070001 (V42B-0000-00000) (3/4" NPT)
1070011 (V42C-0000-00000) (1" NPT)
NORMALLY OPEN (STANDARD)

REPAIR PARTS KITS

DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSIST OF ITEM NO'S 3(2), 5, 6, 8 , 9, 14, 16	1070068 (421-RA)	1070081 (421-RAE)	1070093 (421-RAV)
	BUNA N INCLUDES DIAPHGRAM 1074119 (421-FB)	E.P.D.M. INCLUDES DIAPHGRAM 1074119 (421-FB)	FKM INCLUDES DIAPHGRAM 1074120 (421-FV)
INT. PARTS KIT (NORM. OPEN) CONSIST OF STANDARD ITEM NO'S 4, 7, 10,11(2)	1070118 (421-RF)		
SEAT (ITEM NO. 2)	1074158 (421-MO)		

ASSEMBLY TOOLS

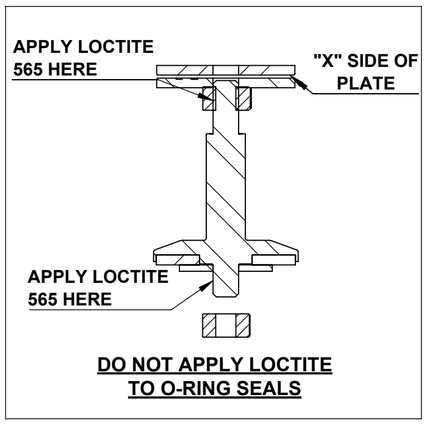
DESCRIPTION	PART NO.
FOR INSTALLATION AND REMOVAL OF SEAT (ITEM #2) (TOOL NOT SHOWN)	1074161 (421-MT)
FOR INSTALLATION AND REMOVAL OF SHAFT GUIDE (ITEM #10) (TOOL NOT SHOWN)	1074124 (421-GT)

TORQUE TABLE

ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
2	SEAT	120 IN/LBS
3	UPPER NUT	90 IN/LBS
3	LOWER NUT	90 IN/LBS
10	GUIDE, SHAFT	120 IN/LBS
13 &15	NUT, & CAP SCREW	140 IN/LBS

NOTES:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2. 1-1968
2. VALVES AVAILABLE WITH B.S.P.T END CONNECTIONS

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS



REVISIONS

ECN	REV.	DESCRIPTION	DATE	APP'D
1791	U	CATALOG SHEET UPDATE, COMPONENT CHANGES	10/15/20	TRK

NO.	DESCRIPTION			STD	PART NO.	QTY.
1	BODY	CAST IRON	3/4" NPT	*	1074085 (421-A3)	1
			1" NPT	*	1074088 (421-A4)	
		CAST BRASS	3/4" NPT		1074077 (421-AB3)	
			1" NPT		1074080 (421-AB4)	
		CAST IRON	3/4" BSP		1074086	
			1" BSP		1074089	
		CAST BRASS	1" BSP		1074081	
2	SEAT - BRASS (REQ'S ASSY TOOL)			*	1074158 (421-M0)	1
3	HEX NUT (1/4-28)			*	1263852 (NUS-0100)	2
4	DISC PLATE - SS			*	1074149	1
5	O-RING		BUNA N	*	1071676 (ORB-024)	1
			E.P.D.M.		1071721 (ORE-024)	
			FKM	*	1071791 (ORV-024)	
6	DISC		BUNA	*	1074140 (421-J)	1
			E.P.D.M.		1074143 (421-JE)	
			FKM		1074146 (421-JV)	
			HYCAR		1074144 (421-JH)	
7	421 COMBINATION SHAFT			*	4510231	1
8	GASKET - COPPER			*	1073948 (200-GG)	1
9	O-RING		BUNA N	*	1071693 (ORB-125)	1
			E.P.D.M.		1071732 (ORE-125)	
			FKM		1071803 (ORV-125)	
10	SHAFT GUIDE - SS (REQ'S ASSY TOOL)			*	1074123	1
11	DIAPHRAGM PLATE - SS			*	43942 (424-H)	2
12	CAP		CAST IRON	*	1074093 (421-C)	1
			CAST BRASS		1074096 (421-CB)	
13	HEX SCREW		PLATED STEEL	*	1072398 (SCZ-0004)	4
			SS(BRASS VALVE ONLY)		1080720 (SCS-0142)	
14	DIAPHRAGM		BUNA N	*	1074119 (421-FB)	1
			FKM		1074120 (421-FV)	
15	HEX NUT		PLATED STEEL	*	1071656 (NUZ-0008)	4
			SS(BRASS VALVE ONLY)		1071649 (NUS-007)	
16	O-RING		BUNA N	*	1071689 (ORB-110TC)	1
			E.P.D.M.		1071726 (ORE-110TC)	
			FKM		1239021 (ORV-110)	

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TOLERANCES:
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1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

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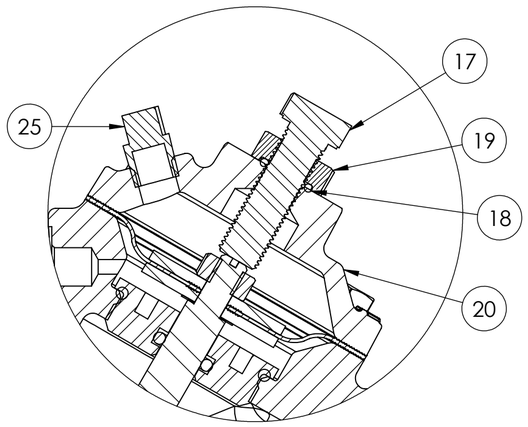
APPROVALS	DATE
DRAWN TRK	10/15/20
CHECKED BY	
APPROVED	

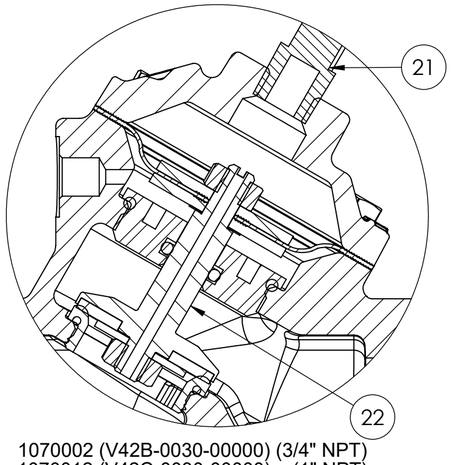
AQ-Matic

CATALOG SHEET, 421
DIAPHRAGM VALVE STANDARD MODEL

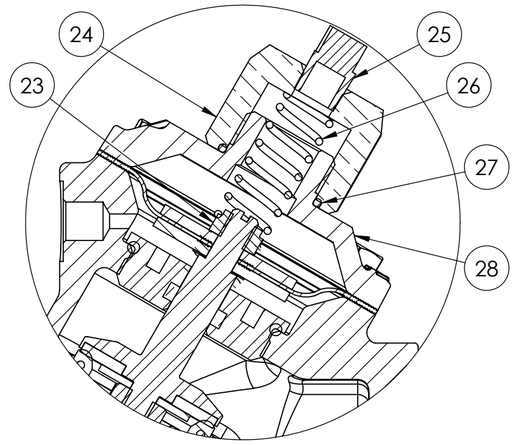
SIZE	DWG NO.	REV.
C	1077613	U
SCALE	SOLIDWORKS FORMAT	SHEET 1 OF 2



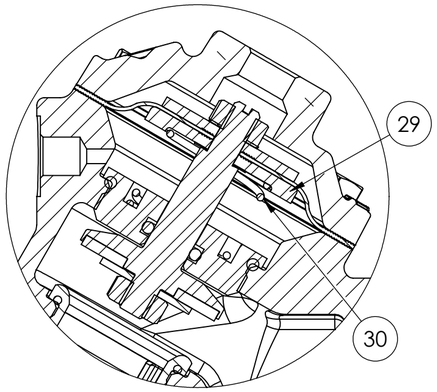
1072563 (V42B-0010-00000) (3/4" NPT)
1070015 (V42C-0010-00000) (1" NPT)
LIMIT STOP



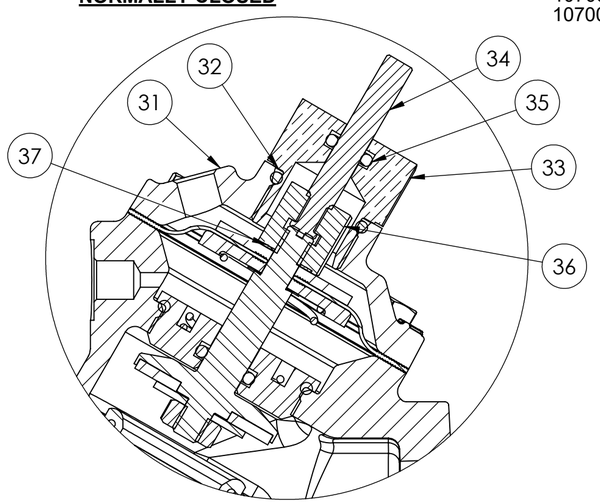
1070002 (V42B-0030-00000) (3/4" NPT)
1070012 (V42C-0030-00000) (1" NPT)
NORMALLY CLOSED



1070003 (V42B-0002-00000) (3/4" NPT)
1070013 (V42C-0002-00000) (1" NPT)
SPRING ASSIST CLOSED



1070004 (V42B-0001-00000) (3/4" NPT)
1070014 (V42C-0001-00000) (1" NPT)
SPRING ASSIST OPEN



1077144 (V42B-0021-00000) (3/4" NPT)
1072648 (V42C-0021-00000) (1" NPT)
POSITION INDICATOR

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE PAGE 1 FOR REV. CHANGES		

NO	DESCRIPTION		STD	PART NO.	QTY.
	LIMIT STOP MODEL				
17	SCREW		*	1072361 (SCS-0030)	1
18	O-RING	BUNA N	*	1071668 (ORB-012)	1
19	HEX NUT		*	4510459 (400-H)	1
20	CAP	CAST IRON	*	1074101 (421-CCC)	1
		CAST BRASS		1074104 (421-CCCB)	
	NORMALLY CLOSED MODEL				
21	PIPE PLUG (1/4" NPT)	PLATED STEEL	*	1071918 (PLZ-0008)	1
		BRASS		1071904 (PLB-0009)	
22	421 COMBINATION SHAFT		*	4510232	1
	SPRING ASSIST CLOSED MODEL				
23	CENTERING NUT		*	1074185 (421-X)	1
24	RETAINER NUT - BRASS		*	1074183 (421-TT)	1
25	PIPE PLUG (1/8" NPT)	PLATED STEEL	*	1071917 (PLZ-0005)	1
		BRASS		1071903 (PLB-0007)	
26	SPRING		*	1078602 (421-SS)	1
27	O-RING		*	1071674 (ORB-020)	1
28	CAP	CAST IRON	*	1074099 (421-CC)	1
		CAST BRASS		1074100 (421-CCB)	
	SPRING ASSIST OPEN MODEL				
29	DIAPHRAGM PLATE, 421, SAO		*	43727	1
30	SPRING		*	1078608	1
	POSITION INDICATOR MODEL				
31	CAP	CAST IRON	*	1074107 (421-CF)	1
		CAST BRASS	*	1074110 (421-CFB)	1
32	O-RING		*	1071692 (ORB-116)	1
33	SHAFT GUIDE BUSHING		*	1074121 (421-GF)	1
34	INDICATOR SHAFT		*	1074164 (421-PM)	1
35	O-RING		*	1071688 (ORB-108TC)	1
36	TOP NUT		*	1074182 (421-TB)	1
37	LOCKWASHER		*	1073589 (WAS-0006)	1

CONVERSION KITS

DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 17 THRU 20	1074155 (421-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23 THRU 28	1074177 (421-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 10, 30	1074179 (421-SOC)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 31 THRU 37	1074163 (421-PIC)

REPAIR PARTS KITS

DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 17, 18, 19	1074154 (421-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 11(2), 22	1070129 (421-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23, 26, 27	1074176 (421-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8, 29, 30	1074178 (421-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 32 THRU 37	1074162 (421-PI)

TORQUE TABLE

ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
20	NUT, LIMIT STOP	90 IN/LBS
24	CENTERING NUT	90 IN/LBS
25	NUT, SPRG RETAINER	120 IN/LBS
34	PI ROD GUIDE	120 IN/LBS
37	NUT, TOP, 428, PI	90 IN/LBS

NOTES:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP MODEL.
2. VALVES AVAILABLE WITH B.S.P.T END CONNECTIONS.

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

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THIRD ANGLE PROJECTION

APPROVALS	DATE
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CHECKED BY	
APPROVED	

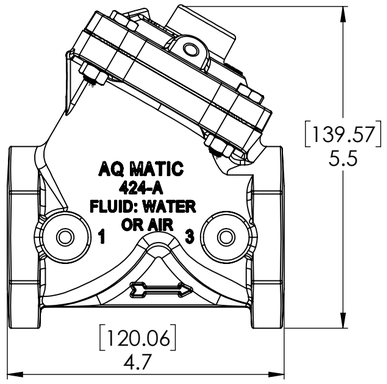
AQ Matic

CATALOG SHEET, 421
DIAPHRAGM VALVE STANDARD MODEL

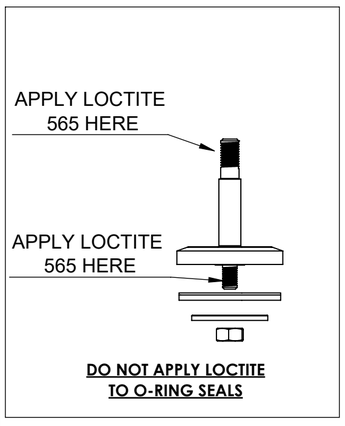
SIZE	DWG NO.	REV.
C	1077613	U
SCALE	SOLIDWORKS FORMAT	SHEET 1 OF 2

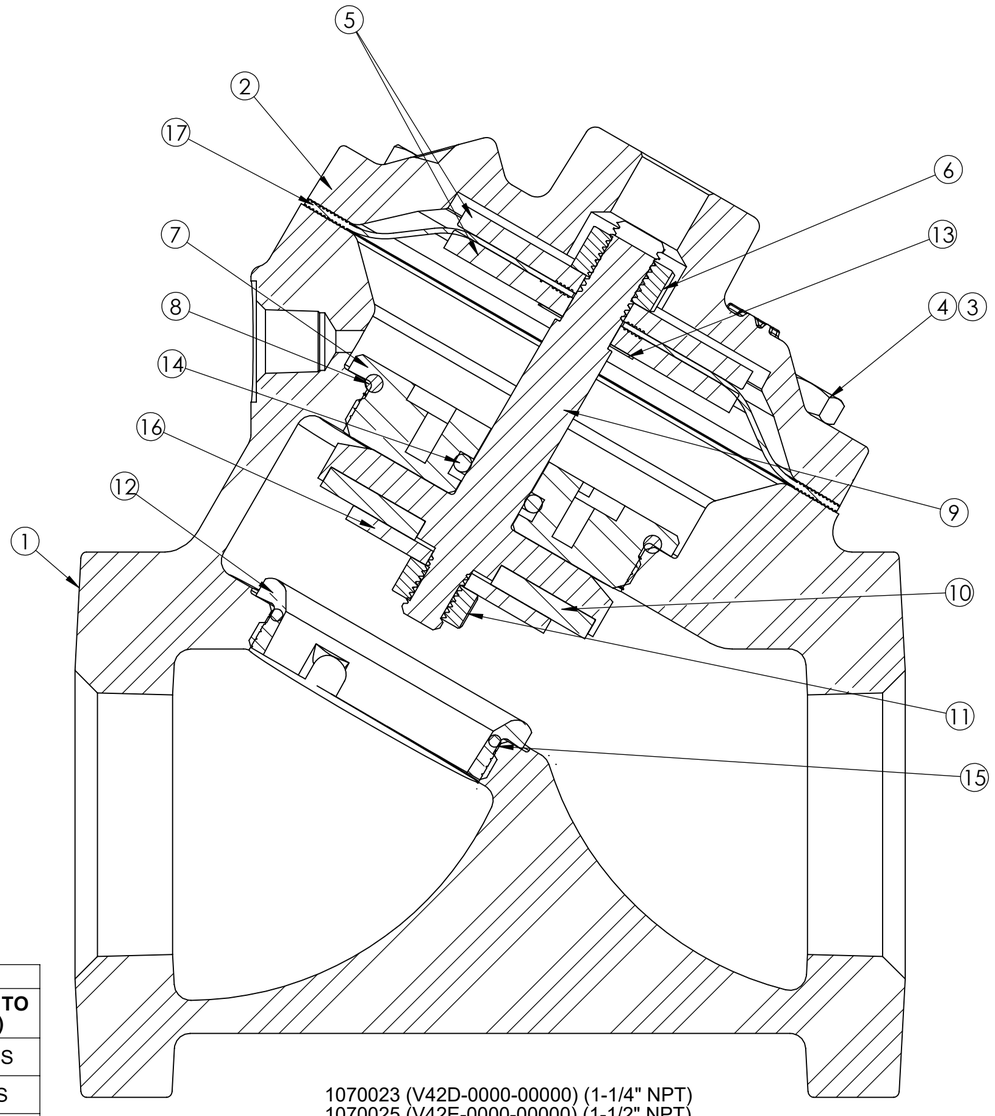
REPAIR PARTS KITS			
DESCRIPTION	**PART NO.**		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 6,8,10,11,13,14,15,17	1070069 (424-RA)	1070082 (424-RAE)	1070094 (424-RAV)
	BUNA N INCLUDES DIAPHGRAM 1074222 (424-FB)	E.P.D.M. INCLUDES DIAPHGRAM 1074222 (424-FB)	FKM INCLUDES DIAPHGRAM 1074224 (424-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 5(2) ,7, 9, 16	1070119 (424-RF)		
SEAT (ITEM NO. 12)	1074245 (424-MO)		

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1752	X	NEW VALVE AND COVER CASTINGS	8/7/20	
1814	Y	WAS 1/4"-18, CORRECTION 1/4"-20	1/5/21	



ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION AND REMOVAL OF SEAT (ITEM #12) (TOOL NOT SHOWN)	1074247 (424-MT)
FOR INSTALLATION AND REMOVAL OF SHAFT GUIDE (ITEM #7) (TOOL NOT SHOWN)	1074227 (424-GT)





1070023 (V42D-0000-00000) (1-1/4" NPT)
1070025 (V42E-0000-00000) (1-1/2" NPT)

NORMALLY OPEN (STANDARD)

ITEM NO.	DESCRIPTION			STD.	PART NUMBER	QTY.
1	BODY	CAST IRON	1- 1/4" NPT	*	1074196 (424-A5)	1
			1- 1/2" NPT	*	1074199 (424-A6)	
		BRASS	1- 1/4" NPT		1074190 (424-AB5)	
			1- 1/2" NPT		1074193 (424-AB6)	
		CAST IRON	1- 1/4" BSP		1074197 (424-A5-BSP)	
			1- 1/2" BSP		1074200 (424-A6-BSP)	
2	CAP		CAST IRON	*	1074202 (424-C)	1
			CAST BRASS		1074206 (424-CB)	
3	HEX NUT 1/4" - 20		PLATED STEEL	*	1071656 (NUZ-0008)	4
			SS		1071649	
4	HEX SCREW 1/4" - 20		PLATED STEEL	*	1072399 (SCZ-0007)	4
			SS		1072392	
5	DIAPHRAGM DISC PLATE		SS	*	43943	2
6	HEX NUT 5/16" - 24		SS	*	1263853	1
7	SHAFT GUIDE		SS	*	1074226	1
8	O-RING -132		BUNA N	*	1071806 (ORVR-132)	1
			E.P.D.M		1071734	
			FKM		1071806	
9	NORMALLY OPEN COMBO SHAFT		SS	*	44013	1
10	DISC		BUNA N	*	1074234 (424-JH)	1
			E.P.D.M.		1074233 (424-JE)	
			FKM		1074236 (424-JV)	
			HYCAR		1074234 (424-JH)	
11	1/4"- 28 HEX NUT		SS	*	1263852	1
12	SEAT - (REQ'S ASSY TOOL)		BRASS	*	1074245 (424-MO)	1
13	WASHER,5/16" X .60 OD		COPPER	*	1074252 (424-R)	1
14	O-RING 2-110		BUNA N	*	1071661 (ORA-110)	1
			E.P.D.M		1071726	
			FKM		1239021	
15	O - RING 028		BUNA N	*	1071793	1
			E.P.D.M.		15243	
			FKM		1071793	
16	DISC PLATE		SS	*	43942	1
17	DIAPHRAGM		BUNA N	*	1074222	1
			FKM		1074224 (424-FV)	

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
12	SEAT	120 IN/LBS
11	LOWER NUT	90 IN/LBS
7	SHAFT GUIDE	120 IN/LBS
6	UPPER NUT	90 IN/LBS
3 & 4	NUT & CAP SCREW	90 IN/LBS

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT OR PRODUCT DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH RoHS 3 EU (EUROPEAN UNION) DIRECTIVE 2015/863

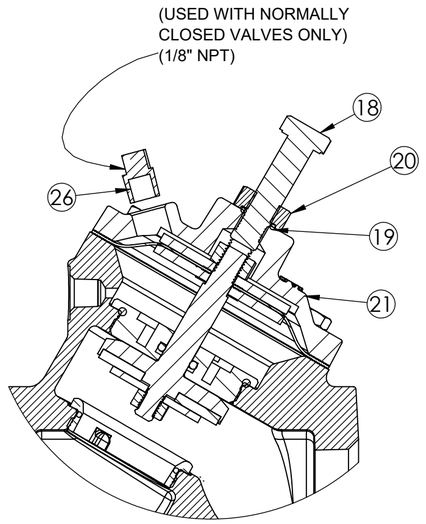
THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	4-3-20
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

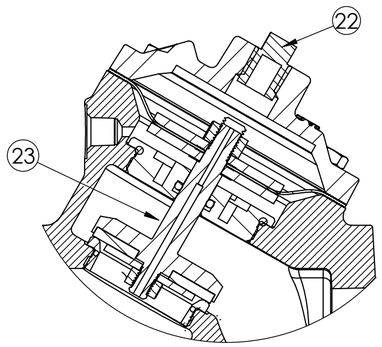
DESCRIPTION
CATALOG SHEET, 424
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV.
C	1077614	Y
SCALE 1:5	SOLIDWORKS FORMAT	SHEET 1 OF 2



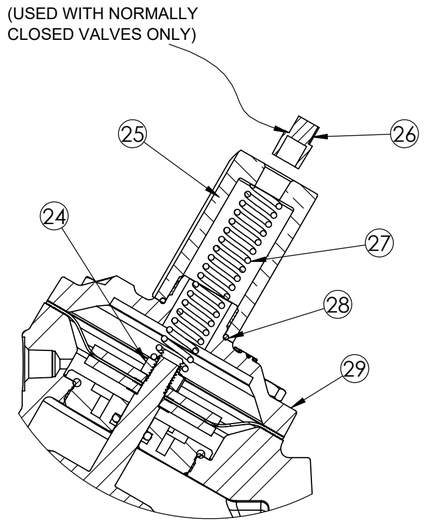
1072720 (V42D-0010-00000) (1-1/4" NPT)
1070028 (V42E-0010-00000) (1-1/2" NPT)

LIMIT STOP



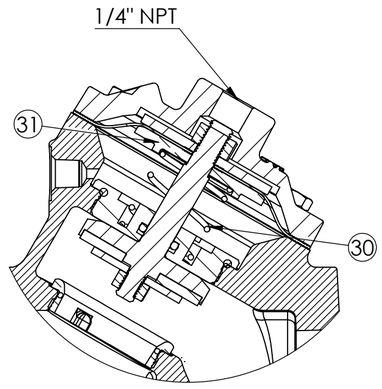
1072723 (V42D-0030-00000) (1-1/4" NPT)
1070026 (V42E-0030-00000) (1-1/2" NPT)

NORMALLY CLOSED



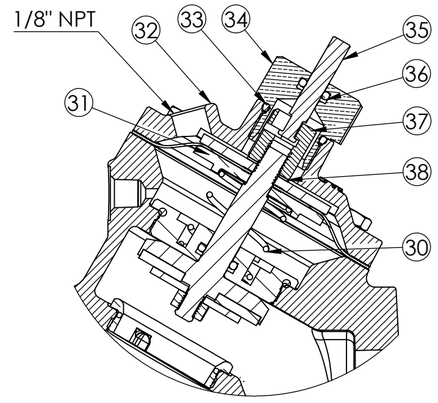
1072716 (V42D-0002-00000) (1-1/4" NPT)
1072792 (V42E-0002-00000) (1-1/2" NPT)

SPRING ASSIST CLOSED



1072715 (V42D-0001-00000) (1-1/4" NPT)
1070027 (V42E-0001-00000) (1-1/2" NPT)

SPRING ASSIST OPEN



1072722 (V42D-0021-00000) (1-1/4" NPT)
1072804 (V42E-0021-00000) (1-1/2" NPT)

POSITION INDICATOR

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE PAGE 1 FOR CHANGES		

NO	DESCRIPTION		STD	PART NO.	QTY.
LIMIT STOP MODEL					
18	SCREW 3/8"-24	SS	*	1072362 (SCS-0031)	1
19	O-RING	BUNA-N	*	1071668 (ORB-012)	1
20	NUT,STOP,3/8"-24	PLATED STEEL	*	4510459 (400-H)	1
21	CAP	CAST IRON	*	1074210 (424-CCC)	1
		CAST BRASS		1074213 (424-CCCB)	
NORMALLY CLOSED MODEL					
22	PIPE PLUG (1/4" NPT)	PLATED STEEL	*	1071918 (PLZ-0008)	1
		BRASS		1071904 (PLB-0009)	
23	COMBINATION SHAFT (NORMALLY CLOSED)	SS	*	44013-02 (424-LL)	1
SPRING ASSIST CLOSED MODEL					
24	CENTER NUT 5/16"-24	SS	*	1074276 (424-X)	1
25	RETAINER NUT	BRASS	*	1074274 (424-TT)	1
26	PIPE PLUG (1/8" NPT)	PLATED STEEL	*	1071917 (PLZ-0005)	1
		BRASS		1071903 (PLB-0007)	
27	SPRING	SS	*	1074270 (424-SS)	1
28	O-RING	BUNA-N	*	1071674 (ORB-020)	1
29	CAP	CAST IRON	*	1074208 (424-CC)	1
		CAST BRASS		1074209 (424-CCB)	
SPRING ASSIST OPEN MODEL					
30	SPRING	SS	*	1236766	1
31	DIAPH. PLATE, 424	SS	*	43728	1
POSITION INDICATOR MODEL					
32	CAP	CAST IRON	*	1074217 (424-CF)	1
		CAST BRASS	*	1074218 (424-CFB)	1
33	O-RING	BUNA-N	*	1071692 (ORB-116)	1
34	SHAFT GUIDE BUSHING	BRASS	*	1074121 (421-GF)	1
35	INDICATOR SHAFT	SS	*	1074251 (424-PM)	1
36	O-RING	BUNA-N	*	1071688 (ORB-108TC)	1
37	TOP NUT	BRASS	*	1074272 (424-TB)	1
38	LOCKWASHER	SS	*	1073590 (WAS-0007)	1

TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
20	NUT, STOP	90 IN/LBS
24	CENTERING NUT	90 IN/LBS
25	RETAINER NUT	120 IN/LBS
34	SHAFT GUIDE BUSHING	120 IN/LBS
37	TOP NUT	90 IN/LBS

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S ***18, 19, 20, 21***	1074243 (424-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S ***24 THRU 29***	1074266 (424-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S ***13, 30, 31***	1074269 (424-SOC)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S ***32 THRU 38***	1074250 (424-PIC)

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S ***18, 19, 20***	1074242 (424-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S ***5 (2x), 7, 16, 23***	1070130 (424-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S ***24, 27, 28***	1074265 (424-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S ***13, 30, 31***	1074268 (424-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S ***33 THRU 38***	1074249 (424-PI)

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	4-3-20
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION
CATALOG SHEET, 424
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV.
C	1077614	Y
SCALE 1:5	SOLIDWORKS FORMAT	SHEET 2 OF 2

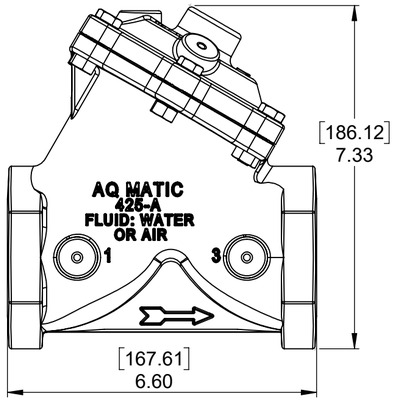
REPAIR PARTS KITS			
DESCRIPTION	**PART NO.**		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 5(2), 7, 8, 9, 10(2), 15	1070070 (425-RA)	1070083 (425-RAE)	1070095 (425-RAV)
	BUNA N INCLUDES DIAPHRAGM 1074296 (425-FB)	E.P.D.M. INCLUDES DIAPHRAGM 1074296 (425-FB)	FKM INCLUDES DIAPHRAGM 1074297 (425-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 2, 3, 6, 13, 14(2)	1070120 (425-RF)		
SEAT (ITEM NO.14)	1074321 (425-MO)		

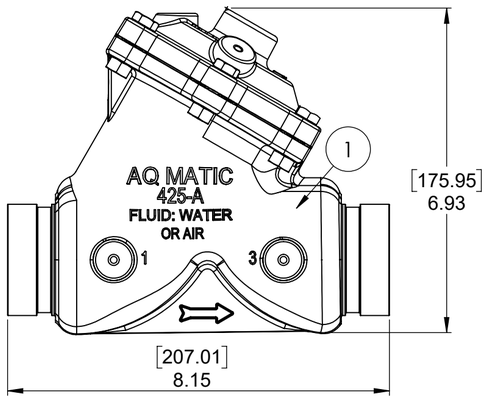
ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION & REMOVAL OF SEAT (ITEM #14) (TOOL NOT SHOWN)	1074411 (426-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #3) (1.125 SOCKET DRIVER)	1074299 (425-GAT)

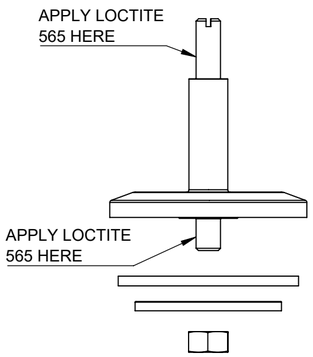
*1074299 - SPANNER WRENCH TOOL USED ON SHAFT GUIDES MADE BETWEEN 2014 THRU 2018. ALL OTHERS ARE SOCKET STYLE

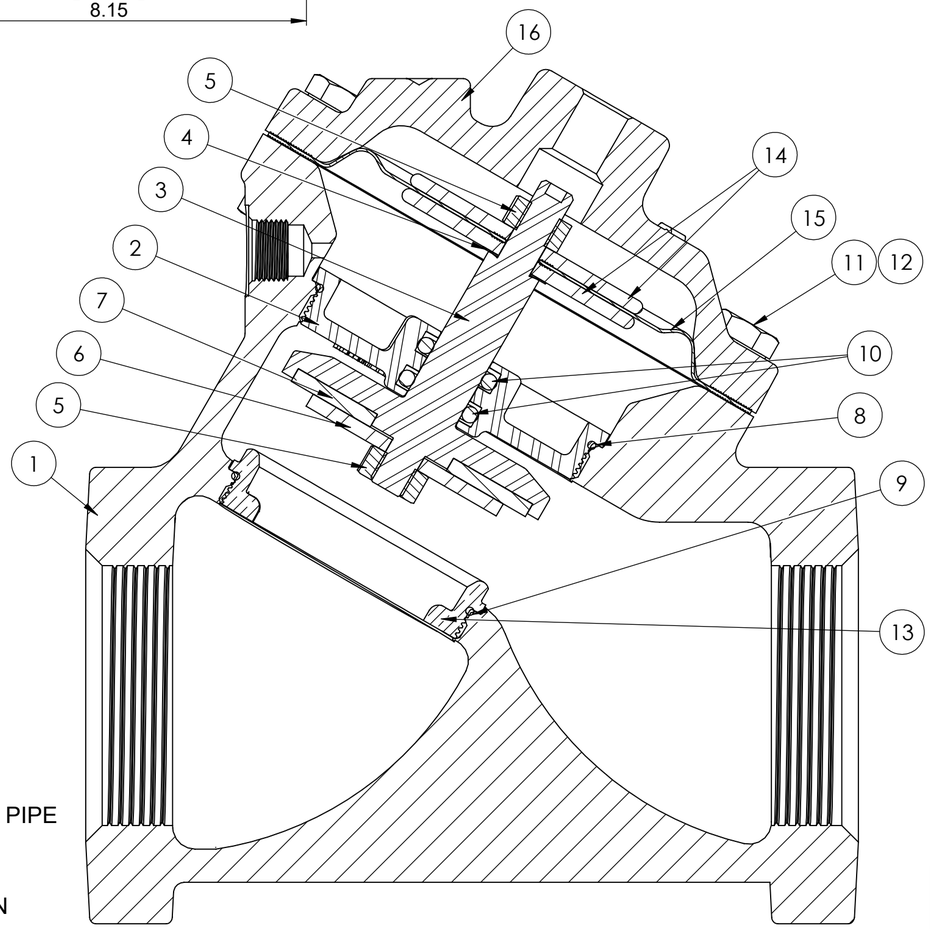
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1752	W	COMPONENT UPDATE	8/7/20	

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO(+/- 10%)**
14	SEAT	120 IN/LBS
6	UPPER NUT	140 IN/LBS
6	LOWER NUT	140 IN/LBS
3	SHAFT GUIDE	120 IN/LBS
12 & 13	NUT, HEX SCREW	140 IN/LBS









1070035 (V42F-0000-00000) (2" NPT)
NORMALLY OPEN (STANDARD)

ITEM NO.	DESCRIPTION			STD	PART NUMBER	QTY
1	MACHINE VALVE BODY, 425	2" NPT	CAST IRON	*	1074277 (425-A)	1
	CAST IRON MACHINE BODY	2" BSP	CAST IRON		1074278 (425-A-BSP)	
	CAST IRON CLAMP DESIGN MACHINED BODY	2" PIPE	CAST IRON		4510482	
2	SHAFT GUIDE (ASSY TOOL REQUIRED)		SS	*	43848	1
3	COMBO SHAFT, NORMALLY OPEN		SS	*	44017 (425-L)	1
4	COPPER GASKET			*	1074252 (424-R)	1
5	HEX NUT (5/16"-24)		SS	*	1263853 (RMET)	2
6	DISC PLATE		SS		43943	1
7	DISC		BUNA	*	1074307 (425-JH)	1
			E.P.D.M.		1074309 (425-JE)	
			FKM		1074312 (425-JV)	
			HYCAR		1074310 (425-JH)	
8	O-RING 2-038		BUNA	*	1071684 (ORB-038)	1
			E.P.D.M.		1071725 (ORE-038)	
			FKM		1071795 (ORV-038)	
9	O-RING 2-035		BUNA	*	1071682 (ORB-035)	1
			E.P.D.M.		1071724 (ORE-035)	
			VITON		1071794 (ORV-035)	
10	O-RING 2-206		BUNA	*	1071699 (ORB-206TC)	2
			E.P.D.M.		1239009 (ORE-206)	
			FKM		1239008 (ORV-206)	
11	HEX SCREW 5/16"-18		PLATED STEEL	*	1072400 (SCZ-0013)	6
12	HEX NUT 5/16"-18		PLATED STEEL	*	1071657 (NUZ-0011)	6
13	SEAT (ASSY TOOL REQUIRED)		BRASS	*	1074321 (425-MO)	1
14	DIAPHRAGM / DISC PLATE		SS		4510417	2
15	DIAPHRAGM		BUNA	*	1074296 (425-FB)	1
			FKM		1074297 (425-FV)	
16	CAP, 425, NPT		CAST IRON		1074281 (425-C)	1

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

NOTE:

1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968.
2. CLAMP VALVE DESIGN STANDARD AWWA C606-15 IPS CUT GROOVE DESIGN
3. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.

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THIRD ANGLE PROJECTION

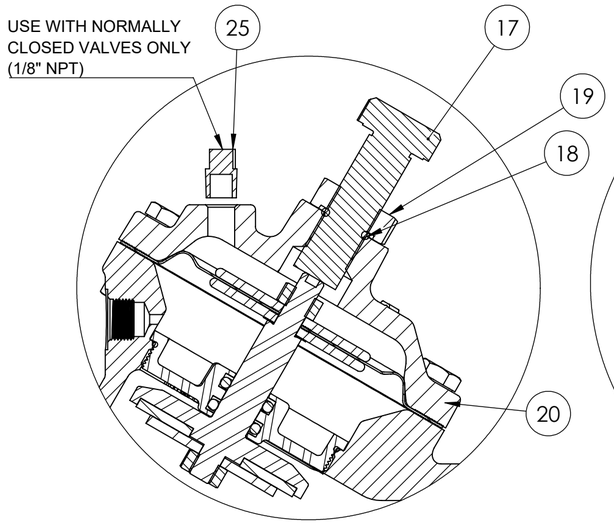
APPROVALS	DATE
DRAWN TRK	4/21/20
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

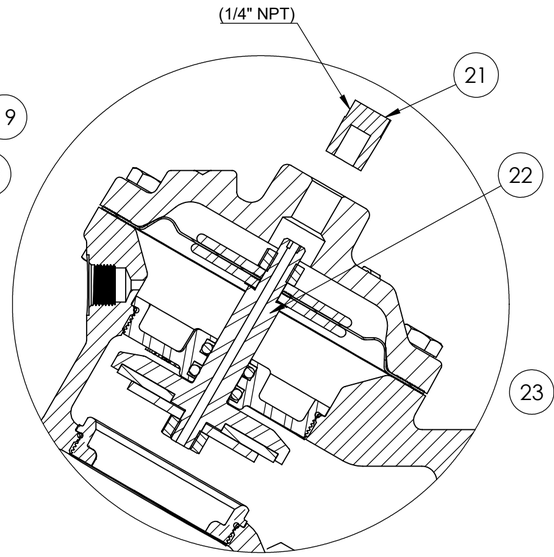
DESCRIPTION
CATALOG SHEET, 425
DIAPHRAGM VALVE

SIZE	DWG NO.	REV.
C	1077615	W

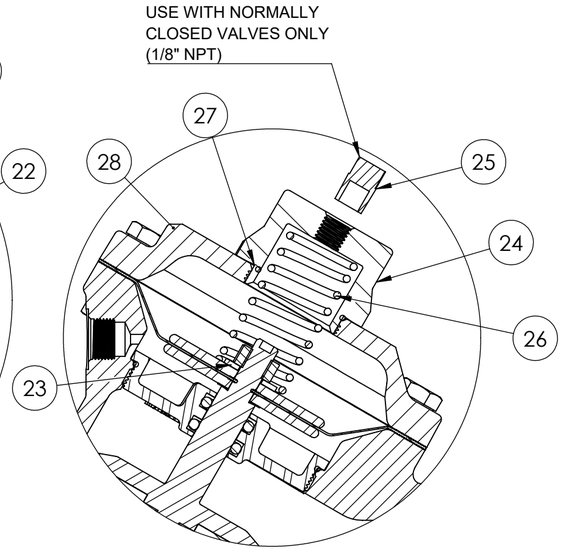
SCALE 1:5 | SOLIDWORKS FORMAT | SHEET 1 OF 2



1070037 (V42F-0010-00000) (2" NPT)
LIMIT STOP



1072894 (V42F-0030-00000) (2" NPT)
NORMALLY CLOSED



1072885 (V42F-0002-00000) (2" NPT)
SPRING ASSIST CLOSED

1070036 (V42F-0001-00000) (2" NPT)
SPRING ASSIST OPEN

1072893 (V42F-0021-00000) (2" NPT)
POSITION INDICATOR

TORQUE TABLE

ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
19	NUT, LIMIT STOP	120 IN/LBS
24	NUT, SPRING RETAINER	120 IN/LBS
33	SHAFT GUIDE BUSHING	120 IN/LBS
36	TOP NUT	120 IN/LBS

NOTE:

1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP MODEL.
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.

REVISIONS

ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE PAGE 1 FOR REVISION CHANGES		

NO.	DESCRIPTION		STD	PART NO.	QTY.
LIMIT STOP MODEL					
17	SCREW		•	1078676 (SCS-0042)	1
18	O-RING		•	1071690 (ORB-112)	1
19	NUT, LIMIT STOP		•	1074434 (426-U)	1
20	CAP, 425, NPT, LS		•	1074285 (425-CCC)	1
NORMALLY CLOSED MODEL					
21	PIPE PLUG (1/4" N.P.T.)	PLATED STEEL	•	1071918 (PLZ0008)	1
		BRASS		1071904 (PLB-0009)	
22	COMBINATION SHAFT (NORM. CLOSED)		•	44017-01 (425-LL)	1
SPRING ASSIST CLOSED MODEL					
23	CENTERING WASHER	BRASS	•	1074083 (421-AH)	1
24	NUT, SPRG RETAINER	SS	•	1074433 (426-TTF)	1
25	PIPE PLUG (1/8" N.P.T.)	PLATED STEEL	•	1071917 (PLZ-0005)	1
		BRASS		1071903 (PLB-0007)	
26	SPRING		•	1078688 (426-SS)	1
27	O-RING		•	1071677 (ORB-025)	1
28	CAP	CAST IRON	•	1074284 (425-CA)	1
SPRING ASSIST OPEN MODEL					
29	SPRING		•	1078692 (426-S)	1
30	WASHER, CENTERING	BRASS		1074436 (426-V)	1
POSITION INDICATOR MODEL					
31	CAP	CAST IRON	•	1074288 (425-CF)	1
32	O-RING		•	1071692 (ORB-116)	1
33	SHAFT GUIDE BRUSHING		•	1074121 (421-GF)	1
34	INDICATOR SHAFT		•	1074325 (425-PM)	1
35	O-RING		•	1071688 (ORB-108-TC)	1
36	TOP NUT		•	1074332 (425-TB)	1
37	LOCKWASHER		•	1073590 (WAS-0007)	1

CONVERSION KITS

DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 17, 18, 19, 20	1074320 (425-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23 THRU 28	1074330 (425-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 5, 29, 15	1074331 (425-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 31 THRU 37	1074324 (425-PIC)

REPAIR PARTS KITS

DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 17, 18, 19	1074319 (425-LS)
INT. PARTS KIT (NORM CLOSED) CONSISTS OF STANDARD ITEM NO'S 3, 7, 15(2), 22	1070131 (425-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23, 26, 27	1074329 (425-SC)
INT PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 5, 29, 15	1074331 (425-SO)
INT PARTS KIT (POSITION INDICATOR) CONSISTS OF STD ITEM NO'S 32 THRU 37	1074323 (425-PI)

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL.

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT OR PRODUCT DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH RoHS 3 EU (EUROPEAN UNION) DIRECTIVE 2015/863

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	4/21/20
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, 425 DIAPHRAGM VALVE

SIZE	DWG NO.	REV.
C	1077615	W

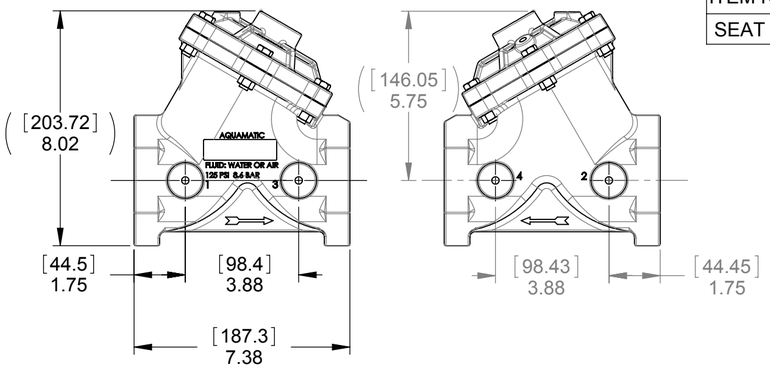
SCALE 1:5 | SOLIDWORKS FORMAT | SHEET 2 OF 2

ASSEMBLY TOOLS

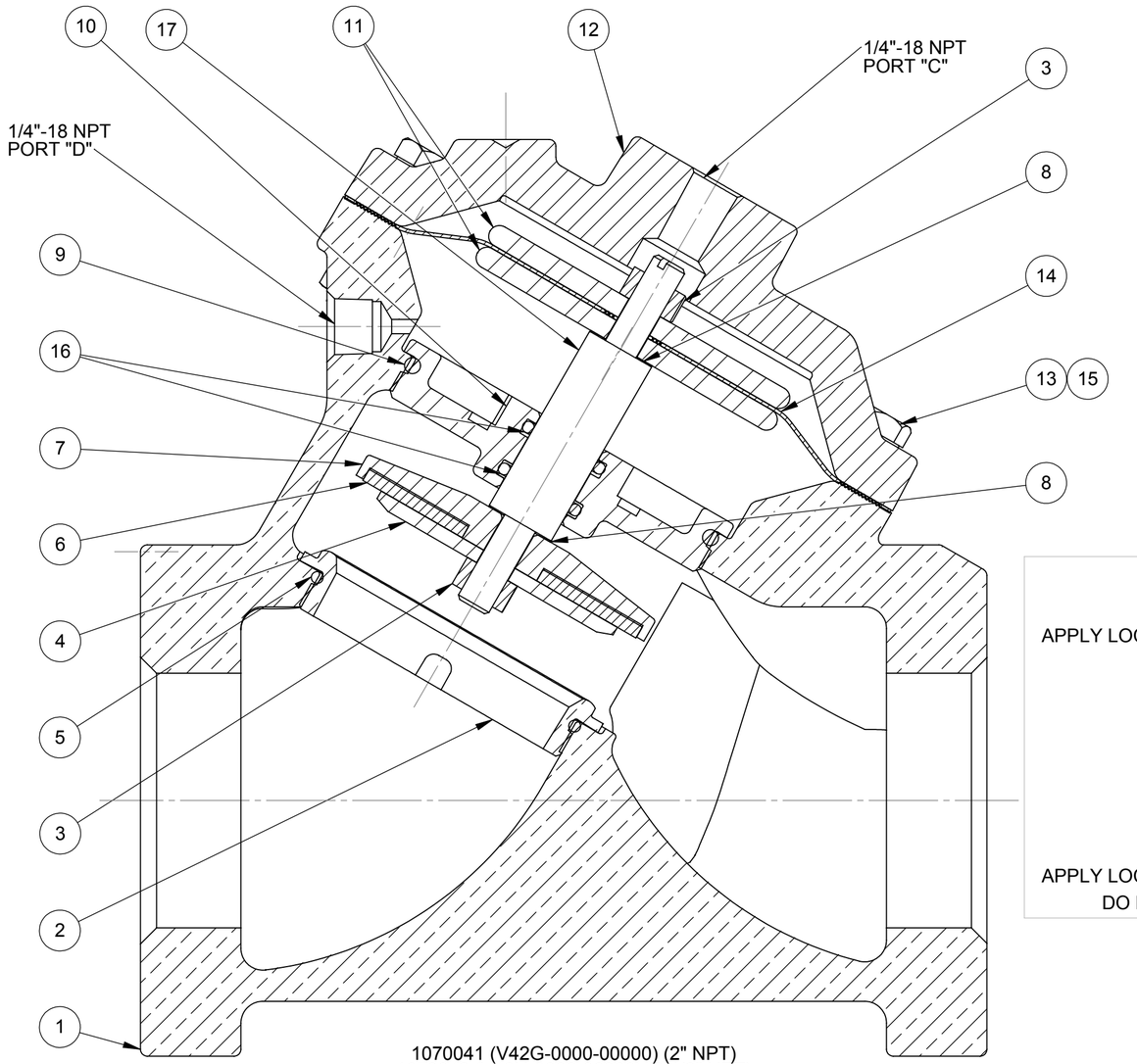
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SEAT (ITEM #2) (TOOL NOT SHOWN)	1074411 (426-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (TOOL NOT SHOWN)	1-1/4" HEX SOCKET

REPAIR PARTS KITS

DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2),5,6,8(2),9,14,16	1070071 (426-RA) BUNA N INCLUDES DIAPHRAGM 1074374 (426-FB)	1070084 (426-RAE) EPDM INCLUDES DIAPHRAM 1074374 (426-FB)	1070096 (426-RAV) FKM INCLUDES DIAPHRAM 1074376 (426-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11(2),17	1070121(426-RF)		
SEAT (ITEM NO. 2)	1074409 (426-MO)		

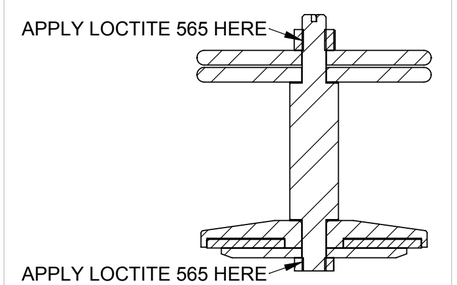


TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED T0 (+/- 10%)
2	SEAT	200 IN/LBS
3	UPPER NUT	140 IN/LBS
3	LOWER NUT	140 IN/LBS
10	SHAFT GUIDE	200 IN/LBS
13 & 15	NUT, HEX SCREW	140 IN/LBS



1070041 (V42G-0000-00000) (2" NPT)
1070042 (V42H-0000-00000) (2 1/2" NPT)

NORMALLY OPEN (STANDARD)



REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	32173	N	CORRECTED ROTATION OF CAPS	17FEB11	MHM
	32879	P	1-WAS: 1074411 (426-MT); 2-ADD'D: 1074127; 3-ADD'D: 42998;	06-06-11	TMS
	102034	R	ITEM #10-WAS 1074379, ITEM# 16-ADDED O-RING 1071691	5-31-13	NBE
	103562	T	ITEM# 4-WAS:1074395, ITEM# 7-WAS:1074381, ITEM# 10-WAS:43244, ITEM# 11-WAS:1074370, ITEM# 26-WAS:1074430, ITEM# 32-WAS: 43047	26JUN14	TJM
	104754	U	1-ADD'D: TORQUE CHARTS (PG-1 & 2)	23JUN15	TJM

NO.	DESCRIPTION		STD	PART NO.	QTY
1	BODY	CAST IRON 2" NPT	*	1074343 (426-A8)	1
		CAST IRON 2 1/2" NPT	*	1081559 (426-A10)	
		CAST BRASS 2" NPT		1074338 (426-AB8)	
		CAST BRASS 2 1/2" NPT		1074335 (426-AB10)	
2	SEAT; BRASS (REQ'S ASSY TOOL)		*	1074409 (426-M0)	1
3	HEX NUT (5/16-24)		*	1263853	2
4	DISC PLATE, SS			1074398	1
5	O-RING	BUNA N	*	1071696 (ORB-144)	1
		EPDM		1071737 (ORE-144)	
		FKM		1071809 (ORV-144)	
6	DISC	BUNA	*	1074389 (426-J)	1
		EPDM		1074391 (426-JE)	
		FKM		1074394 (426-JV)	
		HYCAR		1074392 (426-JH)	
7	DISC HOLDER, SS		*	1074386	1
8	GASKET, COPPER		*	1074252 (424-R)	2
9	O-RING	BUNA N	*	1071706 (ORB-233)	1
		EPDM		1071754 (ORE-233)	
		FKM		1071826 (ORV-233)	
10	SHAFT GUIDE (REQ'S ASSY TOOL)		*	1074378	1
11	DIAPHRAGM PLATE; SS		*	1074371	2
12	CAP	CAST IRON	*	1081560 (426-C)	1
		CAST BRASS		1074348 (426-CB)	
13	HEX SCREW	PLATED STEEL	*	1072401 (SCZ-0015)	6
14	DIAPHRAGM	BUNA N	*	1074374 (426-FB)	1
		FKM		1074376 (426-FV)	
15	HEX NUT	PLATED STEEL	*	1071657 (NUZ-0011)	6
16	O-RING	BUNA N	*	1071691 (ORB-114TC)	2
		EPDM		1071729 (ORE-114TC)	
		FKM		1242391 (ORV-114TC)	
17	SHAFT (NORMALLY OPEN)		*	1074401 (426-L)	1
18	TAG		*	1074129	1
19	RING,TAG ATTACHING		*	42998	1

NOTE:

1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968.
2. VALVES AVAILABLE WITH BSPT END CONNECTIONS.

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2002/95/EEC (RoHS) REQUIREMENTS

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

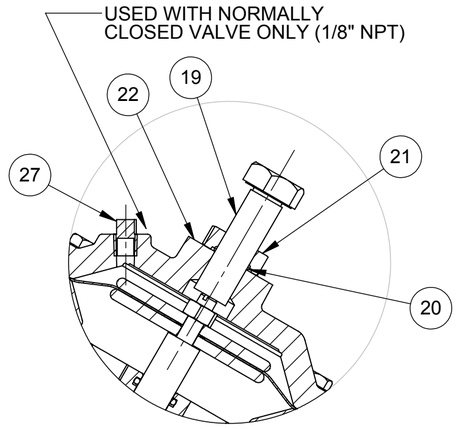
APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

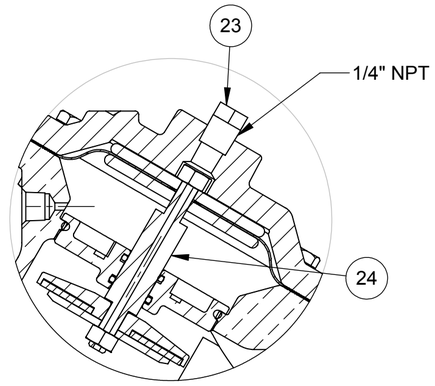
TITLE
CATALOG SHEET, 426
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077616	V

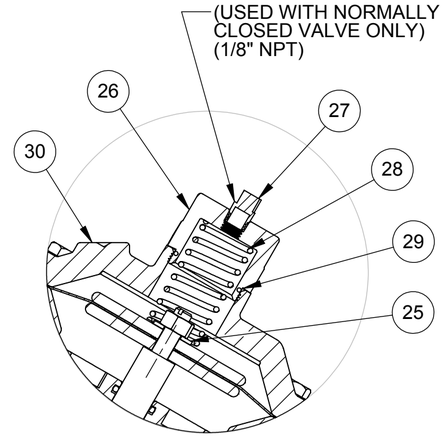
SCALE 1:2 SHEET 1 OF 2



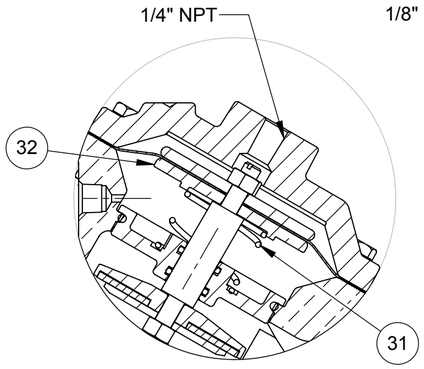
1072939 (V42G-0010-00000) (2"NPT)
1072998 (V42H-0010-00000) (2 1/2" NPT)
LIMIT STOP



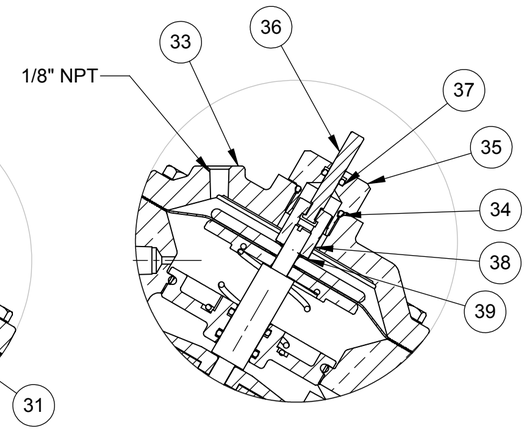
1072945 (V42G-0030-00000) (2"NPT)
1073002 (V42H-0030-00000) (2 1/2" NPT)
NORMALLY CLOSED



1072935 (V42G-0002-00000) (2"NPT)
1072996 (V42H-0002-00000) (2 1/2" NPT)
SPRING ASSIST CLOSED



1072932 (V42G-0001-00000) (2"NPT)
1072994 (V42H-0001-00000) (2 1/2" NPT)
SPRING ASSIST OPEN



1072943 (V42G-0021-00000) (2"NPT)
1073001 (V42H-0021-00000) (2 1/2" NPT)
POSITION INDICATOR

TORQUE TABLE		
ITEM#	DESCRIPTION	TORQUED TO (+/- 10%)
21	NUT	120 IN/LBS
26	RETAINER NUT	140 IN/LBS
35	SHAFT GUIDE BUSHING	140 IN/LBS
38	TOP NUT	120 IN/LBS

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	1001	V	AQ Matic update & verified part numbers	17JAN17	MGS

NO.	DESCRIPTION		STD	PART NO.	QTY
LIMIT STOP MODEL					
19	SCREW		*	1078676	1
20	O-RING		*	1071690 (ORB-112)	1
21	NUT		*	1074434 (426-U)	1
22	CAP	CAST IRON	*	1074354 (426-CCC)	1
		BRASS		1074357 (426-CCCB)	
NORMALLY CLOSED MODEL					
23	PIPE PLUG (1/4" NPT)	PLATED STEEL	*	1071918 (PLZ-0008)	1
		BRASS		1071904 (PLB-0009)	
24	SHAFT (NORMALLY CLOSED)		*	43169 (426-LL)	1
SPRING ASSIST CLOSED MODEL					
25	CENTERING WASHER	BRASS	*	1074083 (421-AH)	1
26	RETAINER NUT	SS	*	1074433	1
27	PIPE PLUG (1/8" NPT)	PLATED STEEL	*	1071917 (PLZ-0005)	1
		BRASS		1071903 (PLB-0007)	
28	SPRING		*	1078688	1
29	O-RING		*	1071677 (ORB-025)	1
30	CAP	CAST IRON	*	1074352 (426-CC)	1
		CAST BRASS		1074353 (426-CCB)	
SPRING ASSIST OPEN MODEL					
31	SPRING			1078692	1
32	PLATE, DIAPHRAGM,426 SAO			43732	1
POSITION INDICATOR MODEL					
33	CAP	CAST IRON		1074360 (426-CF)	1
		CAST BRASS		1074364 (426-CFB)	
34	O-RING			1071692 (ORB-116)	1
35	SHAFT GUIDE BUSHING			1074121 (421-GF)	1
36	INDICATOR SHAFT			1074325 (425-PM)	1
37	O-RING			1071688 (ORB-108TC)	1
38	TOP NUT			1074332 (425-TB)	1
39	LOCKWASHER			1073590 (WAS-0007)	1

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 19,20,21	1074405 (426-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11(2),24	1070132 (426-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 25,28,29	1074425 (426-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8,31,32	1074427 (426-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF STD ITEM NO'S 34 THRU 39	1074413 (426-PI)

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 19,20,21,22	1074406 (426-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 25 THRU 30	1074426 (426-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8,31,32	1074427 (426-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 33 THRU 39	1074414 (426-PIC)

NOTE:

1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP OR POSITION INDICATOR MODELS.
2. VALVES AVAILABLE WITH B.S.P. OR J.I.S. END CONNECTIONS.

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2002/95/EEC (RoHS) REQUIREMENTS

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UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 $\surd$ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

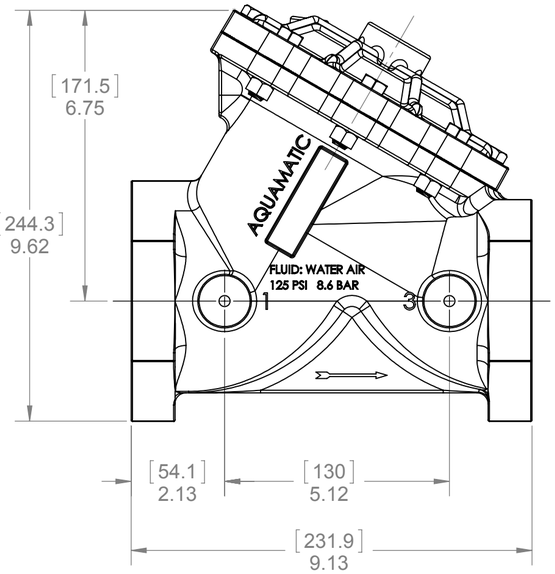
APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

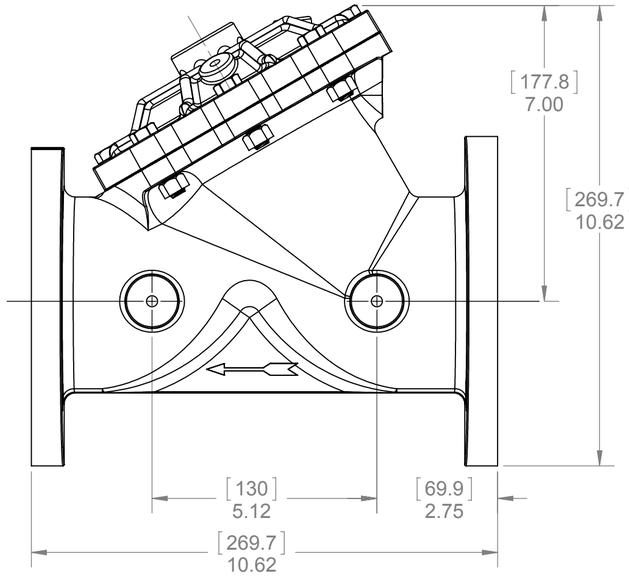
TITLE
CATALOG SHEET, 426
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077616	V

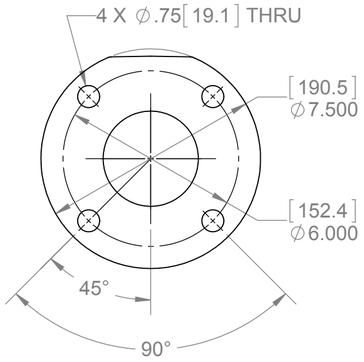
SCALE 1:2 SHEET 2 OF 2



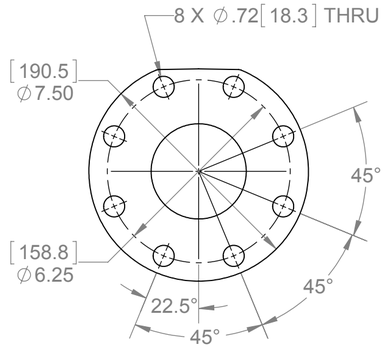
1070043 (V42J-0000-00000)
3" NPT ENDS



1070044 (V42J-3000-00000)
FLANGED ENDS

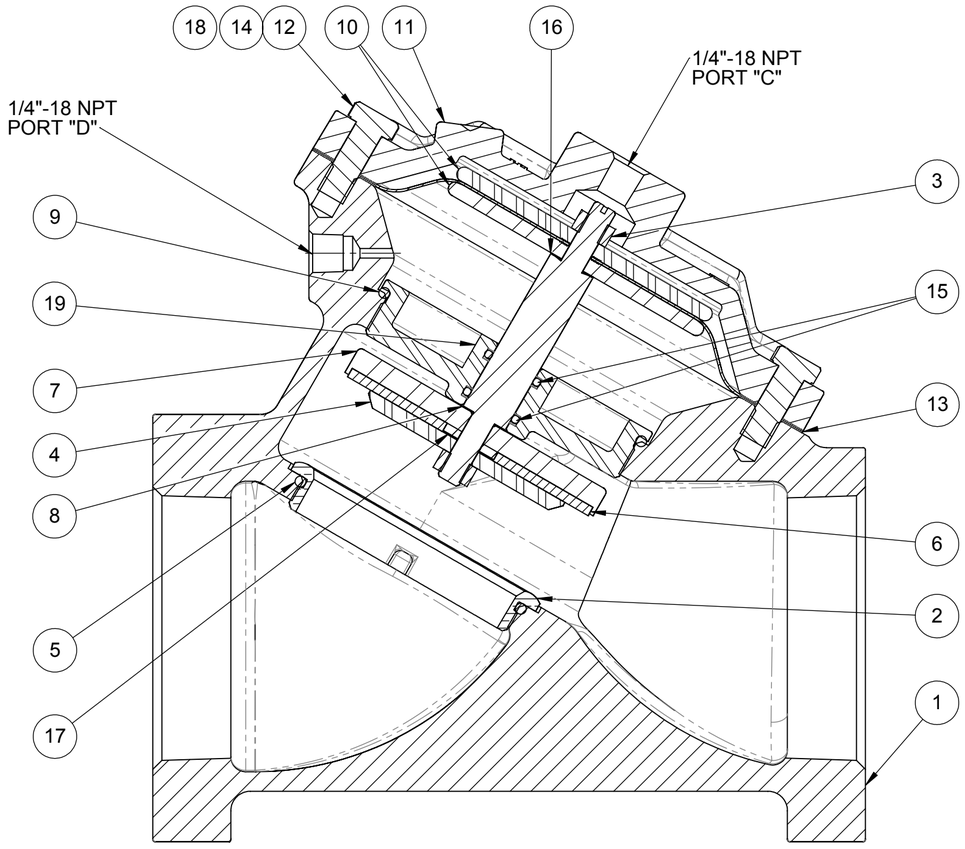


AMERICAN FLANGE PER
A.S.A. 16.1 CLASS 125



METRIC FLANGE PER
BS4504. DIN 10 & ISO R 2084

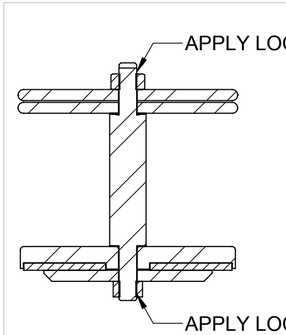
NOTE:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P. OR J.I.S. END CONNECTIONS



NORMALLY OPEN (STANDARD)

SEE REVERSE SIDE FOR
CONFIGURATION OPTIONS

TORQUE CHART		
ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
2	SEAT	500 IN/LBS (41.6 FT/LBS)
3	UPPER NUT	140 IN/LBS
3	LOWER NUT	140 IN/LBS
12,14,&18	NUT, HEX SCREW	140 IN/LBS
19	SHAFT GUIDE	500 IN/LBS (41.6 FT/LBS)



DO NOT APPLY TO O-RING SEALS

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	1101517	L	REDRAWN IN SOLIDWORKS	1-21-13	NE
	102041	M	1-WAS 1074481, 2-ADDED O-RING	6-3-13	NBE
	103682	N	1-ITEM#10-WAS:1074471, 2-ITEM#19-WAS:43245, 3-ITEM#33-WAS:43048, 4-ITEM#4- WAS:1074493	20AUG14	TJM
	104231	P	1- ITEM# 28-1071917, 1071903, 1071916, 2- CHG'D: 1/8 NPT ON LS & PI VERSIONS	04FEB15	TJM
	104754	R	1- ADD'D: TORQUE CHARTS (PG-1 & 2)	25JUN15	TJM

NO.	DESCRIPTION		STD	PART NO.	QTY
1	BODY	THREADED 3" NPT	*	1074446	1
		THREADED 3" BRASS	*	1074449	
		FLANGED 3" ASTM		1074438	
2	SEAT; BRASS (REQ'S ASSY TOOL)		*	1074505	1
3	HEX NUT (5/16-24)	SS	*	1263853	2
4	DISC PLATE	SS		1074495	1
5	O-RING	BUNA N	*	1071706 (ORB-233)	1
		EPDM		1071754 (ORE-233)	
		FKM		1071826 (ORV-233)	
6	DISC	BUNA	*	1074487 (427-J)	1
		EPDM		1074489 (427-JE)	
		FKM		1074492 (427-JV)	
		HYCAR		1074490 (427-JH)	
7	DISC HOLDER	BRASS	*	1074485	1
8	GASKET, COPPER		*	1074252 (424-R)	2
9	O-RING	BUNA N	*	1071708 (ORB-237)	1
		EPDM		1071755 (ORE-237)	
		FKM		1071828 (ORV-237)	
10	PLATE, UPPER DIAPHRAGM	SS	*	1074472	2
11	CAP	CAST IRON	*	1074454 (427)	1
		CAST BRASS		1074457 (427)	
12	HEX SCREW	PLATED STEEL	*	1072405 (3/8 - 16)	6
13	DIAPHRAGM	BUNA N	*	1074374 (426-FB)	1
		FKM		1074376 (426-FV)	
14	HEX NUT	PLATED STEEL	*	1071657 (NUZ-0011)	6
15	O-RING	BUNA N	*	1071691 (ORB-114TC)	2
		EPDM		1071729 (ORE-114TC)	
		FKM		1242391 (ORV-114TC)	
16	SHAFT (NORMALLY OPEN)	SS	*	1074496 (427)	1
17	SPACER	BRASS	*	1074382	1
18	HEX SCREW 3/8 - 16	SS	*	19768	2
19	SHAFT GUIDE	SS	*	1074479	1

REPAIR PARTS KITS

DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2), 5, 6, 8(2), 9, 14, 16	1070072 (427-RA) BUNA N INCLUDES DIAPHRAGM 1074475 (427-FB)	1070085 (427-RAE) E.P.D.M. INCLUDES DIAPHRAGM 1074475 (427-FB)	1070097 (427-RAV) FKM INCLUDES DIAPHAGM 1074477 (427-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 17, 18	1070122 (427-RF)		
SEAT (ITEM NO. 2)	1074505 (427-MO)		

ASSEMBLY TOOLS

DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (NOT SHOWN)	1-1/8" HEX SOCKET

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 √ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

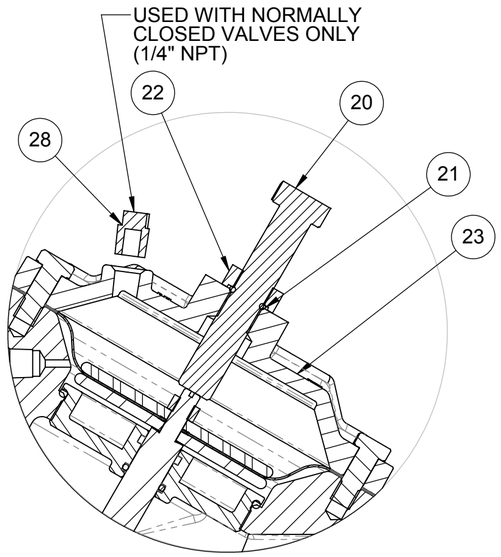
APPROVALS	DATE
DRAWN SM	05/10/11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 427
DIAPHRAGM VALVE STANDARD MODEL

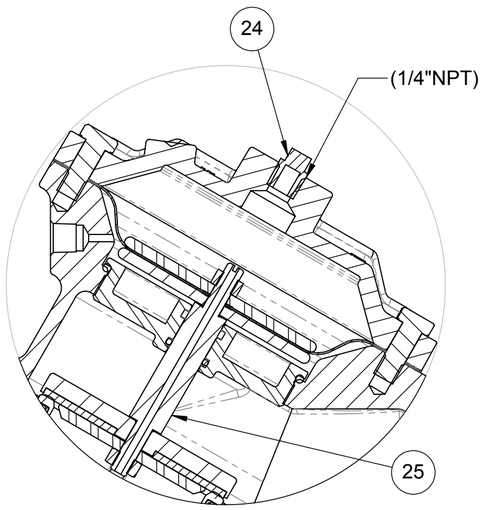
SIZE	DWG NO.	REV
B	BR1077617	S

SCALE 1:2 SHEET 1 OF 2



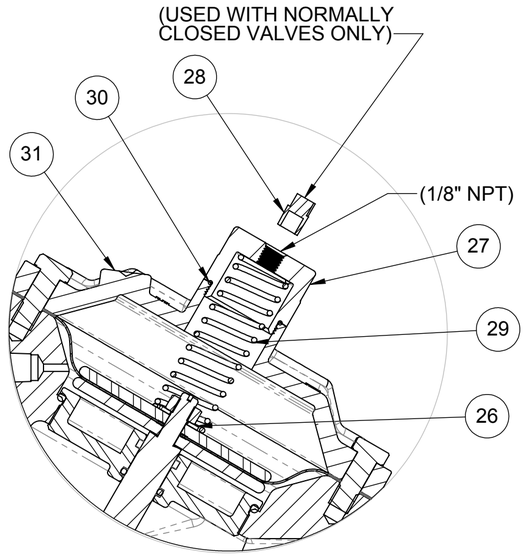
1073045 (V42J-0010-00000) (THREADED)
1073103 (V42J-3010-00000) (FLANGED)

LIMIT STOP



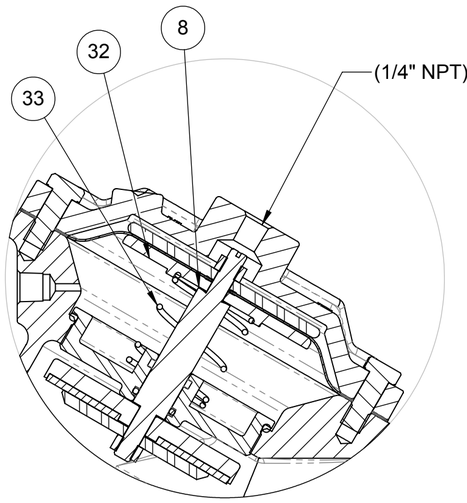
1073055 (V42J-0030-00000) (THREADED)
1073113 (V42J-3030-00000) (FLANGED)

NORMALLY CLOSED



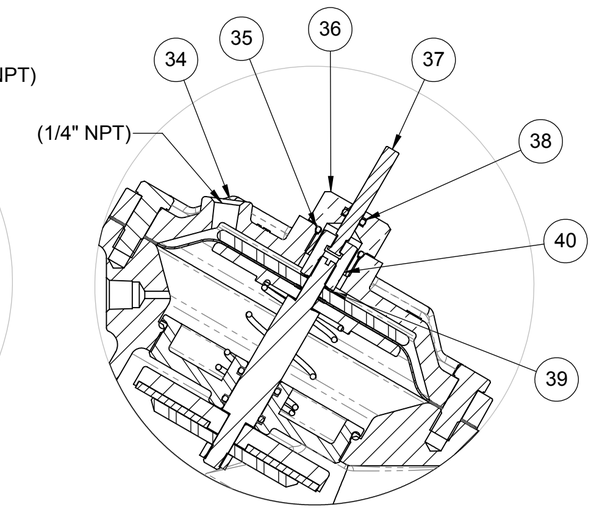
1073047 (V42J-0002-00000) (THREADED)
1073100 (V42J-3002-00000) (FLANGED)

SPRING ASSIST CLOSED



1073045 (V42J-0001-00000) (THREADED)
1073097 (V42J-3001-00000) (FLANGED)

SPRING ASSIST OPEN



1073054 (V42J-0021-00000) (THREADED)
1077374 (V42J-3021-00000) (FLANGED)

POSITION INDICATOR

NOTE:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP OR POSITION INDICATOR MODELS.
2. VALVES AVAILABLE WITH B.S.P. OR J.I.S. END CONNECTIONS.

TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED TO (+/-10%)
22	NUT, LIMIT STOP	120 IN/LBS
27	NUT, RETAINER	140 IN/LBS
36	SHAFT GUIDE	140 IN/LBS
40	TOP NUT	120 IN /LBS

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	1001	S	AQ Matic update & verified part numbers	17JAN17	MGS

ITEM NO.	DESCRIPTION	STD		PART NUMBER	QTY.
	LIMIT STOP MODEL				
20	SCREW, 5/8-18X3.50 HEX HD,	SS	*	1072365	1
21	O-RING,2-112	BUNA	*	1071690	1
22	NUT, LIMIT STOP	PLTD STL	*	1074434	1
23	CAP, 427, LS	CI		1074462	1
	NORMALLY CLOSED MODEL				
24	MALE PIPE PLUGS	PLTD STL	*	1071918	1
		BRASS		1071904	
		SS		1071915	
25	SHAFT, 427, NC	SS	*	1074499	1
	SPRING ASSIST CLOSED MODEL				
26	WASHER	BRASS	*	1074083	1
27	NUT, SPRG RTNR,425 & 465	SS		1074433	1
28	MALE PIPE PLUGS	PLTD STL	*	1071918	1
		BRASS		1071904	
		SS		1071915	
29	SPRING,COMPRESSION	SS	*	1078688	1
30	O-RING,2-025	BUNA	*	1071677	1
31	CAP, 427, SPRING ASSIST	CI	*	1074460	1
	SPRING ASSIST OPEN MODEL				
32	PLATE, DIAPHRAGM,427,SAO	SS		43733	1
33	SPRING, COMPRESSION	SS		1078692	1
	POSITION INDICATOR MODEL				
34	CAP, 427,CI,NPT,PI	CI	*	1074468	1
	CAP, 427, NPT, PI	BRASS		1074469	
35	O-RING,2-116	BUNA	*	1071692	1
36	PI ROD GDE, V42	BRASS	*	1074121	1
37	SHAFT,427,MACH	SS	*	1074510	1
38	O-RING,2-106,TFLN CTD	BUNA	*	1071688	1
39	LOCKWASHER,5/16",INTRNL TOOTH	SS	*	1073590	1
40	TOP NUT	BRASS	*	1074332	1

CONVERSION KITS

DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 20, 21, 22, 23	1074502 (427-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 26 THRU 31	1074519 (427-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8 ,32, 33	1074521 (427-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 34 THRU 40	1074509 (427-PIC)

REPAIR PARTS KITS

DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSIST OF STANDARD ITEM NO'S 20, 21,22	1074501 (427-LS)
INT. PARTS KIT (NORM. CLOSED) CONSIST OF STANDARD ITEM NO'S 4,7,10,11(2),18,25	1070133 (427-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSIST OF STANDARD ITEM NO'S 26, 29, 30	1081565 (427-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSIST OF STANDARD ITEM NO'S 8, 32, 33	1074521 (427-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSIST OF STANDARD ITEM NO'S 35 THRU 40	1074508 (427-PI)

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN SM	05/10/11
APPROVED	
CHECKED	

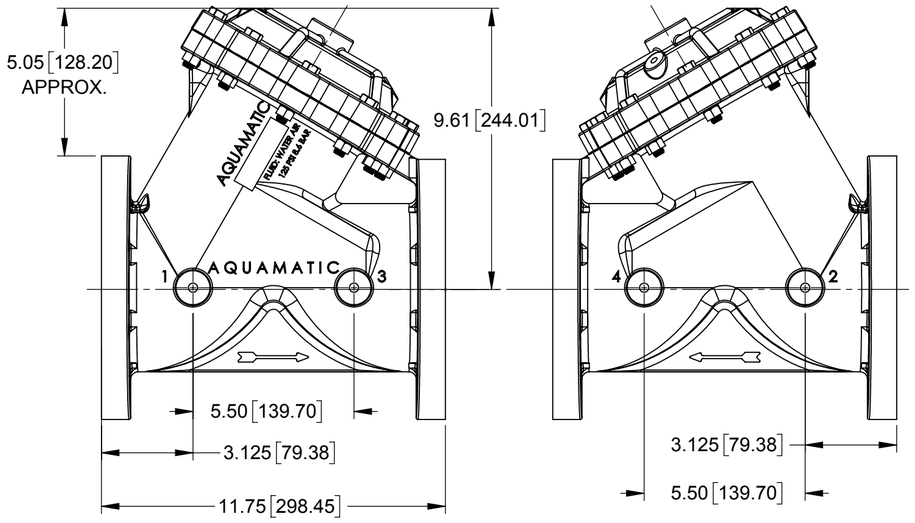
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 427
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077617	S

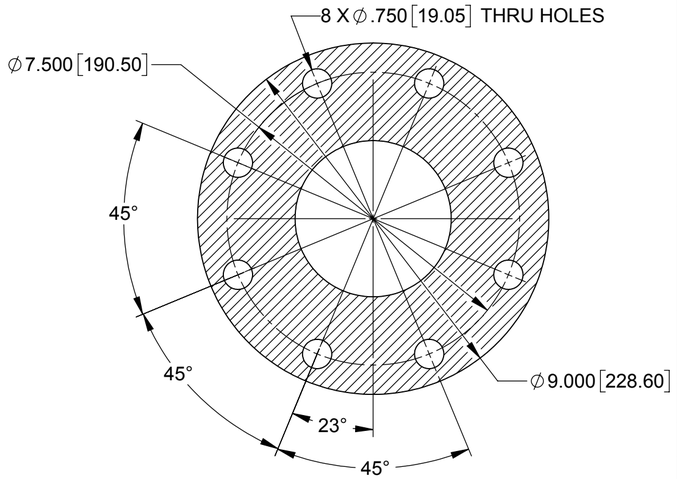
SCALE 1:2 SHEET 2 OF 2

NOTE:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P. END CONNECTIONS.



ASSEBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (NOT SHOWN)	1-1/4" HEX SOCKET

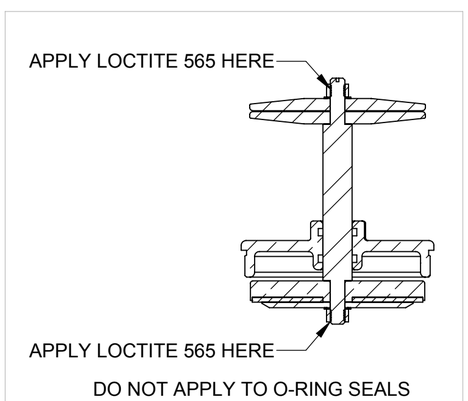
TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
2	SEAT	400 IN/LBS (33 FT/LBS)
3	UPPER NUT	140 IN/LBS
3	LOWER NUT	215 IN/LBS
10	GUIDE, SHAFT	500 IN/LBS (41.6 FT/LBS)
13 &15	NUT, & CAP SCREW	140 IN/LBS



AMERICAN FLANGE PER A.S.A. 16.1 CLASS 125
METRIC FLANGE PER BS 4504, DIN 10 & ISO R 2054

FLANGE STYLE	A	B	C
AMERICAN	9.000	7.500	.750
METRIC	229 MM	180 MM	18 MM

1070045 (V42K-3000-00000) (4" PIPE SIZE)
NORMALLY OPEN (STANDARD)



DO NOT APPLY TO O-RING SEALS

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	101085	L	1-ITEM #17 WAS: 1074578, 2-ITEM #25 WAS: 1074581	27AUG14	TJM
	104610	M	1-ADD'D: ITEM#18-1073591, 2-#27 WAS: 1074430, 3-ADD'D: TORQUE TABLES	11MAY15	TJM
	105687	N	1-ITEM#17 WAS: QTY 1	25FEB16	TJM
	1001	O	AQ Matic update & verified part numbers	17JAN17	MGS
	1284	P	DRAWING 1074587 REPLACED WITH 1074587, DROP BR FROM DRAWING # 1077618	8/9/18	TRK
	1300	Q	CORRECT ERROR ON LOCKWASHER (18) PART#	8/29/18	KJB

NO.	DESCRIPTION		STD	PART NO.	QTY
1	BODY CAST IRON	2" NPT	*	1074522 (428)	1
2	SEAT(REQ'S ASSY TOOL)	BRASS	*	1074585 (428)	1
3	HEX NUT (5/16-24)	SS	*	3001990	2
4	DISC PLATE	SS	*	43734 (428)	1
5	O-RING	BUNA N	*	1071697 (ORB-156)	1
		EPDM		1071739 (ORE-156)	
		FKM		1071811 (ORV-156)	
6	DISC	BUNA	*	1074568	1
		EPDM		1074570	
		FKM		1074573	
		HYCAR		1074571	
7	DISC HOLDER, SS		*	1074590 Ⓟ	1
8	GASKET, COPPER		*	1073950 (110)	2
9	O-RING	BUNA N	*	1071711 (ORB-245)	1
		EPDM		1071759 (ORE-245)	
		FKM		1071832 (ORV-245)	
10	SHAFT GUIDE(REQ'S ASSY TOOL)	BRASS	*	1074563 (428)	1
11	DIAPHRAGM PLATE; SS		*	43759 (428)	2
12	CAP- NPT	CAST IRON	*	104532 (428)	1
13	HEX SCREW	PLATED STEEL	*	1072406	11
14	DIAPHRAGM	BUNA N	*	1074557	1
		FKM		1074559	
15	HEX NUT	PLATED STEEL	*	1071657 (NUZ-0011)	11
16	O-RING	BUNA N	*	1071702 (ORB-210TC)	2
		EPDM		1242718 (ORE-210TC)	
		FKM		1242394 (ORV-210TC)	
17	SHAFT		*	1074579 (428)	1
18	LOCKWASHER, 3/8", INTERNAL		*	1073591	2

REPAIR PARTS KITS			
DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2), 5, 6, 8(2), 9, 14, 16	1070073 (428-RA) BUNA N INCLUDES DIAPHRAGM 1074557 (428-FB)	1070086 (428-RAE) E.P.D.M. INCLUDES DIAPHRAGM 1074557 (428-FB)	1070098 (428-RAV) FKM INCLUDES DIAPHRAGM 1074559 (428-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 17, 18	1070123 (428-RF)		
SEAT (ITEM NO. 2)	1074585 (428-MAO)		

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

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TOLERANCES:
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1 PLACE .X: ± .015 [0.38]
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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

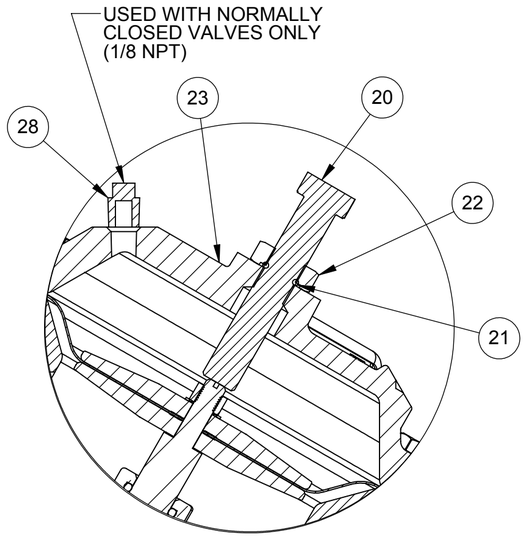
APPROVALS	DATE
DRAWN SM	05/11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

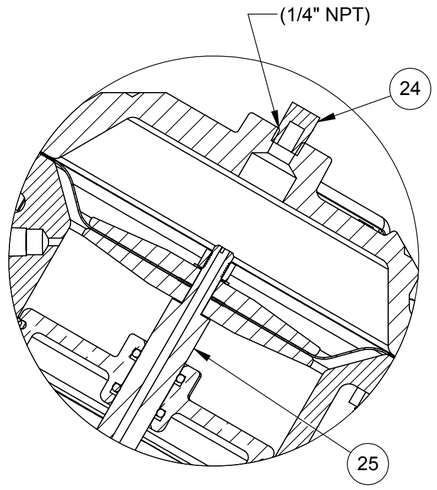
TITLE
CATALOG SHEET, 428
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	1077618	Q

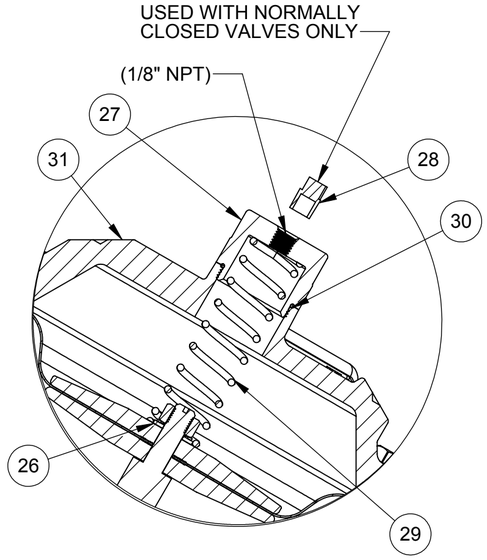
SCALE 1:4 SHEET 1 OF 2



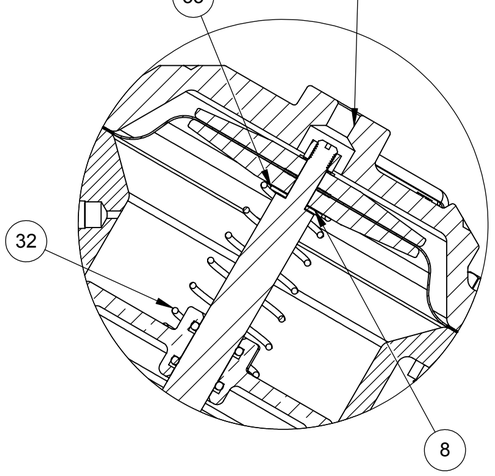
1073151 (V42K-3010-00000)
LIMIT STOP



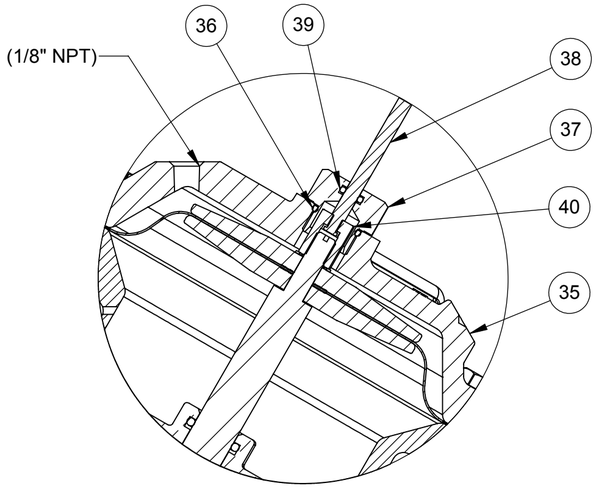
1073158 (V42K-3030-00000)
NORMALLY CLOSED



1073148 (V42K-3002-00000)
SPRING ASSIST CLOSED



1073146 (V42K-3001-00000)
SPRING ASSIST OPEN



1073156 (V42K-3021-00000)
POSITION INDICATOR

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR NOTES		

ITEM NO.	DESCRIPTION	STD	PART NUMBER	QTY.
LIMIT STOP MODEL				
20	SCREW, 5/8-18X3.50 HEX HD,	*	1072365	1
21	O-RING,2-112, BUNA N	*	1071690	1
22	NUT, LIMIT STOP	*	1074434	1
23	CAP, 428,LS, NPT, CI	*	1074542	1
NORMALLY CLOSED MODEL				
24	MALE PIPE PLUGS, PLATED STEEL	*	1071918	1
	MALE PIPE PLUGS, BRASS		1071904	1
25	SHAFT, 428 NORMALLY CLOSED	*	1074582	1
SPRING ASSIST CLOSED MODEL				
26	WASHER, CENTERING, BRASS		1074530	1
27	NUT, SPRG RTNR,426 & 465,SS	*	1074433	1
28	MALE PIPE PLUGS, PLATED STEEL	*	1071917	1
	MALE PIPE PLUGS, BRASS		1071903	1
29	SPRING, COMPRESSION	*	1074607	1
30	O-RING,2-025, BUNA N	*	1071677	1
31	CAP, 428, NPT, CI		1074540	1
SPRING ASSIST OPEN				
8	GASKET, CDA 110 COPPER	*	1073950	1
32	SPRING, COMPRESSION, 428,SAO	*	1074600	1
33	WASHER, BRASS		1074610	1
POSITION INDICATOR MODEL				
35	CAP, 428,CI,NPT,PI		1074549	1
36	O-RING,2-116, BUNA N		1071692	1
37	PI ROD GDE, V42, BRASS		1074121	1
38	SHAFT,428,SS,MACH		1074593	1
39	O-RING,2-108, BUNA N,TFLN CTD		1071688	1
40	NUT,TOP,428,PI		1074608	1

TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
22	NUT, LIMIT STOP	140 IN/LBS
27	NUT, SPRG RETAINER	140 IN/LBS
37	PI ROD GUIDE	140 IN/LBS
40	NUT, TOP, 428, PI	140 IN/LBS

NOTE:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMITED STOP OR POSITION INDICATOR MODELS.

2. VALVES AVAILABLE WITH B.S.P. END CONNECTIONS.

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMITED STOP) CONSISTS OF STANDARD ITEM NO'S 20, 21, 22,	1074583 (428-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 18, 25	1070134 (428-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 28, 29, 30	1074602 (428-SC)
INT. PARTS KIT (SPING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8, 32, 33	1074604 (428-SO)
INT. PARTS KIT (POSTION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 35 THRU39	1074591 (428-PI)

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMITED STOP) CONSISTS OF STANDARD ITEM NO'S 20, 21, 22, 23	1074584 (428-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 26 THRU 31	1074603 (428-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 8, 32, 33	1074606 (428-SOC)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 34 THRU 39	1074592 (428-PIC)

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

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THIRD ANGLE PROJECTION

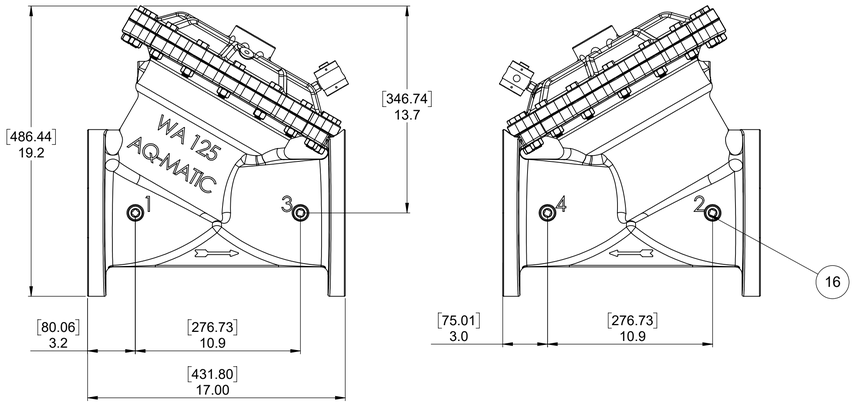
APPROVALS	DATE
DRAWN SM	05/11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 428
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	1077618	Q

SCALE 1:4 | SHEET 2 OF 2

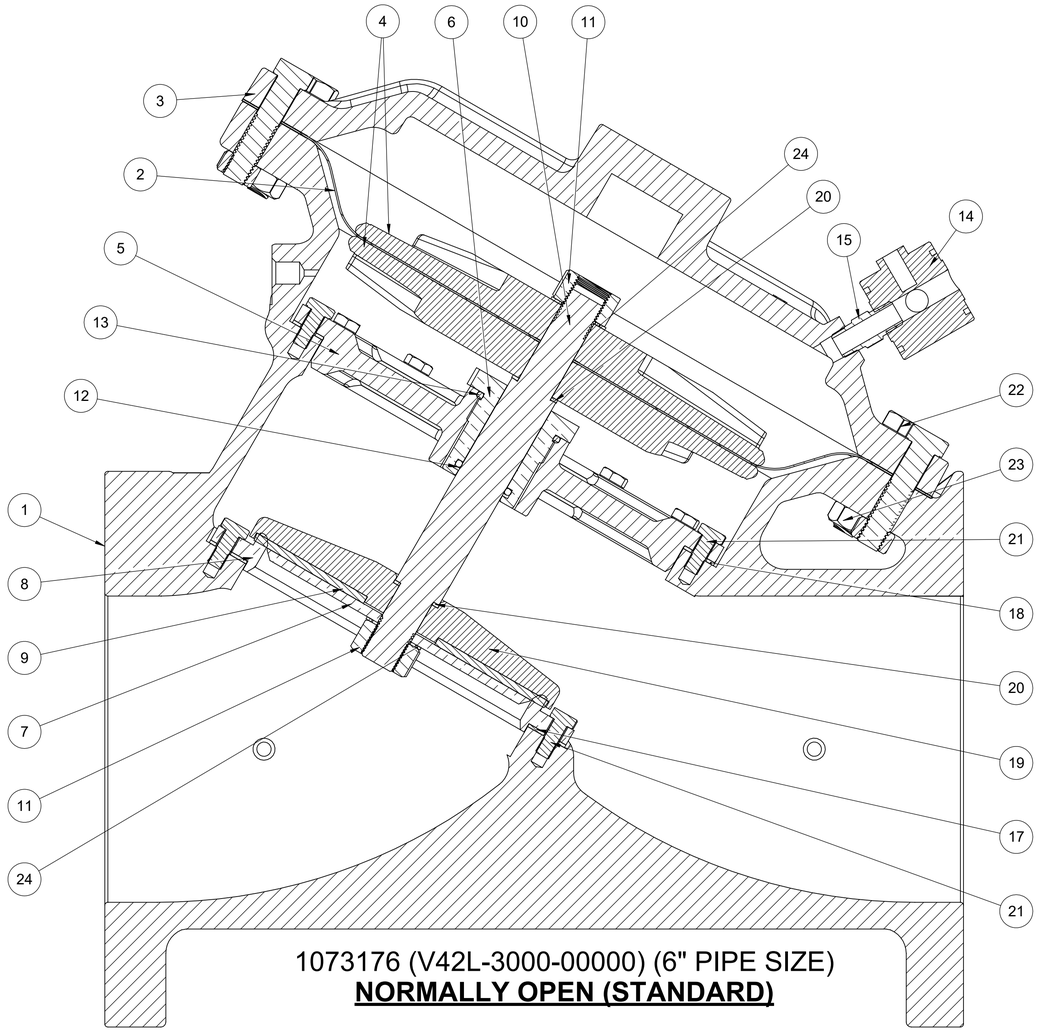


REPAIR PARTS KITS		
DESCRIPTION	**PART NO.**	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 2, 9, 11(2), 12, 13, 17, 18,19, 20(2), 24(2)	1070074 (429-RA)	1070099 (429-RAV)
	BUNA N INCLUDES DIAPHRAGM 1074622 (429-FB)	FKM INCLUDES DIAPHRAGM 1074623 (429-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4(2), 5, 6, 7, 10, 19, 20(2), 21(12), 24(2)	1074653 (429-RF)	
SEAT - ITEM NO. 8	1074640 (429-MO)	

NOTE:

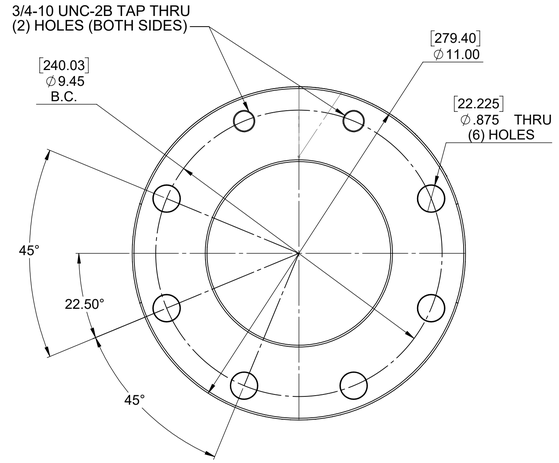
1. **AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1 - 1968**

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1832	R	CATALOG SHEET UPDATE, ON AQ TEMPLATE	1/22/21	

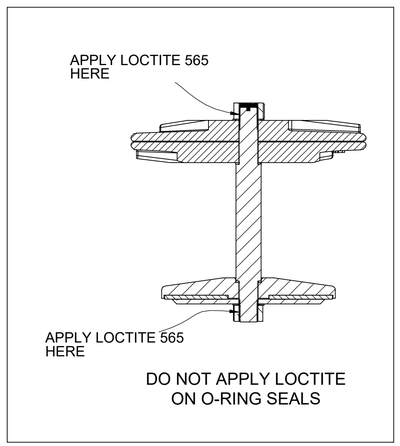


1073176 (V42L-3000-00000) (6" PIPE SIZE)

NORMALLY OPEN (STANDARD)



AMERICAN FLANGE PER A.S.A 16.1 CLASS 125



NORMALLY OPEN (STANDARD CONFIGURATION)

ITEM NO.	DESCRIPTION		STD	PART NUMBER	QTY.
1	VALVE BODY	CAST IRON	*	1074613 (429-A)	1
2	DIAPHRAGM	BUNA-N	*	1074622 (429-FB)	1
		FKM		1074623 (429-FV)	
3	CAP, 429	CAST IRON	*	1074615 (429-C)	1
4	PLATE, DIAPHRAGM	BRASS	*	1074620 (429-D)	2
5	SHAFT GUIDE	CAST IRON	*	1074625 (429-G0)	1
6	GUIDE, SHAFT	BRASS	*	1074646 (429-P)	1
7	PLATE, DISC	BRASS	*	1074634 (429-K)	1
8	LOWER, SEAT	BRASS	*	1074640 (429-MO)	1
9	DISC	HYCAR	*	1074632 (429-JH)	1
		FKM		1074633 (429-JV)	
10	SHAFT NO	STAINLESS STEEL	*	1074636 (429--L)	1
11	NUT, 3/4-16	STAINLESS STEEL	*	3001991	2
12	O-RING, 2-214, FKM	FKM	*	1242721	1
13	O-RING , 2-223	NITRILE	*	1071703 (ORB-223)	1
		FKM		1071820 (ORV-223)	
14	HUMPHREY VALVE N.C.	BRASS	*	1074661 (429-VP)	1
15	FITTING, NIPPLE 1/4MNPTX1.38	BRASS	*	1081648	1
16	MALE PIPE PLUG, 1/4 NPT	PLATED STEEL	*	1071918 (PLZ-0008)	4
17	GASKET, 429, SEAT	BUNA-N	*	1074642 (429-N)	1
18	GASKET, CENTERING PLATE,	BUNA-N	*	1074644 (429-O)	1
19	RETAINER DISC, SS	STAINLESS STEEL	*	4510460 (429-HS)	1
20	GASKET, WASHER	COPPER	*	1073952	2
21	SCREW, HEX HD, CAP, 5/16-18 SS	PLATED STEEL	*	1072355 (SCS-0011)	20
22	SCREW 1/2-13, HEX HD, CAP	PLATED STEEL	*	1072410 (SCZ-0038)	16
23	NUT, 1/2-13	PLATED STEEL	*	16568-02	16
24	LOCK WASHER	STAINLESS STEEL	*	1073592 (WAS-0011)	2

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -1994
UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

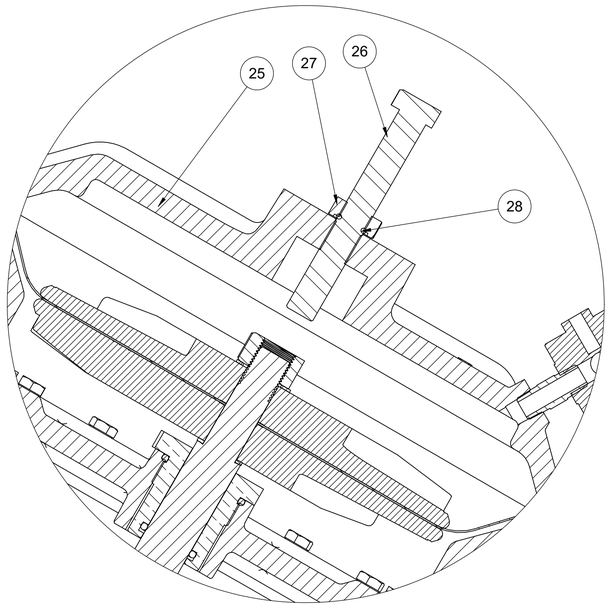
APPROVALS	DATE
DRAWN TRK	1/22/21
CHECKED BY	
APPROVED	

AQMatic

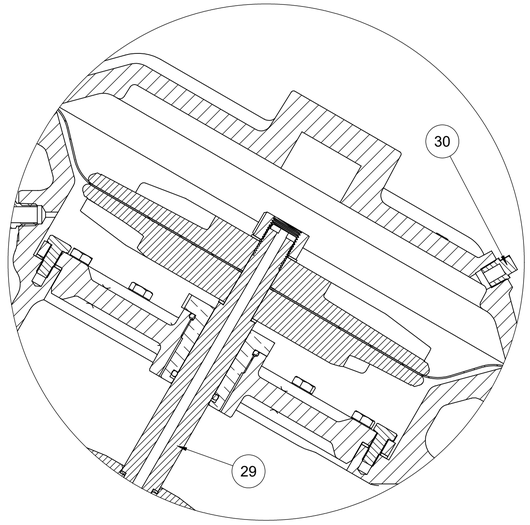
CATALOG SHEET, 429
DIAPHRAGM VALVE STANDARD MODEL

SCALE	SOLIDWORKS FORMAT	DWG NO. 1077619	REV. R
	SHEET 1 OF 2	D	

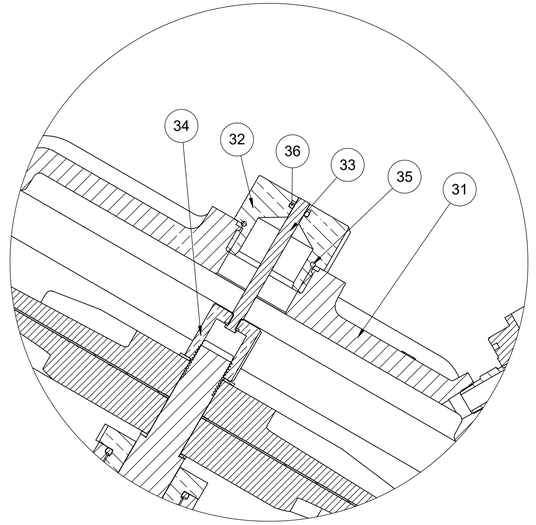
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1832	R	CATALOG SHEET UPDATE, ON AQ TEMPLATE	1/22/21	



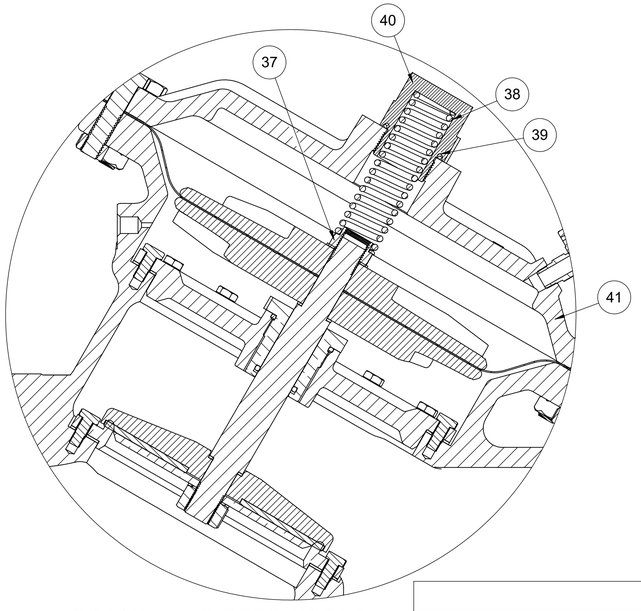
1073184 (V42-3010-00000)
LIMIT STOP



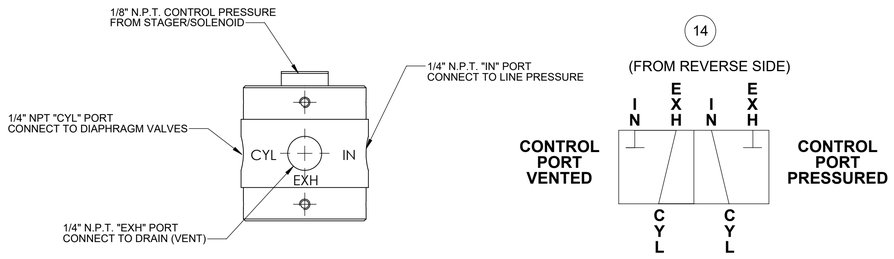
1073187 (V42-3030-00000)
NORMALLY CLOSED



1082048 (V42-3020-00000)
POSITION INDICATOR



4500139 (V42-3002-00000)
SPRING ASSIST CLOSED



THIS 3-WAY "NORMALLY CLOSED" AUXILIARY PILOT VALVE (PART NO. 429-VP) IS FURNISHED WITH ALL V42L DIAPHRAGM VALVES. IT ACCELERATES THE CLOSING AND OPENING SPEED OF THE VALVE.

LIMIT STOP MODEL					
ITEM NO.	DESCRIPTION		STD.	PART NUMBER	QTY.
25	CAP, 429, LIMIT STOP	CAST IRON	*	1074617 (429-CCC)	1
26	SCREW, HEX HD CAP, 5/8-18 X 4.5"	SS	*	1074660 (429-U)	1
27	NUT, LIMIT STOP	SS	*	1074434 (426-U)	1
28	O-RING, 2-112	BUNA-N	*	1071690 (ORB-112)	1

NORMALLY CLOSED MODEL					
ITEM NO.	DESCRIPTION		STD.	PART NUMBER	QTY.
29	SHAFT, 429, NORMALLY CLOSED	SS	*	1074637 (429-LL)	1
30	MALE PIPE PLUG, 1/4 NPT	PLATED STEEL	*	1071918 (PL2-0008)	1

POSITION INDICATOR MODEL					
ITEM NO.	DESCRIPTION		STD.	PART NUMBER	QTY.
31	CAP, 429, POSITION INDICATOR	CAST IRON	*	1074618 (429-CF)	1
32	GUIDE, SHAFT, 429, BRASS		*	1074624 (429-GF)	1
33	SHAFT, 429, SS, MACH		*	1074649 (429-PM)	1
34	NUT, 429, BRASS		*	1074658 (429-TB)	1
35	O-RING, 2-128, NITRILE		*	1071694 (ORB-128)	1
36	O-RING, 2-106, NITRILE, TFLN CTD		*	1071688 (ORB-108TC	1

SPRING ASSIST CLOSED					
ITEM NO.	DESCRIPTION		STD.	PART NUMBER	QTY.
37	NUT, SPRING RETAINER	SS	*	1074663 (429-X)	1
38	SPRING, COMPRESSION	SS	*	1074657 (429-SS)	1
39	O-RING, 2-222, NITRILE		*	1079839 (ORB-222)	1
40	NUT, SPRING RETAINER, 429, BRASS		*	1074659 (429-TT)	1
41	CAP, 429, SPRING ASSIST CLOSED	CAST IRON	*	1074616 (429-CC)	1

REPAIR PARTS KITS	
DESCRIPTION	**PARTS NO.**
INT. PARTS KIT (LIMIT STOP)CONSISTS OF STANDARD ITEM NO'S 26, 27, 28	1074638 (429-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4(2), 5, 6, 7, 19, 22(12), 29	1074654 (429-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 37, 38, 39	1074655 (429-SC)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 20(2), 32 THRU 36	1074647 (429-PI)

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16 (1), 25 THRU 28	1074639 (429-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 11(2), 16, 37 THRU 41	1074656 (429-SCC)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF STANDARD ITEM NO'S 20(2), 31 THRU 36	1074648 (429-PIC)

NOTE
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP OR POSITION INDICATOR.
2. SPRING ASSIST OPEN MODEL AVAILABLE.

SEE REVERSE SIDE FOR STANDARD MODEL NORMALLY OPEN MODEL

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	1/22/21
CHECKED BY	
APPROVED	

aQMatic

CATALOG SHEET, 429
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV.
D	1077619	R
SCALE	SOLIDWORKS FORMAT	SHEET 2 OF 2

AQUAMATIC® V42 SOLENOID-OPERATED SERIES
DIAPHRAGM VALVES

GREAT FIT FOR WATER TREATMENT AUTOMATED PROCESS SYSTEMS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

Unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

All components can be serviced while the valve is in-line

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Cast iron, brass, stainless steel, and nitrile elastomer components for unparalleled service

3/4"-3" threaded [NPT or BSP]

3"-4" flange drilled in accordance with ASA16.1 class 125, or BSP4504

Adaptable to a wide variety of control devices

OPTIONS

Spring-assist closed

Spring-assist open

Limit stop for flow control

Seal and diaphragm materials for special applications

TYPICAL APPLICATIONS

Agricultural Irrigation

Air Control Systems

Car Wash Systems

Concrete Additive

Control Systems

Conveyor Systems

Cooling Towers

Dust Suppression

Fuel Handling

Laundry Equipment

Process Water Systems

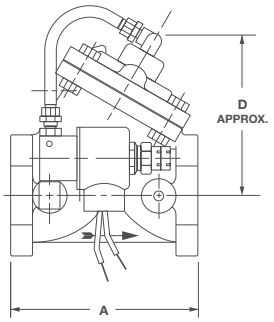
Pump Controls

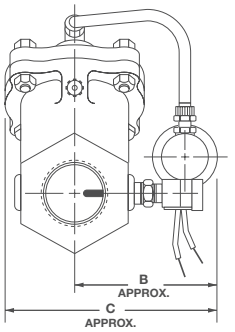
Turf Irrigation

DIMENSIONS

MODEL #	PIPE SIZE	Cv*	DIMENSIONS (APPROXIMATE)			
			A	B	C	D
V42B	3/4"	11.4	3.69" (94 mm)	3.25" (82.5 mm)	4.63" (117.5 mm)	3.81" (96.8 mm)
V42C	1"	12.8	3.69" (94 mm)	3.25" (82.5 mm)	4.63" (117.5 mm)	3.81" (96.8 mm)
V42D	1-1/4"	26.5	4.75" (121 mm)	3.56" (90.5 mm)	5.31" (134.9 mm)	4.56" (115.9 mm)
V42E	1-1/2"	32.5	4.75" (121 mm)	3.56" (90.5 mm)	5.31" (134.9 mm)	4.56" (115.9 mm)
V42F	2"	56	6.62" (168 mm)	3.94" (100.0 mm)	6.63" (168.3 mm)	5.94" (150.8 mm)
V42G	2"	68	7.37" (187 mm)	4.19" (106.4 mm)	7.25" (184.2 mm)	6.25" (158.8 mm)
V42H	2-1/2"	84	7.37" (187 mm)	4.19" (106.4 mm)	7.25" (184.2 mm)	6.25" (158.8 mm)
V42J	3" (threaded)	134	9.00" (229 mm)	4.63" (117.6 mm)	8.25" (209.5 mm)	7.00" (117.8 mm)
V42J	3" (flanged)	134	10.62" (298 mm)	4.63" (117.6 mm)	8.25 (209.5 mm)	7.00" (117.8 mm)
V42K	4"	275	11.75" (432 mm)	5.13" (130.3 mm)	9.50" (241.3 mm)	8.75" (222.3 mm)

*Cv = Flowrate (gal/minute) of water at 60°F (15.5°C) at a 1 psi pressure drop.Liters/minute = gal/minute x 3.78





CURRENT DRAIN (AMPERES)

Voltage	Inrush	Holding
24V 60 Hz	1.1	0.65
120V 60 Hz	0.2	0.1
220V 50 Hz	0.1	0.07
12 VDC	–	0.6
24 VDC	–	0.3

OPERATING SPECIFICATIONS

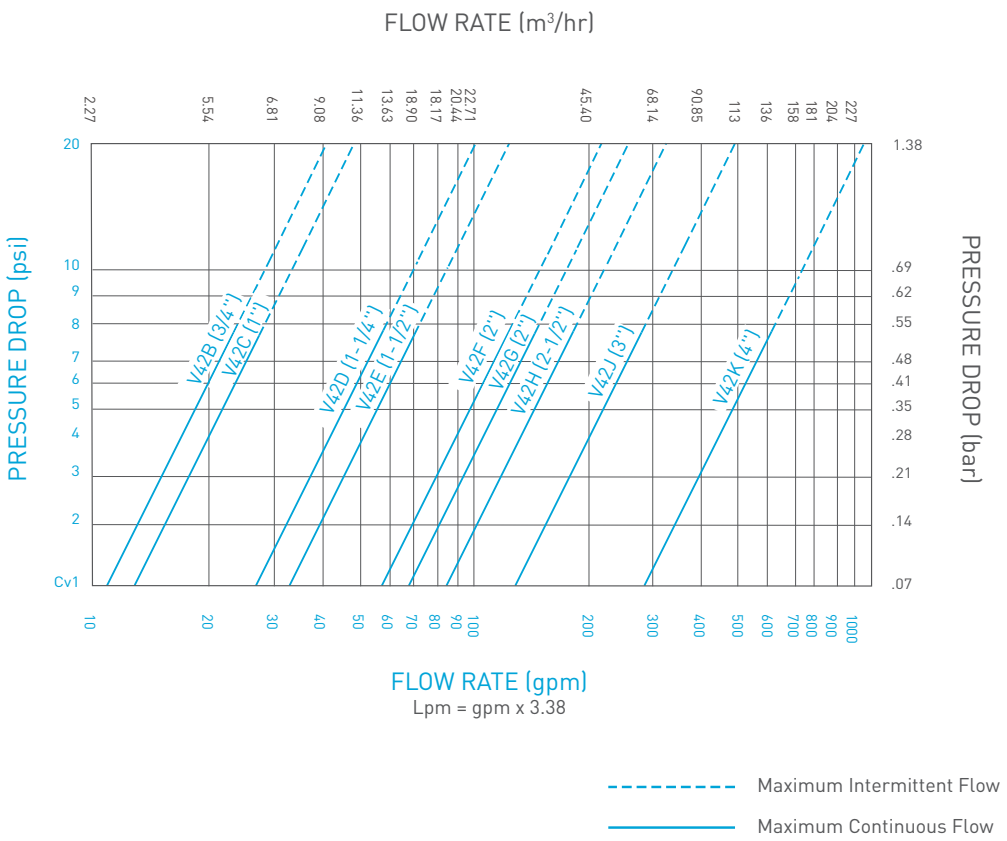
Working Pressure	125 psi (8.6 bar)
Max Temperature	150°F (65°C)

Energized to open:
Line pressure is directed through the solenoid to the upper diaphragm chamber, closing the valve. Activating the solenoid vents the upper diaphragm chamber, allowing the valve to open.

Energized to close:
The upper diaphragm chamber is vented, allowing the valve to open. Activating the solenoid pressurizes the upper diaphragm chamber, closing the valve.

Independent control pressure:
An independent source of pressure is used through the solenoid to control the diaphragm valve.

PERFORMANCE DATA



16605 West Victor Rd. New Berlin, WI 53151

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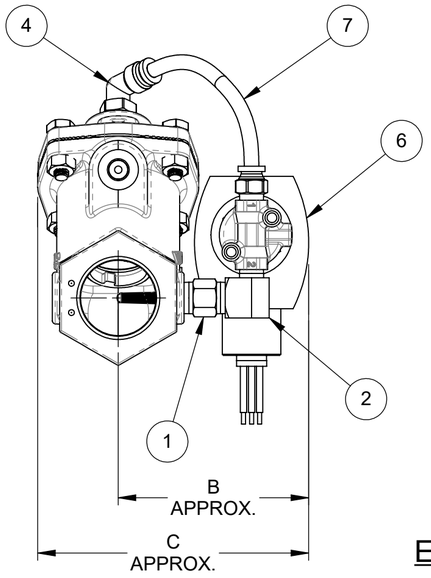
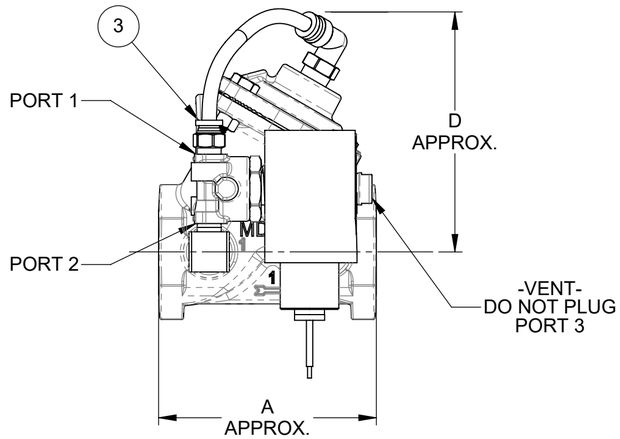
1229847 REV L MA2016

BILL OF MATERIALS																		
ITEM NO	PART NO	DESCRIPTION	421 EC QTY	424 EC QTY	425 EC QTY	426 EC QTY	427 EC QTY	427F EC QTY	428 EC QTY	429 EC QTY	421 EO QTY	424 EO QTY	425 EO QTY	426 EO QTY	427 EO QTY	427F EO QTY	428 EO QTY	429 EO QTY	UNITS
1	1074004	STRAINER ASSEMBLY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
3	1078763	FITTING, 1/8MNPT X 1/4, PUSH FIT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
4	1078766	FITTING, ELBOW, 1/4" MNPT X 1/4" TUBE	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	-	EACH
5	1078765	FITTING, ELBOW, 1/8" MNPT X 1/4" TUBE	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	EACH
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
	4510496-02	SOLENOID, 3-WAY, 220/60																	
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC																	
	4510496-04	SOLENOID, 3-WAY, 24 VDC																	
7	1071936	TUBING, POLY 1/4" O.D. X .035	5	6	8	8	9	10	13	16	4	5	7	8	9	9	12	19	INCHES
8	43947	FITTING, ADAPTER, 1/4MNPT X 1/4FMNPT	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	EACH

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
G		1-ADD'D; NOTE-6 PG-1, 2-ADD'D: NOTE-5 PG-2	3/13/2015	TJM
H	1001	AQ-MATIC UPDATES AND VERIFIED PART NUMBERS	1/20/2017	MGS
I	1144	SERVICE PARTS ONLY 1075634 AND 1070651, REMOVED FROM CATALOG	10/19/2017	TRK/JJ
J	1257	FIX BOM/BALLOON ISSUES ON SHEETS ONE AND TWO	6/28/2018	KB
K	1365	FIX ISSUES WITH DRAWING VIEWS, CORRECT OTHER SMALL ERRORS	11/20/2018	KB
L	1386	REMOVE 1070650 SOLENOID	1/7/2019	TRK
M	1506	ADDED 24 VDC SOLENOID (1070651) OPTION	6/26/2019	KJB
N	1678	REDRAWN PER NEW MODEL, REPLACE SOLENOIDS WITH 4510496 SERIES	3/30/2020	PMJ

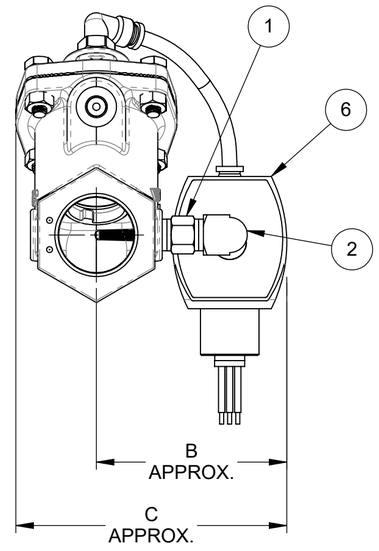


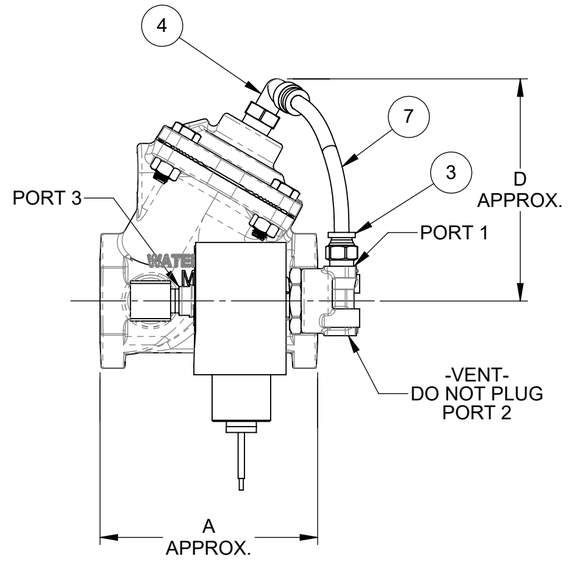


ENERGIZED TO CLOSE

SOLENOID ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

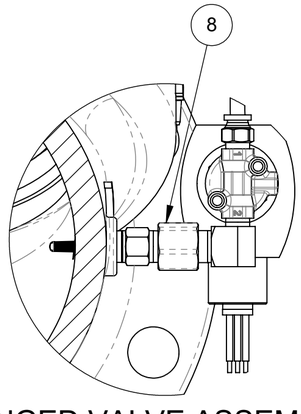




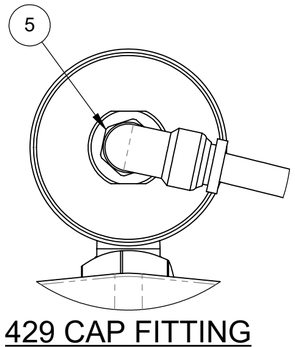
ENERGIZED TO OPEN

SOLENOID DE-ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1 IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

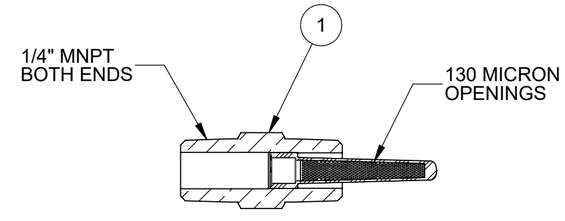
SOLENOID ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE



FLANGED VALVE ASSEMBLY



429 CAP FITTING



STRAINER ASSEMBLY

VALVE SERIES	PIPE SIZE	A	B	C	D
V42B	3/4"	[94] 3.72	[83] 3.25	[118] 4.63	[104] 4.09
V42C	1"				
V42D	1-1/4"	[120] 4.73	[91] 3.58	[135] 5.33	[123] 4.86
V42E	1-1/2"				
V42F	2"	[168] 6.60	[100] 3.94	[168] 6.63	[158] 6.21
V42G	2"	[187] 7.35	[111] 4.38	[190] 7.47	[166] 6.55
V42H	2-1/2"				
V42J	3" THREADED	[232] 9.13	[122] 4.82	[214] 8.44	[181] 7.11
	3" FLANGED	[270] 10.62	[145] 5.73	[241] 9.48	[181] 7.11
V42K	4"	[298] 11.75	[154] 6.05	[268] 10.55	[253] 9.97
V42L	6"	[432] 17.00	[172] 6.78	[372] 14.65	[392] 15.41

NOTES:

1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE AND CONFIGURATION.
2. B.S.P.T. THREADED VALVES AVAILABLE UPON REQUEST.
3. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
4. BOSS NO. 1 ON VALVE TAPPED 1/4" N.P.T.
5. SEE PAGE 2 FOR DRY DRAIN OPTION & PAGE 3 FOR INDEPENDANT PRESSURE.
6. "EC" REFERS TO ENERGIZED CLOSED. "EO" REFERS TO ENERGIZED OPEN. "427F" REFERS TO THE 427 FLANGED OPTION.

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT OR PRODUCT DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH RoHS 3 EU (EUROPEAN UNION) DIRECTIVE 2015/863

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	3/13/2020
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

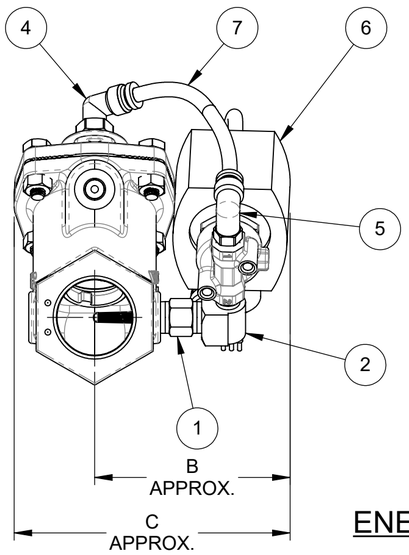
DESCRIPTION: CATALOG SHEET, V420, SOLENOIDS

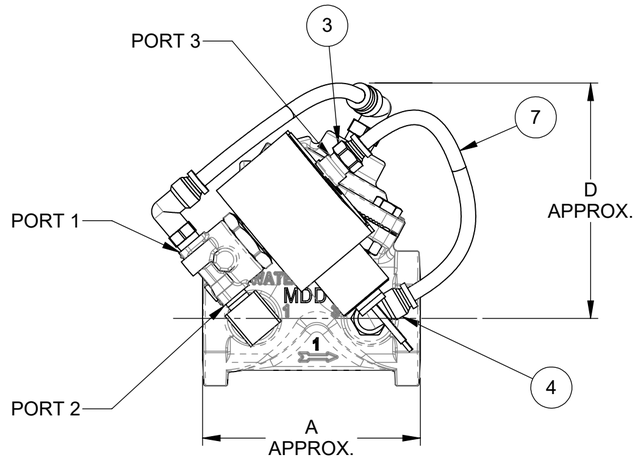
SIZE	DWG NO.	REV.
C	1078113	N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 1 OF 4

BILL OF MATERIALS																		
ITEM NO	PART NO	DESCRIPTION	421 ECDD QTY	424 ECDD QTY	425 ECDD QTY	426 ECDD QTY	427 ECDD QTY	427F ECDD QTY	428 ECDD QTY	429 ECDD QTY	421 EODD QTY	424 EODD QTY	425 EODD QTY	426 EODD QTY	427 EODD QTY	427F EODD QTY	428 EODD QTY	429 EODD QTY	UNITS
1	1074004	STRAINER ASSEMBLY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
3	1078763	FITTING, 1/8MNPT X 1/4, PUSH FIT	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	EACH
4	1078766	FITTING, ELBOW, 1/4" MNPT X 1/4" TUBE	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	EACH
5	1078765	FITTING, ELBOW, 1/8" MNPT X 1/4" TUBE	1	1	1	1	-	-	-	1	1	1	1	1	1	1	1	2	EACH
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
	4510496-02	SOLENOID, 3-WAY, 220/60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	4510496-04	SOLENOID, 3-WAY, 24 VDC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
7	1071936	TUBING, POLY 1/4" O.D. X .035	5	6	7	8	9	9	12	16	5	4	5	6	7	7	10	14	INCHES
			6	4	4	3	2	3	3	8	4	3	3	3	4	4	4	10	
8	43947	FITTING, ADAPTER, 1/4MNPT X 1/4FMNPT	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	EACH

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE PAGE ONE FOR LIST OF CHANGES		

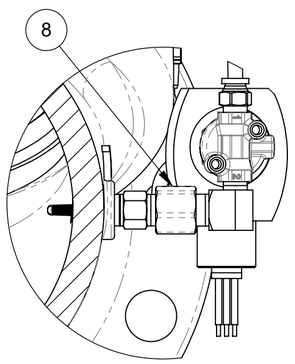




ENERGIZED TO CLOSE, DRY DRAIN OPTION

SOLENOID ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.



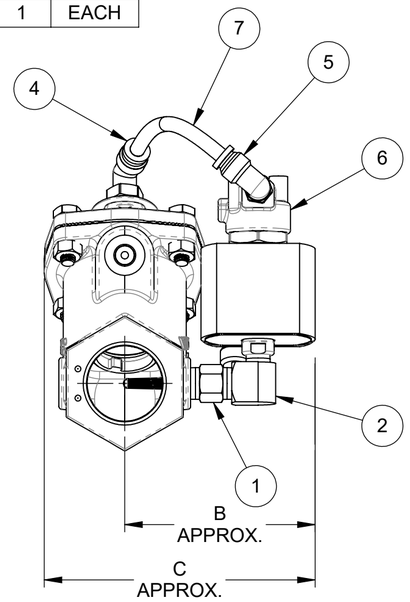
FLANGED VALVE ASSEMBLY

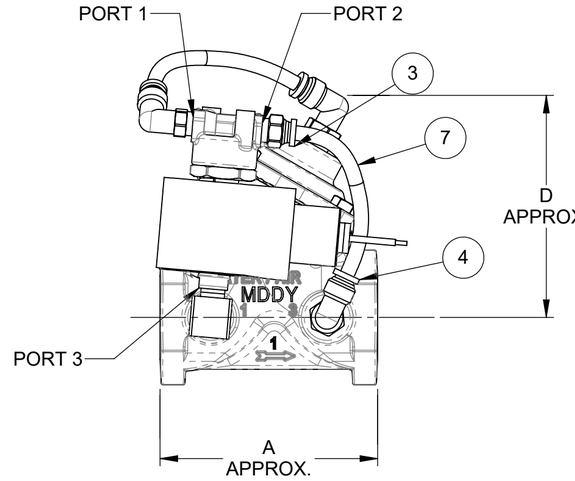
NOTES:

1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE AND CONFIGURATION.
2. B.S.P.T. THREADED VALVES AVAILABLE UPON REQUEST.
3. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
4. BOSS NO. 1 ON VALVE TAPPED 1/4" N.P.T.
5. SEE PAGE 2 FOR DRY DRAIN OPTION & PAGE 3 FOR INDEPENDANT PRESSURE.
6. "ECDD" REFERS TO ENERGIZED TO CLOSE, DRY DRAIN.
   "EODD" REFERS TO ENERGIZED TO OPEN, DRAY DRAIN.
   "427F" REFERS TO FLANGED OPTION FOR 427 VALVES.

7 427 - 429 ECDD VALVES USE (X2) 1078763 FITTINGS ON THE SOLENOID.

VALVE SERIES	PIPE SIZE	A	B	C	D
V42B	3/4"	[94] 3.72	[85] 3.34	[120] 4.71	[102] 4.02
V42C	1"				
V42D	1-1/4"	[126] 4.95	[93] 3.66	[138] 5.41	[119] 4.67
V42E	1-1/2"				
V42F	2"	[168] 6.60	[100] 3.94	[168] 6.63	[153] 6.02
V42G	2"	[187] 7.35	[109] 4.27	[186] 7.34	[159] 6.26
V42H	2-1/2"				
V42J	3" THREADED	[232] 9.13	[120] 4.73	[212] 8.35	[178] 7.02
	3" FLANGED	[270] 10.62	[136] 5.34	[231] 9.09	[175] 6.89
V42K	4"	[298] 11.75	[144] 5.67	[258] 10.16	[249] 9.81
V42L	6"	[432] 17.00	[170] 6.69	[370] 14.57	[392] 15.41

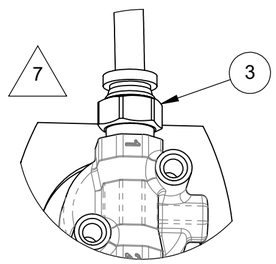




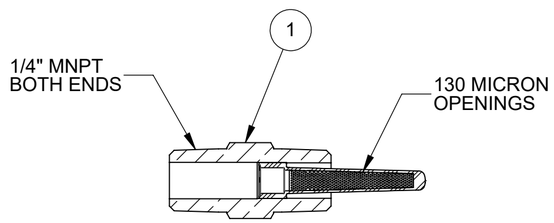
ENERGIZED TO OPEN, DRY DRAIN OPTION

SOLENOID DE-ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1 IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE



427 - 429 ENERGIZED TO CLOSE DRY DRAIN



STRAINER ASSEMBLY

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

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CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	3/13/2020
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

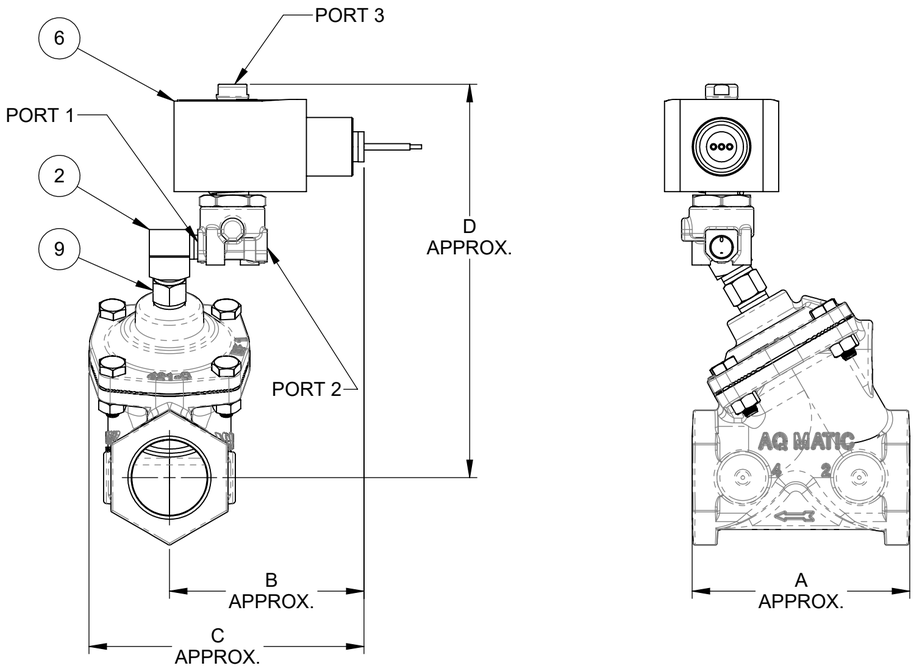
DESCRIPTION: CATALOG SHEET, V420, SOLENOIDS

SIZE	DWG NO.	REV.
C	1078113	N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 4

BILL OF MATERIALS											
ITEM NO	PART NO	DESCRIPTION	421 IP QTY	424 IP QTY	425 IP QTY	426 IP QTY	427 IP QTY	428 IP QTY	429 IP QTY	429 IP/QTY.	UNITS
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	EACH
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	EACH
	4510496-02	SOLENOID, 3-WAY, 220/60									
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC									
	4510496-04	SOLENOID, 3-WAY, 24 VDC									
9	1081648	FITTING, NIPPLE 1/4MNPTX1.38	1	1	1	1	1	1	1	-	EACH
10	1074038	FITTING, NIPPLE, 1/4 X 1/8 REDUCER, BRASS	-	-	-	-	-	-	-	1	EACH

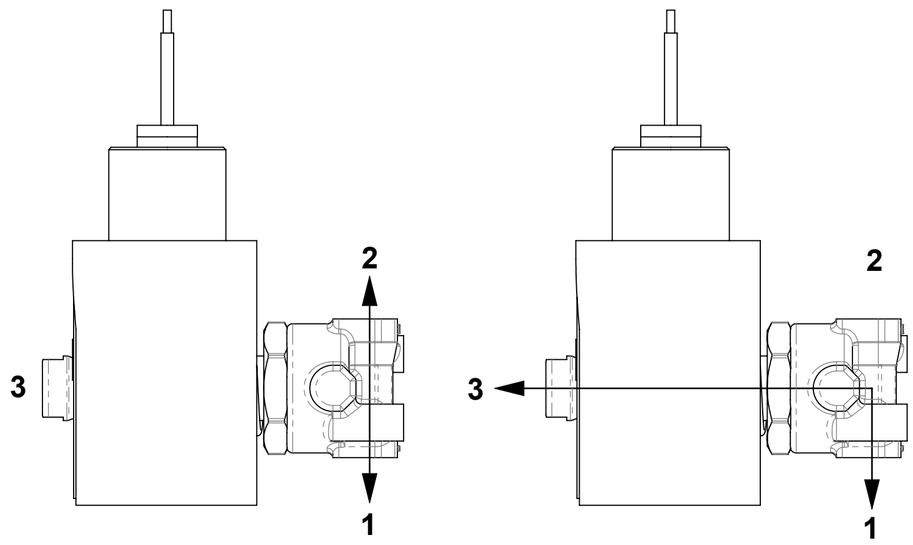
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET ONE FOR LIST OF CHANGES		

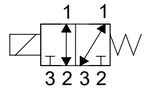


SOLENOID INFORMATION

SOLENOID ENERGIZED

SOLENOID DE-ENERGIZED





FLOW STATES - PRESSURE AT ANY PORT			
	PORT 1	PORT 2	PORT 3
ENERGIZED	OPEN	OPEN	CLOSED
DE-ENERGIZED	OPEN	CLOSED	OPEN

INDEPENDANT CONTROL PRESSURE

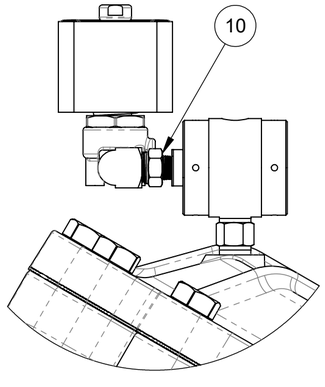
CONTROL PRESSURE MUST BE EQUAL TO OR GREATER THAN LINE PRESSURE.

ENERGIZE TO OPEN:
APPLY CONTROL PRESSURE TO SOLENOID PORT 3. (PORT 2 VENTED)

ENERGIZE TO CLOSE:
APPLY CONTROL PRESSURE TO SOLENOID PORT 2. (PORT 3 VENTED)

VALVE SERIES	PIPE SIZE	A	B	C	D
V42B	3/4"	[106] 4.19	[84] 3.32	[119] 4.70	[171] 6.72
V42C	1"				
V42D	1-1/4"	[127] 4.98	[84] 3.32	[129] 5.07	[190] 7.49
V42E	1-1/2"				
V42F	2"	[168] 6.60	[84] 3.32	[153] 6.01	[225] 8.84
V42G	2"	[187] 7.35	[84] 3.32	[162] 6.39	[233] 9.18
V42H	2-1/2"				
V42J	3" THREADED	[232] 9.13	[92] 3.63	[184] 7.25	[247] 9.74
	3" FLANGED	[270] 10.62	[95] 3.75	[191] 7.50	[247] 9.73
V42K	4"	[298] 11.75	[114] 4.50	[228] 8.99	[320] 12.60
V42L	6"	[432] 17.00	[200] 7.88	[400] 15.75	[441] 17.35

429 ATTACHMENT



NOTES:

1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE AND CONFIGURATION.
2. B.S.P.T. THREADED VALVES AVAILABLE UPON REQUEST.
3. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
4. BOSS NO. 1 ON VALVE TAPPED 1/4" N.P.T.
5. SEE PAGE 2 FOR DRY DRAIN OPTION & PAGE 3 FOR INDEPENDANT PRESSURE.
6. "EC" REFERS TO ENERGIZED CLOSED. "EO" REFERS TO ENERGIZED OPEN.
   "427F" REFERS TO THE 427 FLANGED OPTION.

CURRENT DRAIN		
VOLTAGE	HOLDING	INRUSH
24 VAC	25 VA	50 VA
120 VAC	25 VA	50 VA
220 VAC	25 VA	50 VA
24 VDC	10.1 W	

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3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	3/13/2020
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, V420, SOLENOIDS

SIZE C | DWG NO. 1078113 | REV. N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 3 OF 4

OPTIONAL VARIATIONS OF INDEPENDENT PRESSURE CONTROL

ITEM NO	PART NO	DESCRIPTION	421 IP LS	424 IP LS	425 IP LS	426 IP LS	427 LS IP	427F LS IP	428 LS IP	429 LS IP	421 SAC IP	424 SAC IP	425 SAC IP	426 SAC IP	427 SAC IP	427F SAC IP	428 SAC IP	429 SAC IP
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	4510496-02	SOLENOID, 3-WAY, 220/60																
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC																
	4510496-04	SOLENOID, 3-WAY, 24 VDC																
9	1081648	FITTING, NIPPLE 1/4MNPTX1.38	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-
10	1074038	FITTING, NIPPLE, 1/4 X 1/8 REDUCER, BRASS	1	1	1	1	-	-	-	1	1	1	1	1	1	1	1	1

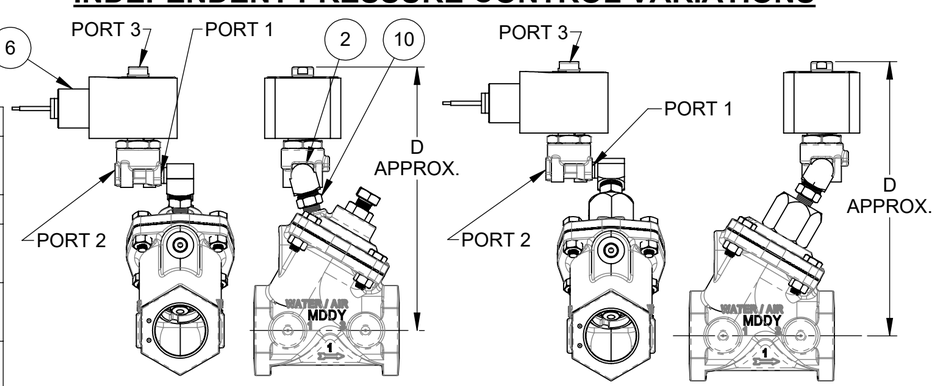
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET ONE FOR CHANGES		

OPTIONAL VARIATIONS OF ENERGIZED OPEN AND ENERGIZED CLOSED

ITEM NO	PART NO	DESCRIPTION	421 EC LS	424 EC LS	425 EC LS	426 EC LS	427 EC LS	427F EC LS	428 EC LS	429 EC LS	421 EC SAC	424 EC SAC	425 EC SAC	426 EC SAC	427 EC SAC	427F EC SAC	428 EC SAC	429 EC SAC	421 EO LS	424 EO LS	425 EO LS	426 EO LS	427 EO LS	427F EO LS	428 EO LS	429 EO LS	421 EO SAC	424 EO SAC	425 EO SAC	426 EO SAC	427 EO SAC	427F EO SAC	428 EO SAC	429 EO SAC	UNITS
1	1074004	STRAINER ASSEMBLY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
3	1078763	FITTING, 1/8MNPT X 1/4, PUSH FIT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
4	1078766	FITTING, ELBOW, 1/4" MNPT X 1/4" TUBE	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	EACH
5	1078765	FITTING, ELBOW, 1/8" MNPT X 1/4" TUBE	1	1	1	1	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	1	1	1	1	1	1	1	1	1	1	EACH
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
	4510496-02	SOLENOID, 3-WAY, 220/60																																	
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC																																	
	4510496-04	SOLENOID, 3-WAY, 24 VDC																																	
7	1071936	TUBING, POLY 1/4" O.D. X .035	4	4	6	7	8	9	12	16	5	8	8	9	10	11	14	16	6	6	8	8	9	9	13	19	5	7	7	8	10	10	13	19	INCHES
8	43947	FITTING, ADAPTER, 1/4MNPT X 1/4FMNPT	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	EACH

ITEM NO	PART NO	DESCRIPTION	421 ECDD LS	424 ECDD LS	425 ECDD LS	426 ECDD LS	427 ECDD LS	427F ECDD LS	428 ECDD LS	429 ECDD LS	421 ECDD SAC	424 ECDD SAC	425 ECDD SAC	426 ECDD SAC	427 ECDD SAC	427F ECDD SAC	428 ECDD SAC	429 ECDD SAC	421 EODD LS	424 EODD LS	425 EODD LS	426 EODD LS	427 EODD LS	427F EODD LS	428 EODD LS	429 EODD LS	421 EODD SAC	424 EODD SAC	425 EODD SAC	426 EODD SAC	427 EODD SAC	427F EODD SAC	428 EODD SAC	429 EODD SAC	UNITS
1	1074004	STRAINER ASSEMBLY	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
2	1074040	ELBOW, REDUCER 1/4"FNPT X 1/8" MNPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
3	1078763	FITTING, 1/8MNPT X 1/4, PUSH FIT	1	1	1	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
4	1078766	FITTING, ELBOW, 1/4" MNPT X 1/4" TUBE	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	EACH
5	1078765	FITTING, ELBOW, 1/8" MNPT X 1/4" TUBE	2	2	2	2	-	-	-	1	2	2	2	2	1	1	1	1	2	2	2	2	1	1	1	2	2	2	2	2	2	2	2	2	EACH
6	4510496-01	SOLENOID, 3 WAY, 120/60 VAC	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	EACH
	4510496-02	SOLENOID, 3-WAY, 220/60																																	
	4510496-03	SOLENOID, 3-WAY, 24/60 VAC																																	
	4510496-04	SOLENOID, 3-WAY, 24 VDC																																	
7	1071936	TUBING, POLY 1/4" O.D. X .035	4	4	6	7	8	9	13	16	5	8	8	9	10	10	13	16	3	3	4	5	6	7	10	14	5	5	5	7	8	8	11	14	INCHES
			6	5	4	4	2	3	3	8	6	5	3	3	2	3	3	8	5	3	3	3	4	4	4	10	4	3	3	3	4	4	4	10	
8	43947	FITTING, ADAPTER, 1/4MNPT X 1/4FMNPT	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	-	-	-	-	-	1	1	1	EACH

INDEPENDENT PRESSURE CONTROL VARIATIONS

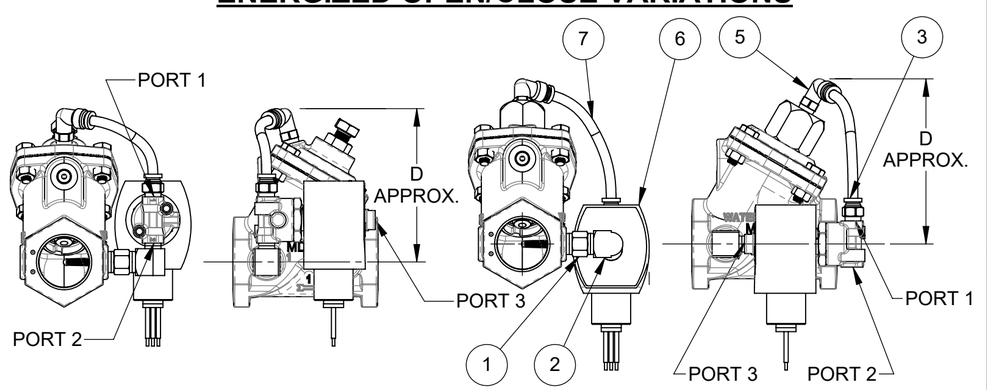


"D" DIMENSION FOR OPTIONAL VALVE CAPS					
VALVE SERIES	PIPE SIZE	ENERGIZE OPEN OR CLOSE		INDEPENDANT CONTROL PRESSURE	
		LS	SAC	LS	SAC
V42B	3/4"	[100] 3.93	[114] 4.48	[171] 6.73	[178] 7.00
V42C	1"				
V42D	1-1/4"	[127] 5.02	[156] 6.13	[192] 7.54	[224] 8.82
V42E	1-1/2"				
V42F	2"	[169] 6.64	[156] 6.16	[229] 9.00	[227] 8.93
V42G	2"	[179] 7.05	[179] 7.06	[241] 9.47	[250] 9.85
V42H	2-1/2"				
V42J	3" THREADED	[203] 7.99	[196] 7.72	[262] 10.31	[265] 10.44
	3" FLANGED	[203] 7.99	[196] 7.71	[262] 10.32	[264] 10.41
V42K	4"	[267] 10.53	[267] 10.52	[342] 13.45	[337] 13.28
V42L	6"	[392] 15.41	[392] 15.41	[392] 15.41	[392] 15.41

NOTES:

1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE AND CONFIGURATION.
2. B.S.P.T. THREADED VALVES AVAILABLE UPON REQUEST FOR 421-427
3. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
4. SEE PAGE 1 FOR ENERGIZED OPEN OR CLOSED, PAGE 2 FOR DRY DRAIN OPTION, & PAGE 3 FOR INDEPENDANT PRESSURE.
5. "EC" REFERS TO ENERGIZED CLOSED. "EO" REFERS TO ENERGIZED OPEN.
   "ECDD" REFERS TO ENERGIZED CLOSED, DRY DRAIN.
   "EODD" REFERS TO ENERGIZED OPEN, DRY DRAIN.
   "427F" REFERS TO THE 427 FLANGED OPTION.
   "LS" REFERS TO VALVES WITH LIMIT STOP OR POSITION INDICATOR OPTION.
   "SAC" REFERS TO VALVES WITH SPRING ASSIST CLOSE OPTION.
6. FOR 427 - 429 ECDD, SOLENOID USES (X2) 1078763, LESS (X1) 1078765.

ENERGIZED OPEN/CLOSE VARIATIONS



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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT OR PRODUCT DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH RoHS 3 EU (EUROPEAN UNION) DIRECTIVE 2015/863

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	3/13/2020
CHECKED BY	
APPROVED	

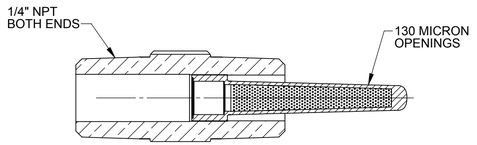
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, V420, SOLENOIDS

SIZE	DWG NO.	REV.
C	1078113	N

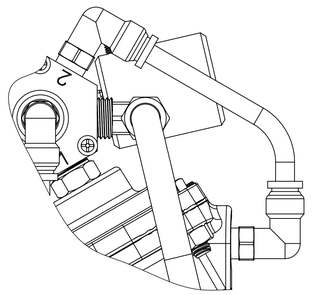
SCALE 1:3 | SOLIDWORKS FORMAT | SHEET 4 OF 4

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	104648	F	1-UPDATED TITLE BLOCKS, 2-ADD'D: PG-3 & 6 FOR STD FLOAT VERSIONS, 3-ADD'D: 421 SAC VIEW ON PG'S 3 & 4.	22MAY15	TJM
1&2-PG2, 2&3-PG3, 4-PG4, 5&6-PG5, 7&8-PG6	104648	G	1-IT#14-WAS:1074001, 2-ROTATED IT#22 180°, 3-IT#14-WAS:1074001,4-ADDED SIDE VIEWS, 5-IT#15-WAS:1074001,6-IT#18-REMD:1074002,7-IT#15-WAS:1074001,8-IT#18-REMD:1074002	19AUG15	TJM
1-PG2 3,5&6 2-PG 3,&5 3-PG-7	105334	H	1-WAS:3029346 NOW:16586-8, 2-IT# 18 WAS IT# 26, 3-ADD'D: PG-7 (CLOSED IF- LOW)	25NOV15	TJM
	1001	J	AQ Matic update & verified part numbers	20JAN17	MGS
	1372	K	1-UPDATE VALVE BODIES/CAPS, 2-CORRECT ASSEMBLY ISSUES	12/06/18	KJB

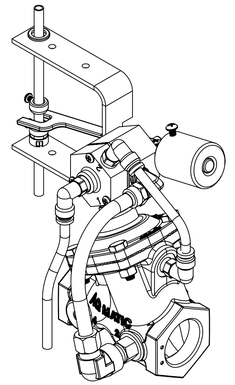


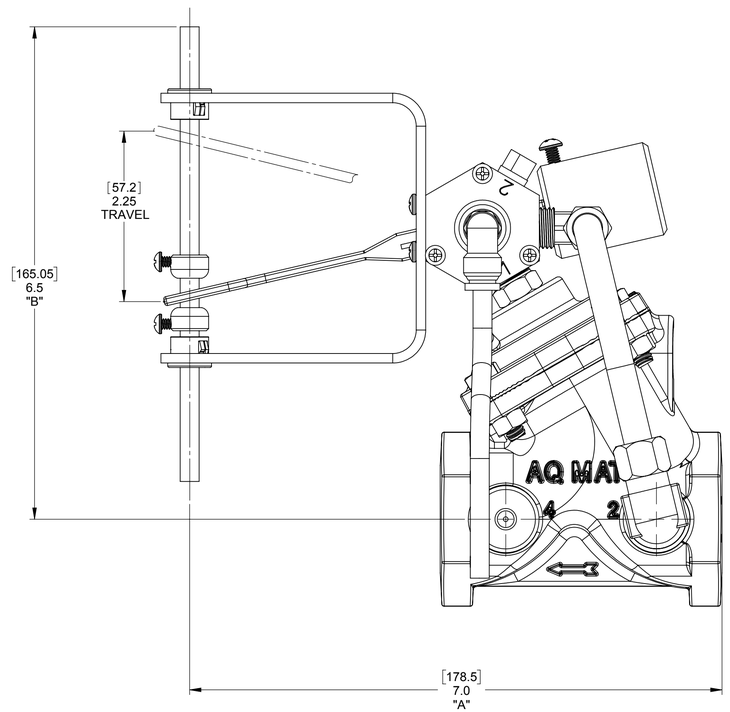
SECTION A-A
SCALE 2 : 1

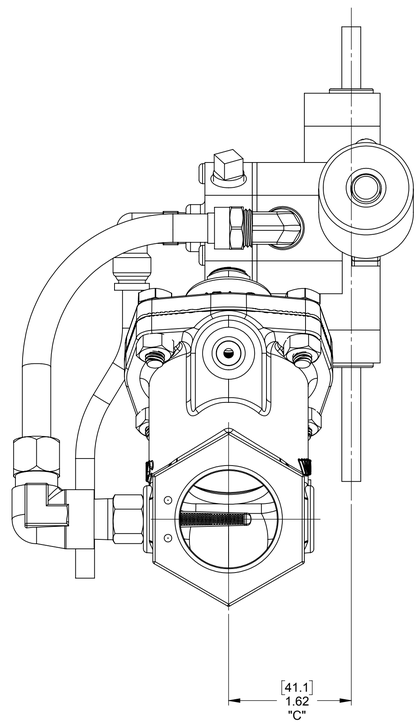
STRAINER ASSEMBLY

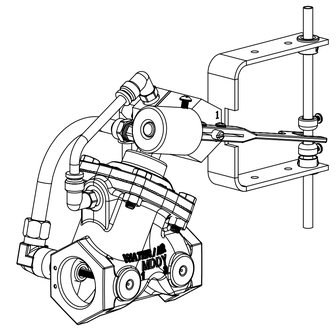


POWERED OPEN OPTION
FOR DETAILED ASSEMBLY SEE PG'S - 2 & 5









VALVE SERIES	421	424	425	426	427	428
PIPE SIZE	1"	1-1/4", 1-1/2"	2"	2"	3"	4"
A	7.20 182.9	8.29 210.6	9.29 132.1	9.87 236.0	10.80 274.3	12.80 325.1
B	6.50 165.1	7.81 198.4	8.37 212.6	9.56 242.8	10.56 268.2	13.81 350.8
C	1.70 43.2	4.20 106.7	5.20 132.1	5.20 132.1	6.20 157.5	6.20 157.5

421-428 FLOAT VALVES ON THIS PAGE

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ALL FINISHED MACHINED SURFACES 125 √ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

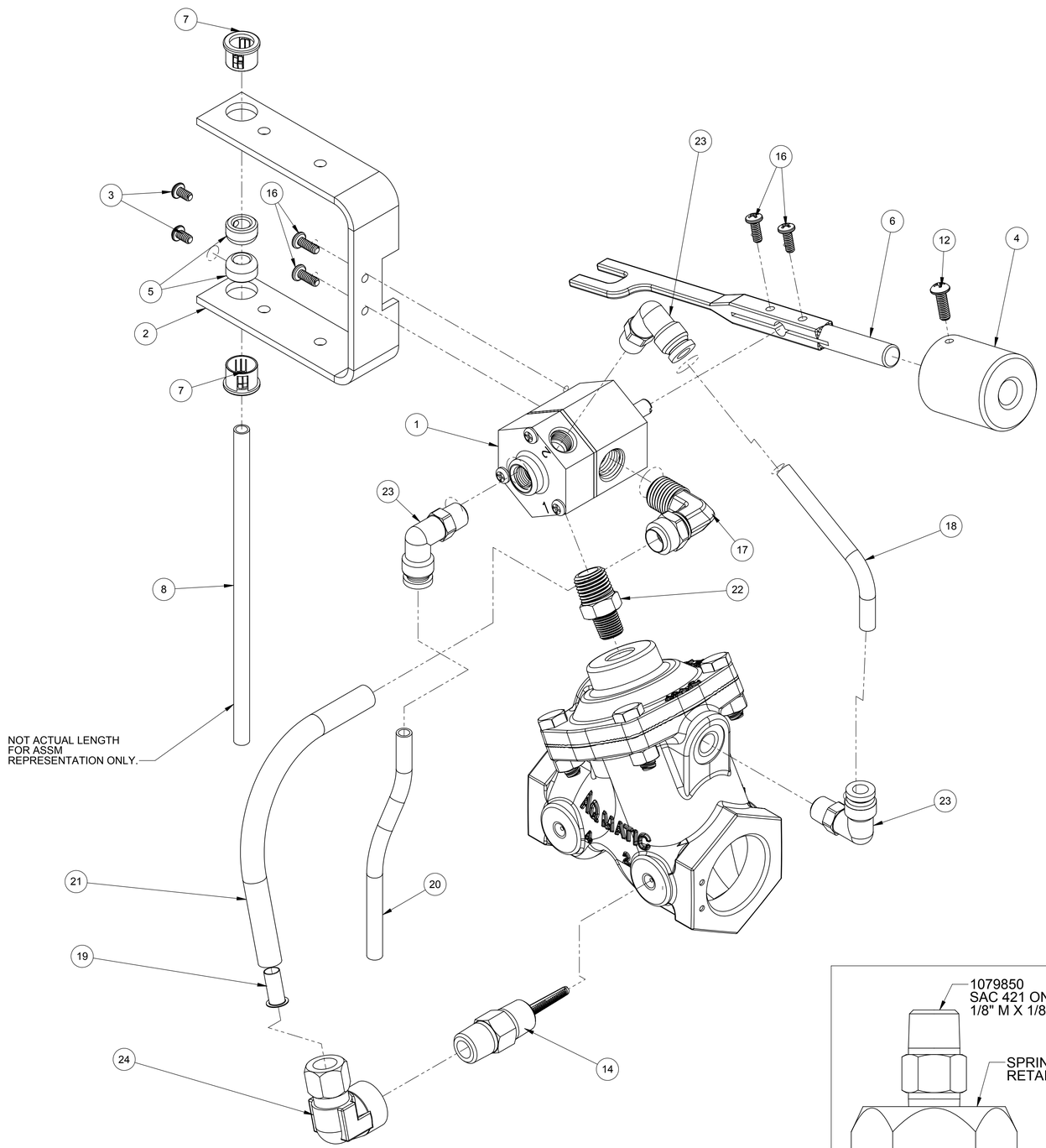
APPROVALS	DATE
DRAWN SM	04/18/11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 1 OF 7

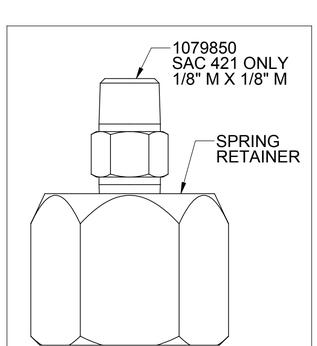


REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		

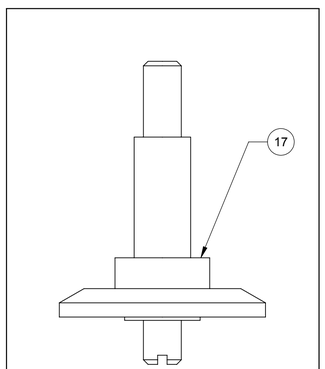
ITEM NO.	DESCRIPTION	PART NUMBER	QTY. (421)
1	PILOT CNTL ASSY, 348, -AE	1073992	1
2	BRACKET, 348,	1074012	1
3	RD. HD. MACH. SCREW, (6-32 X 1/4)	1072370	2
4	COUNTERWEIGHT, STD	1074014	1
5	CENTERING COLLAR, BRASS	1074017	2
6	LEVER, 348	1074034	1
7	BUSHING,	1074016	2
8	FLOAT ROD,	1074023	1
9	STUD, THRD, #12-24 UNC-2A, BRASS	1074025	1
10	GREASE, LUBRIPLATE, FGL-2	16856-8	1
11	FLOAT,SAND,5"	1073996	1
12	RD. HD. MACH SCREW, (8-32 X 1/2)	1072375	1
13	STRAINER,	1074002	1
14	STRAINER ASSY	1074004	1
15	SPACER, BRASS	1074127	1
16	SCREW, PHLP, PN HD	1072371	4
17	FITTING, ELBOW, BRASS	1074037	1
18	TUBING, POLY 1/4" O.D. X .035	1071936	1
19	FITTING,INSERT,3/8	10332	1
20	TUBING, POLY 1/4" O.D. X .035	1071936	1
21	FITTING,TUBE,.37 OD	1071940	1
22	FITTING, NIPPLE,1/4X1/8 REDUCR	1074038	1
23	FITTING, ELBOW,TUBE,1/8MNPT X	1078765	3
24	FITTING, ELBOW,TUBE 1/4FNPTX3/	1074007	1

SEE NOTE 2

PAINT OPTIONS	
PART #	COLOR
42805	RED
43198	BLUE
42807	BLACK
42808	ASH



421 SAC VERSION ONLY



SPACER ASSEMBLY VIEW

NOTES:

1. DRILL AND TAP PORT #2 WITH 1/4" NPT. [421 VALVE]
2. SEE DRAWING 1078193 FOR ROD LENGTH/MATERIAL OPTIONS.
3. 421 MODEL IS SHOWN ON THIS DRAWING SHEET. SEE SHEET 4, 5, & 6 FOR 424-428 MODELS.
4. STANDARD 421 MODEL SHOWN.

POWERED OPEN VERSION

421 FLOAT VALVES ONLY ON THIS PAGE

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN SM	04/18/11
APPROVED	
CHECKED	

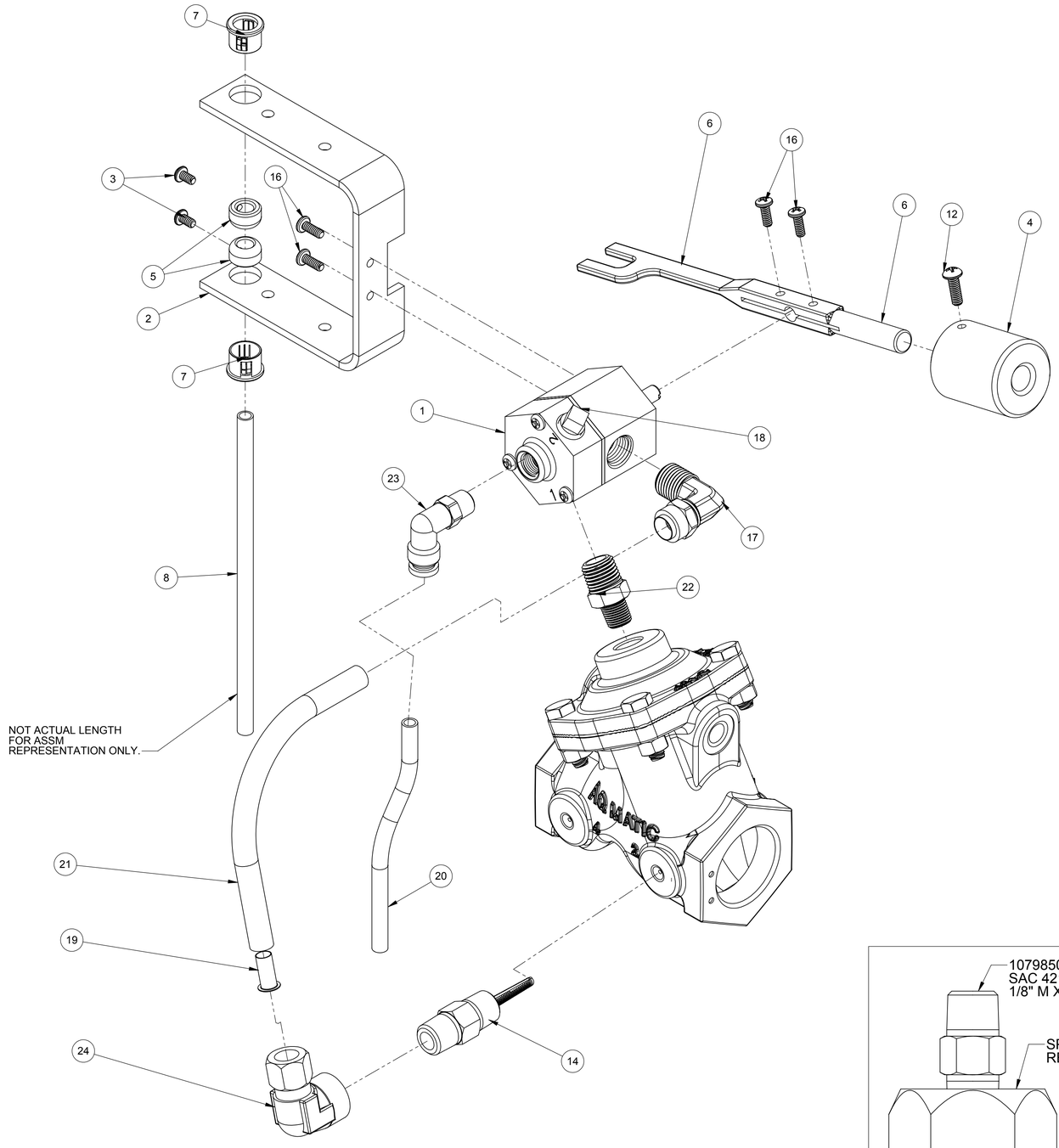
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM
FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 2 OF 7

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		



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7	BUSHING	1074016	2
SEE NOTE-2 → 8	FLOAT ROD	1074023	1
9	STUD, THRD, #12-24 UNC-2A, BRASS	1074025	1
10	GREASE, LUBRIPLATE, FGL-2	16856-8	1
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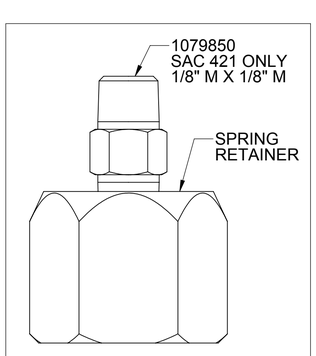
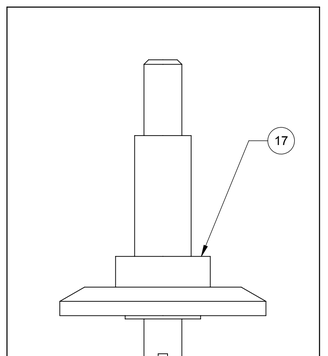
13	STRAINER	1074002	1
14	STRAINER ASSY	1074004	1
15	SPACER, BRASS	1074127	1
16	SCREW, PHLP, PN HD	1072371	4
17	FITTING, ELBOW, BRASS	1074037	1
18	PLUG, PIPE	1071903	1
19	FITTING,INSERT,3/8	10332	1
20	TUBING, POLY 1/4" O.D. X .035	1071936	1
21	FITTING,TUBE,.37 OD	1071940	1
22	FITTING, NIPPLE,1/4X1/8 REDUCR	1074038	1
23	FITTING, ELBOW,TUBE,1/8MNPT X	1078765	1
24	FITTING, ELBOW,TUBE 1/4FNPTX3/	1074007	1

PAINT OPTIONS	
PART #	COLOR
42805	RED
43198	BLUE
42807	BLACK
42808	ASH



421 SAC VERSION ONLY



SPACER ASSEMBLY VIEW

NOTES:

1. DRILL AND TAP PORT #2 WITH 1/4" NPT. [421 VALVE]
2. SEE DRAWING 1078193 FOR ROD LENGTH/MATERIAL OPTIONS.
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4. STANDARD 421 MODEL SHOWN.

STANDARD VERSION

421 FLOAT VALVES ONLY ON THIS PAGE

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THIRD ANGLE PROJECTION

	APPROVALS	DATE
DRAWN	SM	04/18/11
APPROVED		
CHECKED		

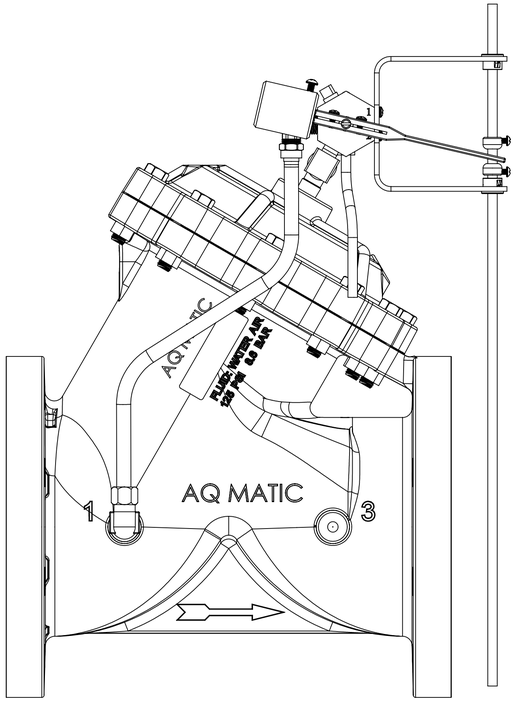
AQ Matic
Valve & Controls Company Inc.

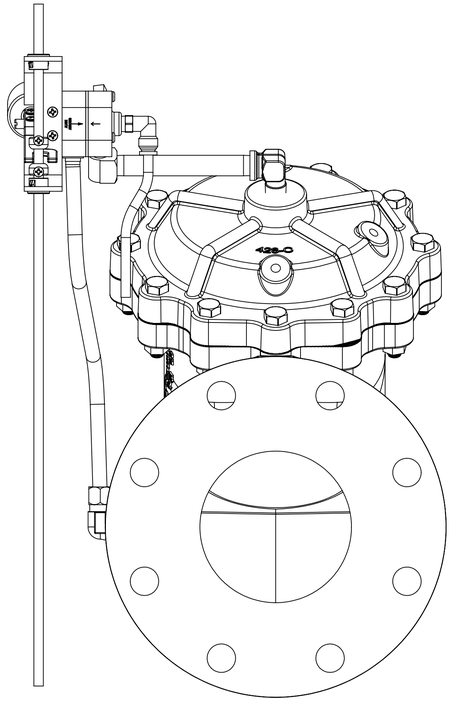
TITLE
CATALOG SHEET, 420 DAIPHRAGM FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

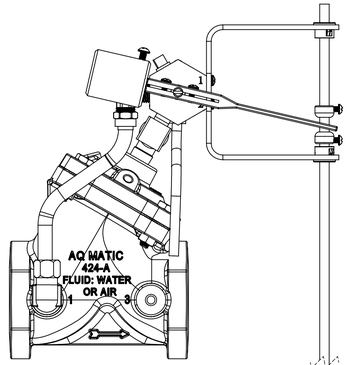
SCALE 1:1 SHEET 3 OF 7

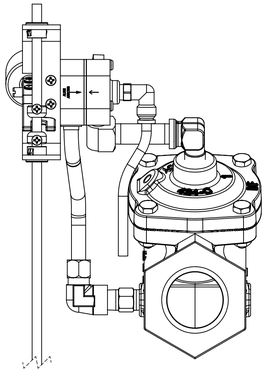
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		





BR1078190-428





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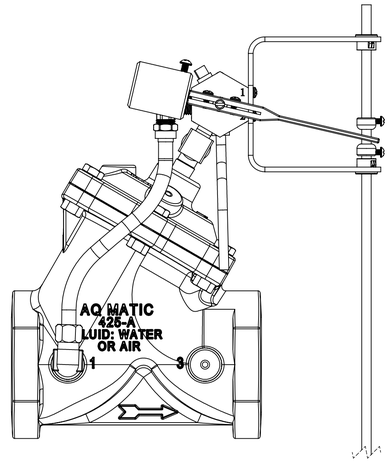
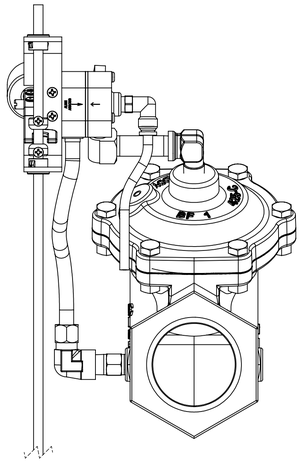
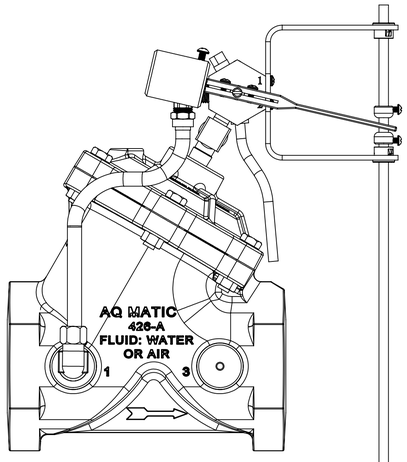
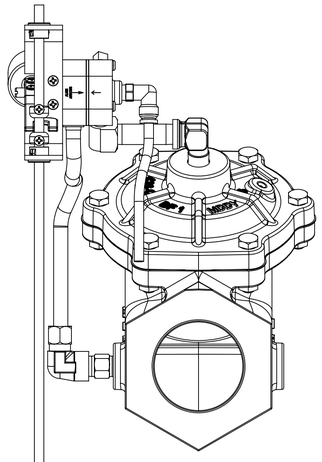




BR1078190-425





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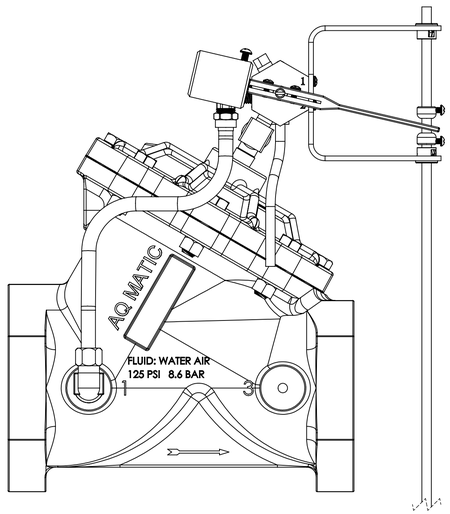

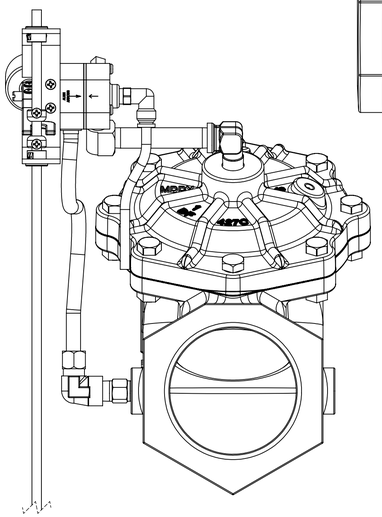

BR1078190-427

424 - 428 SRANDARD VERSIONS SHOWN

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

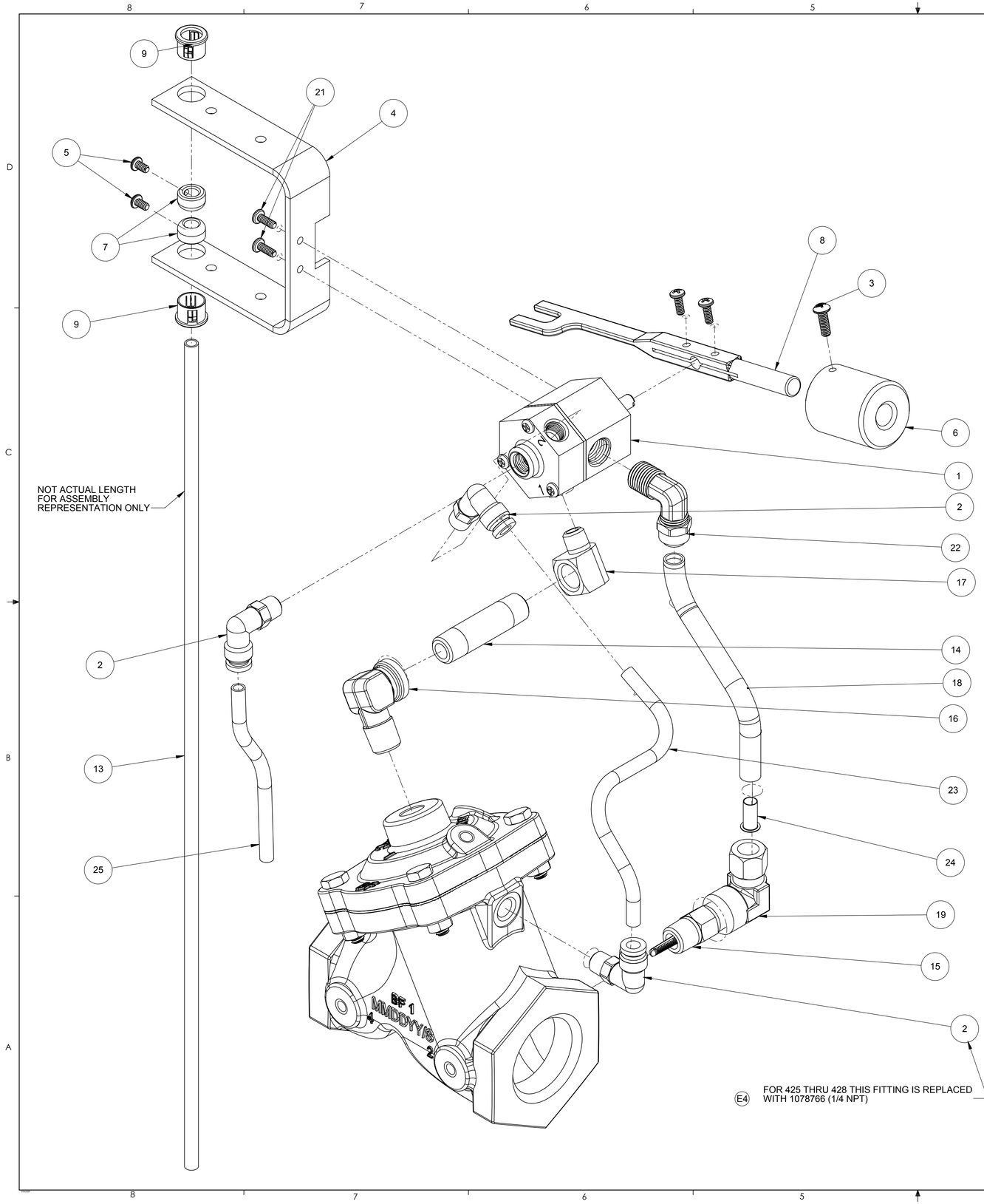
APPROVALS	DATE
DRAWN SM	04/18/11
APPROVED	
CHECKED	

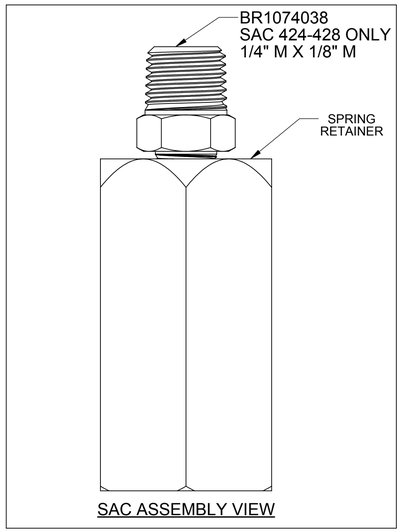
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 4 OF 7





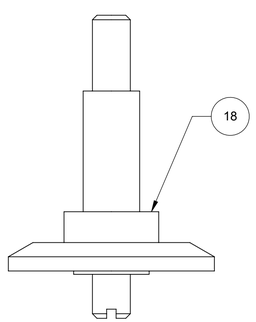
SAC ASSEMBLY VIEW

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		

ITEM NO.	DESCRIPTION		PART NUMBER	QTY. (424-428) POWERED OPEN
1	PILOT CNTL ASSY, 348, -AE		1073992	1
2	FITTING, ELBOW,TUBE,1/8MNPT X		1078765	3
3	RD. HD. MACH SCREW, (8-32 X 1/2)		1072375	1
4	BRACKET, 348,		1074012	1
	CENTERING COLLAR, BRASS		1074017	2
5	RD. HD. MACH. SCREW, (6-32 X 1/4)		1072370	2
6	COUNTERWEIGHT, STD		1074014	1
8	LEVER, 348		1074034	1
9	BUSHING,		1074016	2
10	STUD, THRD, #12-24 UNC-2A, BRASS		1074025	1
11	GREASE, LUBRIPLATE, FGL-2		16856-8	1
12	FLOAT,SAND,5"		1073996	1
13	FLOAT ROD,		1074023	1
14	FITTING, NIPPLE 1/4NPTX2,BRASS	424	1071905	1
	PIPE NIPPLE 1/4" X 3"	425,426	1071906	
	PIPE NIPPLE 1/4" X 4"	427,428	1071907	
15	STRAINER ASSY		1074004	1
16	FITTING, ELBOW,1/4 MNPT X 1/4F		1074041	1
17	FITTING, ELBOW,REDUCER,BRS		1074040	1
18	STRAINER,		BR1074002	1
19	FITTING, ELBOW,TUBE 1/4FNPTX3/		1074007	1
20	SPACER, BRASS	424	1074230	1
		425	1074305	
		426	1074385	
		427	1074484	
		428	1074565	
21	SCREW, PHLP, PN HD		1072371	4
22	FITTING, ELBOW, BRASS		1074037	1
23	TUBING, POLY 1/4" O.D. X .035		1071936	1
24	FITTING,INSERT,3/8		10332	1
25	TUBING, POLY 1/4" O.D. X .035		1071936	1

SEE NOTE-2

PAINT OPTIONS	
PART #	COLOR
42805	RED
43198	BLUE
42807	BLACK
42808	ASH



SPACER ASSEMBLY VIEW

NOTES:

1. DRILL AND TAP PORT #1 WITH 1/4" NPT. [424-428 VALVES]
2. SEE DRAWING 1078193 FOR ROD LENGTH / MATERIAL OPTIONS.
3. POWERED OPEN 424 MODEL SHOWN.

POWERED OPEN VERSION
FOR 424 THRU 428
VALVES W/FLOAT

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACh) REQUIREMENTS.

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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

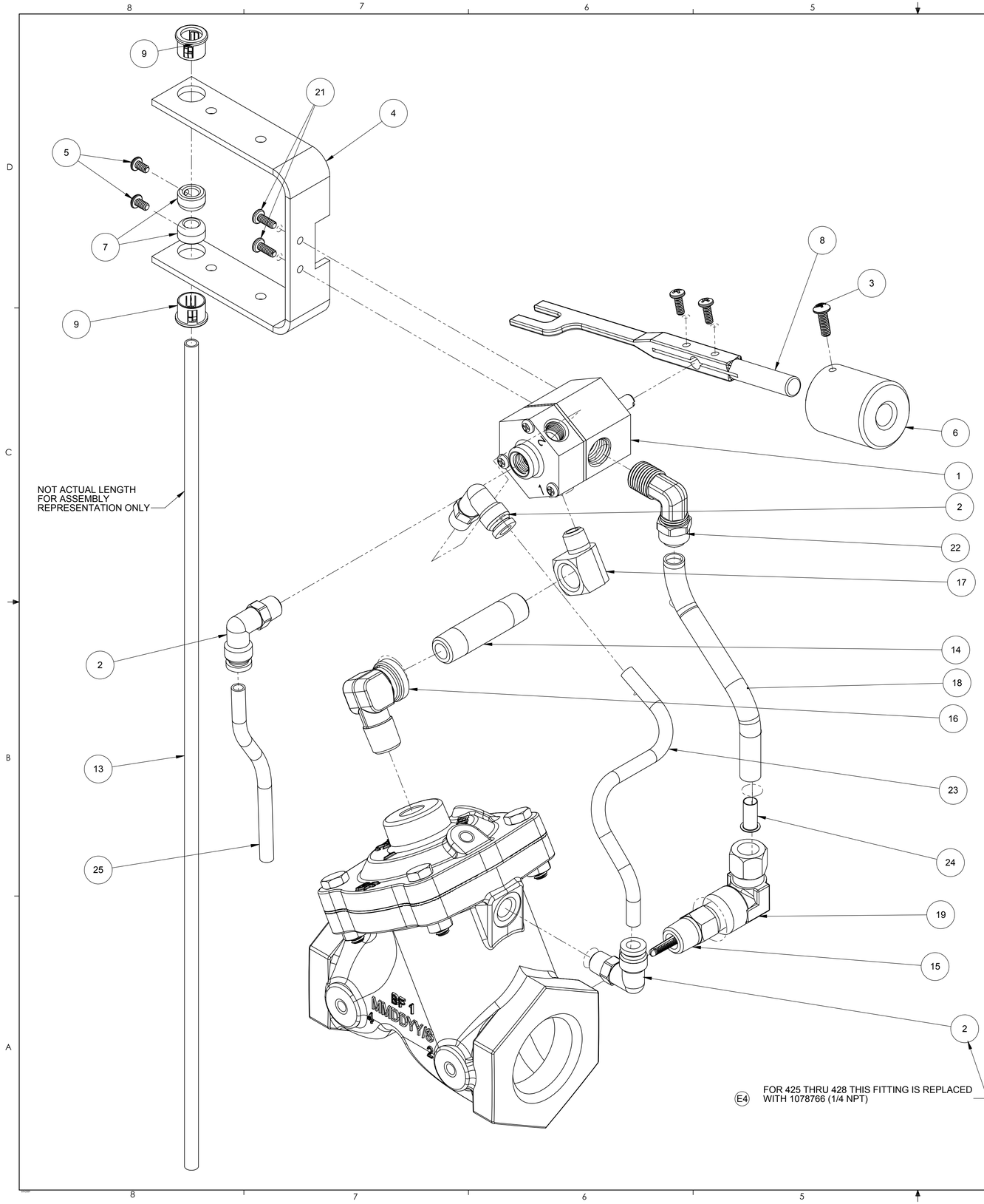
APPROVALS	DATE
DRAWN SM	04/18/11
APPROVED	
CHECKED	

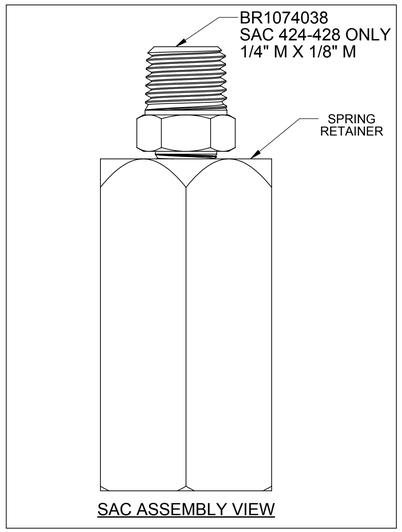
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM
FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 5 OF 7





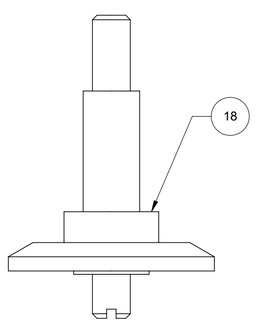
SAC ASSEMBLY VIEW

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		

ITEM NO.	DESCRIPTION		PART NUMBER	QTY. (424-428) POWERED OPEN
1	PILOT CNTL ASSY, 348, -AE		1073992	1
2	FITTING, ELBOW,TUBE,1/8MNPT X		1078765	3
3	RD. HD. MACH SCREW, (8-32 X 1/2)		1072375	1
4	BRACKET, 348,		1074012	1
	CENTERING COLLAR, BRASS		1074017	2
5	RD. HD. MACH. SCREW, (6-32 X 1/4)		1072370	2
6	COUNTERWEIGHT, STD		1074014	1
8	LEVER, 348		1074034	1
9	BUSHING,		1074016	2
10	STUD, THRD, #12-24 UNC-2A, BRASS		1074025	1
11	GREASE, LUBRIPLATE, FGL-2		16856-8	1
12	FLOAT,SAND,5"		1073996	1
13	FLOAT ROD,		1074023	1
14	FITTING, NIPPLE 1/4NPTX2,BRASS	424	1071905	1
	PIPE NIPPLE 1/4" X 3"	425,426	1071906	
	PIPE NIPPLE 1/4" X 4"	427,428	1071907	
15	STRAINER ASSY		1074004	1
16	FITTING, ELBOW,1/4 MNPT X 1/4F		1074041	1
17	FITTING, ELBOW,REDUCER,BRS		1074040	1
18	STRAINER,		BR1074002	1
19	FITTING, ELBOW,TUBE 1/4FNPTX3/		1074007	1
20	SPACER, BRASS	424	1074230	1
		425	1074305	
		426	1074385	
		427	1074484	
		428	1074565	
21	SCREW, PHLP, PN HD		1072371	4
22	FITTING, ELBOW, BRASS		1074037	1
23	TUBING, POLY 1/4" O.D. X .035		1071936	1
24	FITTING,INSERT,3/8		10332	1
25	TUBING, POLY 1/4" O.D. X .035		1071936	1

SEE NOTE-2

PAINT OPTIONS	
PART #	COLOR
42805	RED
43198	BLUE
42807	BLACK
42808	ASH



SPACER ASSEMBLY VIEW

NOTES:

1. DRILL AND TAP PORT #1 WITH 1/4" NPT. [424-428 VALVES]
2. SEE DRAWING 1078193 FOR ROD LENGTH / MATERIAL OPTIONS.
3. POWERED OPEN 424 MODEL SHOWN.

POWERED OPEN VERSION
FOR 424 THRU 428
VALVES W/FLOAT

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2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

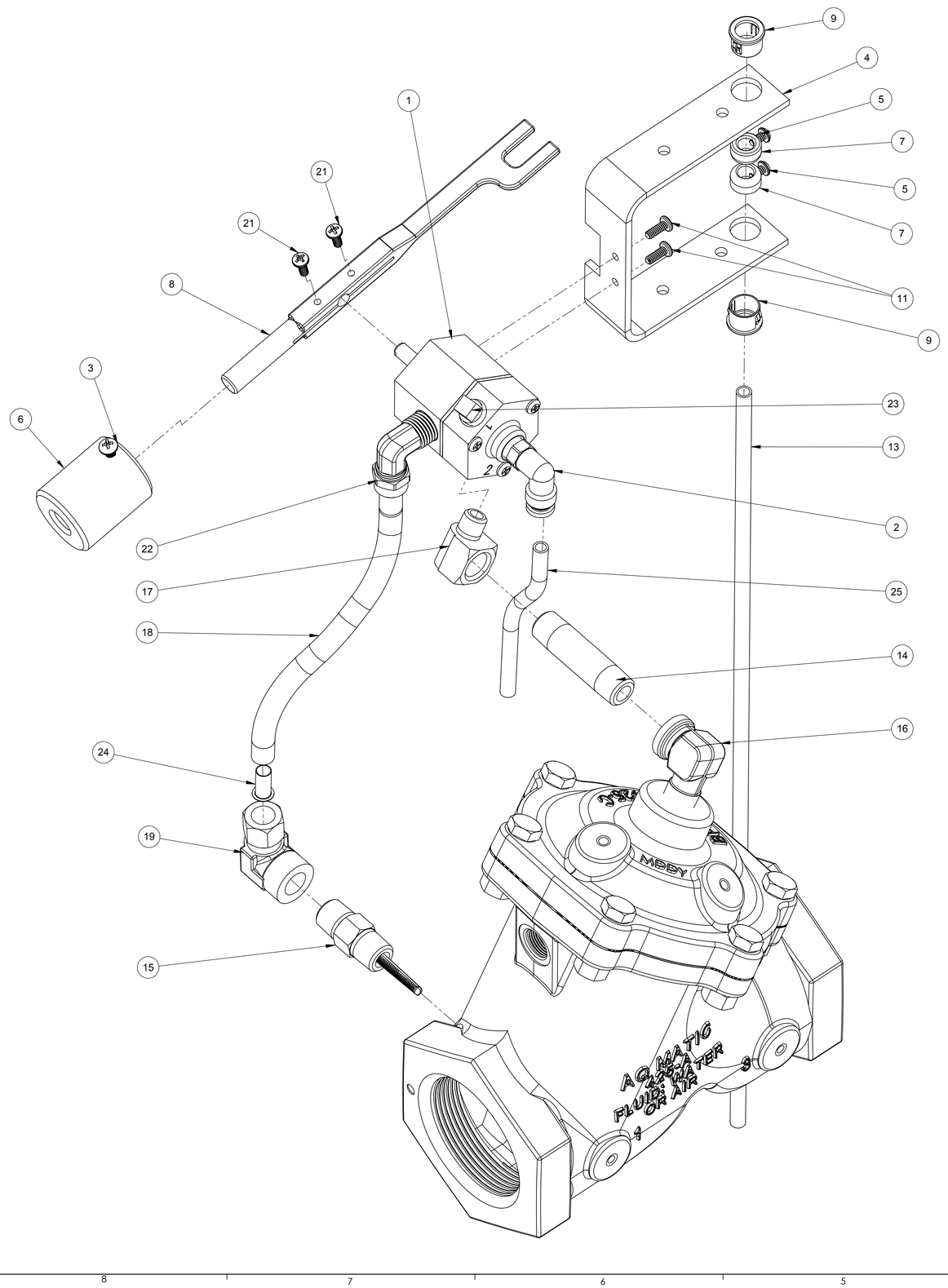
APPROVALS	DATE
DRAWN SM	04/18/11
APPROVED	
CHECKED	

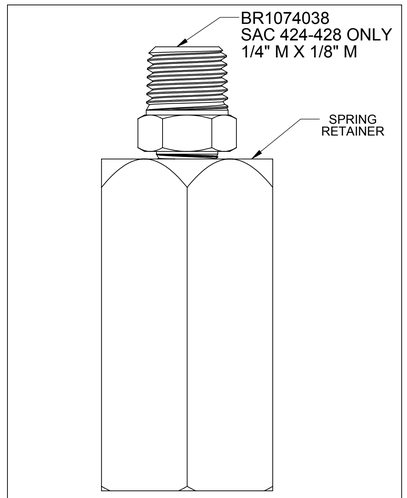
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM
FLOAT OPERATED VALVES

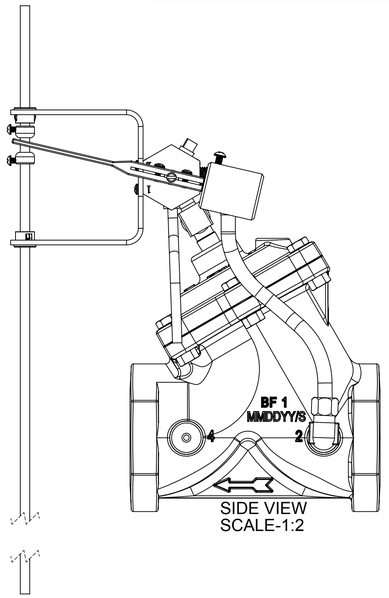
SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 5 OF 7

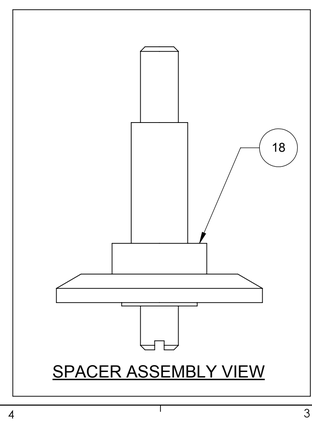




SAC ASSEMBLY VIEW



SIDE VIEW
SCALE-1:2



SPACER ASSEMBLY VIEW

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR NOTES		

ITEM NO.	DESCRIPTION		PART NUMBER	QTY. (424-428) CLOSED IF LOW
1	PILOT CNTL ASSY, 348, -AE		1073992	1
2	FITTING, ELBOW,TUBE,1/8MNPT X		1078765	1
3	RD. HD. MACH SCREW, (8-32 X 1/2)		1072375	1
4	BRACKET, 348		1074012	1
5	RD. HD. MACH. SCREW, (6-32 X 1/4)		1072370	2
6	COUNTERWEIGHT, STD		1074014	1
7	CENTERING COLLAR, BRASS		1074017	2
8	LEVER, 348		1074034	1
9	BUSHING		1074016	2
10	STUD, THRD, #12-24 UNC-2A, BRASS		1074025	1
11	GREASE, LUBRIPLATE, FGL-2		16856-8	1
12	FLOAT,SAND,5"		1073996	1
13	FLOAT ROD		1074023	1
14	FITTING, NIPPLE, 1/4NPTX2,BRASS	424	1071905	1
	PIPE NIPPLE 1/4" X 3"	425,426	1071906	
	PIPE NIPPLE 1/4" X 4"	427,428	1071907	
15	STRAINER ASSY		1074004	1
16	FITTING, ELBOW,1/4 MNPT X 1/4F		1074041	1
17	FITTING, ELBOW,REDUCER,BRS		1074040	1
18	FITTING,TUBE,.37 OD		1071940	1
19	FITTING, ELBOW,TUBE 1/4FNPTX3/		1074007	1
20	SPACER, BRASS	424	1074230	1
		425	1074305	
		426	1074385	
		427	1074484	
		428	1074565	
21	SCREW, PHLP, PN HD		1072371	4
22	FITTING, ELBOW, BRASS		1074037	1
23	PLUG,PIPE,1/8" MNPT,BRS,SQ HD		1071903	1
24	FITTING,INSERT,3/8		10332	1
25	TUBING, POLY 1/4" O.D. X .035		1071936	1

SEE NOTE-2

NOTES:

1. DRILL AND TAP PORT #2 WITH 1/4" NPT. [424-428 VALVES]
2. SEE DRAWING 1078193 FOR ROD LENGTH/MATERIAL OPTIONS.
3. STANDARD VERSION 425 MODEL SHOWN.

PAINT OPTIONS	
PART #	COLOR
42805	RED
43198	BLUE
42807	BLACK
42808	ASH

STANDARD VERSION
CLOSED IF- LOW,
CLOSED BY-PILOT PRESSURE,
OPEN BY- VENT

FOR 424 THRU 428
VALVES W/FLOAT

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION		
APPROVALS	DATE	
DRAWN	SM	04/18/11
APPROVED		
CHECKED		

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 420 DAIPHRAGM
FLOAT OPERATED VALVES

SIZE	DWG NO.	REV
B	1078190	K

SCALE 1:1 SHEET 7 OF 7

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
PILOT CONTROL REPAIR PARTS INCLUDES ITEM NO. 3 THRU 9	1074019 (348-IAB)

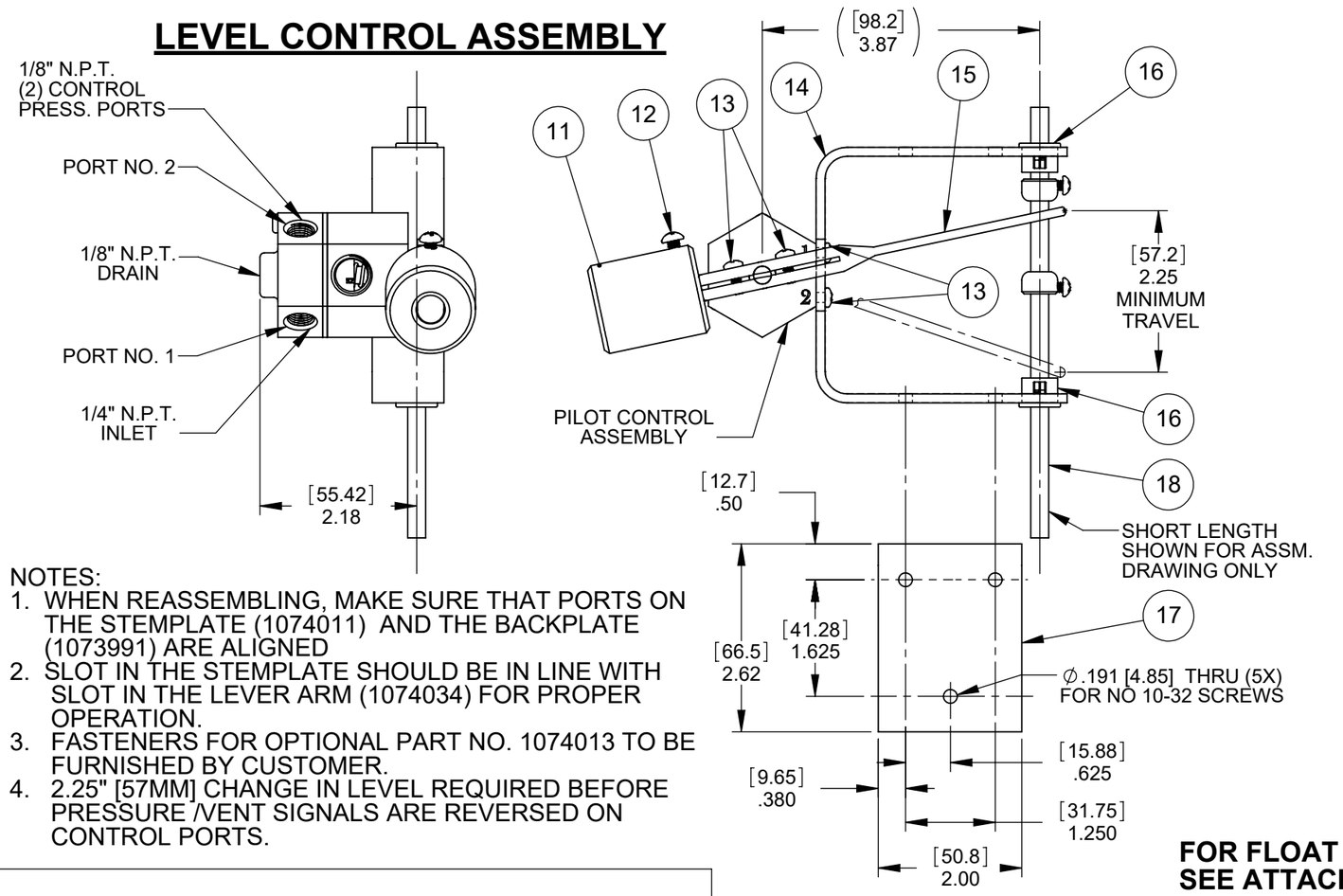
	PORT 1	PORT 2
FLOAT UP	PRESSURED	VENTED
FLOAT DOWN	VENTED	PRESSURED

F1 / G1 LEVEL CONTROL ASSEMBLY	FLOAT ROD ASSEMBLY
1074042 (348LC)	1074020 (348-K) (BRASS - 36")
1074044 (348LCK)	1074026 (348-KK) (BRASS - 54")
1074043 (348LCB)	1074028 (348-KL) (BR WELL - 36")
1074047 (348LCX)	NO FLOAT OR ROD INCL.

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	103972	F	1-REM'D: 1074046, 2-REM'D: ITEM# 18-1074030, 3-REM'D: ITEM# 18-1074027, 4-REM'D: PG-3,(OPTIONAL) 36" & 54" SS FLOAT ROD ASSY, 5-UPDATED TITLE BLOCK	7-3-12	TJM
	104611	G	1-REM'D: 1074045, 2-REM'D: ITEM# 18-BR1074029, 3-REM'D: PG-3 (OPTIONAL) 36" PVC FLOAT ROD ASS'Y	12MAY15	TJM
	1001	H	AQ Matic Update & Part Number Verification	12MAY17	MGS
	1801	J	P/N 1074022 CHANGED TO1074025, MINOR FORMAT CHANGES	11/9/2020	PMJ

LEVEL CONTROL ASSEMBLY



NOTES:
1. WHEN REASSEMBLING, MAKE SURE THAT PORTS ON THE STEMPLATE (1074011) AND THE BACKPLATE (1073991) ARE ALIGNED
2. SLOT IN THE STEMPLATE SHOULD BE IN LINE WITH SLOT IN THE LEVER ARM (1074034) FOR PROPER OPERATION.
3. FASTENERS FOR OPTIONAL PART NO. 1074013 TO BE FURNISHED BY CUSTOMER.
4. 2.25" [57MM] CHANGE IN LEVEL REQUIRED BEFORE PRESSURE /VENT SIGNALS ARE REVERSED ON CONTROL PORTS.

PILOT CONTROL ASSEMBLY

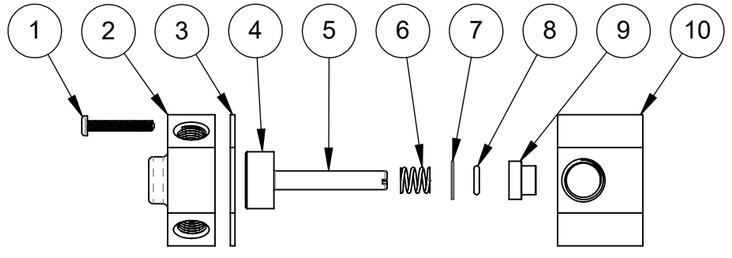
ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1075759	SCREW, 6-32 X 7/8, PAN HEAD	3
2	1073991	BACKPLATE, 348, BRASS	1
3	1084171	GASKET, BACKPLATE, 48 STAGER	1
4	1074845	STEMPLATE, 48,ALPHA	1
5	1074010	STEMSHAFT ASSY, SERIES 348	1
6	1074822	SPRING, COMPRESSION, 348	1
7	1074074	WASHER, 302,SS	1
8	1071667	O-RING, 2-010	1
9	1073994	BUSHING, SHAFT, 348	1
10	1074009	BONNET, 348, BRASS	1

LEVEL CONTROL ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION		QTY.
11	SEE SHEET 2	COUNTERWEIGHT		1
12	1072375	RD. HD. MACH SCREW, (8-32 X 1/2)		1
13	1072371	SCREW, PHLP, PN HD, 6-32 X 3/8", SS		4
14	1074012	BRACKET, 348		1
15	1074034	LEVER, 348		1
16	1074016	BUSHING		2
17	1074013	MOUNTING BRACKET (OPTIONAL)		1
18	1074020	FLOAT ROD ASS'Y (SEE PAGES 2 - 3 FOR PARTS LIST	BRASS (36")	1
19	1074026		BRASS (54")	1
20	1074028		BRASS (36" - BR WELL)	1
21	1239443		BRASS (54" - BR WELL)	1

FOR FLOAT ROD ASSEMBLY OPTIONS, SEE ATTACHED SHEETS

PILOT CONTROL ASSEMBLY - (1073992)



SEIRES 348 LEVEL CONTROL FLOAT OPERATED VALVE

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1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	07-02-12
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

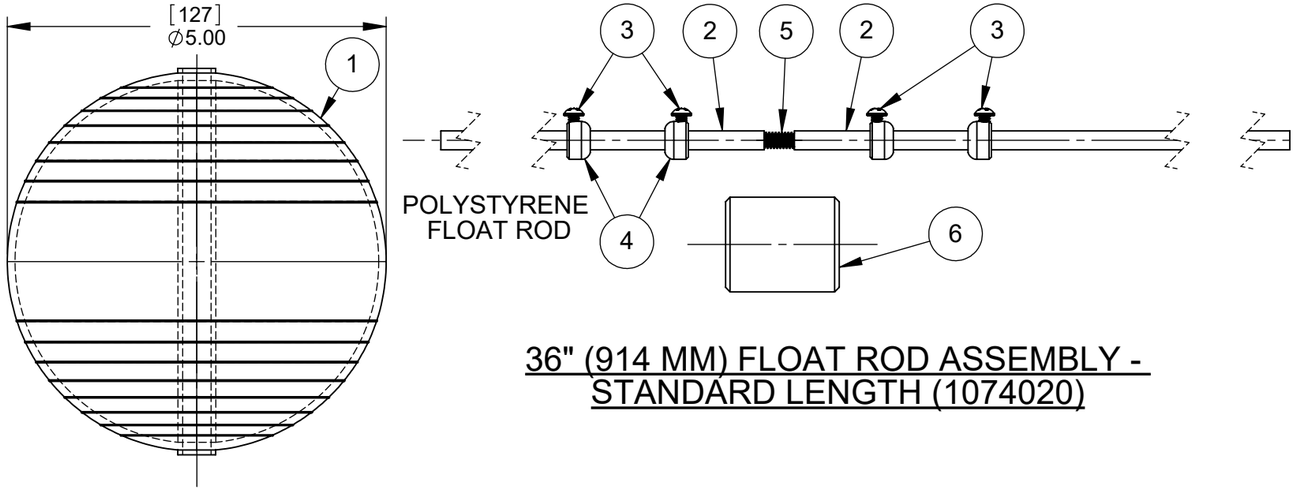
TITLE
FLOAT OPERATED LEVEL CONTROL, V420 FLOAT ROD ASSEMBLIES

SIZE	DWG NO.	REV
B	1078193	J

SCALE 1:2 | SHEET 1 OF 3

BR42887

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES.		



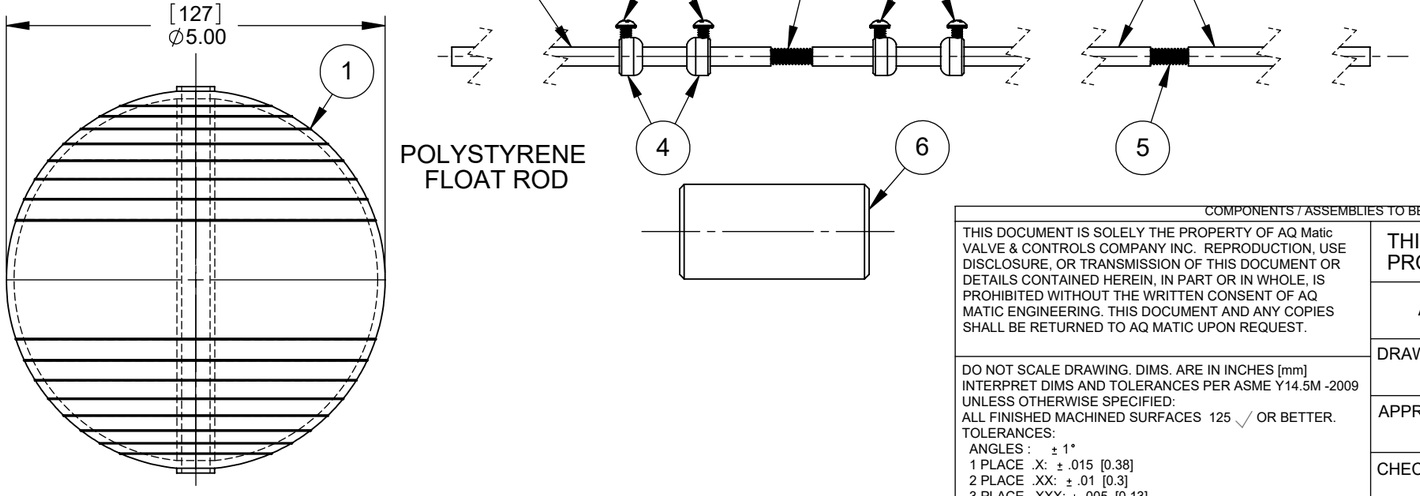
36" (914 MM) FLOAT ROD ASSEMBLY - STANDARD LENGTH (1074020)

STANDARD 36" FLOAT ROD ASSEMBLY 1074020

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1073996	FLOAT, SAND, 5"	1
2	1074023	TUBE, FLOAT ROD, BRASS 18" LG	2
3	1072370	RD. HD. MACH. SCREW, (6-32 X 1/4)	4
4	1074017	CENTERING COLLAR, BRASS	4
5	1074025	STUD, THRD, #12-24 UNC-2A, SS	1
6	1074014	COUNTERWEIGHT, STD	1

G3

SERIES 420 DIAPHRAGM VALVES FLOAT ROD ASSEMBLIES



54" (1372 MM) FLOAT ROD ASSEMBLY - STANDARD LENGTH (1074020)

OPTIONAL 54" FLOAT ROD ASSEMBLY 1074026

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1073996	FLOAT, SAND, 5"	1
2	1074023	TUBE, FLOAT ROD, BRASS 18" LG	3
3	1072370	RD. HD. MACH. SCREW, (6-32 X 1/4)	4
4	1074017	CENTERING COLLAR, BRASS	4
5	1074025	STUD, THRD, #12-24 UNC-2A, SS	2
6	1074015	COUNTERWEIGHT, SPECIAL	1

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ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	07-02-12
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

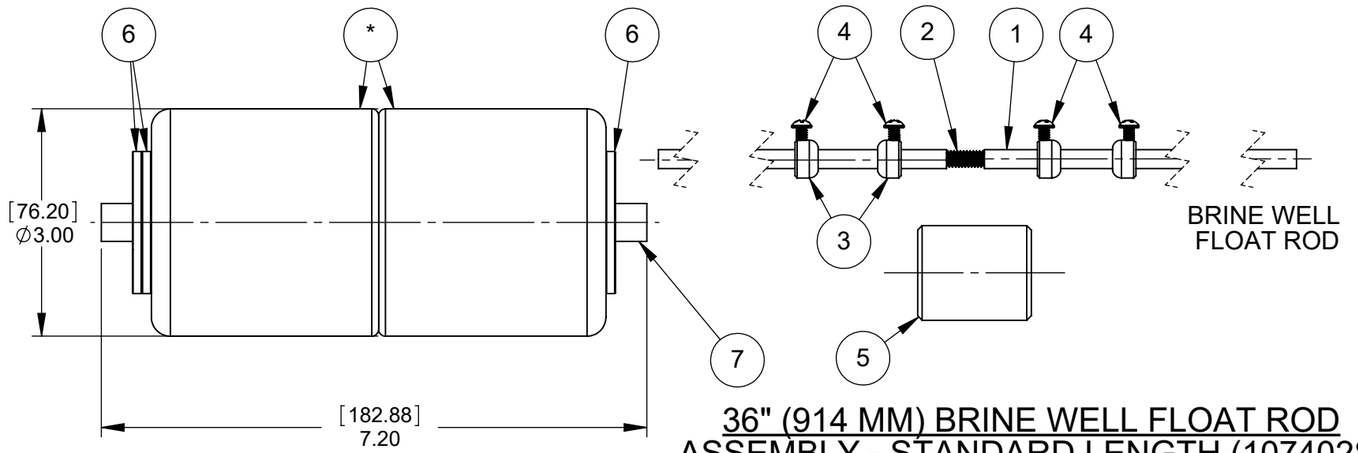
TITLE
FLOAT OPERATED LEVEL CONTROL, V420 FLOAT ROD ASSEMBLIES

SIZE	DWG NO.	REV
B	1078193	J

SCALE 1:2 | SHEET 2 OF 3

BR42887

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES.		

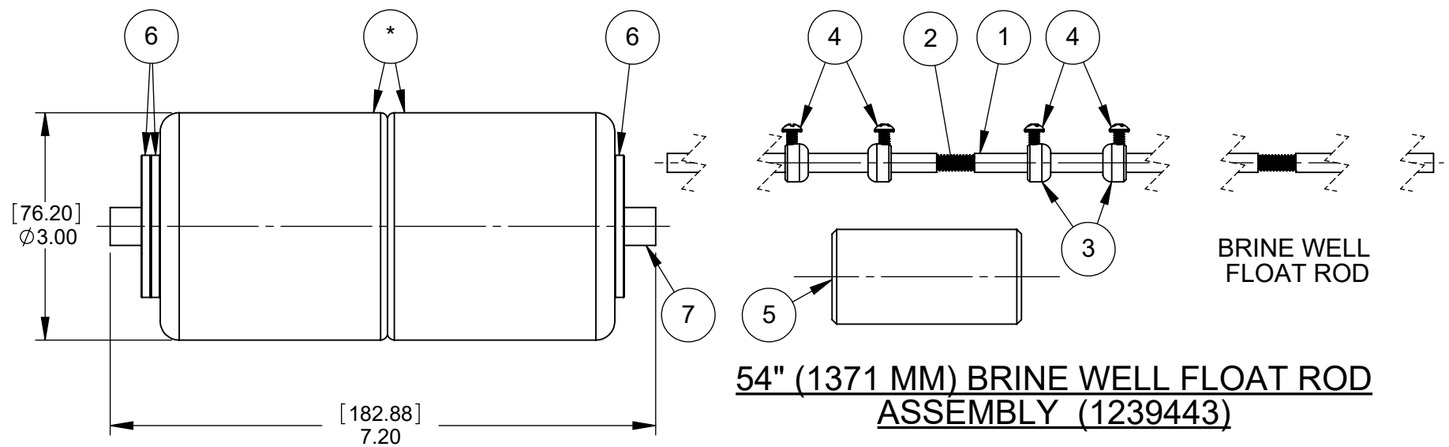


36" (914 MM) BRINE WELL FLOAT ROD ASSEMBLY - STANDARD LENGTH (1074028)

SERIES 420 DIAPHRAGM VALVES FLOAT ROD ASSEMBLIES

OPTIONAL 36" BRINE WELL FLOAT ROD ASSEMBLY 1074028

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1074023	TUBE, FLOAT ROD, BRASS 18" LG	2
2	1074025	STUD, THRD, #12-24 UNC-2A, SS	1
3	1074017	CENTERING COLLAR, BRASS	4
4	1072370	RD. HD. MACH. SCREW, (6-32 X 1/4)	4
5	1074014	COUNTERWEIGHT, STD	1
6	1074032	WEIGHT, FLOAT, BRASS	3
7	1074036	TUBE, .50, BRASS	1



54" (1371 MM) BRINE WELL FLOAT ROD ASSEMBLY (1239443)

OPTIONAL 54" BRINE WELL FLOAT ROD ASSEMBLY 1239443

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1074023	TUBE, FLOAT ROD, BRASS 18" LG	3
2	1074025	STUD, THRD, #12-24 UNC-2A, SS	2
3	1074017	CENTERING COLLAR, BRASS	4
4	1072370	RD. HD. MACH. SCREW, (6-32 X 1/4)	4
5	1074015	COUNTERWEIGHT, SPECIAL	1
6	1074032	WEIGHT, FLOAT, BRASS	3
7	1074036	TUBE, .50, BRASS	1

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TOLERANCES:
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1 PLACE .X: ± .015 [0.38]
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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	07-02-12
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
FLOAT OPERATED LEVEL CONTROL,
V420 FLOAT ROD ASSEMBLIES

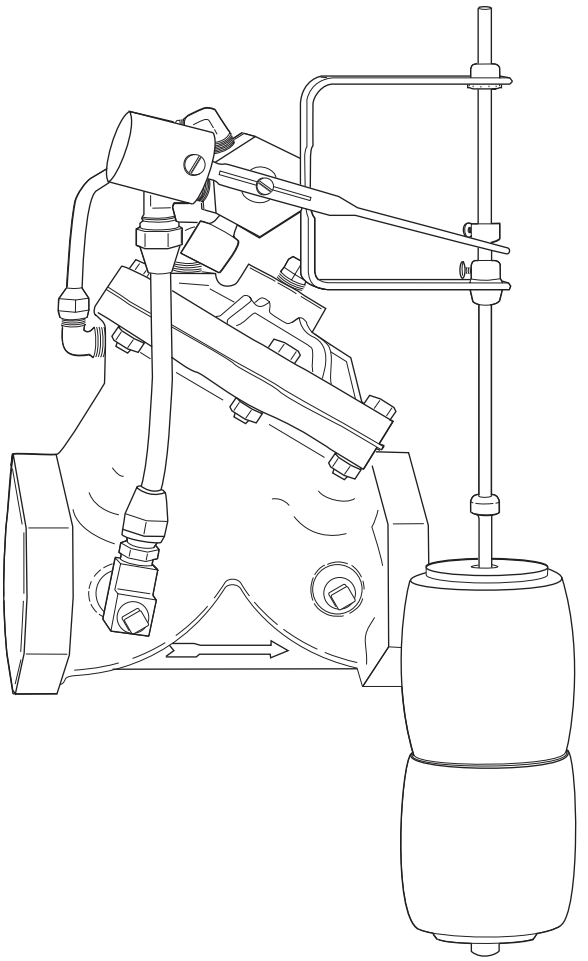
SIZE	DWG NO.	REV
B	1078193	J

SCALE 1:2 | SHEET 3 OF 3

BR42887

AQUAMATIC FLOAT OPERATED BRINE VALVE

INSTALLATION INSTRUCTIONS



DESCRIPTION

The AquaMatic Brine Control Valve is a pilot-controlled, hydraulically-operated Y-pattern diaphragm valve. It is controlled by pressure and vacuum which determines the upper and lower brine levels in the tank.

The valve will allow a predetermined amount of brine to be withdrawn and automatically refill with fresh water through a common line. Refilling is achieved while the softener is in fast rinse and service.

FEATURES

- Positive opening and closing of valve by combining vacuum and pressure.
- Pilot uses fresh water and vacuum for control pressures.
- Air and drip-tight closure after brining and also refilling.
- Completely automatic in the opening and closing operation of the brine and refill cycles.

OPERATION

With the softener in service position and brine tank at the predetermined upper level, line pressure is directed to the upper chamber of the diaphragm valve. This closes the valve. The lower chamber of the valve is vented to atmosphere through the pilot control.

With the softener in brine position, the vacuum created by the action of the ejector is transferred through the pilot control to the upper chamber of the diaphragm valve. The valve opens to allow brine to be withdrawn from the brine tank.

When the predetermined amount of brine has been withdrawn, the float contacts the lower float stop. The weight of the float will cause the lever arm to rotate to the down position. The vacuum is transferred to the lower chamber. This closes the valve and stops the flow of brine. The valve remains closed until the fast rinse cycle occurs.

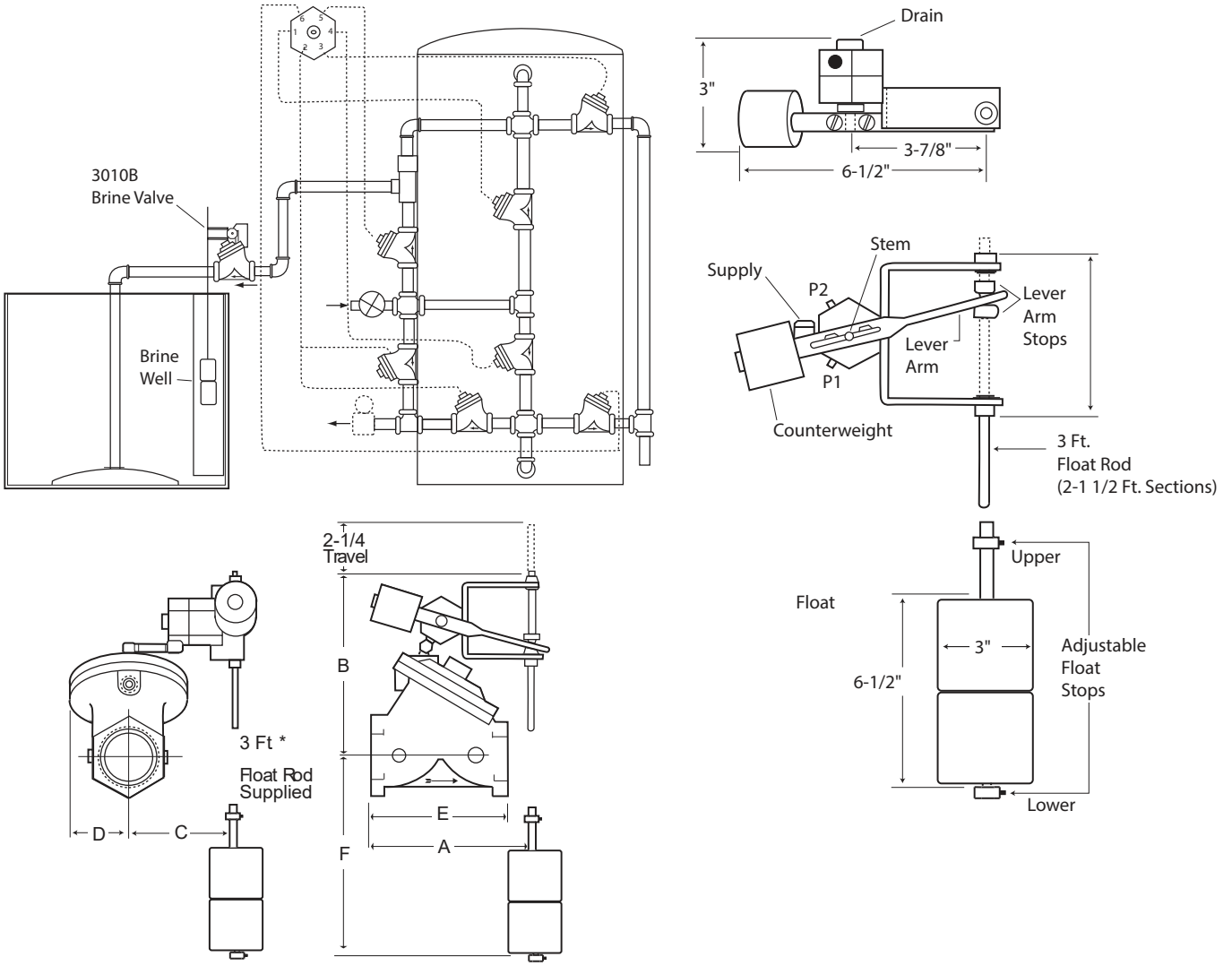
With the softener in the fast rinse position, line pressure replaces the vacuum in the lower chamber. This will force the valve to the open position and allow the fresh water to refill the brine tank. At the predetermined upper level the float contacts the upper float stop. The lever arm rotates to the up position and pressure is directed to the upper chamber of the diaphragm valve. This will close the valve (drip-tight) until the next brine cycle.

SPECIFICATIONS

Size:	3/4" through 1.5" NPT or BSP
Pressure:	125 psi maximum recommended
Vacuum:	2 - 28 inHg
Temperature:	32 to 140°F (0 to 60°C)
Fluid:	Water and salt brine
Materials:	
	Body and cover - cast iron
	Valve trim - brass and stainless steel
	Seals - Buna-N
Diaphragm:	Buna-N on nylon
Pilot Control:	Brass
	Stainless steel
	Neoprene gasket
	Buna-N O-ring
	PTFE template
Float Rod:	Brass
Float:	Close-celled Spongex

CALIFORNIA PROPOSITION 65 WARNING

⚠ WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.



Size	Dim.	A	B	C	D	E	F*
3/4" to 1"	in	7.31	6.50	1.50	2.12	3.68	29
	mm	186	165	38	54	93	735
1-1/4" to 1-1/2"	in	6.31	7.81	3.31	1.75	4.75	28
	mm	160	198	84	44	120	711

INSTALLATION

1. Before installation, the pipe lines should be flushed thoroughly to remove all chips, scale, and other foreign matter
2. Valve should be installed with refill flow in the direction as shown by the arrow on the body of the valve.
3. The float rod should be installed as shown above.
4. The counterweight should be adjusted to balance the weight of the float rod.
5. Float is now installed on the float rod. The spacing between the float stops determines the travel or range of the float. This travel controls the amount of brine to be transferred to the softener tank.
6. Calculate the amount of brine required for a regeneration cycle. Convert gallons of brine to number of inches of draw down in the brine tank. Adjust distance between "Adjustable float stops" on float rod to achieve proper brine draw down.
7. Once the correct draw down has been established, the upper liquid level in the brine tank can be controlled by adjusting "lever arm stops". This action does not affect the brine draw down controlled by the float.

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1204627 REV D AU2016

VAV SERIES HIGH CYCLE VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** V A V _ - 0 _ _ - 0 0 0

PIPE SIZE (B thru K std)

B = 3/4" (20mm)	G = 2" (50mm - VAV6)
C = 1" (25mm)	H = 2-1/2" (63mm)
D = 1-1/4" (32mm)	J = 3" (75 or 80mm)
E = 1-1/2" (40mm)	K = 4" (100mm)
F = 2" (50mm - V425)	

BODY SIZE (ref only)

1 = 1"	7 = 3"
4 = 1-1/2"	8 = 4"
5 = 2"	
6 = 2-1/2"	

END CONNECTIONS (0 std [Connections also apply to body & cap bosses that are drilled & tapped])

0 = Female N.P.T.	3 = Flanged, A.S.T.M.	5 = Grooved Per Ansi/Awwa C606 (see note 1)
1 = Female B.S.P.T. (Tapered)	4 = Flanged, B.S.P.T.	

BODY & CAP MATERIAL (0 std)

0 = Cast Iron

VALVE OPTIONS (00 std)

00 = NO	02 = NO, SAC	32 = NC, SAC
01 = NO, SAO	30 = NC	SX = Special Valve **

SEAL MATERIALS (9 std)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEALS	STATIC SEALS	KIT SERIES	MAX TEMP
9	Buna-N	Hycar	Aflas	Fluoroelast.	RA	150° F
C	Fluoroelast	Hycar	Aflas	Fluoroelast.	RAHT	250° F

INTERNAL PARTS (0 std)

0 = Brass and Stainless Steel

DRILL & TAP BOSSES (0 std [1/4" NPT std for all sizes])

0 = None	3 = Boss #3	6 = Bosses #1,2
1 = Boss #1	4 = Boss #4	7 = Bosses #1,3
2 = Boss #2	5 = Bosses #1,2,3,4	8 = Bosses #2,4

00 (unless Special Drawing number is assigned)

* To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a 3/4" NPT Cast Iron Valve Model VAV1 with Normally Closed and Spring Assist Closed Options is designated as a VAVB-0032-90000.

** A special valve will have a custom drawing number (_ _ _ _ _ _)
and the item number format is (VAV?-??SX-_ _ _ _ _)
where the last 5 numbers (Far Right) are the last five digits of the drawing number.

1 Grooved End option only available on 2" VAV5 valves.

REV.	ECO. NO.	DESCRIPTION	BY/DATE
G	32935	**Added seal option "C"** **Removed seal option "8"**	TMS 15-Jun-11
H	1778	**Added grooved (end connections)**	MM 1-Oct-20

42989

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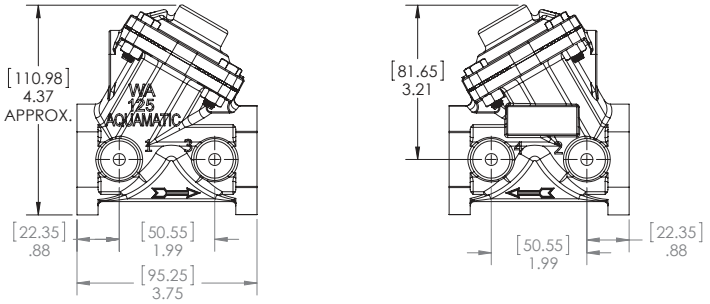
42989 REV H OCT 20

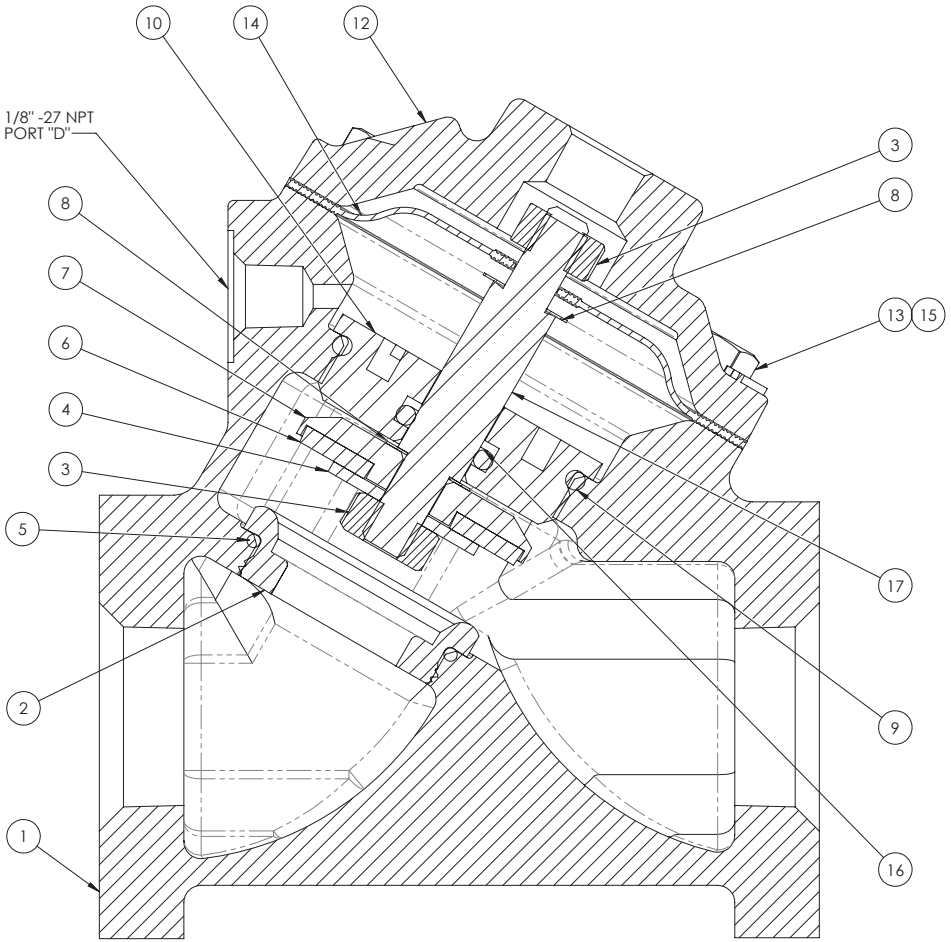


REPAIR PARTS KITS		
DESCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2), 5, 6, 8(2), 9, 14, 16	1070106 (AV1-RA)	1070498 (AV-RAHT)
	INCLUDES DISC 1074144 (421-JH) DIAPHRAGM 1074119	INCLUDES DISC 1074145 (421-JT) DIAPHRAGM 1074120
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 17	1070118 (421-RF)	
SEAT (ITEM NO. 2)	1074158 (421-MO)	

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SEAT (ITEM #2) (TOOL NOT SHOWN)	1074161 (421-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (TOOL NOT SHOWN)	1074124 (421-GT)

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	104236	K	REDRAWN IN SOLIDWORKS	2/6/15	ANH
	1001	M	AQ Matic update & verifed part numbers	20JAN17	MGS
	1665	N	Update Diaphram Plated Assembly View	3/3/20	TRK

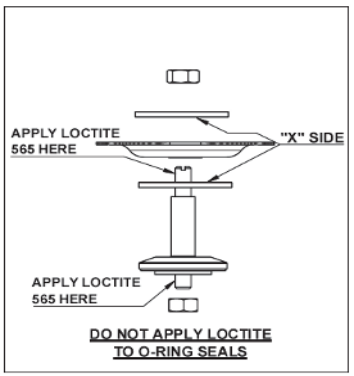
NO.	DESCRIPTION		STD	PART NO.	QTY.
1	VALVE BODY	CAST IRON	3/4" NPT	*	1074085 (421-A3)	1
			1" NPT	*	1074088 (421-A4)	
2	SEAT (REQ'S ASSY TOOL)		BRASS	*	1074158 (421-M0)	1
3	HEX NUT (1/4-28)		SS	*	1263852	2
4	DISC PLATE		SS	*	1074149	1
5	O-RING		FKM	*	1071791 (ORV-024)	1
6	DISC		HYCAR	*	1074144 (421-JH)	1
7	DISC HOLDER		SS	*	1074128	1
8	GASKET		COPPER	*	1073948 (200-GG)	2
9	O-RING		FKM	*	1071803 (ORV-125)	1
10	SHAFT GUIDE (REQ'S ASSY TOOL)		SS	*	1074123	1
11	DIAPHRAGM PLATE		SS	*	43942	2
12	CAP		CAST IRON	*	1074093 (421-C)	1
13	HEX SCREW 1/4"-20		PLATED STEEL	*	1072398 (SCZ-0004)	4
14	DIAPHRAGM		BUNA N	*	1074119	1
			FKM		1074120	
15	HEX NUT 1/4"-20		PLATED STEEL	*	1071656 (NUZ-0008)	4
16	O-RING		AFLAS	*	1071661 (ORA-110)	1
17	SHAFT (NORMALLY OPEN)		SS	*	1074150 (421-L)	1



1072459 (VAVB-0000-90000) (3/4" NPT)
1072464 (VAVC-0000-90000) (1" NPT)
NORMALLY OPEN (STANDARD)

NOTE:

1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS



SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X ± .015 [0.38]
2 PLACE .XX ± .01 [0.3]
3 PLACE .XXX ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN ANH	2/5/15
APPROVED	
CHECKED	

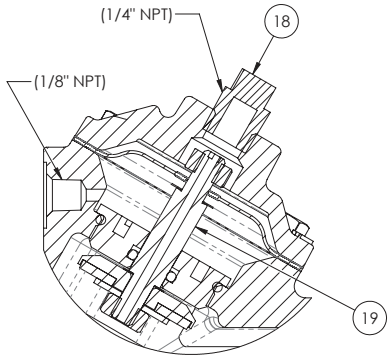
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, VAV1, 3/4" & 1" NPT OR BSPT

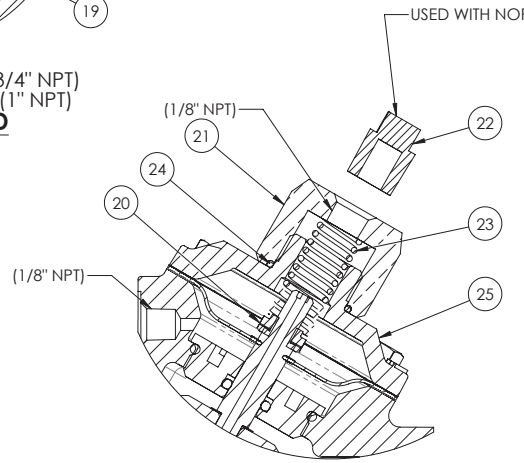
SIZE	DWG NO.	REV
B	1077635	N

SCALE 1:1 SHEET 1 OF 2

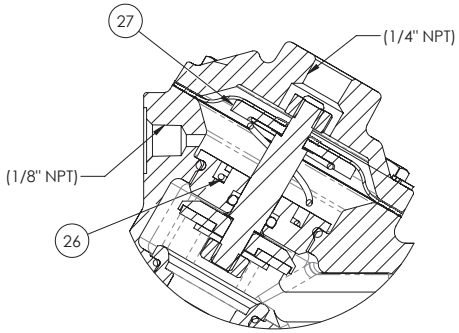
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR REVISIONS		



1072462 (VAVB-0030-90000) (3/4" NPT)
1072469 (VAVC-0030-90000) (1" NPT)
NORMALLY CLOSED



1072461 (VAVB-0002-90000) (3/4" NPT)
1072467 (VAVC-0002-90000) (1" NPT)
SPRING ASSIST CLOSED



1072456 (VAVB-0001-90000) (3/4" NPT)
1072460 (VAVC-0001-90000) (1" NPT)
SPRING ASSIST OPEN

NO.	DESCRIPTION		STD	PART NO.	QTY.
	NORMALLY CLOSED MODEL				
18	PIPE PLUG (1/4" N.P.T.)	PLATED STEEL	*	1071918 (PLZ-0008)	1
19	SHAFT (NORMALLY CLOSED)		*	1074153 (421-LL)	1
	SPRING ASSIST CLOSED MODEL				
20	CENTERING NUT		*	1074185 (421-X)	1
21	RETAINER NUT	BRASS	*	1074183 (421-TT)	1
22	PIPE PLUG (1/8" N.P.T.)	BRASS	*	1071903 (PLB-0007)	1
23	SPRING		*	1078602	1
24	O-RING		*	1071674 (ORB-020)	1
25	CAP	CAST IRON	*	1074099 (421-CC)	1
	SPRING ASSIST OPEN MODEL				
26	SPRING		*	1078608	1
27	DIAPHRAGM PLATE, SAO	SS	*	43727	1

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 19	1070129 (421-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 20, 23, 24	1074176 (421-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 26	1074178 (421-SO)

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 20 THRU 25	1074177 (421-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 10, 26	1074179 (421-SOC)

SEE REVERSE SIDE FOR
NORMALLY OPEN MODEL

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ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

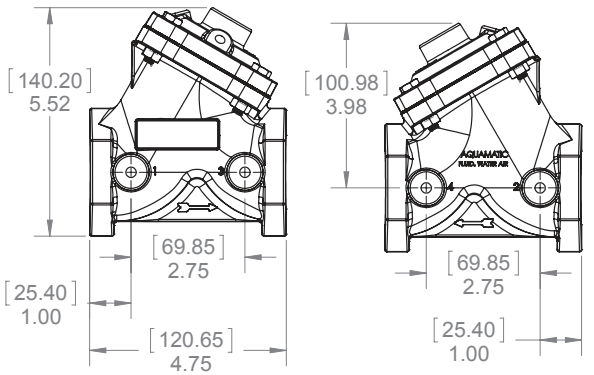
APPROVALS	DATE
DRAWN ANH	2/5/15
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, VAV1, 3/4" & 1"
NPT OR BSPT

SIZE	DWG NO.	REV
B	1077635	N

SCALE 1:1 SHEET 2 OF 2

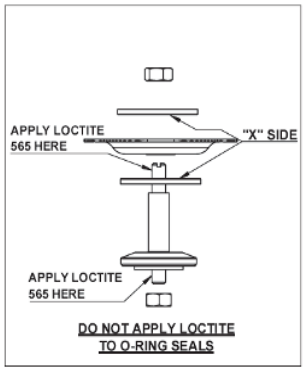


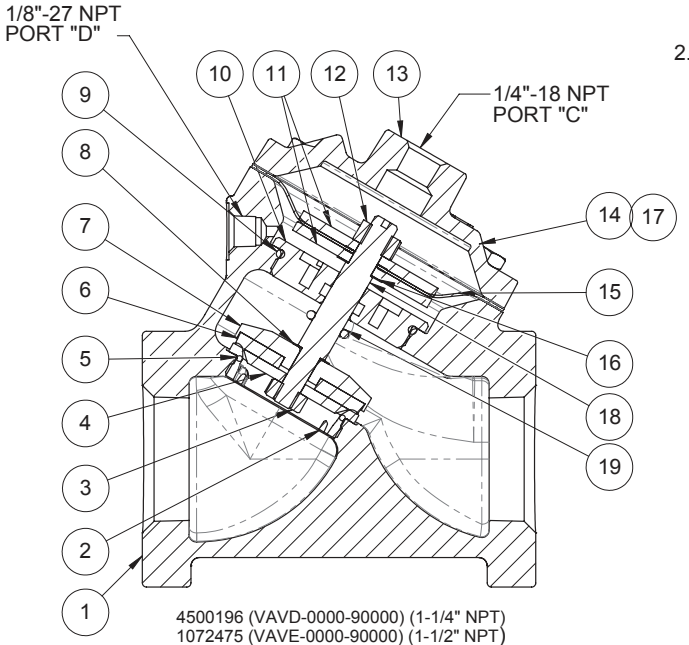
REPAIR PARTS KITS		
DISCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 5, 6, 8, 9, 12, 15, 16, 18	1070107 (AV4-RA) INCLUDES DISC 1074234 (424-JH) DIAPHRAGM 1074222 (424-FB)	1070502 (AV4-RAHT) INCLUDES DISC 1074235 (424-JT) DIAPHRAGM 1074224 (424-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 19	1070119 (424-RF)	
SEAT (ITEM NO 2)	1074245 (424-MO)	

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SEAT (ITEM NO. 2) (TOOL NOT SHOWN)	1074247 (424-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM NO. 10) (TOOL NOT SHOWN)	1074227 (424-GT)

NOTE:

1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.





4500196 (VAVD-0000-90000) (1-1/4" NPT)
1072475 (VAVE-0000-90000) (1-1/2" NPT)
NORMALLY OPEN (STANDARD)

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	104291	G	REDRAWN IN SOLIDWORKS-1-ITEM# 4- WAS:1074237, 2-ITEM#7-WAS:1074229, 3-ITEM #10-WAS: 1074225, 4-ITEM#11-WAS: 1074220- FORM# NOW DWG NUMBER	3/3/15	ANH
	104479	H	1- ITEM #11 WAS: 1074221	07APR15	TJM
	1001	J	AQ Matic update & verified part numbers	17JAN17	MGS
	1667	K	Update Diaphram Plate Assembly View	3/3/20	TRK

NO.	DESCRIPTION		STD	PART NO.	QTY.
1	VALVE BODY, CI	1-1/4" NPT	*	1074196 (424-A5)	1
		1-1/2" NPT	*	1074199 (424-A6)	1
2	SEAT (REQ'S ASSY TOOL)	BRASS	*	1074245 (424-MO)	1
3	HEX NUT (1/4-28)		*	1263852	1
4	DISC PLATE	STAINLESS STEEL	*	1074238	1
5	O-RING	FKM	*	1071793 (ORV-028)	1
6	DISC	HYCAR	*	1074234 (424-JH)	1
		GLASS FILLED TEFLON		1074235 (424-JT)	1
7	DISC HOLDER	STAINLESS STEEL	*	1074231	1
8	GASKET	COPPER	*	1073948 (200-GG)	1
9	O-RING	FKM	*	1071806 (ORV-132)	1
10	SHAFT GUIDE	STAINLESS STEEL	*	1074226	1
11	DIAPHRAGM PLATE	STAINLESS STEEL	*	43943	2
12	HEX NUT (5/16-24)		*	1263853	1
13	CAP	CAST IRON	*	1074202 (424-C)	1
14	HEX SCREW 1/4"-20	PLATED STEEL	*	1072399 (SCZ-0007)	4
15	DIAPHRAGM	BUNA N	*	1074222 (424-FB)	1
		FKM		1074224 (424-FV)	1
16	GASKET	COPPER	*	1074252 (424-R)	1
17	HEX NUT 1/4"-20	PLATED STEEL		1071656 (NUZ-0008)	4
18	O-RING	AFLAS	*	1071661 (ORA-110)	1
19	SHAFT (NORMALLY OPEN)		*	1074239 (424-L)	1

SEE SHEET 2 FOR CONFIGURATION OPTIONS

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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UNLESS OTHERWISE SPECIFIED:
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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

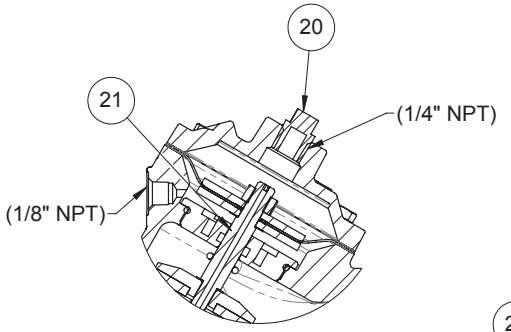
APPROVALS	DATE
DRAWN ANH	2/20/15
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

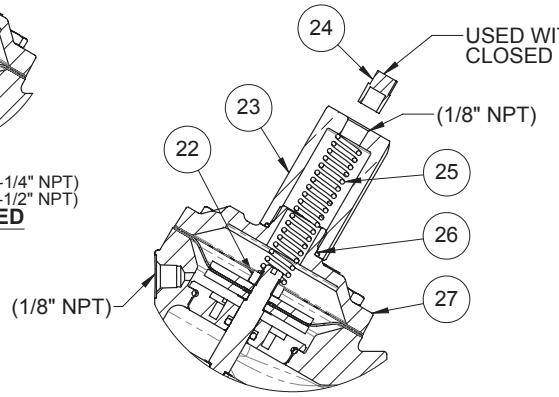
TITLE
CATALOG SHEET, AV4,DIAPHRAGM VALVE

SIZE	DWG NO.	RFV
B	1077636	K

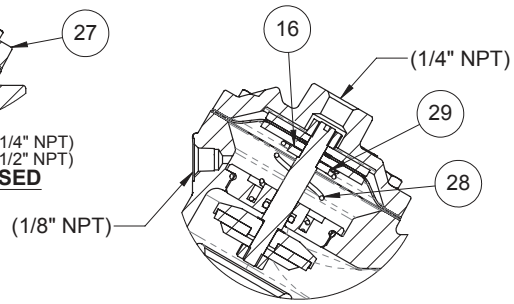
SCALE 1:2 SHEET 1 OF 2



4500197 (VAVD-0030-90000)(1-1/4" NPT)
1072479 (VAVE-0030-90000)(1-1/2" NPT)
NORMALLY CLOSED



1072472 (VAVD-0002-90000)(1-1/4" NPT)
1072477 (VAVE-0002-90000)(1-1/2" NPT)
SPRING ASSIST CLOSED



1072471 (VAVD-0001-90000)(1-1/4" NPT)
1070064 (VAVE-0001-90000)(1-1/2" NPT)
SPRING ASSIST OPEN

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR REVISIONS		

NO.	DESCRIPTION		STD	PART NO.	QTY.
NORMALLY CLOSED MODEL					
20	PIPE PLUG (1/4" N.P.T.)	PLATED STEEL	*	1071918 (PLZ-0008)	1
21	SHAFT (NORMALLLY CLOSED)		*	1074241 (424-LL)	1
SPRING ASSIST CLOSED MODEL					
22	CENTERING NUT		*	1074276 (424-X)	1
23	RETAINER NUT	BRASS	*	1074274 (424-TT)	1
24	PIPE PLUG (1/8" N.P.T.)	BRASS	*	1071903 (PLB-0007)	1
25	SPRING		*	1074270 (424-SS)	1
26	O-RING		*	1071674 (ORB-020)	1
27	CAP	CAST IRON	*	1074208 (424-CC)	1
SPRING ASSIST OPEN MODEL					
16	GASKET	COPPER	*	1074252 (424-R)	1
28	SPRING		*	1236766	1
29	CENTERING WASHER	BRASS	*	1074382 (426-HA)	1

REPAIR PARTS KIT	
DESCRIPTION	PART NO.
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 11(2), 21	1070130 (424-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 25, 26	1074265 (424-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 16,28,29	1074268 (424-SO)

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22 THRU 27	1074266 (424-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 10, 16, 28, 29	1074269 (424-SOC)

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

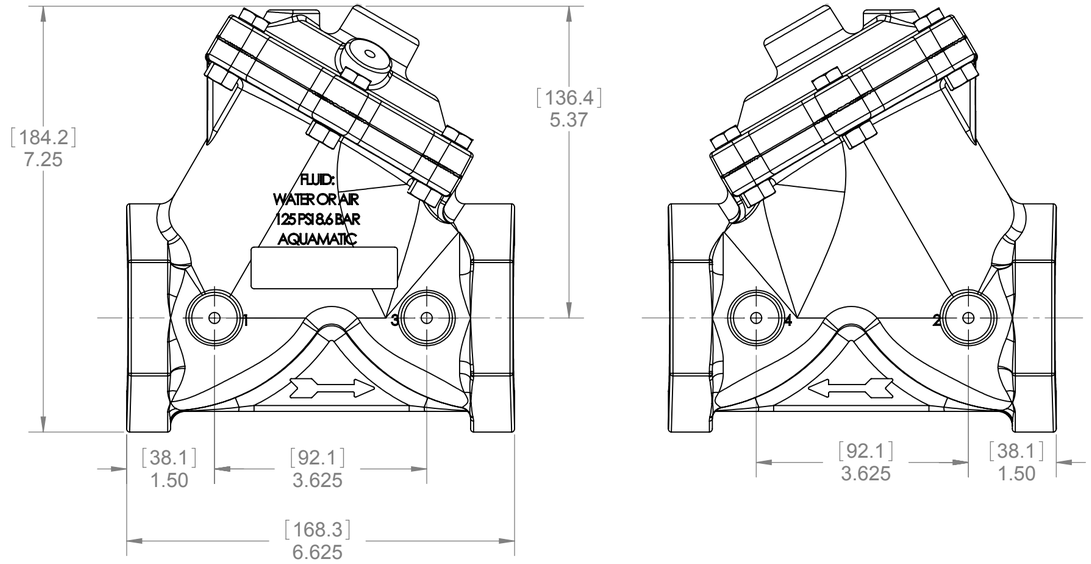
APPROVALS	DATE
DRAWN ANH	2/20/15
APPROVED	
CHECKED	

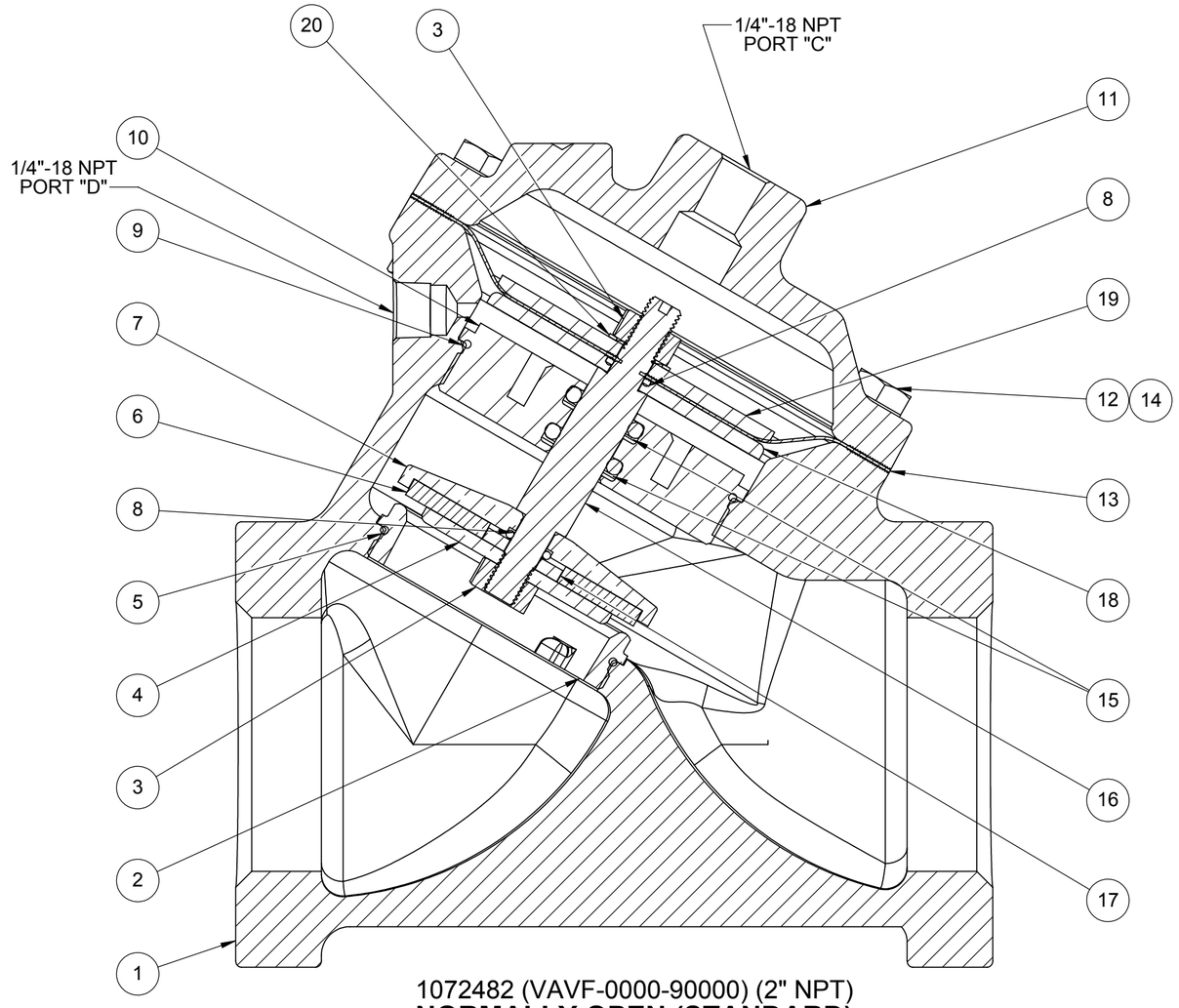
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV4,DIAPHRAGM VALVE

SIZE B | DWG NO. 1077636 | REV K

SCALE 1:2 | SHEET 2 OF 2





1072482 (VAVF-0000-90000) (2" NPT)
NORMALLY OPEN (STANDARD)

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	102029	H	REDRAWN IN SOLIDWORKS, 1-WAS BR1074296	5-30-13	NBE
	103665	J	1-ITEM#10-WAS:BR43243, 2-ADD'D: ITEM#20	19AUG14	TJM
	103821	K	1- FIXED BOM/BALLOON NUMBERING, 2- UPDATED TITLE BLOCK	24SEP14	MCP
	103964	L	1-ITEM #20 WAS: 1073594	07NOV14	TJM
	1001	M	AQ Matic update & verified part numbers	16JAN17	MGS

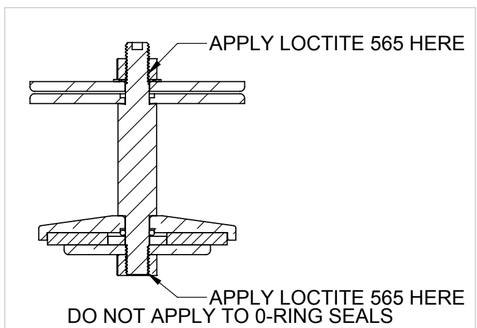
NO.	DESCRIPTION		STD	PART NO.	QTY
1	VALVE BODY, 425, CI	2" NPT	*	1074277	1
2	SEAT; BRASS (REQ'S ASSY TOOL)		*	1074321 (425)	1
3	HEX NUT (5/16-24)		*	1263853	2
4	DISC PLATE, AV5	BRASS		1074313	1
5	O-RING	FKM		1071794 (ORV-035)	1
6	DISC	TEFLON	*	1074311 (425)	1
		HYCAR		1074310 (425)	
7	DISC HOLDER, AV5	BRASS	*	1074304	1
8	O-RING	FKM	*	1071786 (ORB-011)	2
9	O-RING	FKM	*	1071795 (ORB-038)	1
10	SHAFT GUIDE (REQ'S ASSY TOOL)	SS	*	43775	1
11	CAP, 425, NPT TAP TOP	CAST IRON	*	1074281	1
12	SCREW 5/16-18x1 1/8", HX HD		*	1072400	6
13	DIAPHRAGM	BUNA N	*	1074296	1
		FKM		1074297	
14	HEX NUT, 5/16" - 18	PLATED STEEL	*	1071657 (NUZ-0011)	6
15	O-RING	AFLAS	*	1071664 (ORB-206)	2
16	SHAFT (NORMALLY OPEN)		*	1074314 (425)	1
18	PLATE, LOWER DIAPHRAGM		*	1074295	1
19	PLATE, UPPER DIAPHRAGM		*	1074294	1
20	LOCKWASHER, 5/16,INTERNAL		*	1073590	1

REPAIR PARTS KITS

DESCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSIST OF ITEM NO'S 3(2),5,6,8(2),9,14,16(2)	1070108 (AV5-RA)	1070503 (AV5-RAHT)
	INCLUDES DISC 1074310 (425-JH) DIAPHRAGM 1074296 (425-FB)	INCLUDES DISC 1074311 (425-JT) DIAPHRAGM 1074297 (425-FV)
INT. PARTS KIT (NORM. OPEN) CONSIST OF STANDARD ITEM NO'S 4,7,10,17,18,19,20	1070504 (AV5-RF)	
SEAT (ITEM NO. 2)	1074321 (425-MO)	

ASSEMBLY TOOLS

DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SEAT (ITEM #2) (TOOL NOT SHOWN)	1074411 (426-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (TOOL NOT SHOWN)	1074299 (425-GAT)



NOTE:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	08-25-12
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

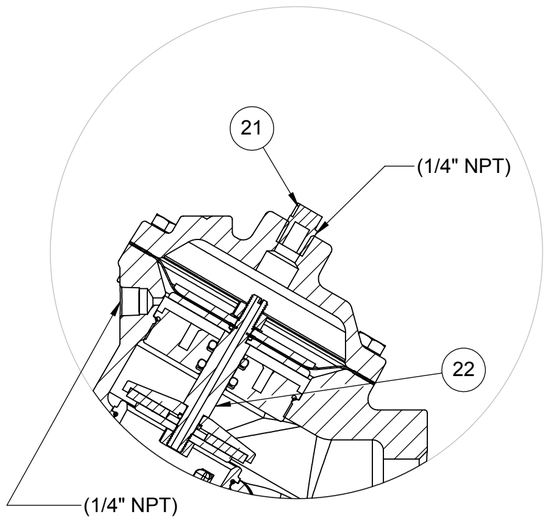
TITLE: CATALOG SHEET, AV5

SIZE B | DWG NO. BR1077637 | REV M

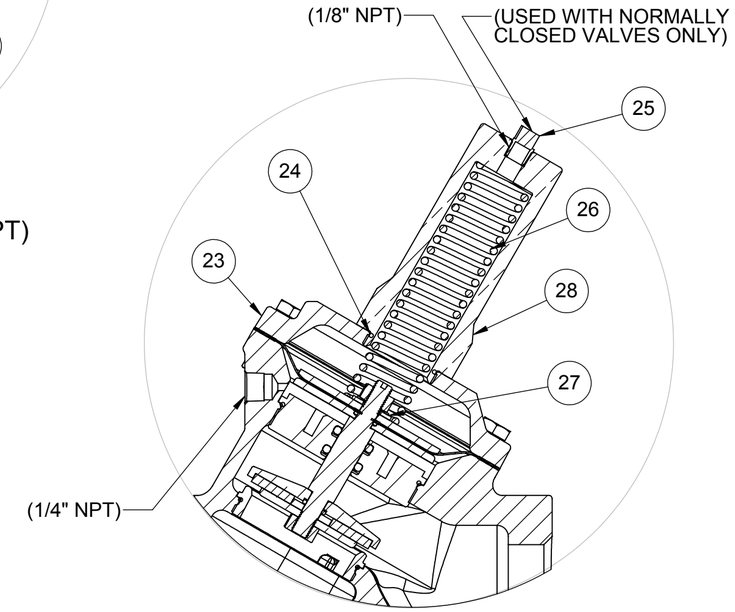
SCALE 1:2 | SHEET 1 OF 2

BR42888

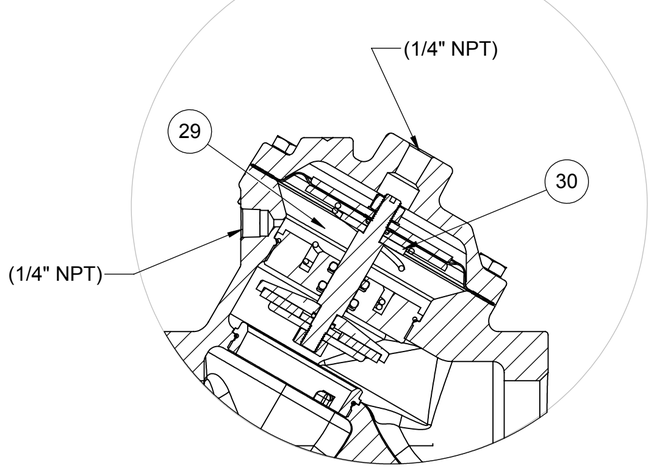
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET ONE FOR LIST OF CHANGES		



1072486 (VAVF-0030-90000) (2" NPT)
NORMALLY CLOSED



1072485 (VAVF-0002-90000) (2" NPT)
SPRING ASSIST CLOSED



1072484 (VAVF-0001-90000) (2" NPT)
SPRING ASSIST OPEN

NORMALLY CLOSED MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
21	MALE PIPE PLUGS,	1071918	1
22	VALVE SHAFT, STANDARD, NC	1074317	1

SPRING ASSIST CLOSED MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
23	CAP, 425,SPRING ASSIST CLOSED, CI	1074284	1
24	O-RING,2-025, BUNA N	1071677	1
25	MALE PIPE PLUGS,	1071903	1
26	COMPRESSION SPRING, SERIES	1074429	1
27	WASHER, BRASS	1074083	1
28	NUT, SPRING RETAINER, AV6,BRASS	1074431	1

SPRING ASSIST OPEN MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
29	SPRING, COMPRESSION	1078692	1
30	WASHER, CENTERING,BRASS	1074436	1

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22 THRU 37	1070507 (AV5-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1070508 (AV5-SO)

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 18, 19, 20, 24	1070505 (AV-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 25, 26	1070506 (AV5-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1070508 (AV5-SO)

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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

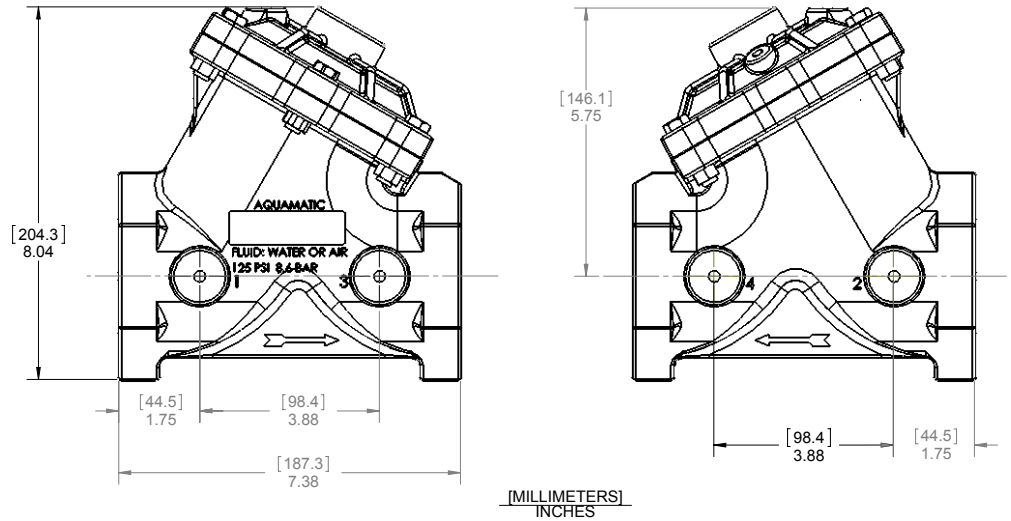
APPROVALS	DATE
DRAWN NE	08-25-12
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE: CATALOG SHEET, AV5

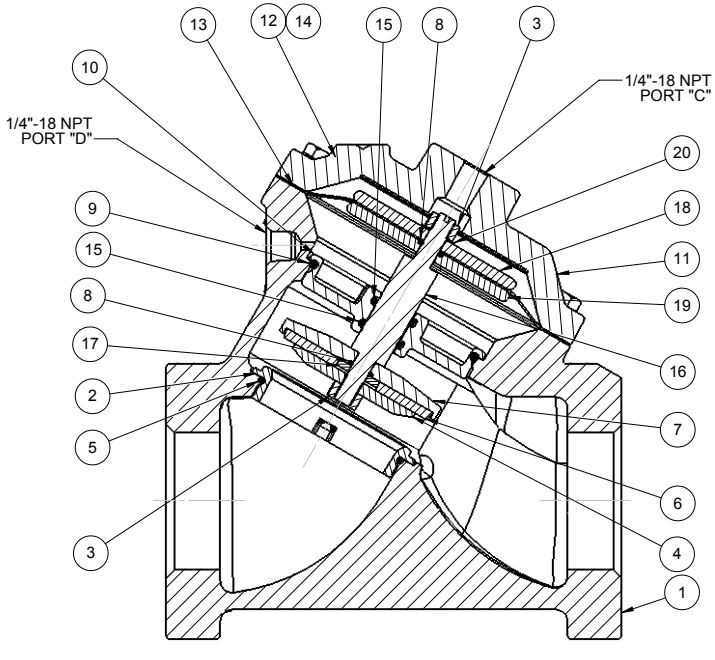
SIZE B | DWG NO. BR1077637 | REV M

SCALE 1:2 | SHEET 2 OF 2



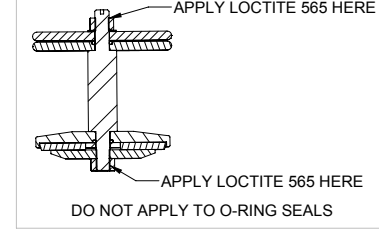
[MILLIMETERS]
INCHES

NOTE:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968.
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.



1072489 (VAVG-0000-90000) (2"NPT)
1072495 (VAVH-0000-90000) (2-1/2"NPT)

NORMALLY OPEN (STANDARD)



DO NOT APPLY TO O-RING SEALS

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	102071	K	REDRAWN IN SOLID WORKS 1-WAS 1074377	06-07-13	NBE
	102740	L	1-WAS: 1074377, NOW: 43244	28APR14	TJM
	103665	M	1-MOVED ITEM 20 FROM BOTTOM OF SHAFT TO TOP.	19AUG14	TJM
	103882	N	1- ROTATED CAP SO PORT IS AT INLET SIDE IN ALL VIEWS, 2- UPDATED TITLE BLOCK	16OCT14	TJM
	103964	P	1-ITEM #20 WAS: 1073594	07NOV14	TJM

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, 426 (CAST IRON)	2" NPT	1074343	1
		2 1/2" NPT	1081559	
2	SEAT, 426, BRASS*		1074409	1
3	NUT,HEX, 5/16"-24 ,SS		1263853	2
4	DISC PLATE, BRASS		1074396	1
5	O-RING, -144	FKM	1071809	1
6	DISC, 426	HYCAR	1074392	1
		FKM	1074393	
7	HOLDER,DISC, AV6, BRASS		1074383	1
8	O-RING, -011	FKM	1071786	2
9	O-RING, -233	FKM	1071826	1
10	GUIDE, 426 SHAFT*		1074378	1
11	CAP, 426, NPT, (CAST IRON)		1081560	1
12	SCREW,HEX HD CAP,5/16-18X1-3/8		1072401	6
13	DIAPHRAGM, 426	BUNA	1074374	1
		FKM	1074376	
14	HEX NUT, 5/16"-18, PLATED		1071657	6
15	O-RING, -114	ALFAS	1071662	2
16	SHAFT,426,NO		1074401	1
17	SPACER, BRASS		1074382	1
18	PLATE, DIAPHRAGM, UPPER,SS		1074371	1
19	PLATE, DIAPHRAGM, LOWER,SS		1074372	1
20	LOCKWASHER, 5/16", INTERNAL TOOTH		1073590	1

*REQUIRES ASSEMBLY TOOL

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SEAT (ITEM #2) (TOOL NOT SHOWN)	1074411 (426-MT)
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (TOOL NOT SHOWN)	1-3/16" HEX SOCKET

REPAIR PARTS KITS		
DESCRIPTION	PART NO.	
DIAPHRAGM & SEAL KIT CONSISTS OF ITEM NO'S 3(2), 5, 6, 8(2), 9, 13, & 15(2)	1070109 (AV6-RA) INCLUDES DISC P/N 1074392 (HYCAR) AND DIAPHRAGM P/N 1074374 (BUNA N)	1070510 (AV6-RAHT) INCLUDES DISC P/N 1074393 (TEFLON) AND DIAPHRAGM P/N 1074376 (FKM)
INT. PARTS KIT (NORM. OPEN) CONSIST OF STANDARD ITEM NO'S 4, 7, 10, 16, 17, 18. 19	10705011 (AV6-RF)	
SEAT (ITEM NO. 2)	1074407	

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

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UNLESS OTHERWISE SPECIFIED:
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TOLERANCES:
ANGLES ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

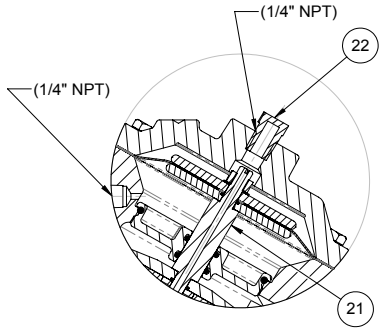
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV6
DIAPHRAGM VALVE STANDARD MODEL

SIZE B | DWG NO. BR1077638 | REV Q

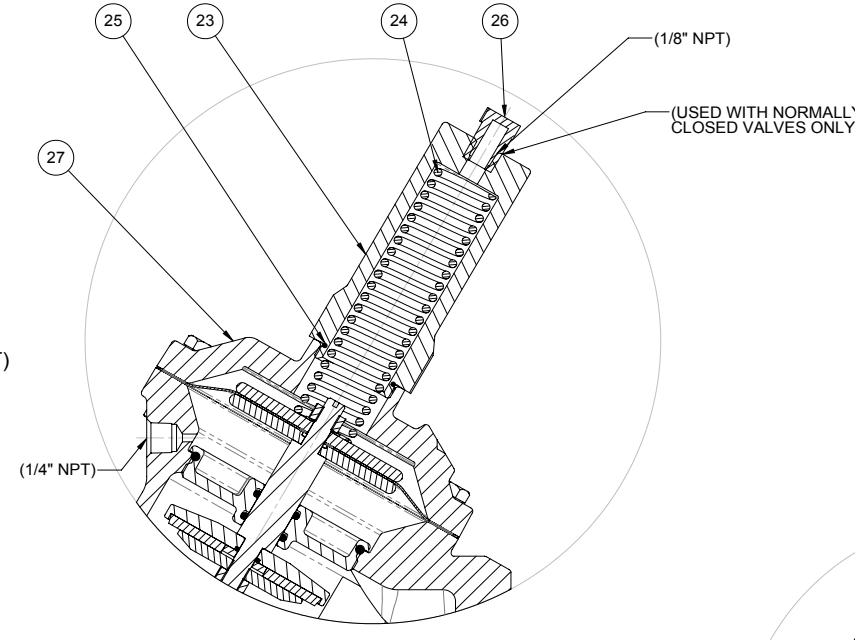
SCALE 1:2 | SHEET 1 OF 2

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	1001	Q	AQ Matic update & verified part numbers	17JAN17	MGS



3026107 (VAVG-0030-90000) (2" NPT)
1080794 (VAVH-0030-90000) (2-1/2" NPT)

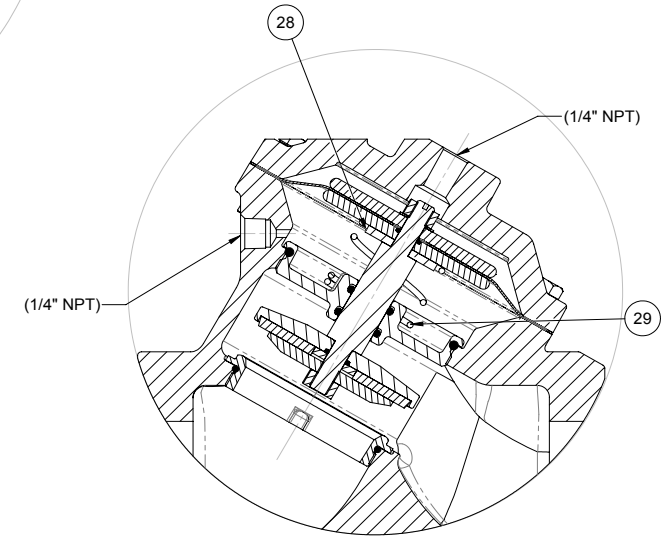
NORMALLY CLOSED



1077120 (VAVG-0002-90000) (2" NPT)
1072498 (VAVH-0002-90000) (2-1/2" NPT)

SPRING ASSIST CLOSED

NORMALLY CLOSED MODEL			
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
21	1	43169	SHAFT,426,NC
22	1	1071918	PLUG,PIPE,1/4" MNPT
SPRING ASSIST CLOSED MODEL			
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
23	1	1074431	SPRING RETAINER NUT, 425 & 426
24	1	1074429	COMPRESSION SPRING
25	1	1071677	O-RING,2-025, BUNA
26	1	1071903	PLUG,PIPE,1/8" MNPT
27	1	1074352	CAP - SAC (CAST IRON)
SPRING ASSIST OPEN MODEL			
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
28	1	1074436	WASHER, CENTERING,BRASS
29	1	1078692	SPRING, COMPRESSION



1072491 (VAVG-0001-90000) (2" NPT)
1072497 (VAVH-0001-90000) (2-1/2" NPT)

SPRING ASSIST OPEN

SEE REVERSE SIDE FOR
STANDARD NORMALLY OPEN MODEL

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 7, 10, 17, 18, 19, 21	1070512 (AV6-RG)
INT. PARTS KIT(SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23 & 24	1070513 (AV6-SC)
INT. PARTS KIT(SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28 & 29	1070515 (AV6-SO)

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT(SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 23 THRU 27	1070514 (AV6-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28 & 29	1070515 (AV6-SO)

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

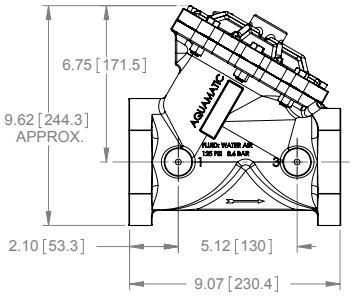
APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

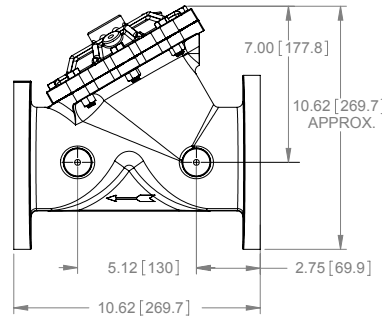
TITLE
CATALOG SHEET, AV6
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077638	Q

SCALE 1:2 SHEET 2 OF 2

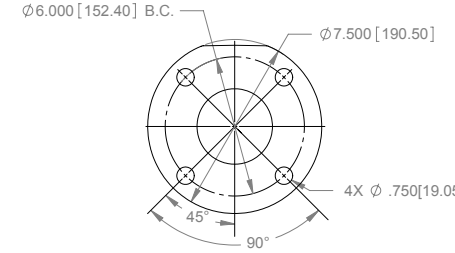


1235690 (VAVJ-0000-900000)
3" NPT ENDS

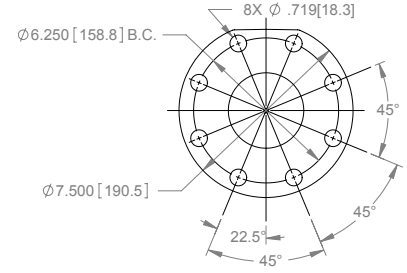


11077128 (VAVJ-3000-900000)
FLANGED ENDS

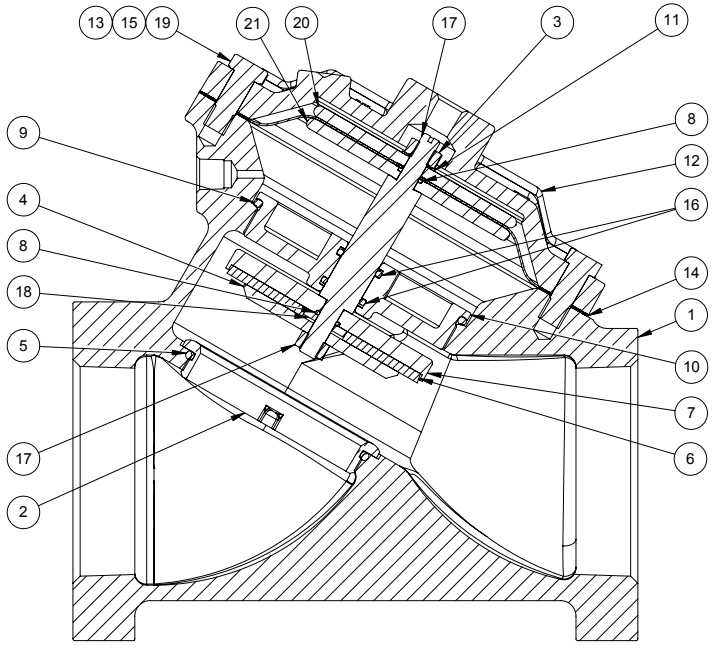
NOTE:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.



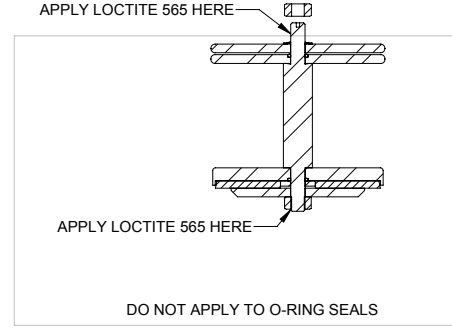
AMERICAN FLANGE PER
A.S.A. 16.1 CLASS 125



METRIC FLANGE PER
BS4504. DIN 10 & ISO R 2084



NORMALLY OPEN (STANDARD)



DO NOT APPLY TO O-RING SEALS

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	102056	K	REDRAWN - FORM # NOW DWG # (WAS 1084043), 1-1074495-WAS:1074493, 2-1074479-WAS: 1074478	6-4-13	NBE
	103665	L	ITEM #-11 WAS: QTY -2 .	19AUG14	TJM
	103964	M	1-ITEM #-11 WAS: 1073594, 2-UPDATED TITLE BLOCKS	10NOV4	TJM
	1001	N	AQ Matic update & verified part numbers	17JAN17	MGS

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, 427, CAST IRON	THREADED	1074446	1
		FLANGED	1083918	
2	SEAT, 427, MACHINING	BRASS	1074505	1
3	NUT,HEX, 5/16"-24	SS	1263853	2
4	PLATE, DISC	(303 SS)	1074495	1
5	O-RING, ORV-233	FKM	1071826	1
6	DISC, 427	HYCAR	1074490	1
		TELFON	1074491	1
7	DISC HOLDER, ALUM/BRONZE		1074483	1
8	O-RING, -011	FKM	1071786	2
9	O-RING, -237	FKM	1071828	1
10	SHAFT GUIDE, MACHINING		1074479	1
11	LOCKWASHER, 5/16", INTERNAL TOOTH		1073590	1
12	CAP, 427, MACHINING	CAST IRON	1074454	1
13	SCREW, 3/8-16 X 1 1/2", HX HD	PLATED STEEL	1072405	6
14	DIAPHRAGM SERIES 427,	BUNA-N	1074475	1
	DIAPHRAGM SERIES 427,	FKM	1074477	1
15	HEX NUT, 3/8-16	PLATED STEEL	1071658	6
16	O-RING, -114	ALFAS	1071662	2
17	SHAFT, 427, NO		1074496	1
18	SPACER, BRASS		1074382	1
19	HEX HEAD CAP SCREW, 3/8-16X 1.00	STAINLESS STEEL	19768	2
20	PLATE, UPPER DIAPHRAGM		1074472	1
21	DIAPH PLT, 427,LWR, MACH	SS	1074473	1

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #10) (NOT SHOWN)	1-3/16" HEX SOCKET

REPAIR PARTS KITS		
DESCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2),5,6,8(2),9,14,16(2)	1070110 (AV7-RA) INCLUDES DISC 1074490 (427-JH), DIAPHRAGM 1074475 (427-FB)	1070516(AV7-RAHT) INCLUDES DISC 1074491 (427-JT), DIAPHRAGM 1074477 (427-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11,17,18,20,21	1070517 (AV7-RF)	
SEAT (ITEM NO. 2)	1074505	

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

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TOLERANCES:
ANGLES ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	10-20-11
APPROVED	
CHECKED	

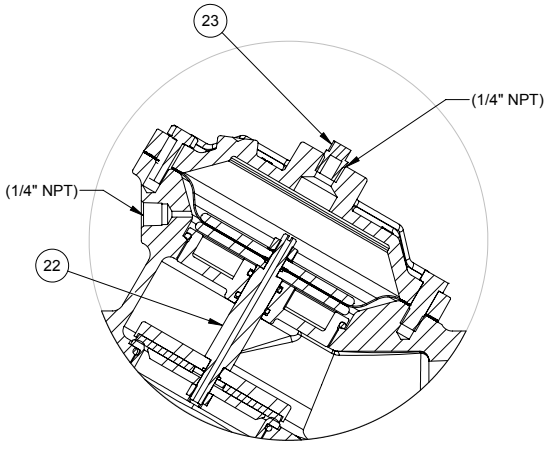
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV7
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077639	N

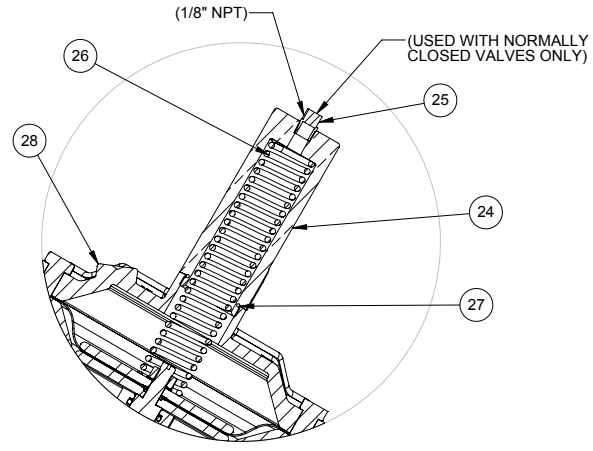
SCALE 1:2 SHEET 1 OF 2

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES		



1269740 (VAVJ-0030-90000) (THREADED)
1242257 (VAVJ-3030-90000) (FLANGED)

NORMALLY CLOSED



3018900 (VAVJ-0002-90000) (THREADED)
1080797 (VAVJ-3002-90000) (FLANGED)

SPRING ASSIST CLOSED

NORMALLY CLOSED MODEL

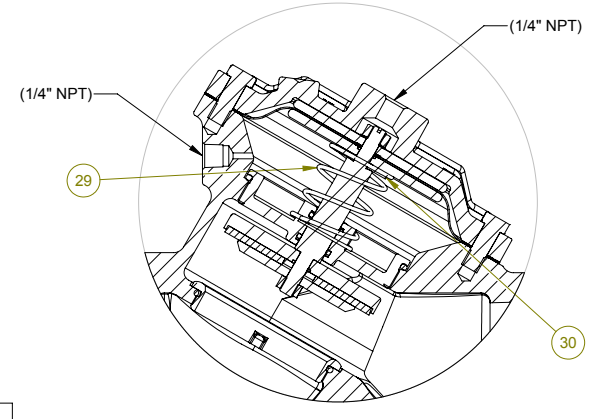
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
22	SHAFT, 427, NC		1074499	1
23	MALE PIPE PLUG	PLATED STEEL	1071918	1

SPRING ASSIST CLOSED MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
24	NUT, SPRING RETAINER	BRASS	1074431	1
25	MALE PIPE PLUGS (1/8" NPT)	BRASS	1071903	1
26	COMPRESSION SPRING		1074429	1
27	O-RING,2-025	BUNA	1071677	1
28	CAP, 427, SPRING ASSIST	CAST IRON	1074460	1

SPRING ASSIST OPEN MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
29	SPRING, COMPRESSION		1078692	1
30	WASHER, CENTERING	BRASS	1074436	1



1072502 (VAVJ-0001-90000) (THREADED)
1072509 (VAVJ-3001-90000) (FLANGED)

SPRING ASSIST OPEN

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11,18,20,21,23	BR1070518 (AV7-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 26,27	BR1070513 (AVG-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 29, 30	BR1070520 (AV7-SO)

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 24 THRU 28	BR1070519 (AV-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 29, 30	BR1070520 (AV7-SO)

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

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3 PLACE .XXX ± .005 [0.13]

THIRD ANGLE PROJECTION

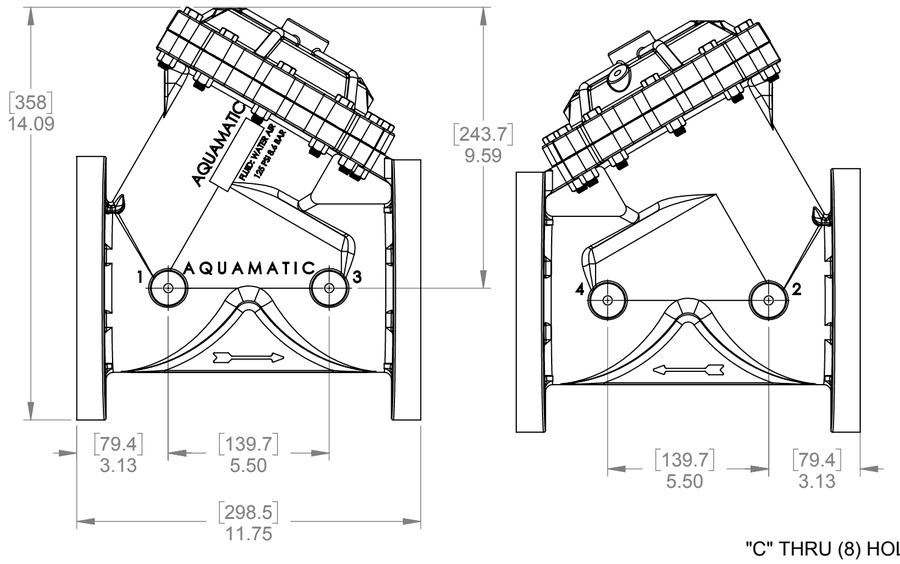
APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV7
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	BR1077639	N

SCALE 1:1 SHEET 2 OF 2



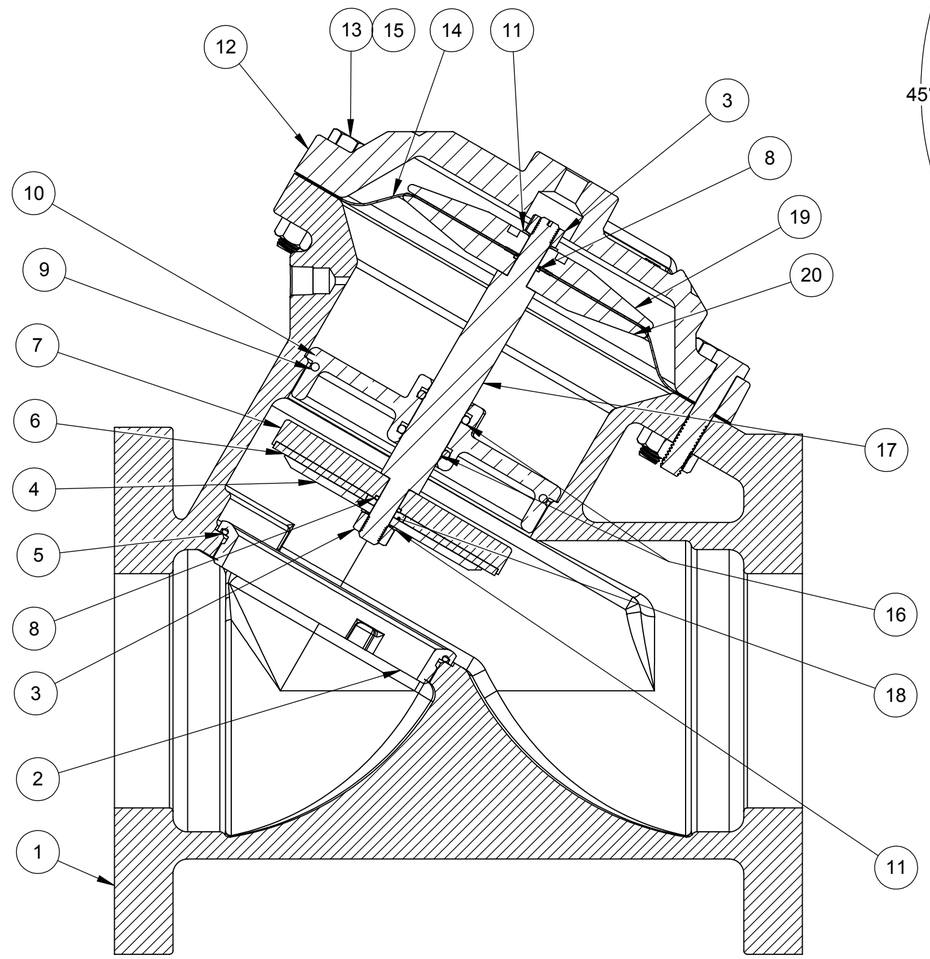
REPAIR PARTS KIT

DESCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3(2), 5, 6, 8(2), 9, 14, 16(2)	1070111 (AV8-RA)	1070521 (AV8-RAHT)
	INCLUDES DISC 1074571 (428-JH) DIAPHRAGM 1074557 (428-FB)	INCLUDES DISC 1074572 (428-JT) DIAPHRAGM 1074559 (428-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11,17,18,19,20	1070522 (AV8-RF)	
SEAT (ITEM NO. 2)	1074585 (428-MAO)	

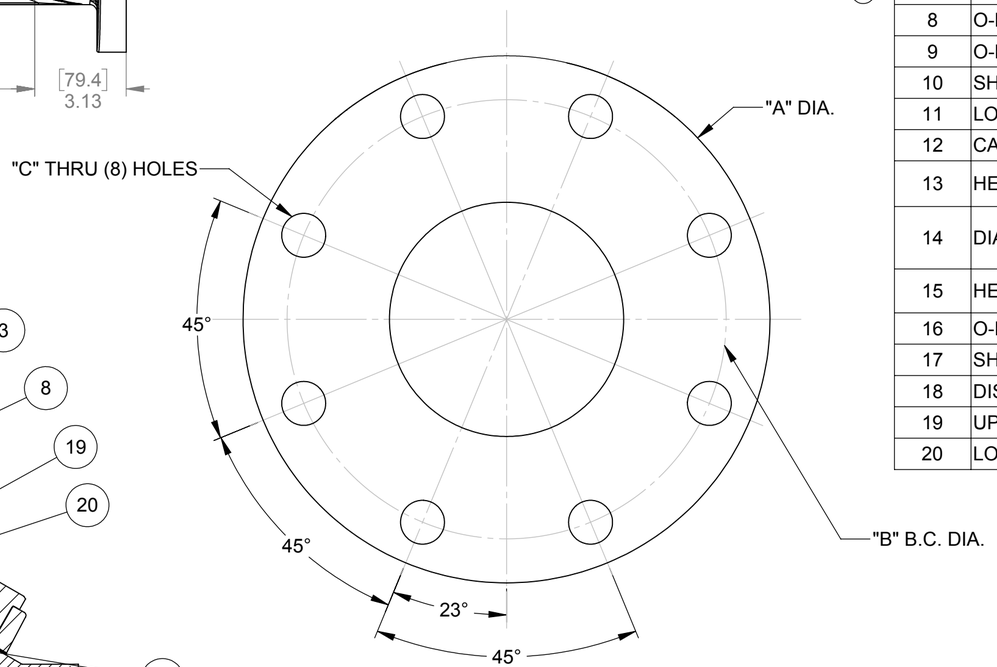
REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	103684	J	REDRAWN IN SOLIDWORKS, FORM # NOW DWG #, ITEM# 4 WAS:1074575 ,ADD'D: ITEM#11, DWG # WAS:1084044	8/20/14	ANH
	103964	K	ITEM #11 WAS: 1073594	10NOV14	TJM
	105687	L	1-ITEM #10 WAS: 1074560	02MAR16	TJM
	1001	M	AQ Matic update & verified part numbers	17JAN17	MGS
	1188	N	PART/DRAWING CHANGE WAS 1074588, NOW 1074589	1/26/18	TRK

NO.	DESCRIPTION		STD	PART NO.	QTY
1	BODY	CAST IRON	*	1074522 (428-A)	1
2	SEAT	BRASS	*	1074585 (428-MAO)	1
3	HEX NUT(3/8-24)		*	3001990	2
4	DISC PLATE	SS	*	43734 (428-KA)	1
5	O-RING	FKM	*	1071811 (ORV-156)	1
6	DISC	HYCAR	*	1074571 (428-JH)	1
		GLASS FILLED TEFLON		1074572 (428-JT)	
7	DISC HOLDER	SS	*	1074589 (428-NAS)	1
8	O-RING	FKM	*	1071787 (ORV-012)	2
9	O-RING	FKM	*	1071832 (ORV-245)	1
10	SHAFT GUIDE	BRASS	*	1074563	1
11	LOCKWASHER, 3/8", INTERNAL TOOTH		*	1073591	2
12	CAP	CAST IRON	*	1074532 (428-C)	1
13	HEX SCREW 3/8"-16	PLATED STEEL	*	1072406 (SCZ-0027)	11
14	DIAPHRAGM	BUNA N	*	1074557 (428-FB)	1
		FKM		1074559 (428-FV)	
15	HEX NUT 3/8"-16	PLATED STEEL	*	1071658 (NUZ-0014)	11
16	O-RING	AFLAS	*	1071665 (ORA-210)	2
17	SHAFT (NORMALLY OPEN)		*	1074579 (428-LAA)	1
18	DISC SPACER	BRASS	*	1074565 (428-HA)	1
19	UPPER DIAPHRAGM PLATE		*	1074554 (428-DA)	1
20	LOWER DIAPHRAGM PLATE		*	1074555 (428-DAA)	1



1072513 (VAVK-3000-90000) (4" PIPE SIZE)
NORMALLY OPEN (STANDARD)

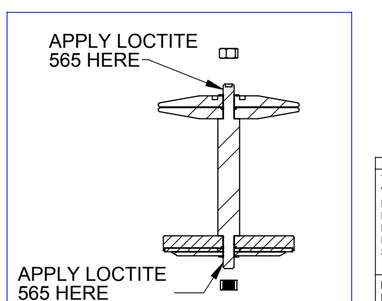


AMERICAN FLANGE PER A.S.A. 16.1 CLASS 125
METRIC FLANGE PER BS 4504, DIN 10 & ISO R 2084

NOTE:

1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B2.1-1968
2. VALVES AVAILABLE WITH B.S.P.T. END CONNECTIONS.

FLANGE STYLE	A	B	C
AMERICAN	9.000	7.500	.750
METRIC	229MM	180MM	18MM



DO NOT APPLY TO O-RINGS

SEE SHEET 2 FOR CONFIGURATION OPTIONS

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2002/95/EEC (RoHS) REQUIREMENTS

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN ANH	8/19/14
APPROVED	
CHECKED	

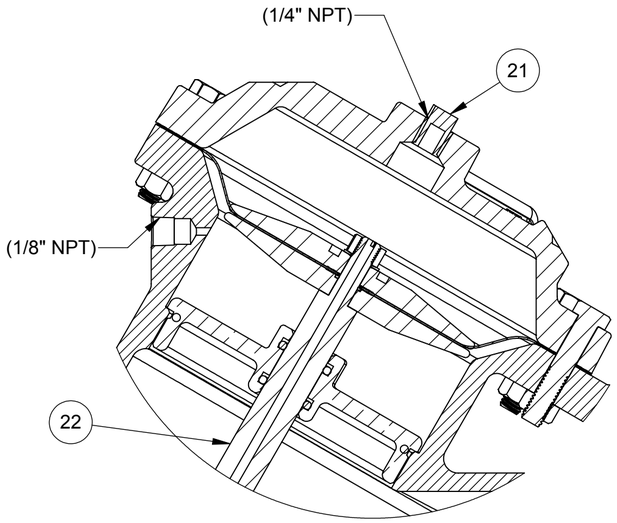
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV8,
STANDARD MODEL

SIZE	DWG NO.	REV
B	1077640	N

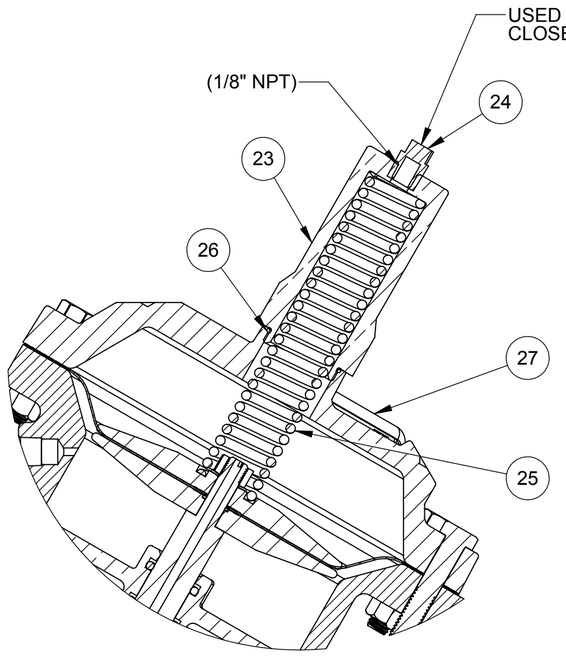
SCALE 1:4 SHEET 1 OF 2

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES		

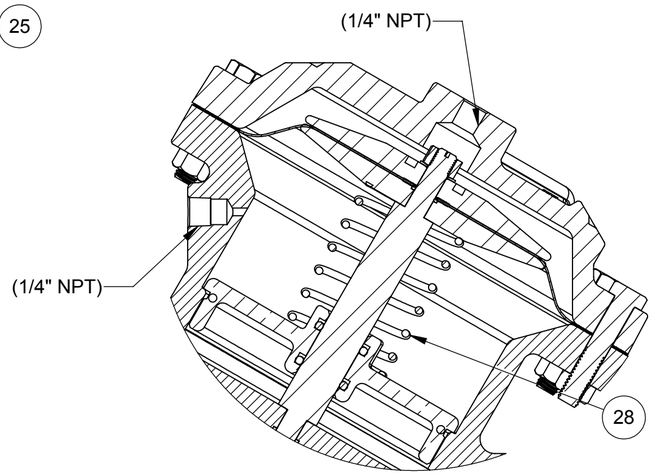


VAVK-3030-90000
NORMALLY CLOSED

NORMALLY CLOSED					
NO.	DESCRIPTION		STD	PART NO.	QTY
21	PIPE PLUG (1/4" N.P.T.)	CAST IRON	*	1071918 (PLZ-0008)	1
22	SHAFT (NORMALLY CLOSED)		*	1074582 (458-LLA)	1
SPRING ASSIST CLOSED					
NO.	DESCRIPTION		STD	PART NO.	QTY
23	RETAINER NUT	BRASS	*	1074609 (428-TT)	1
24	PIPE PLUG (1/8" N.P.T.)	BRASS	*	1071903 (PLB-0007)	1
25	SPRING		*	1074601 (428-SB)	1
26	O-RING		*	1071677 (ORB-025)	1
27	CAP	CAST IRON	*	1074540 (428-CC)	1
SPRING ASSIST OPEN MODEL					
NO.	DESCRIPTION		STD	PART NO.	QTY
28	SPRING		*	1074605 (428-SOA)	1



1072516 (VAVK-3002-90000)
SPRING ASSIST CLOSED



1072514 (VAVK-3001-90000)
SPRING ASSIST OPEN

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF STANDARD ITEM NO'S 4,7,10,11,18,19,20,25	1070523 (AV8-SCC)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 29,30	1070524 (AV8-SC)
IN. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO. 32	1070526 (AV8-SO)
CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 27-31	1070525 (AV-SCC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO. 32	1070526 (AV8-SO)

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

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UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 √ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN ANH	8/19/14
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, AV8,
STANDARD MODEL

SIZE	DWG NO.	REV
B	1077640	N

SCALE 1:4 SHEET 2 OF 2

AQUAMATIC® V46 SERIES
STAINLESS STEEL CONTROL VALVES

HIGH-FLOW VALVES FOR CORROSION-RESISTANT APPLICATIONS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

- Unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves
- All components can be serviced while the valve is in-line
- Separate flow and control chambers permit positive closing without springs
- Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime
- Durable stainless steel [CF8M] corrosion-resistant alloy, all metal internal parts machined from 316 stainless steel alloy
- Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators
- Adaptable to a wide variety of control devices

OPTIONS

- Spring-assist closed
- Spring-assist open
- Limit stop for flow control
- Position indicator
- Normally Closed†
- Seal and diaphragm materials for special applications†
- Available in threaded or flanged end configurations

TYPICAL APPLICATIONS

- Bottling Plants
- Chemical Injection
- Condensate Polishers
- Corrosive Liquid Handling
- Deionizers
- Laundry Equipment
- Ozone Generators
- Paper and Pulp Process
- Water Systems
- Reverse Osmosis Equipment
- Steam Sterilization

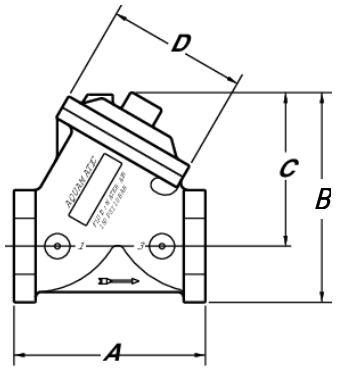
IAPMO R&T

Certified by IAPMO R&T to NSF/ANSI 61 and NSF/ANSI 372 for lead free compliance.

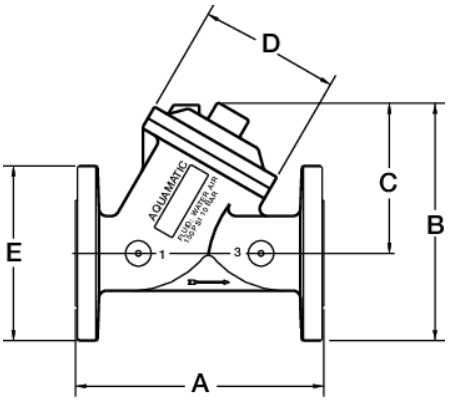
DIMENSIONS

MODEL #	ENDS	PIPE SIZE	Cv*	WEIGHT (STANDARD VALVE)	DIMENSIONS (APPROXIMATE)				
					A	B	C	D	E
V46C	Threaded	1"	14	4 lbs (1.8 kg)	3.75" (95 mm)	4.45" (113 mm)	3.21" (82 mm)	2.75" (70 mm)	–
V46E	Threaded	1-1/2"	33	7 lbs (3.1 kg)	4.75" (121 mm)	5.00" (127 mm)	3.50" (89 mm)	3.50" (89 mm)	–
V46F	Threaded	2"	54	15 lbs (6.8 kg)	6.62" (168 mm)	7.28" (185 mm)	5.34" (136 mm)	4.84" (123 mm)	–
V46C	Flanged	1"	14	6 lbs (2.7 kg)	5.50" (140 mm)	5.49" (139 mm)	3.36" (85 mm)	2.75" (70 mm)	4.25" (108 mm)
V46E	Flanged	1-1/2"	33	10 lbs (4.5 kg)	6.50" (165 mm)	6.45" (164 mm)	3.95" (100 mm)	3.50" (89 mm)	5.00" (127 mm)
V46F	Flanged	2"	54	18 lbs (8.2 kg)	8.50" (216 mm)	8.16" (207 mm)	5.16" (131 mm)	4.84" (123 mm)	6.00" (152 mm)

*Cv is the flow rate in gallons per minute of water at 60°F and 1 psid pressure drop. Liters per minute = Gal/Min x 3.78



THREADED



FLANGED

PRINCIPLES OF OPERATION

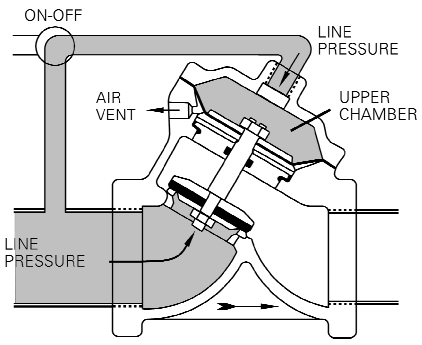
DRIP-TIGHT CLOSING

Closure is obtained by directing line pressure or equivalent independent pressure into the upper chamber. This pressure on the large diaphragm area causes the valve disc to seal against the seat.

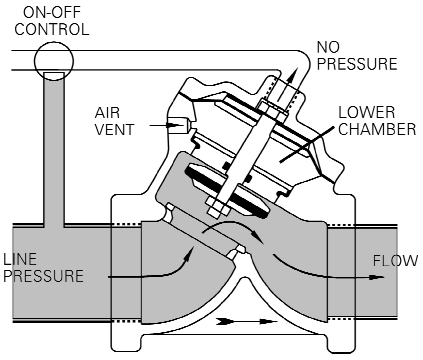
FULL OPEN OPERATION

When the closing pressure in the upper chamber is relieved by venting the pilot line, the valve opens positively, by line pressure on the disc.

VALVE CLOSED



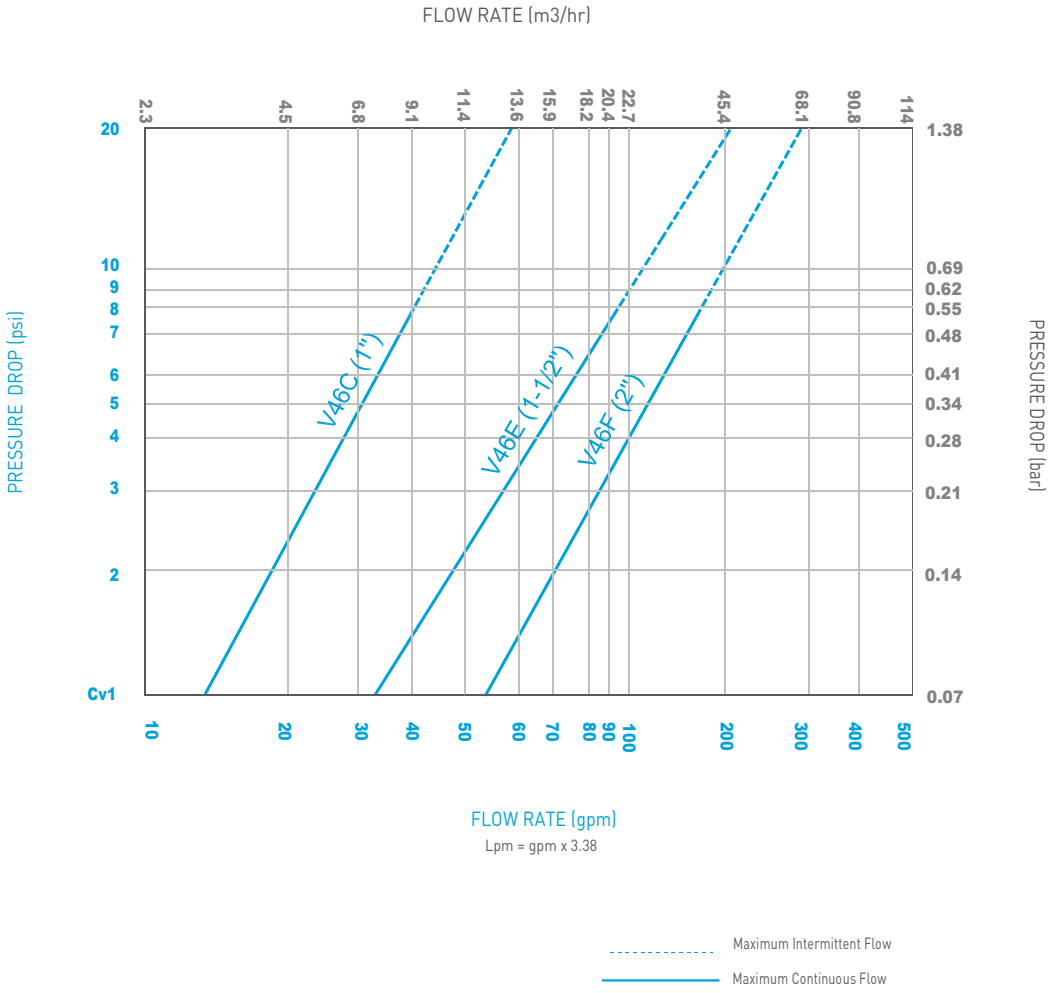
VALVE OPEN



OPERATING SPECIFICATIONS	THREADED VALVE	FLANGED VALVES
Maximum Working Pressure	250 psi (17 bar)	150 psi (10.3 bar)
Temperature	Standard: 150°F (65°C) Maximum: 250°F (120°C) †	Standard: 150°F (65°C) Maximum: 250°F (120°C) †
Pipe Sizes	1", 1½", and 2" threaded (NPT)	1", 1½", and 2" flanged (ASTM)

†IAPMO R&T NSF/ANSI 61 and NSF/ANSI 372 certifications are limited to restrictions below. Other options were not tested for certification:
Cold water applications below 73°F (23°C).
Normally Open valves.
Buna-N seal material (seal option #0).

PERFORMANCE DATA



16605 West Victor Rd. New Berlin, WI 53151

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1235600 REV J AP2019

V46 SERIES DIAPHRAGM VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** V 4 6 _ - _ 2 _ _ - _ 3 0 0 0

PIPE SIZE
- C = 1" (25mm)
- E = 1-1/2" (40mm)
- F = 2" (50mm)

BODY SIZE (Reference only)
- 1 = 1"
- 4 = 1-1/2"
- 5 = 2"

END CONNECTIONS
- 0 = Female N.P.T.
- 3 = Flanged / Female N.P.T. Boss Taps

BODY & CAP MATERIAL
- 2 = 316 Stainless Steel (Cast CF8M)

VALVE OPTIONS (00 = Standard)
- 00 = NO
- 01 = NO, SAO
- 02 = NO, SAC
- 10 = NO, LS
- 11 = NO, LS, SAO
- 30 = NC
- 32 = NC, SAC
- 40 = NC, LS

SEAL MATERIALS (0 = Standard) (Option 5 not valid for NC valves)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEAL	STATIC SEALS	MAX TEMPERATURE
0	Buna-N	Buna-N	Buna-N	Buna-N	150° (65°C)
1	Buna-N	EPDM	EPDM	EPDM	200° (93°C)
2	FKM	FKM	FKM	FKM	250° (121°C)
4	FKM	EP	EP	EP	200° (93°C)
5	Buna-N	FKM	FKM	FKM	200° (93°C)

INTERNAL PARTS
- 3 = 316 Stainless Steel

* To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a 1" NPT Stainless Steel Valve Model V461 with Normally Closed and Spring Assist Closed Options is designated as a V46C-0232-03000.

REV.	ECO NO.	DESCRIPTION	BY/DATE	
C	21190	Reviewed for Pentair ECN release	JJJ	17-Nov-09
D	103533	REM'D:FEMALE BSPT (TAPERED) THD OPTION	TJM	20-Jun-14
E	1778	TOOK OUT OPTION 6 (SEAL MATERIAL)	MM	OCT-1-2020

42988

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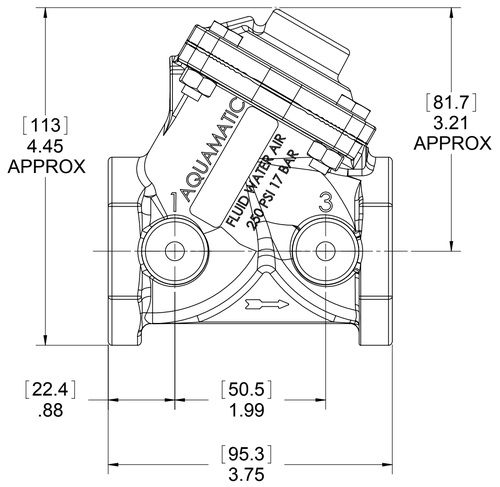
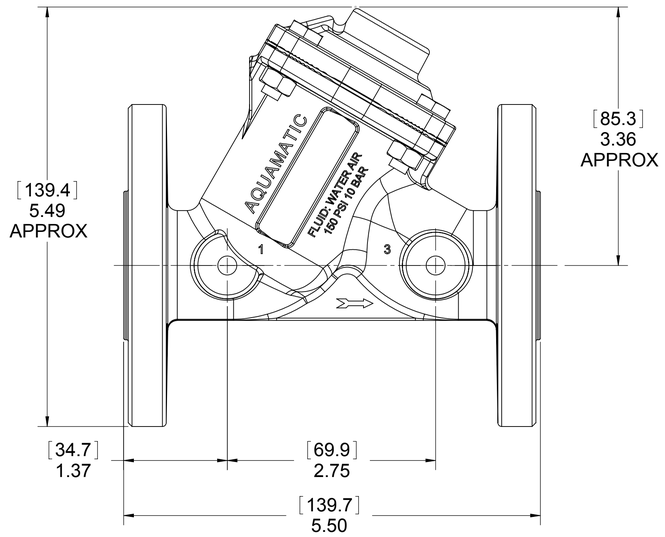
42988 REV E 2020

THREADED

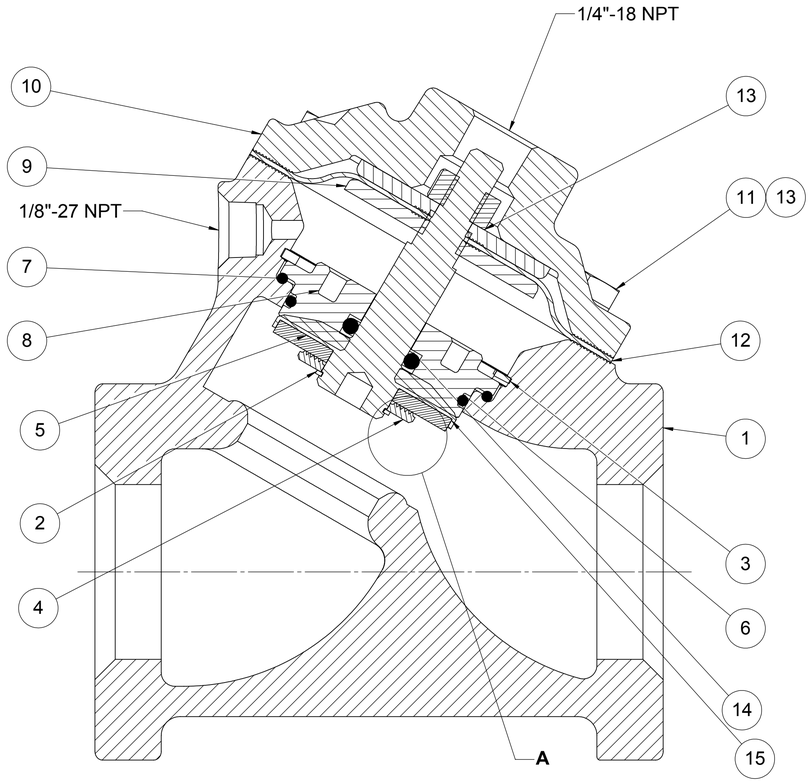


MODEL: V46C-0200-03000 (THREADED)

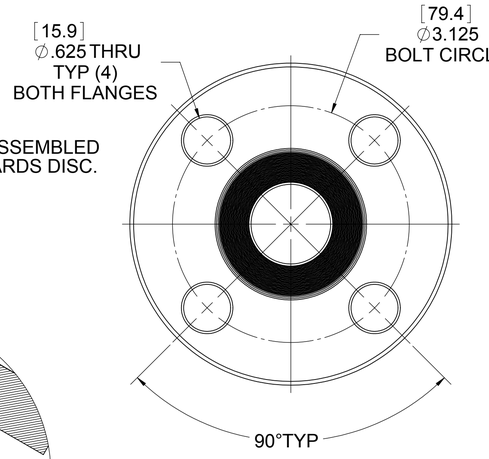
FLANGED



MODEL: V46C-3200-03000 (FLANGED)

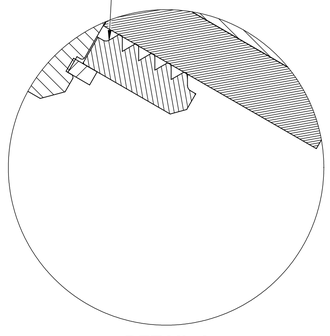


NORMALLY OPEN (STANDARD)



FLANGES PER ASTM B16.5
CLASS 150 AND ISO 7005-1 PN20

DISC PLATE-ASSEMBLED
W/ RIBS TOWARDS DISC.



F1 **DETAIL A**
SCALE 8 : 1

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
100100	E	REDRAWN IN SOLIDWORKS	01/04/12	NBE
100886	F	1-AD DETAIL VIEW OF DISC PLATE ASSEMBLY	07/12/12	TJM
1001	H	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/17/17	MGS
1455	I	DIAPHRAGM AND SEAL KIT ELIMINATION	04/02/19	TRK
1564	J	CORRECTED MINOR FORMATTING ISSUES	10/19/19	KJB

ITEM NO.	DESCRIPTION			STD	PART NUMBER	QTY.
1	BODY, 461 THREADED	NPT	CAST CF8M (316 SS)	*	1079053	1
	BODY,FLANGE,461,SS,1.00,ASTM	NPT		*	1078568	
2	RING, RETAINING, SPIRAL		316 SS	*	1078562	1
3	RING, RETAINING, SPIRAL		316 SS	*	1075695	1
4	PLATE, DISC, 461,SS		316 SS	*	1075690	1
5	DISC		BUNA N	*	1074140	1
			E.P.D.M.		1074143	
			FKM		1074146	
6	O-RING, 2-026		BUNA N	*	1079834	1
			E.P.D.M.		1081944	
			FKM		1081946	
7	O-RING, 2-029		BUNA N	*	1079835	1
			E.P.D.M.		1081945	
			FKM		1081947	
8	SHAFT GUIDE, SS		316 SS	*	1078579	1
9	PLATE, DIAPHRAGM, 461		316 SS	*	1075684	2
10	CAP, NPT TAP TOP, CSS		CAST CF8M	*	1078572	1
11	SCREW, HEX, 1/4-20 UNC 2-A		316 SS	*	1075692	4
12	DIAPHRAGM, 421, NBR		BUNA N	*	1074119	1
			FKM		1074120	
13	NUT, HEX, 1/4"-20,SS		316 SS	*	1075693	5
14	O-RING, 2-110, TFLN CTD		BUNA N	*	1071689	1
			E.P.D.M.		1071726	
			FKM		1239021	
15	SHAFT, 461 NORMALLY OPEN		CAST CF8M	*	1078584	1

NOTES:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B1.20.1.
2. VALVES AVAILABLE IN BSPT CONFIGURATION. (SEE ITEM 1)

- SEE SHEET 2 FOR CONFIGURATION OPTIONS

REPAIR PARTS KITS			
DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 2, 3, 5, 6, 7, 12, 13, 14	BR1078620	BR1078621	BR1078622
	BUNA N INCLUDES DIAPHRAGM BR1074119	E.P.D.M. INCLUDES DIAPHRAGM BR1074119	FKM INCLUDES DIAPHRAGM BR1074120
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 15	BR1078623		

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -1994
UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT, PART, OR ASSEMBLY DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH THE EU (EUROPEAN UNION) DIRECTIVE: RoHS DIRECTIVE 2011/65/EC.

THIRD ANGLE PROJECTION

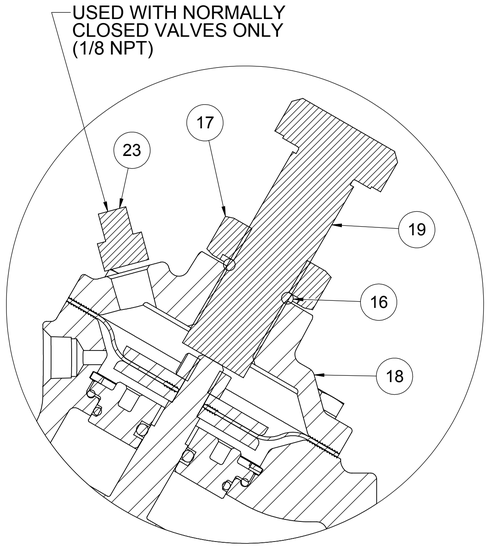
APPROVALS	DATE
DRAWN NE	12/27/11
CHECKED BY	
APPROVED	

AQMatic

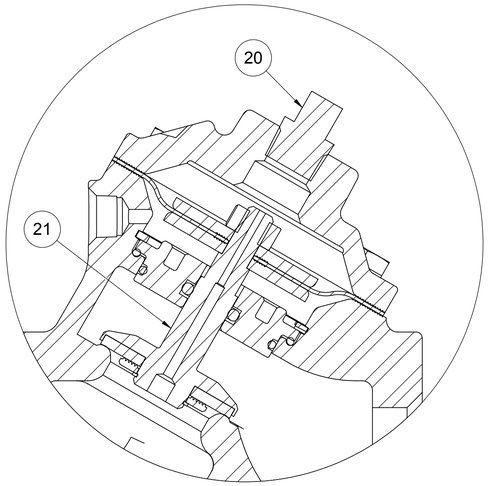
CATALOG SHEET, 461, 316SS
STANDARD MODEL

SIZE	DWG NO.	REV.
D	1078633	J
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 1 OF 2

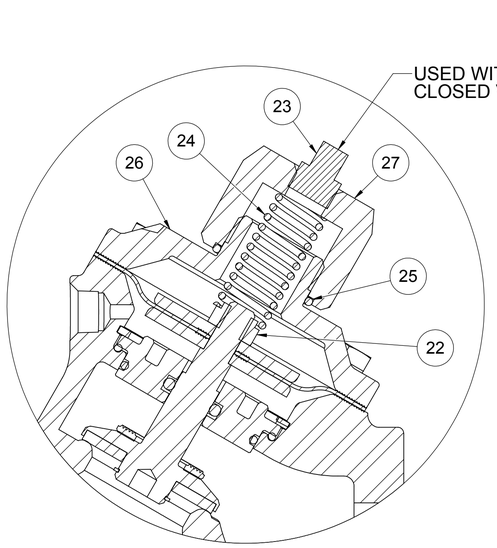
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR LIST OF CHANGES		



V46C-3210-03000 (FLANGED)
V46C-0210-03000 (THREADED)
LIMIT STOP



V46C-3230-03000 (FLANGED)
V46C-0230-03000 (THREADED)
NORMALLY CLOSED



V46C-3202-03000 (FLANGED)
V46C-0202-03000 (THREADED)
SPRING ASSIST CLOSED

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
16	O-RING, 2-112	BUNA	1071690	1
17	NUT, LIMIT STOP, 461-465	SS	1078678	1
18	CAP, SPRING ASSIST CLOSED, 461	SS	1078590	1
19	BOLT, 5/8-18 X 2", HEX	SS	1078676	1

NORMALLY CLOSED MODEL

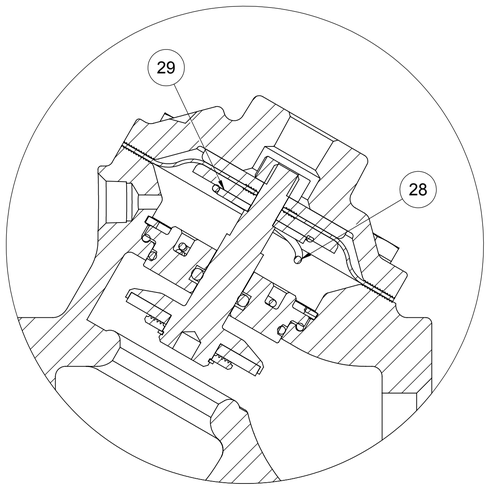
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
20	PLUG, 1/4" NPT SQ HD	SS	1078592	1
21	SHAFT, NORMALLY CLOSED, 461	SS	1078594	1

SPRING ASSIST CLOSED MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
22	NUT, SPRING CENTERING	SS	1078596	1
23	PLUG, 1/8" NPT SQ HD	SS	1078600	1
24	SPRING, COMPRESSION	SS	1078602	1
25	O-RING, 2-020	BUNA	1071674	1
26	CAP, SPRING ASSIST CLOSED, 461	SS	1078604	1
27	NUT, SPRING RETAINER	SS	1078598	1

SPRING ASSIST OPEN MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
28	SPRING, COMPRESSION	SS	1078608	1
29	WASHER, CENTERING	SS	1236665	1



V46C-3201-03000 (FLANGED)
V46C-0201-03000 (THREADED)
SPRING ASSIST OPEN

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18	1078624
INT. PARTS KIT (NORMALLY CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 21	1078625
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 25, 26	1078626
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1078627

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18, 19	1078629
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 23, 24, 25, 26, 27	1078630
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1078627

NOTE:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMIT STOP MODEL.

- SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -1994
UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES: ± 1°
1 PLACE X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT, PART, OR ASSEMBLY DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH THE EU (EUROPEAN UNION) DIRECTIVE: RoHS DIRECTIVE 2011/65/EC.

THIRD ANGLE PROJECTION

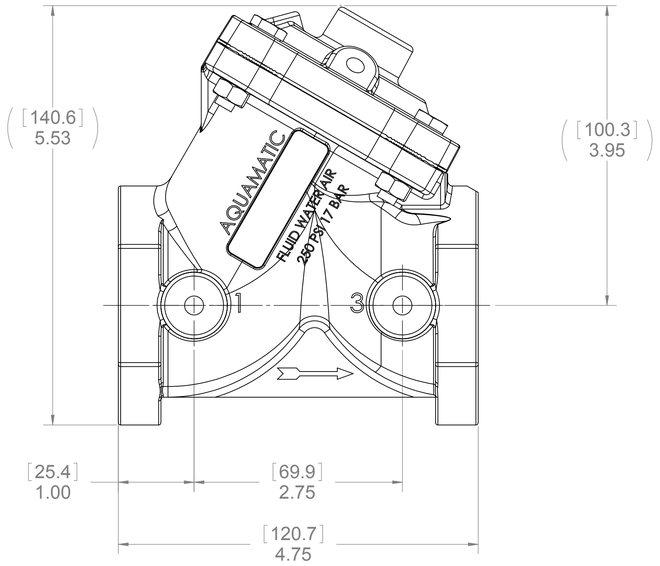
APPROVALS	DATE
DRAWN NE	12/27/11
CHECKED BY	
APPROVED	

AQ Matic

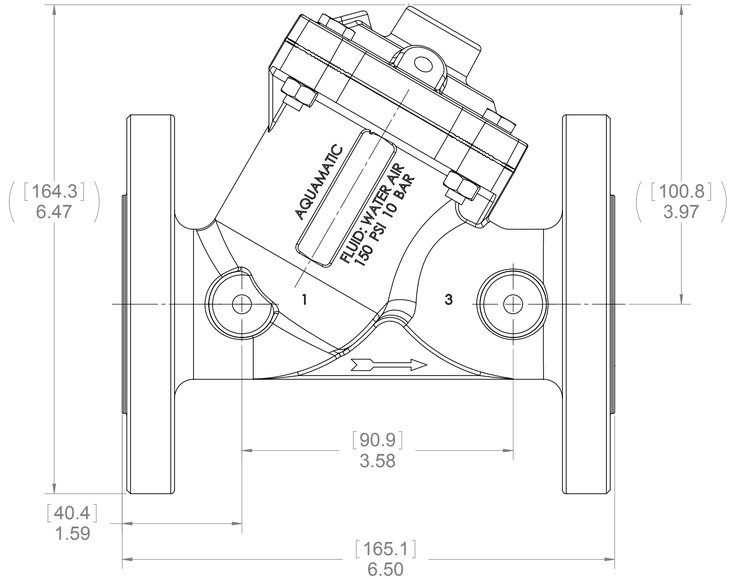
CATALOG SHEET, 461, 316SS
STANDARD MODEL

SIZE	DWG NO.	REV.
D	1078633	J
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 2 OF 2

THREADED

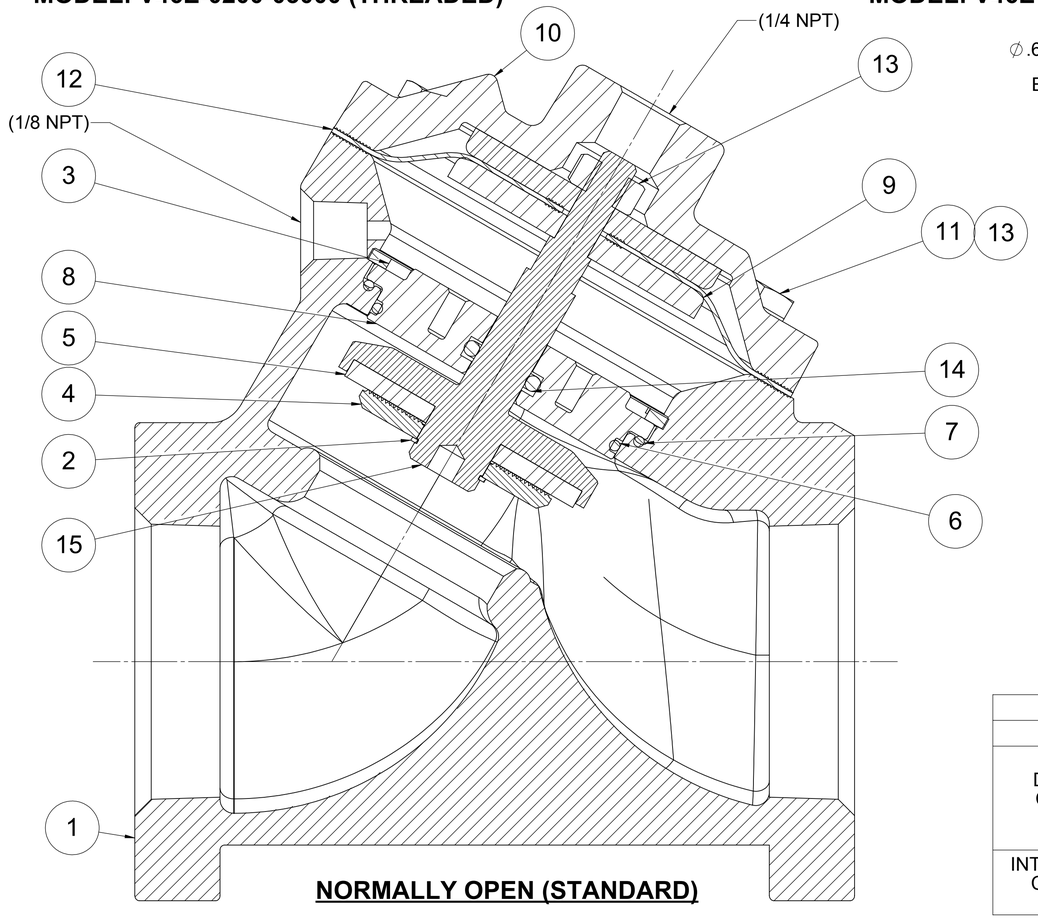


FLANGED

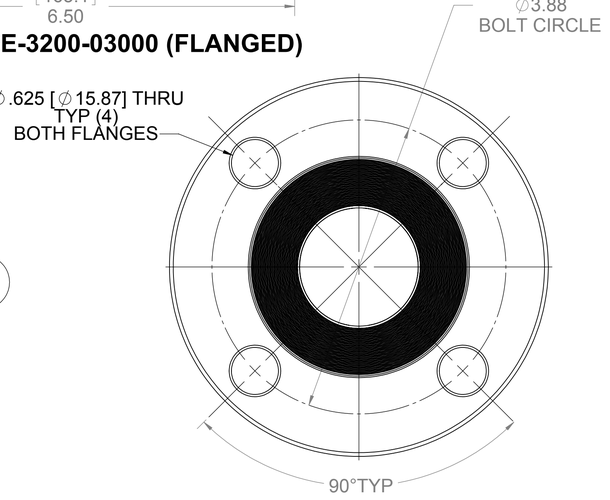


MODEL: V46E-0200-03000 (THREADED)

MODEL: V46E-3200-03000 (FLANGED)



NORMALLY OPEN (STANDARD)



FLANGES PER ASTM B16.5
CLASS 150 AND ISO 7005-1 PN20

REPAIR PARTS KITS			
DESCRIPTION	PART NO.		
	1236768	1236769	1236775
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 2, 3, 5, 6, 7, 12, 13, 14 (K)	BUNA N INCLUDES DIAPHRAGM 1074222	E.P.D.M. INCLUDES DIAPHRAGM 1074222	FKM INCLUDES DIAPHRAGM 1236800
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 15	1236780		

REVISIONS

ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	100100	G	REDRAWN IN SOLIDWORKS	1-4-12	NBE
	103445	H	MODIFIED DIMENSIONS TO SHOW AS REF ON PAGE ONE.	18JUN14	TJM
	1001	J	AQ Matic update & verified part numbers	17JAN17	MGS
	1455	K	DIAPHRAGM AND SEAL KIT ELIMINATION	4/2/19	TRK

ITEM NO.	DESCRIPTION		STD	PART NUMBER	QTY.
1	BODY, 464 1.5" NPT THREADED	CAST CF8M (316 SS)	*	1084204	1
	BODY, 464, FLANGED,			1084208	
2	RING, RETAINING, SPRIAL	316 SS	*	1078562	1
3	RING,RETAINING,2.255X.078,SS	316 SS	*	1236749	1
4	PLATE,DISC,464,MCHD	316 SS	*	1236752	1
5	DISC, 424, BUNA	BUNA N	*	1074232	1
	DISC, 424, EP	E.P.D.M.		1074233	
	DISC, 424, VITON	FKM		1074236	
6	O-RING,2-031,NITRILE	BUNA N	*	1071680	1
	O-RING,EP,ORE-031	E.P.D.M.		1236771	
	O-RING, -031, FKM	FKM		1236777	
7	O-RING (NITRILE), 2-033	BUNA N	*	1236751	1
	O-RING,EP,ORE-033	E.P.D.M.		1236772	
	O-RING, -033, FKM	FKM		1236778	
8	SHAFT GUIDE, 464,SS	316 SS	*	1236755	1
9	PLATE, DIAPHRAGM, 464,SS	316 SS	*	1236754	2
10	CAP, NPT TAP TOP, CSS	CAST CF8M	*	1236753	1
11	SCREW,HEX HD,1/4-20X 1 1/8,SS	316 SS	*	1236794	4
12	DIAPHRAGM, 424, NBR	BUNA N	*	1074222	1
	DIAPHRAGM, 424, FKM	FKM		1074224	
13	NUT, HEX, 1/4"-20,SS	316 SS	*	1075693	5
14	O-RING,2-110,NITRILE,TFLN CTD	BUNA N	*	1071689	1
	O-RING, EPDM,TEFLON COATED,	E.P.D.M.		1071726	
	O-RING, -110TC, FKM	FKM		1239021	
15	SHAFT, 464 NORMALLY OPEN	CAST CF8M	*	1084212	1

NOTES:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B1.20.1.
2. VALVES AVAILABLE IN BSPT CONFIGURATION. (SEE ITEM 1)

SEE SHEET 2 FOR CONFIGURATION OPTIONS

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 √ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X ± .015 [0.38]
2 PLACE .XX ± .01 [0.3]
3 PLACE .XXX ± .005 [0.13]

THIRD ANGLE PROJECTION

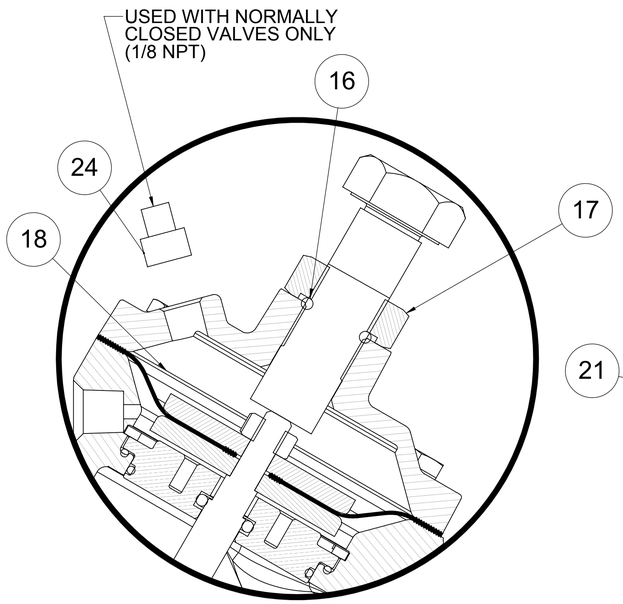
APPROVALS	DATE
DRAWN NE	12-27-11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

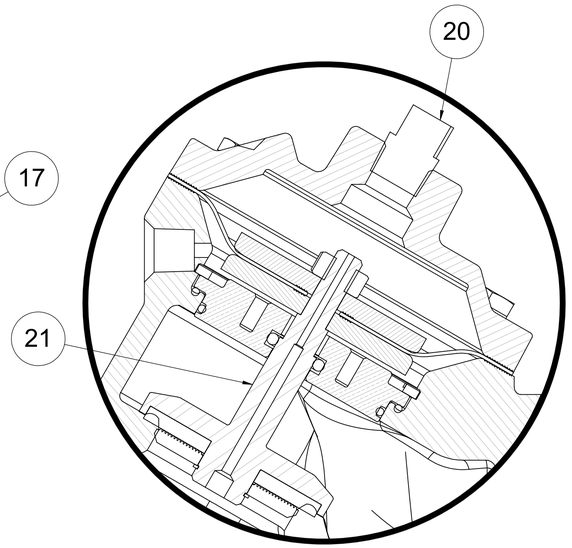
TITLE
CATALOG SHEET, 464,DIA VALVE
STANDARD MODEL

SIZE	DWG NO.	REV
B	1236757	K

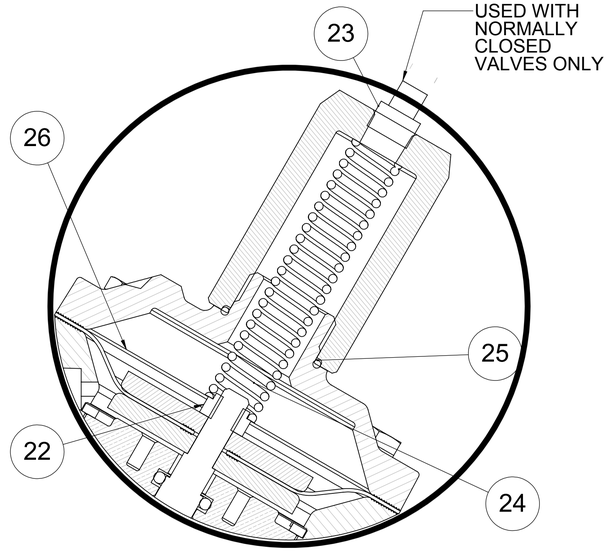
SCALE 1:1 SHEET 1 OF 2



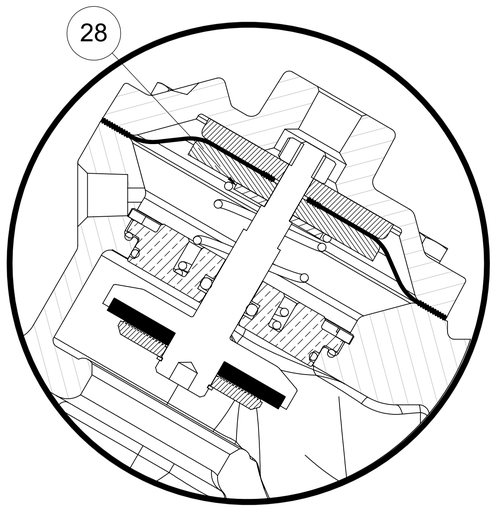
LIMIT STOP
MODEL:V46E-3210-03000 (FLANGED)
MODEL:V46E-0210-03000 (THREADED)



NORMALLY CLOSED
MODEL:V46E-3230-03000 (FLANGED)
MODEL:V46E-0230-03000 (THREADED)



SPRING ASSIST CLOSED
MODEL:V46E-3202-03000 (FLANGED)
MODEL:V46E-0202-03000 (THREADED)



SPRING ASSIST OPEN
MODEL:V46E-3201-03000 (FLANGED)
MODEL:V46E-0201-03000 (THREADED)

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES.		

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
16	O-RING,2-112,NITRILE	BR1071690	1
17	NUT,LIMITED STOP,461-465	1078678	1
18	CAP, LIMIT STOP W/NPT PORT,	1236759	1
45	BOLT,HEX HD,FLL THRD,5/8-18X2	BR1078676	1

NORMALLY CLOSED MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
20	PLUG, 1/4 IN. NPT SQUARE HEAD		1078592	1
21	SHAFT, 464, NORMALLY CLOSED		1236762	1
46	DIAPHRAGM, 424	BUNA	1074222	1
		FKM	1074224	

SPRING ASSIST CLOSED MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
22	NUT, SPRING CENTERING, SS	1078596	1
23	PLUG,1/8",SQ HD,316SS	1078600	1
24	SPRING,SS,COMPRESSION,464	1236764	1
25	O-RING,2-020,NITRILE	1071674	1
26	CAP, SPRING ASSIST CLOSED,CSS	1236765	1
52	SPRING RETAINER NUT, 316 SS	1236763	1

SPRING ASSIST OPEN MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
28	WASHER, CENTERING,SS	1236665	1
55	SPRING, COMPRESSION	1236766	1

NOTE:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMITED STOP MODEL.

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18	1236781
INT. PARTS KIT (NORMALLY CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 21	1236782
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 25, 26	1236783
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1236784

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18, 19	1236785
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 23, 24, 25, 26, 27	1236786
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1236784

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ±.1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	12-27-11
APPROVED	
CHECKED	

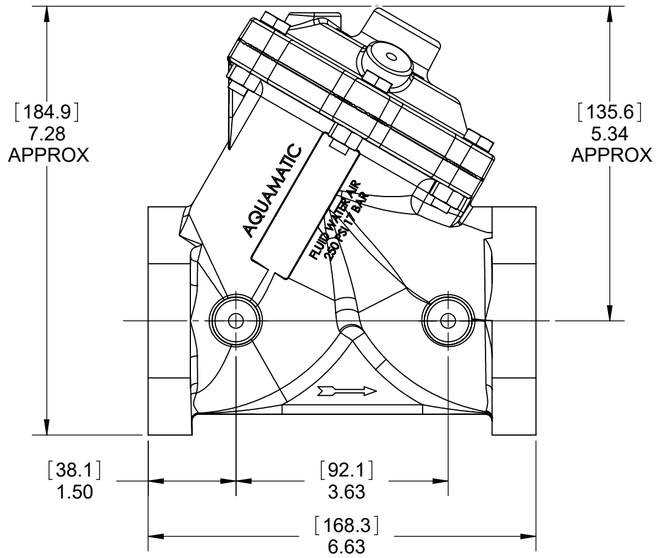
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 464,DIA VALVE
STANDARD MODEL

SIZE B | DWG NO. 1236757 | REV K

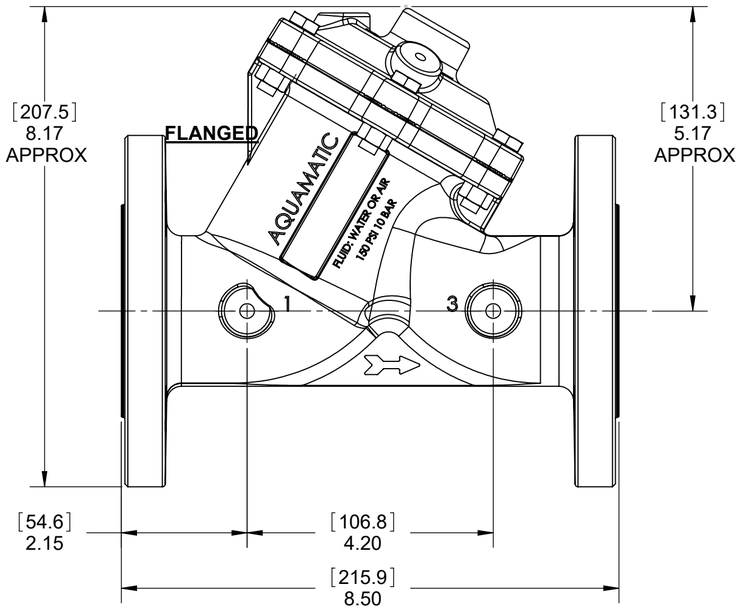
SCALE 1:1 | SHEET 2 OF 2

THREADED



MODEL: V46F-0200-03000 (THREADED)
(1239092)

FLANGED

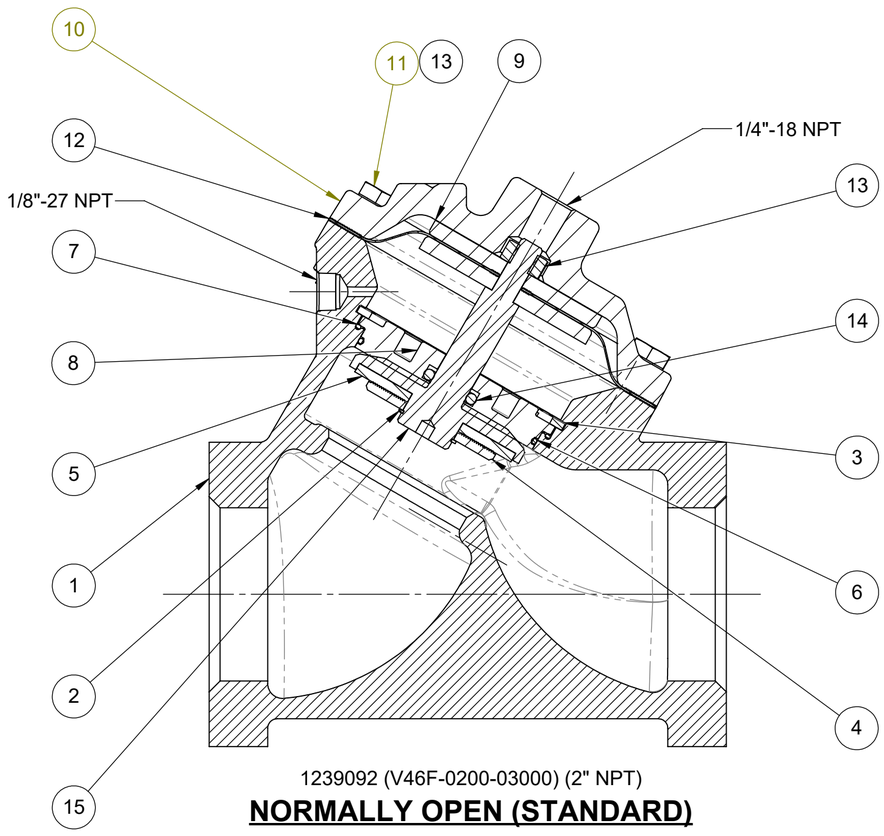


MODEL: V46F-3200-03000 (FLANGED)
(1081116)

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	100100	G	REDRAWN IN SOLIDWORKS	1-4-12	NBE
	1001	H	AQ Matic update & verified part numbers	17JAN17	MGS
	1455	I	DIAPHRAGM AND SEAL KIT ELIMINATION	4/2/19	TRK
	1879	J	SHEET 2 VIEW DISPLAY FIX	4/19/21	PMJ

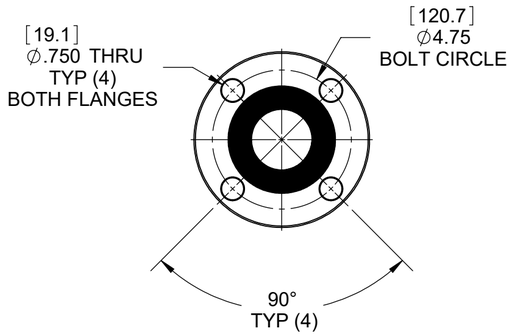
ITEM NO.	DESCRIPTION			STD	PART NUMBER	QTY.
1	BODY, 465, 2.00, NPT	NPT	CAST CF8M (316 SS)	*	1079059	1
	BODY 465, FLANGED	NPT			1078656	1
2	RING,RETAINING,.710X.031		316 SS	*	1078566	1
3	RING,RETAINING,3.053X.093		316 SS	*	1078648	1
4	DISC PLATE, 465		316 SS	*	1078654	1
5	DISC		BUNA	*	1074307	1
			E.P.D.M.		1074309	1
			FKM		1074312	1
6	O-RING, ORE-037		BUNA N	*	1079836	1
			E.P.D.M.		1081948	1
			FKM		1081950	1
7	O-RING, ORE-039		BUNA N	*	1071685	1
			E.P.D.M.		1081949	1
			FKM		1071796	1
8	SHAFT GUIDE,465		316 SS	*	1078666	1
9	DIAPHRAGM PLATE, 465		316 SS	*	1078664	2
10	CAP, 465, NPT TAP TOP		CAST CF8M	*	1078660	1
11	SCREW,HX HD CAP,5/16-18X1 1/4		316 SS	*	1078652	6
12	DIAPHRAGM, SERIES 425		BUNA N	*	1074296	1
	DIAPHRAGM, DOUBLE COATED		FKM		1074297	1
13	HEX NUT, 5/16"-18		316 SS	*	1078650	7
14	O-RING, -206TC		BUNA N	*	1071699	1
			FKM		1239009	1
15	SHAFT, 465, NORMALLY OPEN		CAST CF8M	*	1078670	1

TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUE TO (+/- 10%)
11 &13	NUT, SCREW, HEX HEAD	140 IN/LBS
13	NUT UPPER	140 IN/LBS

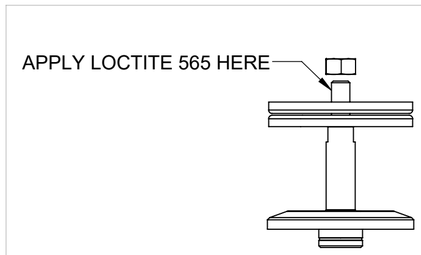


1239092 (V46F-0200-03000) (2" NPT)

NORMALLY OPEN (STANDARD)



FLANGES PER ASTM B16.5
CLASS 150 AND ISO 7005-1 PN20



SEE SHEET 2 FOR
CONFIGURATION OPTIONS

NOTES:
1. AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) PER ANSI B1.20.1.
2. VALVES AVAILABLE IN BSPT CONFIGURATION. (SEE ITEM 1)

REPAIR PARTS KITS			
DESCRIPTION	PART NO.		
	BR1078704	BR1078705	BR1078706
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 2, 3, 5, 6, 7, 12, 13, 14 (I)	BUNA N INCLUDES DIAPHRAGM 1074296	E.P.D.M. INCLUDES DIAPHRAGM 1074296	FKM INCLUDES DIAPHRAGM 1074297
INT. PARTS KIT (NORM. OPEN) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 15	1078707		

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	12-27-11
APPROVED	
CHECKED	

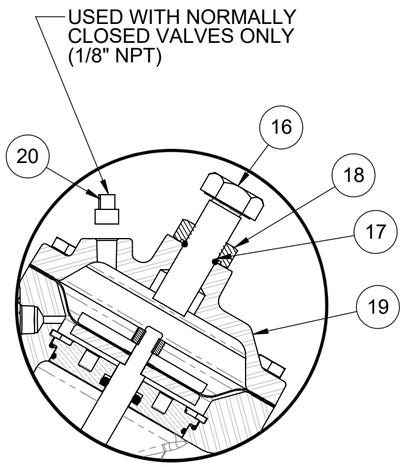
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 465
DIAPHRAGM VALVE STANDARD MODEL

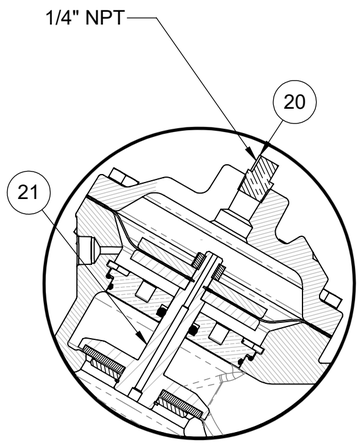
SIZE	DWG NO.	REV
B	1078717	J

SCALE 1:2 SHEET 1 OF 2

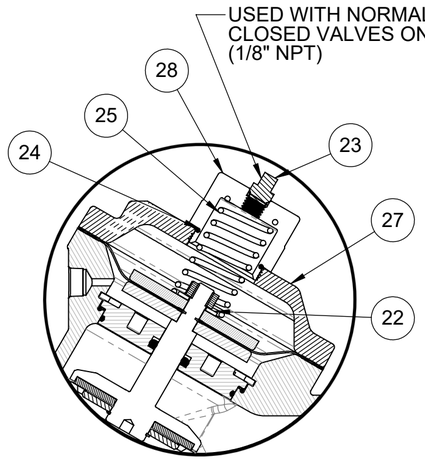
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES		



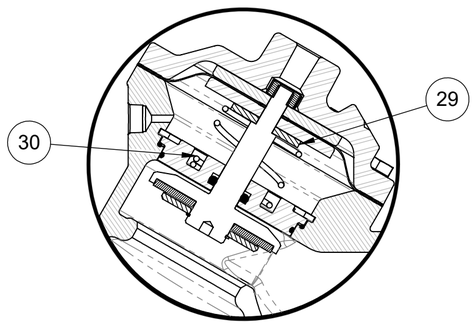
LIMIT STOP
MODEL:V46F-3210-03000 (FLANGED)
MODEL:V46F-0210-03000 (THREADED)



NORMALLY CLOSED
MODEL:V46F-3230-03000 (FLANGED)
MODEL:V46F-0230-03000 (THREADED)



SPRING ASSIST CLOSED
MODEL:V46F-3202-03000 (FLANGED)
MODEL:V46F-0202-03000 (THREADED)



SPRING ASSIST OPEN
MODEL:V46F-3201-03000 (FLANGED)
MODEL:V46F-0201-03000 (THREADED)

NOTE:
1. SPRING ASSIST CLOSED MODEL CANNOT BE COMBINED WITH LIMITED STOP MODEL.

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
16	BOLT,HEX HD,FLL THRD,5/8-18X2	SS	1078676	1
17	O-RING,2-112,NITRILE	BUNA	1071690	1
18	NUT,LIMITED STOP,461-465	SS	1078678	1
19	CAP, 465, NPT, LIMIT STOP	SS	1078680	1

NORMALLY CLOSED MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
20	PLUG, 1/4 IN. NPT SQUARE HEAD	SS	1078592	1
21	SHAFT, 465 NORMALLY CLOSED	SS	1078682	1

SPRING ASSIST CLOSED MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
22	WASHER,CENTERING,465/426/427	SS	1078684	1
23	PLUG,1/8",SQ HD	SS	1078600	1
24	O-RING,2-025,NITRILE	BUNA	1071677	2
25	SPRING,COMPRESSION	SS	1078688	1
27	CAP, 465, SPRING ASST CLSD	SS	1078690	1
28	NUT, SPRG RTNR,425 & 465	SS	1078686	1

SPRING ASSIST OPEN MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
29	SPRING, COMPRESSION	SS	1078692	1
30	SPACER,CENTERING	SS	1078694	1

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18	1078708
INT. PARTS KIT (NORMALLY CLOSED) CONSISTS OF STANDARD ITEM NO'S 4, 8, 9(2), 21	1078709
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 25, 26	1078710
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1078711

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF STANDARD ITEM NO'S 16, 17, 18, 19	1078713
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF STANDARD ITEM NO'S 22, 23, 24, 25, 26, 27	1078714
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF STANDARD ITEM NO'S 28, 29	1078711

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	12-27-11
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 465
DIAPHRAGM VALVE STANDARD MODEL

SIZE	DWG NO.	REV
B	1078717	J

SCALE 1:2 SHEET 2 OF 2

AQUAMATIC® K52 SERIES
COMPOSITE CONTROL VALVES

CONSTRUCTED OF CORROSION-RESISTANT MATERIALS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

The unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

All components can be serviced while the valve is in-line

Separate flow and control chambers permit positive closing without springs

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators

All internal parts in contact with media are made of composite materials*

Seals are ethylene propylene for better chemical resistance**

K52 Series Valves are available in sizes from 1/2"- 2"

A variety of available end connectors make the valve compatible for 3/8"-3" pipe sizes

Adaptable to a wide variety of control devices

OPTIONS

Normally open [standard]
Normally closed*†
Spring-assist closed
Spring-assist open
Limit stop for flow control
Position indicator

Seal and diaphragm materials for special applications†
Union End Connectors - Female socket weld connectors for easy installation and the ability to remove the valve without disrupting the service piping

TYPICAL APPLICATIONS

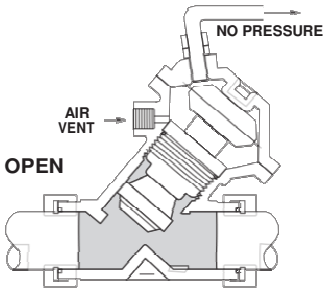
Chemical Injection
Deionizers Desalinization
Detergent and Bleach Handling
Electronic Industry
Evaporation
Fertilizer Spray Equipment
Level Control Systems
Metal Recovery Systems
Mining Wastes
Process Water Systems
Water Treatment Systems

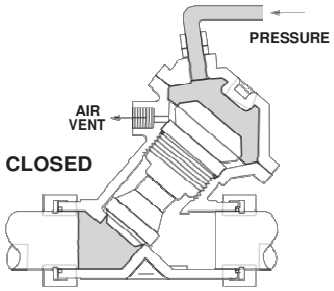
IAPMO R&T ®
Certified by IAPMO R&T to NSF/ANSI 61 and NSF/ANSI 372 for lead free compliance.

* Normally closed valve configurations are NOT recommended when used with corrosive fluids.
** Valves are NOT recommended for use with any aromatic, hydrocarbon-based media.

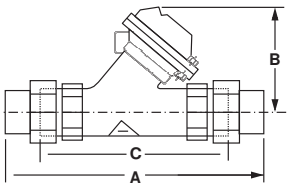
DIMENSIONS

MODEL #	PIPE SIZE	Cv	WEIGHT (STANDARD VALVE)	END CONNECTOR STYLE	DIMENSIONS (APPROXIMATE)					
					A	B	C	D	E	F
K520	1/2"	4.0	1 lbs (0.5 kg)	Union End Connectors	7.0" (177.8 mm)	2.62" (66.5 mm)	4.87" (123.7 mm)	–	–	–
K521	1"	15.0	1 lbs (0.5 kg)		9" (228.6 mm)	4.06" (103.1 mm)	6.31" (160.3 mm)	–	–	–
K524	1-1/2"	38.0	2 lbs (0.9 kg)		12.5" (317.5 mm)	5.06" (128.5 mm)	9.31" (135.0 mm)	–	–	–
K524	2"	41.0	2 lbs (0.9 kg)	Female / Male Socket Weld End Connectors	10.50" (266.7 mm)	5.06" (128.5 mm)	–	–	–	–
K526	2-1/2"	100.0	6 lbs (2.7 kg)		15" (381.0 mm)	7.31" (185.7 mm)	–	–	–	–
K520	1/2"	4.0	1 lbs (0.5 kg)	Grooved Adapter End Connectors	7" (177.8 mm)	2.62" (66.5 mm)	3.93" (99.8 mm)	–	–	–
K521	1"	15.0	1 lbs (0.5 kg)		9" (228.6 mm)	4.06" (103.1 mm)	4.50" (114.3 mm)	–	–	–
K524	1-1/2"	38.0	2 lbs (0.9 kg)		12.5" (336.5 mm)	5.06" (128.5 mm)	7.75" (196.8 mm)	–	–	–
K524	2"	41.0	2 lbs (0.9 kg)	Flanged End Connectors	9" (226.6 mm)	5.06" (128.5 mm)	6.00" (152.4 mm)	.75" (19.05 mm)	4.75" (120.85 mm)	.688" (174.8 mm)
K526	2-1/2"	100.0	6 lbs (2.7 kg)		11.37" (288.8 mm)	7.31" (185.7 mm)	6.94" (176.3 mm)	.94" (23.9 mm)	5.50" (139.7 mm)	6.88" (174.8 mm)
K526	3"	100.0	6 lbs (2.7 kg)		12.37" (314.2 mm)	7.31" (185.7 mm)	7.38" (187.5 mm)	1.81" (45.9 mm)	6.000" (152.4 mm)	.750" (19.05 mm)

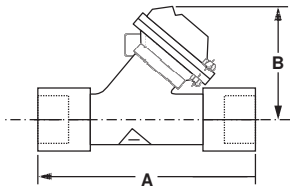




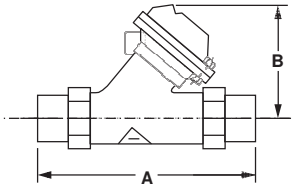
Union End Connectors



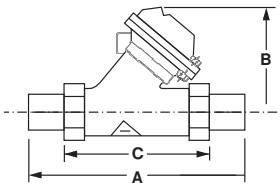
Female Socket Weld End Connectors



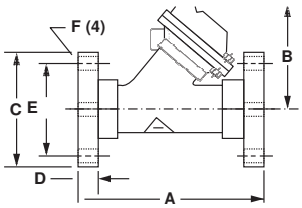
Male Socket Weld End Connectors



Grooved Adaptor Connectors



Flanged End Connectors

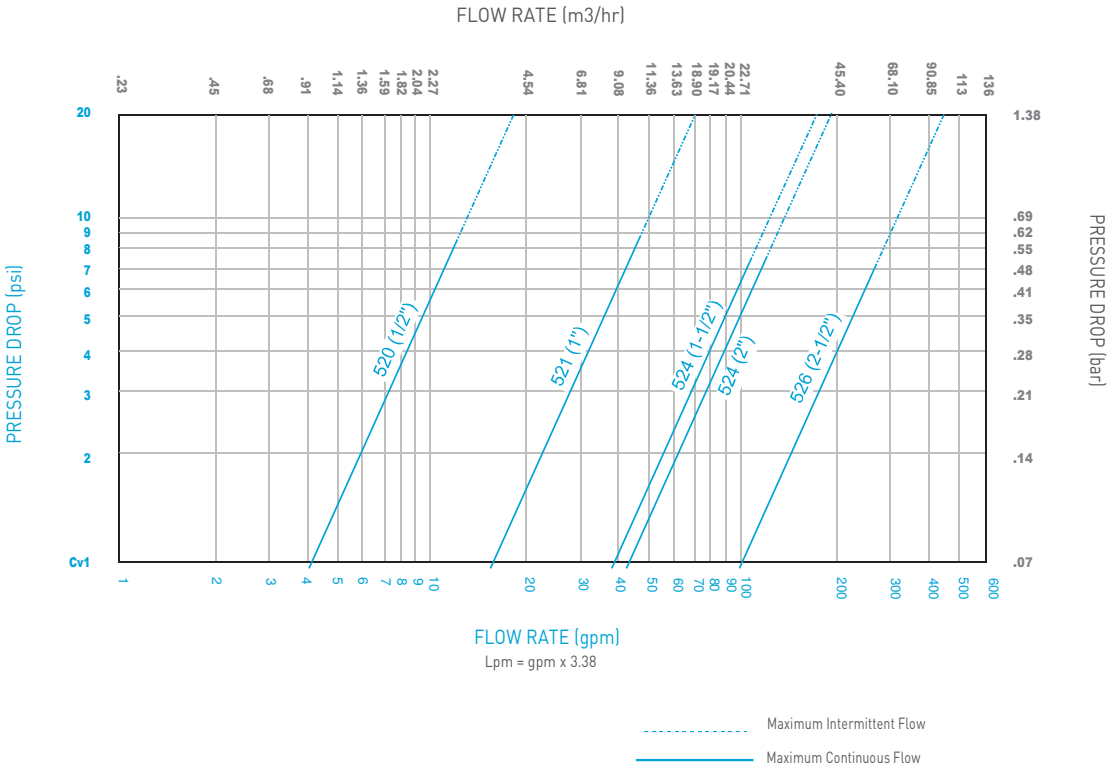


OPERATING SPECIFICATIONS

Max Pressure	125 psi (8.6 bar)
Max Temperature†	140°F (60°C)

†IAPMO R&T NSF/ANSI 61 and NSF/ANSI 372 certifications are limited to restrictions below. Other options were not tested for certification:
Cold water applications below 73°F (23°C).
Normally Open valves.
EPDM seal material (seal option #1).

PERFORMANCE DATA



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K52 SERIES DIAPHRAGM VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** K 5 2 _ - X 2 _ _ - _ 4 _ _ _

BODY SIZE
- 0 = 1/2"
- 1 = 1"
- 4 = 1-1/2"
- 6 = 2-1/2"

END CONNECTIONS (X std)
- X = None

BODY & CAP MATERIAL (2 std)
- 2 = Noryl

VALVE OPTIONS (00 std for K521, K524, K526; 01 std for K520) [opt 00, 12, 32, & 42 not valid on K520]
[NC & XNC not valid with solenoid options]

00 = NO	12 = NO, LS, SAC	42 = NC, LS, SAC
01 = NO, SAO	21 = NO, PI, SAO	B2 = XNC, SAC
02 = NO, SAC	30 = NC	SX = Special Valve **
10 = NO, LS	31 = NC, SAO	
11 = NO, LS, SAO	32 = NC, SAC (See note 1)	

SEAL MATERIALS (1 std) (Option no. 2 not available on series 526 valves)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEALS	STATIC SEALS	KIT SERIES	TYPICAL USE
1	Buna-N	EP	EP	EP	RA	Water
2	Fluoroelast.	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAVFV	Call Factory
5	Buna-N	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAV	Acid
6	Buna-N	Butyl	Butyl	Butyl	RAJ	Caustic

INTERNAL PARTS (4 std)
- 4 = Noryl/PVC (140°F (60°C) Valve Rating)

DRILL & TAP BOSSES (0 std [1/8" NPT std for K520/K521/K524; 1/4" NPT std for K526])

0 = None	3 = Boss #3	6 = Bosses #1,2
1 = Boss #1	4 = Boss #4	
2 = Boss #2	5 = Bosses #1,2,3,4	

SOLENOID OPTIONS (0 std) [Solenoid option not available with NC or XNC valves]

0 = None	2 = Energize to Close (EC)	4 = EO w/ Dry Drain
1 = Energize to Open (EO)	3 = Independent pressure (IP)	5 = EC w/ Dry Drain

SOLENOID FEATURES (0 std) not valid with Independent Pressure (OPTION A)

0 = None	D = 115V/60HZ, NEMA 4	F = 24V/60HZ, NEMA 4
A = 24VDC	E = 220V/50HZ, NEMA 4	

* To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a 2" Plastic Valve Model K524 with Normally Closed and Spring Assist Closed Options is designated as a K524-X232-14000.

** A special valve will have a custom drawing number (_ _ _ _ _ _ _)
and the item number format is (K52?-?2SX-_ _ _ _ _)
where the last 5 numbers (Far Right) are the last five digits of the drawing number.

Valve Option Notes:

1. **Option 32 (NC, SAC) not possible on K520, use option B2 (XNC, SAC).**

REV.	ECO NO.	DESCRIPTION	BY/DATE	
E	21190	Revised for Pentair ECN release	JJJ	17-Nov-09
F	1778	TOOK OUT OPTION 7 DRILL AND TAP	MM	OCT-1-2020
G	1789	ADDED 24VDC TO SOLENOID	MM	OCT-15-2020

BR42983

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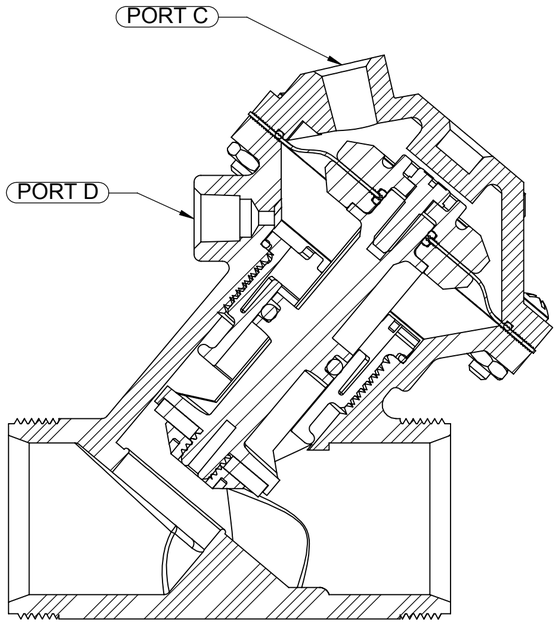
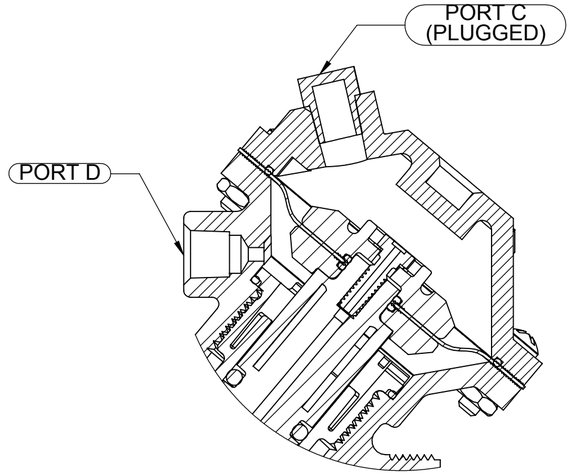
DIAPHRAGM VALVE CONFIGURATIONS - STANDARD MODEL

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1507	C	TRANSFER TO AQ TEMPLATE	05/20/19	KJB



NORMALLY OPEN

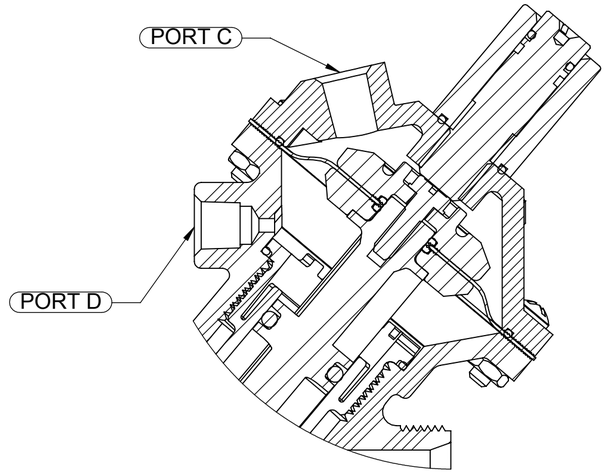
LINE PRESSURE/FLOW AGAINST THE VALVE SEATING DISC WILL OPEN THE VALVE. CONROL PRESSURE APPLIED TO THE TOP OF THE DIAPHRAGM (PORT "C") WILL CLOSE THE VALVE.



NORMALLY CLOSED

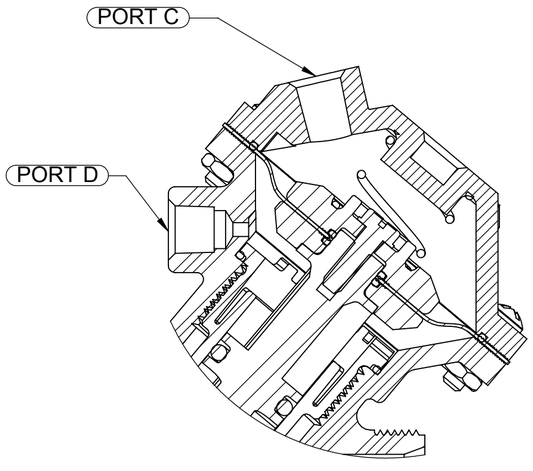
LINE PRESSURE AGAINST THE DISC, TRANSFERRED THRU THE VALVE'S HOLLOW SHAFT TO THE TOP OF THE DIAPHRAGM, WILL CLOSE THE VALVE. CONTROL PRESSURE AT PORT "D" WILL OPEN THE VALVE. ADDITION OF "SPRING ASSIST CLOSED" FEATURE IS RECOMMENDED FOR THE FOLLOWING CONDITIONS:

1. LOW PRESSURE AND/OR FLOW.
2. VALVE DISCHARGES TO ATMOSPHERE



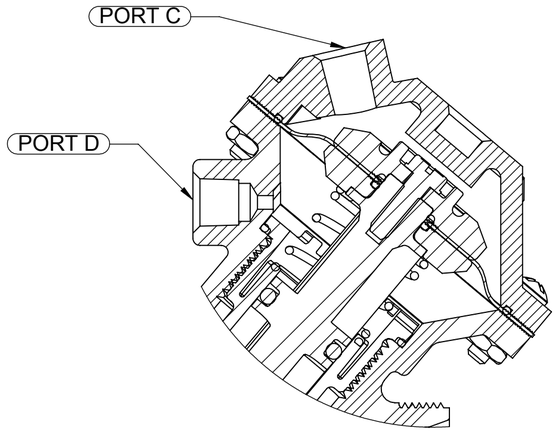
LIMIT STOP

INCLUDES AN ADJUSTMENT SCREW WHICH LIMITS THE VALVE STROKE. MAY BE USED TO CONTROL FLOW RATE, HOWEVER, FLOW RATE WILL VARY WITH CHANGES IN PRESSURE.



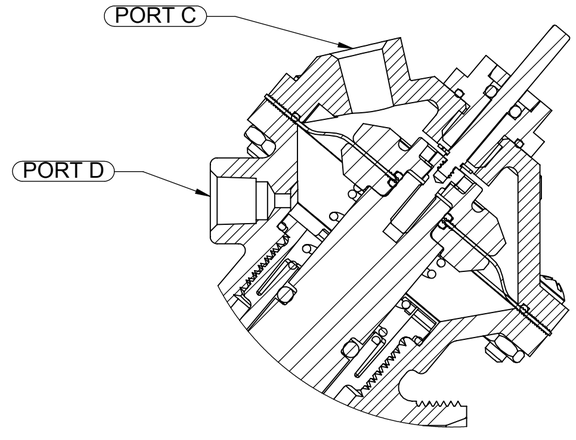
SPRING ASSIST CLOSED

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE LOSURE IN THE ABSENCE OF LINE AND CONTROL PRESSURES.



SPRING ASSIST OPEN

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE OPENING IN THE ABSENCE OF LINE AND CONTROL PRESSURES. (STANDARD ON SERIES 520 VALVES).



POSITION INDICATOR

INDICATOR ROD IS ATTACHED TO MAIN VALVE STEM TO SHOW POSITION OF VALVE. ONLY AVAILABLE WITH SPRING ASSIST OPEN OPTION.

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ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN KJB	05/20/19
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APPROVED	

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K52 SERIES CONFIGURATIONS & BASIC INFORMATION

SIZE	DWG NO.	REV.
C	1078147	C
SCALE	SOLIDWORKS FORMAT	SHEET 1 OF 2

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR ALL CHANGES.		

PLASTIC DIAPHRAGM VALVES (520 THRU 526)

SERIES	PIPE SIZE	SEAT AREA IN. / CM.	SEAT AREA SQ. IN. / SQ. CM.	DIAPHRAGM AREA SQ. IN. / SQ. CM.	TOTAL STROKE IN. / CM.	DIAPHRAGM CHAMBER (VOLUME) CU IN / CU CM	Cv*	Kv**	FLOW RATE @ 10 FT./SEC (3 M./SEC.) NOTE 1 GAL/MIN / CU M/HR	FLOW RATE @ 20 FT./SEC (3 M./SEC.) NOTE 2 GAL/MIN / CU M/HR	PRESSURE DROP @ 10 FT./SEC (3 M./SEC.) NOTE 1 PSI / bar	PRESSURE DROP @ 20 FT./SEC (6 M./SEC.) NOTE 2 PSI / bar
520	1/2"	0.507 / 1.28	0.20 / 1.30	0.52 / 3.35	0.28 / 0.71	0.55 / 9.00	4.0	3.4	6.2 / 1.4	12.4 / 2.8	2.4 / 0.16	9.6 / 0.66
521	1"	0.996 / 2.52	0.77 / 4.96	2.07 / 13.35	0.56 / 1.42	3.05 / 49.90	15.0	13.0	24 / 5.4	48 / 10.8	2.5 / 0.17	10.2 / 0.7
524	1 1/2"	1.62 / 4.11	2.06 / 13.28	3.86 / 24.89	1.00 / 2.54	7.32 / 119	38.0	32.7	64 / 14.4	128 / 28.8	2.8 / 0.19	11.3 / 0.78
526	2 1/2"	2.37 / 6.01	3.30 / 28.38	8.32 / 53.66	1.62 / 4.11	12.20 / 200	100.0	86.0	136 / 31.0	272 / 62.0	1.8 / 0.12	7.4 / 0.51

* Cv - FLOWRATE (GAL./MIN.) OF WATER AT 60°F. AT 1 P.S.I PRESSURE DROP

**Kv - FLOWRATE (CU. M./HR.) OF WATER AT 15.5°C. AT 1 BAR PRESSURE DROP

NOTE 1: MAXIMUM CONTINUOUS VELOCITY THROUGH THE VALVE.

NOTE 2: MAXIMUM CONTINUOUS VELOCITY. EXTENDED SERVICE AT THIS VELOCITY MAY CAUSE CAVITATION

TO DETERMINE FLOWRATE AT ANY GIVEN PRESSURE DROP,
THE FOLLOWING FORMULAS CAN BE USED.

FOR WATER AND LIQUIDS:

$$Q = \frac{Cv\sqrt{\Delta P}}{\sqrt{e}}$$

Q - FLOWRATE IN GAL./MIN.
ΔP - PRESSURE DROP (LB./SQ. IN.)
e - SPECIFIC GRAVITY (WATER = 1.00)

FOR AIR AND GAS:

WHEN P2<.5P1

$$Q = \frac{CFM\ \sqrt{e}}{.5P1}$$

WHEN P2>.5P1

$$Q = \frac{CFM\ \sqrt{e}}{\sqrt{\Delta P\ P2}}$$

CFM - CU. FT./MIN. FLOW
e - SPECIFIC GRAVITY (AIR = 1.00)
P1 - INLET PRESSURE (LB./SQ. IN.)
P2 - OUTLET PRESSURE (LB./SQ. IN.)

THE DATA PRESENTED HERE IS BELIEVED TO BE RELIABLE AND OFFERED AS SUGGESTION ONLY. ACTUAL RESULTS MAY VARY DEPENDING UPON APPLICATION

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TOLERANCES:
ANGLES : ± 1°
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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN KJB	05/20/19
CHECKED BY	
APPROVED	

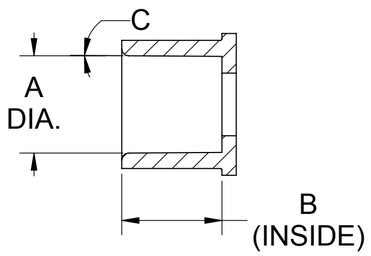
AQ Matic

K52 SERIES CONFIGURATIONS & BASIC INFORMATION

SIZE	DWG NO.	REV.
C	1078147	C
SCALE	SOLIDWORKS FORMAT	SHEET 2 OF 2

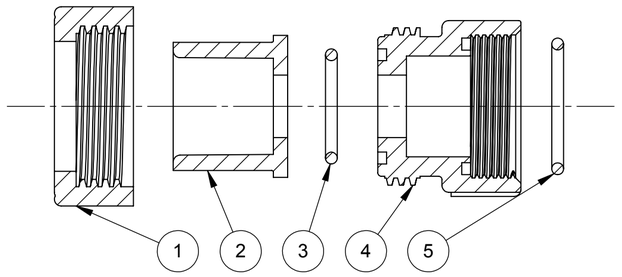
DIAPHRAGM VALVE INFORMATION - STANDARD MODEL

1/2", 1", & 1-1/2" ADAPTOR, END CONNECTOR PARTS & KITS



FEMALE SOCKET WELD END CONNECTOR

VALVE SERIES	STANDARD	DIAMETER A	DEPTH B	TAPER C
520	A.S.T.M. 1/2"	.848/.856"	.875"	0°, 24'
	I.S.O. NS-15	20.1/20.3 MM	22.2 MM	0°, 15'
	J.I.S 16	21.9/22.3 MM	22.2 MM	0°, 19'
521	A.S.T.M. 1"	1.325/1.335"	1.125"	0°, 23'
	I.S.O. NS-25	32.1/32.3 MM	28.6 MM	0°, 15'
	J.I.S 25	31.9/32.4 MM	28.6 MM	0°, 16'
524	A.S.T.M. 1-1/2"	1.912/1.924"	1.375"	0°, 23'
	I.S.O. NS-40	50.1/50.3 MM	34.9 MM	0°, 15'
	J.I.S 40	47.9/48.5 MM	34.9 MM	0°, 16'



UNION END ADAPTOR

SERIES 520 UNION END ADAPTOR KITS

A.S.T.M. 1/2" INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070184 (K520100)
	BUTYL O-RING	1070185 (K520101)
	FKM O-RING	1070186 (K520102)
I.S.O NW-15 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070190 (K520103)
	BUTYL O-RING	1070191 (K520104)
	FKM O-RING	1070192 (K520105)
J.I.S - 16 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070193 (K520106)
	BUTYL O-RING	1070194 (K520107)
	FKM O-RING	1070195 (K520108)

SERIES 521 UNION END ADAPTOR KITS

A.S.T.M. 1" INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070202 (K521100)
	BUTYL O-RING	1071153 (K521101)
	FKM O-RING	1071154 (K521102)
I.S.O NW-25 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070204 (K521103)
	BUTYL O-RING	1071155 (K521104)
	FKM O-RING	1071156 (K521105)
J.I.S - 25 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070205 (K521106)
	BUTYL O-RING	1071157 (K521107)
	FKM O-RING	1071158 (K521108)

SERIES 524 UNION END ADAPTOR KITS

A.S.T.M. 1-1/2" INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070208 (K524100)
	BUTYL O-RING	1071220 (K524101)
	FKM O-RING	1070209 (K524102)
I.S.O NW-40 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070212 (K524103)
	BUTYL O-RING	1071221 (K524104)
	FKM O-RING	1070213 (K524105)
J.I.S - 40 INCLUDES ITEMS 1,2,3,4,5	E.P.D.M O-RING	1070214 (K524106)
	BUTYL O-RING	1071222 (K524107)
	FKM O-RING	1070215 (K524108)

NOTE: ALL ADAPTOR KITS CONTAIN (2) ADAPTORS, (ONE KIT REQ'D PER VALVE)

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1416	A	RELEASE NEW DESIGN	07/25/01	VP
103861	B	1- REDRAWN IN SOLIDWORKS, 2- WAS 1074991, 3- WAS 1070153, 4- WAS 1070154, 5- WAS 57.2 MM, 6- WAS 23.5 MM	10/06/14	TJM
1001	C	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/20/17	MGS
1507	D	1-ADD MODEL NUMBERS TO KIT CALLOUTS, 2-CORRECT MINOR ERRORS, 3- CONSOLODATE 1081309 & 1081309-2	05/15/19	KJB

SERIES 520 UNION END ADAPTOR

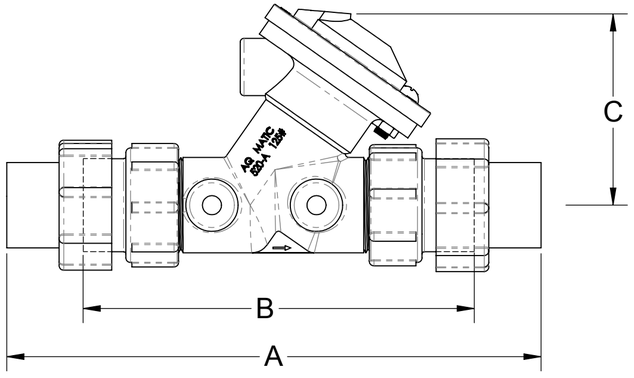
1	TAILPIECE NUT		1074995
2	FEMALE SOCKET WELD END CONNECTOR	A.S.T.M. 1/2"	3020727
		I.S.O. NW-15	1074992
		J.I.S. 16	1074993
3	O-RING	E.P.D.M	1071730
		BUTYL	1071766
		FKM	1071801
4	TAILPIECE		1074996
5	O-RING	E.P.D.M	1071731
		BUTYL	1071767
		FKM	1071802

SERIES 521 UNION END ADAPTOR

1	TAILPIECE NUT		1075067
2	FEMALE SOCKET WELD END CONNECTOR	A.S.T.M. 1"	1075061
		I.S.O. NW-25	1075063
		J.I.S. 25	1075065
3	O-RING	E.P.D.M	1071732
		BUTYL	1071768
		FKM	1071803
4	TAILPIECE		1075068
5	O-RING	E.P.D.M	1071733
		BUTYL	1071769
		FKM	1071804

SERIES 524 UNION END ADAPTOR

1	TAILPIECE NUT		1075150
2	FEMALE SOCKET WELD END CONNECTOR	A.S.T.M. 1-1/2"	1075144
		I.S.O. NW-40	1075146
		J.I.S. 40	1075148
3	O-RING	E.P.D.M	1071735
		BUTYL	1071771
		FKM	1071807
4	TAILPIECE		1075151
5	O-RING	E.P.D.M	1071736
		BUTYL	1071772
		FKM	1071808



VALVE SERIES	UNITS	LENGTH A	LENGTH B	HEIGHT C
520	INCHES	7.00	4.87	2.62
	MM	177.8	123.7	66.5
521	INCHES	9.00	6.31	4.06
	MM	228.6	160.3	103.1
524	INCHES	12.50	9.31	5.06
	MM	317.5	236.5	128.5

- SEE DRAWING 1078150 FOR THREADED SOCKET WELD ENDS & THREADED FLANGED ADAPTORS

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -1994
UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

THE COMPONENT, PART, OR ASSEMBLY DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH THE EU (EUROPEAN UNION) DIRECTIVE: RoHS DIRECTIVE 2011/65/EC.

APPROVALS	DATE
DRAWN MCP	7OCT14
CHECKED BY	
APPROVED	

AQMatic

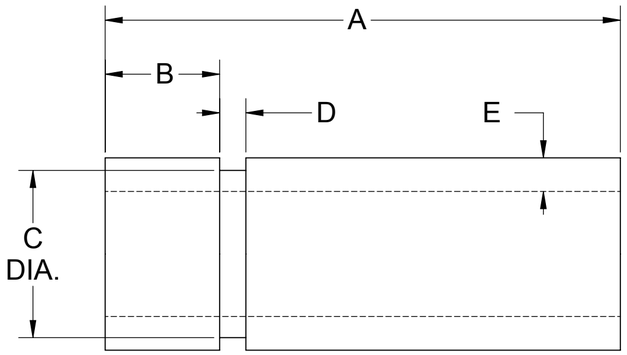
K520, K521, K524 END CONECTOR PARTS & KITS

SIZE C | DWG NO. 1081309 | REV. D

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 1 OF 2

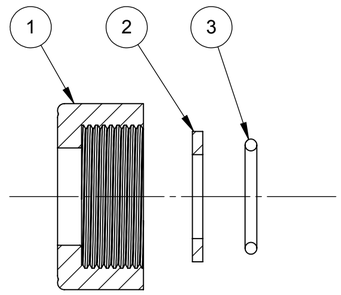
1/2", 1", & 1-1/2" ADAPTOR, END CONNECTOR PARTS & KITS

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES		



RING GROOVE DIMENSIONS

VALVE SERIES	UNITS	LENGTH A	LOCATION B	DIA. C	WIDTH D	WALL THK E
520	INCHES	2.25	0.500	0.730	0.115	0.147
	MM	57.2	12.7	18.5	2.9	3.7
521	INCHES	3.00	0.500	1.200	0.115	0.179
	MM	76.2	12.7	30.5	2.9	4.55
524	INCHES	4.00	0.875	1.800	0.115	0.200
	MM	101.6	22.2	45.7	2.9	5.1



RETAINER NUT/SPLIT RING CONNECTOR

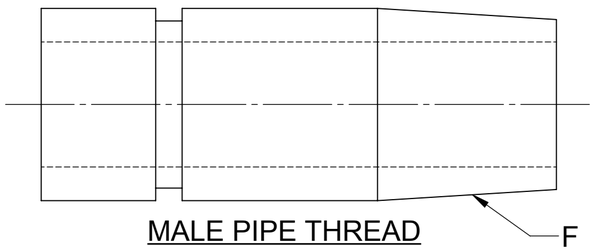
VALVE SERIES			520	521	524
1	RETAINER NUT		1074974	1075041	1075112
2	SPLIT RING		1074975	1075042	1075113
3	O-RING	E.P.D.M	1071730	1071732	1071734
		BUTYL	1071766	1071768	1071770
		FKM	1071801	1071803	1071806

RETAINER NUT/SPLIT RING CONNECTOR KITS

SERIES 520 INCLUDES ITEMS 1,2,3	E.P.D.M O-RING	1070238 (K520109)
	BUTYL O-RING	1070239 (K520110)
	FKM O-RING	1070240 (K520111)
SERIES 521 INCLUDES ITEMS 1,2,3	E.P.D.M O-RING	1070244 (K521109)
	BUTYL O-RING	1071159 (K521110)
	FKM O-RING	1071160 (K52111)
SERIES 524 INCLUDES ITEMS 1,2,3	E.P.D.M O-RING	1070246 (K524109)
	BUTYL O-RING	1071223 (K524110)
	FKM O-RING	1070247 (K524111)

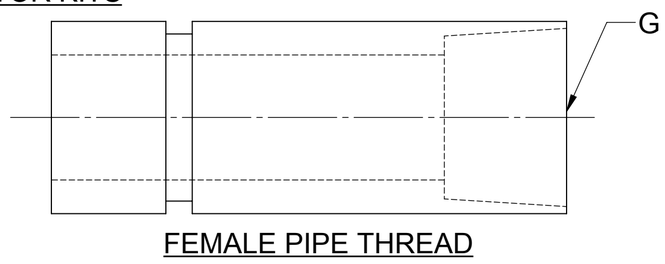
NOTE: ALL CONNECTOR KITS CONTAIN (2) CONNECTORS, (ONE KIT REQ'D PER VALVE)

GROOVED ADAPTOR KITS



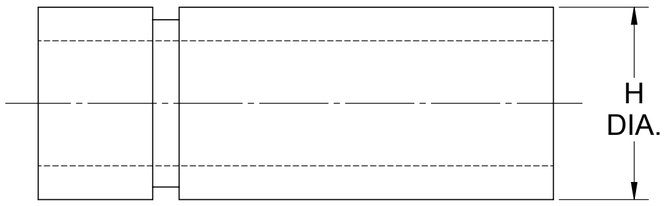
MALE PIPE THREAD

VALVE SERIES	520	521	524
PART NO.	1070221	1070227	1070233
DIM. F	1/2" NPT	1" NPT	1-1/2" NPT



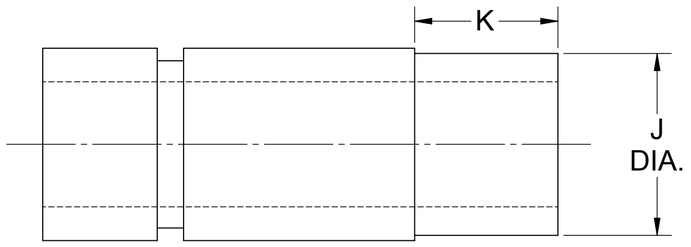
FEMALE PIPE THREAD

VALVE SERIES	520	521	524
PART NO.	1070222	1070228	1070234
DIM. G	3/8" NPT	3/4" NPT	1-1/4" NPT



MALE SOCKET WELD

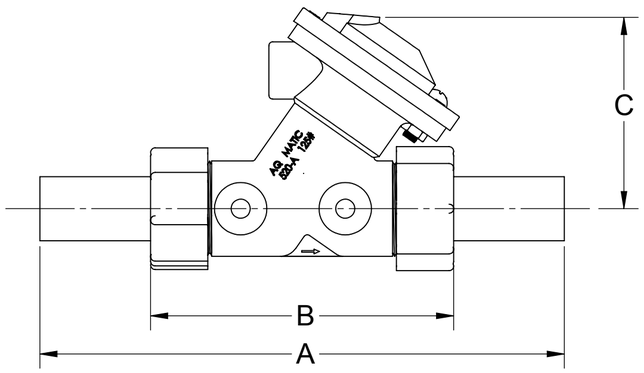
VALVE SERIES	520	521	524
PART NO.	1070220	1070226	1070232
DIM. H	0.840 IN. / 21.3 MM	1.315 IN. / 33.4 MM	1.900 IN. / 48.3 MM



MALE SOCKET WELD (METRIC)

VALVE SERIES	520	521	524
PART NO.	1071057	1071091	1071162
DIM. J	20.2 MM	32.2 MM	50.2 MM
DIM. K	15.9 MM	25.4 MM	30.0 MM

NOTE: ALL ADAPTOR KITS CONTAIN (2) ADAPTORS, (ONE KIT REQ'D PER VALVE)



VALVE SERIES	UNITS	LENGTH A	LENGTH B	HEIGHT C
520	INCHES	7.00	3.93	2.62
	MM	177.8	99.8	66.5
521	INCHES	9.00	4.50	4.06
	MM	228.6	114.3	103.1
524	INCHES	13.25	7.75	5.06
	MM	336.5	196.9	128.5

- SEE DRAWING 1078150 FOR THREADED SOCKET WELD ENDS & THREADED FLANGED ADAPTORS

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ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN MCP	7OCT14
CHECKED BY	
APPROVED	

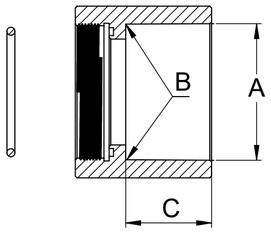
K520, K521, K524 END CONNECTOR PARTS & KITS

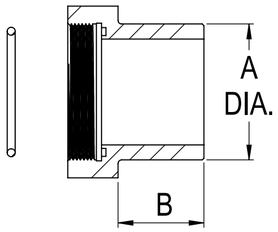
SIZE	DWG NO.	REV.
C	1081309	D

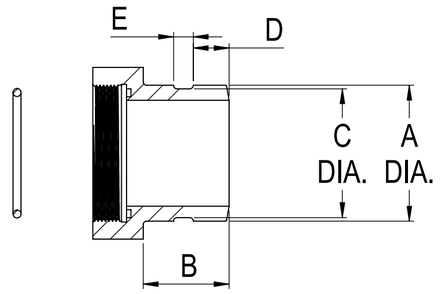
SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 2

THREADED END CONNECTORS

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
	A	RELEASE NEW DESIGN	07/25/01	VP
1507	B	TRANSFER TO AQ TEMPLATE	05/15/19	KJB
1608	C	ADD 4510478 ASSEMBLE, PART# 4510473	3/5/20	TRK
1675	D	ADD 4510518 ASSEMBLE, PART# 4510517	3/16/20	TRK







FEMALE SOCKET WELD END CONNECTOR

VALVE SERIES	PART NO.	STANDARD	ENTRANCE A	BOTTOM B	DEPTH C
524	1075126	A.S.T.M. 2"	2.387"	2.369"	1.50"
	1075128	I.S.O. NW-50	2.494"	2.481"	1.50"
	1075127	J.I.S. 50	2.376"	2.354"	1.50"
526	1075207	A.S.T.M. 2-1/2"	2.889"	2.868"	1.81"
	1075209	I.S.O. NW-65	2.970"	2.953"	1.81"
	1077594	J.I.S. 65	3.011"	2.984"	1.81"

MALE SOCKET WELD END CONNECTOR

VALVE SERIES	PART NO.	STANDARD	DIAMETER A	DEPTH B
524	1075129	A.S.T.M. 2"	2.375/2.370"	1.50"
	1075131	I.S.O. NW-50	2.490/2.486"	1.50"
526	1075210	A.S.T.M. 2 1/2"	2.882/2.868"	1.69"
	1075213	I.S.O. NW-65	2.965/2.953"	1.69"

GROOVED END CONNECTOR

VALVE SERIES	PART NO.	PIPE SIZE	DIAMETER A	DEPTH B	DIAMETER C	DEPTH D	WIDTH E
524	4510473	ASTM 2"	2.375/2.370"	1.50"	2.250"	.625"	.344"
526	4510517	ASTM 2 1/2"	2.882/2.868"	1.69"	2.720"	.625"	.344"

FEMALE SOCKET WELD END CONNECTOR KITS

VALVE SERIES	STANDARD	KIT PART NO.
524	A.S.T.M. 2"	1070256 (K524-UF08UEP)
	I.S.O. NW-50	1070260 (K524-UF50MEP)
	J.I.S. 50	1071165 (K524-UF50JEP)
526	A.S.T.M. 2-1/2"	1070257 (K526-UF10UEP)
	I.S.O. NW-65	1070261 (K526-UF65MEP)
	J.I.S. 65	1076600 (K526-UF65JEP)

MALE SOCKET WELD END CONNECTOR KITS

VALVE SERIES	STANDARD	KIT PART NO.
524	A.S.T.M. 2"	1070264 (K524-UM08UEP)
	I.S.O. NW-50	1070268 (K524-UM50MEP)
526	A.S.T.M. 2-1/2"	1070265 (K526-UM10UEP)
	I.S.O. NW-65	1070269 (K526-UM65MEP)

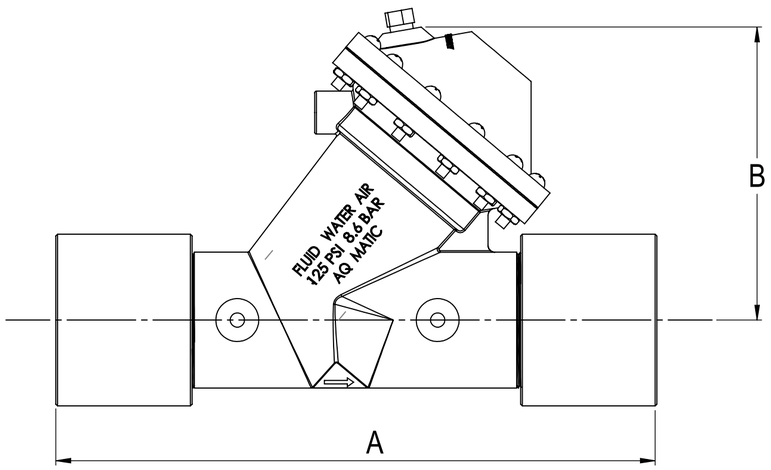
GROOVED END CONNECTOR KITS

PIPE SIZE	KIT PART NO.
ASTM 2"	4510478 (K524-UGO8UEP)
ASTM 2 1/2"	4510518 (K526-UG10UEP)

NOTE: ALL CONNECTOR KITS CONTAIN (2) CONNECTORS AND (2) O-RINGS* (ONE KIT REQ'D PER VALVE)

O-RING FOR SOCKET WELD AND GROOVED END CONNECTORS

VALVE SERIES	MATERIAL	PART NO.	O-RING IDENTIFIER
524	E.P.D.M.	1071750	E
526	E.P.D.M.	1071753	E



VALVE SERIES	PIPE SIZE	UNITS	LENGTH A	HEIGHT B
524	2"	INCHES	10.50	5.06
		MM	266.7	128.5
526	2-1/2"	INCHES	15.00	7.31
		MM	381.0	185.7

*WHEN ORDERING KITS, INSERT O-RING IDENTIFIER INTO PART NUMBER AS SHOWN BELOW
EXAMPLE: K524-UF08UEP (2" FEMALE SOCKET WELD WITH E.P.D.M. O-RING)

O-RING IDENTIFIER

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

	APPROVALS	DATE
DRAWN	JWB	07/25/01
CHECKED BY		
APPROVED		

AQ-MATIC VALVES AND CONTROLS

K524, K526
END CONNECTOR PARTS & KITS

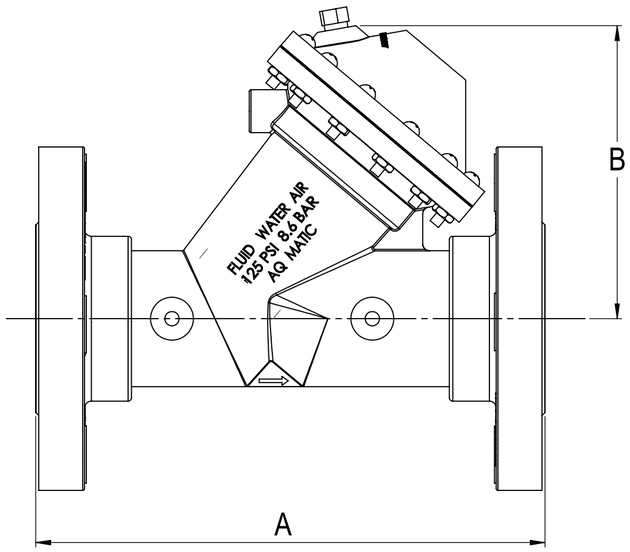
SIZE	DWG NO.	REV.
C	1078150	D

SCALE 1:1 | SOLIDWORKS FORMAT | SHEET 1 OF 2

2" & 2-1/2" END CONNECTOR PARTS & KITS

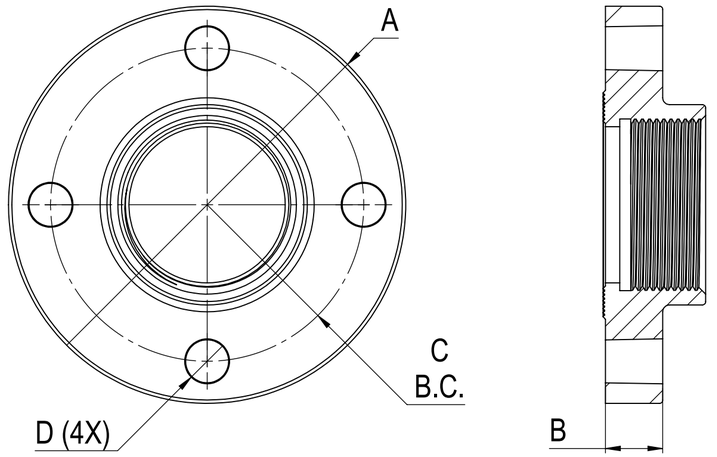
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR ALL CHANGES.		

2", 2-1/2", & 3" END CONNECTOR PARTS & KITS



VALVE SERIES	PIPE SIZE	UNITS	LENGTH A	HEIGHT B
524	2"	INCHES	9.00	5.06
		MM	228.6	128.5
526	2-1/2"	INCHES	11.37	7.31
		MM	288.8	185.7
	3"	INCHES	12.37	7.31
		MM	314.2	185.7

THREADED FLANGED END CONNECTORS



FLANGED END CONNECTOR

VALVE SERIES	STANDARD	PART NO.	DIAMETER A	THICKNESS B	DIAMETER C	DIAMETER D
524	A.S.T.M 2"	3020168	6.00"	.75"	4.750"	.688"
526	A.S.T.M 2-1/2"	1075189	6.94"	.94"	5.500"	.688"
	A.S.T.M. 3"	3020169	7.38"	1.81"	6.000"	.750"

O-RING FOR FLANGED END CONNECTOR

VALVE SERIES	MATERIAL	PART NO.
524	E.P.D.M	1071750
526	E.P.D.M	1071753

FLANGED END CONNECTOR KITS

VALVE SERIES	STANDARD	KIT PART NO.
524	A.S.T.M 2"	1070250 (K524-V)
526	A.S.T.M 2-1/2"	1070251 (K524-L)
	A.S.T.M. 3"	1070252 (K524-T)

NOTE: ALL CONNECTOR KITS CONTAIN (2) CONNECTORS AND (2) O-RINGS* (ONE KIT REQ'D PER VALVE)

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS

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UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X ± .015 [0.38]
2 PLACE .XX ± .01 [0.3]
3 PLACE .XXX ± .005 [0.13]

THIRD ANGLE PROJECTION

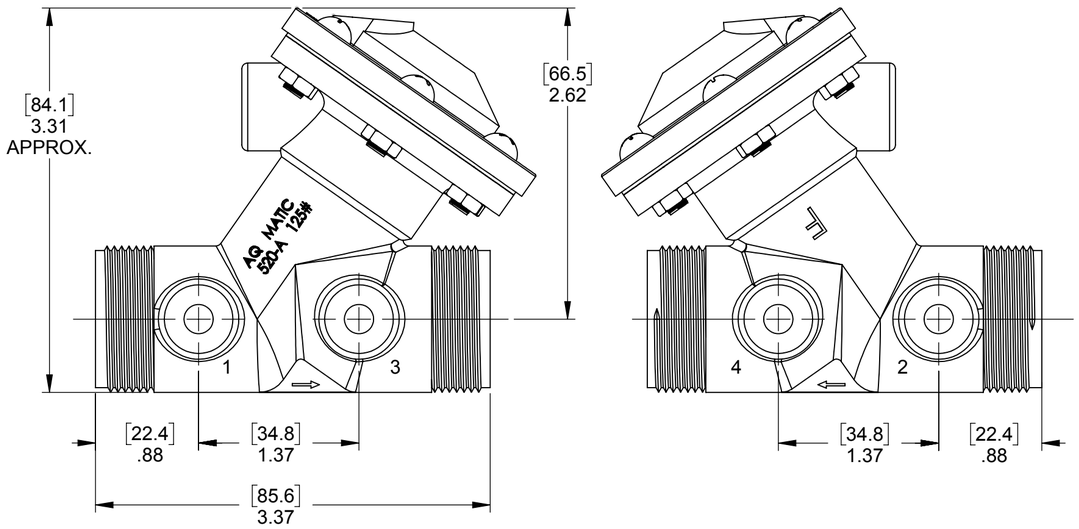
APPROVALS	DATE
DRAWN JWB	07/25/01
CHECKED BY	
APPROVED	

AQMatic

K524, K526
END CONNECTOR PARTS & KITS

SIZE	DWG NO.	REV.
C	1078150	D

SCALE | SOLIDWORKS FORMAT | SHEET 2 OF 2

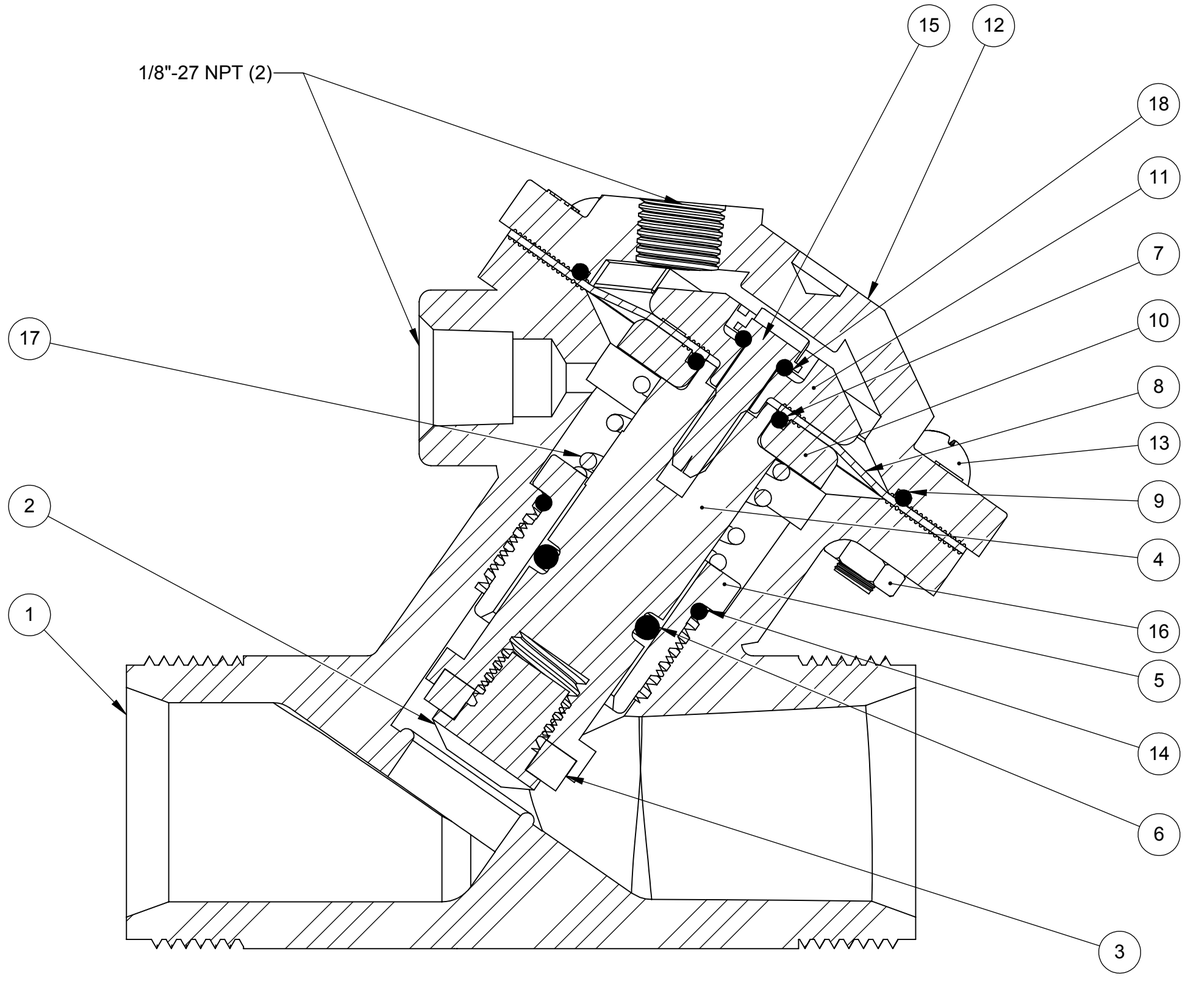


REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1001	O	UPDATE TO AQ MATIC & VERIFIED PART NUMBERS	01/16/17	MGS
1507	P	LOGO UPDATE, REMOVE BR FROM DRW #, FIX MINOR ERRORS, ADD TORQUE TABLE	05/02/19	KJB

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #5)	1074989 (520-Z)
TO HOLD SHAFT (ITEM #4) DURING ASSEMBLY/DISASSEMBLY	1077834

TORQUE TABLE		
ITEM #	DESCRIPTION	TORQUED TO (+/- 10%)
2	SCREW, PLATE, DISC	8 IN-LB
5	GUIDE, SHAFT	32 IN-LB
13 & 16	CA P SCREW & NUT	30 IN-LB
15	SCREW, CUTTING	15 IN-LB

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, VALVE, 520	NORYL	1074943	1
2	SCREW,DISC,PLATE,520	NORYL	1077903	1
3	DISC	EPDM	1074966	1
		BUTYL	1074967	
		FKM	1074968	
4	SHAFT, 520	NORYL	1077854	1
5	GUIDE,SHAFT,520	NORYL	1074964	1
6	O-RING, -111	EPDM	1071727	1
		BUTYL	1071764	
		FKM	1071799	
7	O-RING, -012	EPDM	1071717	1
		FKM	1071787	
8	DIAPHRAM	BUNA	1078035	1
		FKM	1078047	
9	O-RING, -030	EPDM	3015801	1
10	PLATE,DIAPHRAGM,LWR	NORYL	1077858	1
11	PLATE,DIAPHRAGM,UPR	NORYL	1077856	1
12	CAP, VALVE, 520	NORYL	1074948	1
13	SCREW,10-32x5/8",RND HD	SS	1072379	6
14	O-RING, -018	EPDM	1071720	1
		BUTYL	1071762	
		FKM	1071790	
15	SCREW, CUTTING 1/4" TYPE BT	SS	1077781	1
16	HEX NUT, 10-32	SS	1071647	6
17	SPRING, COMPRESSION	SS	1074982	1
18	O-RING, -007	FKM	41122-01	1



1070140 (K520-X201-14000)
NORMALLY OPEN W/ SPRING ASSIST OPEN (STANDARD)

REPAIR PARTS KIT		
DESCRIPTION	PART NO.	
DIAPHRAGM & SEAL KIT CONSISTS OF ITEM NO'S 3,6,7,8,9,14,18	1081784 (520-RAN) E.P.D.M. INCLUDES DIAPHRAGM 1078035	1081783 (520-RAJN) BUTYL INCLUDES DIAPHRAGM 1078035
	1081787 (520-RAVN) FKM INCLUDES DIAPHRAGM 1078035	1081786 (520-RAVFVN) FKM INCLUDES DIAPHRAGM 1078047
INT. PART KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,10,11,15	1079600 (K520-RFN)	

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEEET 2 FOR CONFIGURATION OPTIONS

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CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

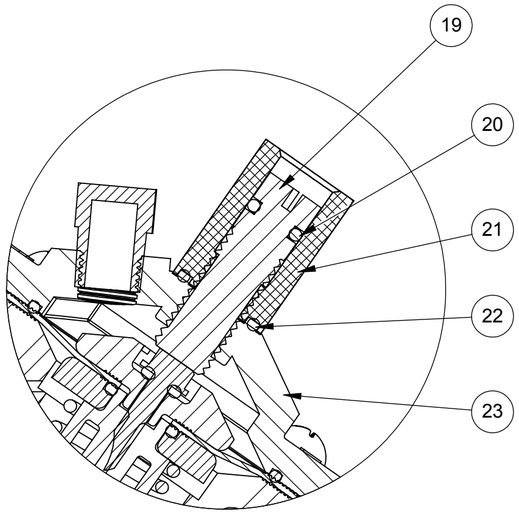
APPROVALS	DATE
DRAWN NE	
CHECKED BY	
APPROVED	

AQ Matic

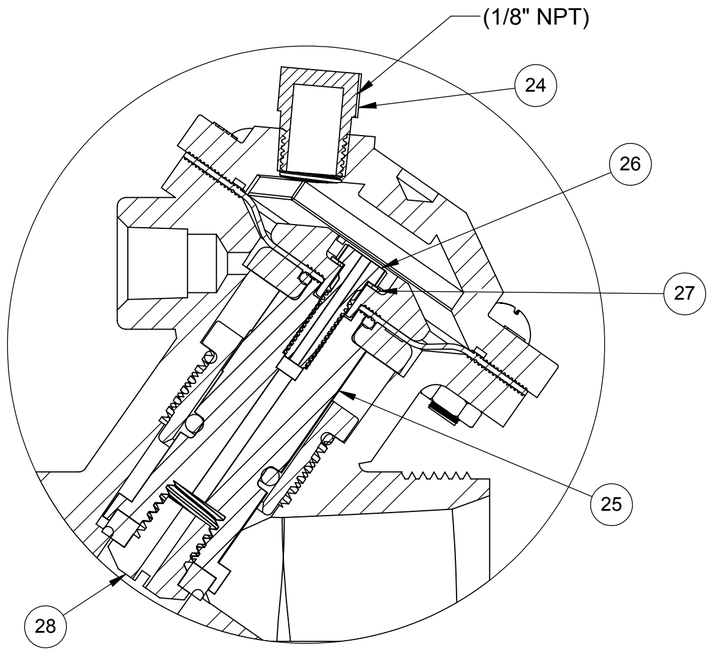
CATALOG SHEET, 520, VALVE
STANDARD MODEL

SIZE	DWG NO.	REV.
C	1078139	P
SCALE 1:2	SOLIDWORKS FORMAT	SHEET 1 OF 2

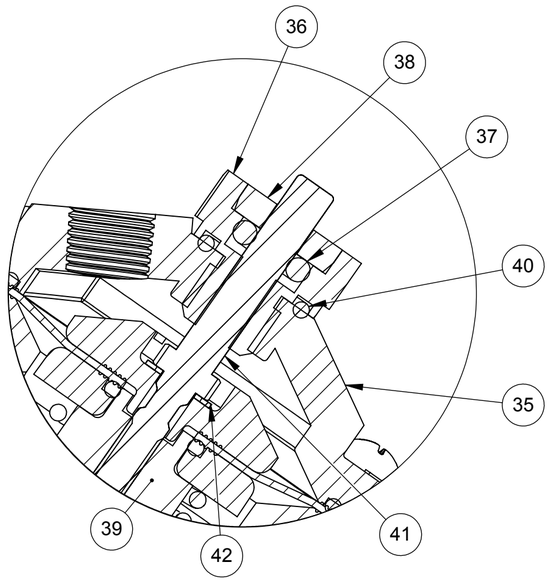
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES		



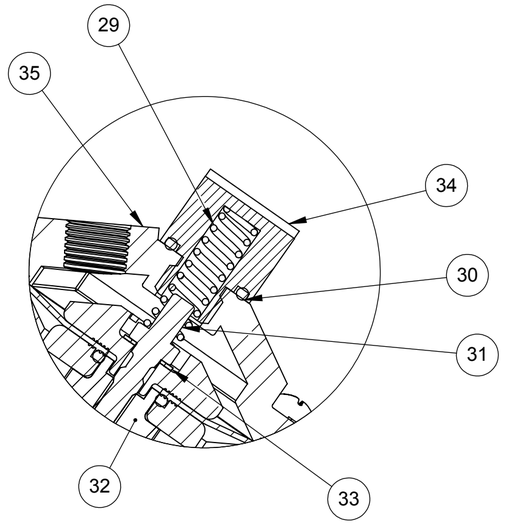
1070141 (K520-X211-14000)
LIMIT STOP



1071082 (K520-X230-14000)
NORMALLY CLOSED



1071079 (K520-X221-14000)
POSITION INDICATOR



1070143 (K520-X202-14000)
SPRING ASSIST CLOSED

LIMIT STOP MODEL				
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
19	LIMIT STOP SCREW, 520	SS	1074988	1
20	O-RING, 2-010	BUNA	1071667	1
21	LIMIT STOP NUT, 520	SS	1074987	1
22	O-RING, 2-013	BUNA	1071669	1
23	CAP, LIMIT STOP, 520	NORYL	1074946	1
NORMALLY CLOSED MODEL				
24	MALE PIPE PLUGS, 1/8" NPT	HDPE	1071912	1
25	SHAFT, 520, NC	NORYL	1077905	1
26	SCREW, 520, DIA PLT, NC	SS	1077818	1
27	WASHER, LOCK, INTERNAL, #8	SS	1006351	1
28	DISC SCREW, 520, NC	NORYL	1078324	1
SPRING ASSIST CLOSED MODEL				
29	SPRING, COMPRESSION	SS	1074981	1
30	O-RING, 2-013	BUNA	1071669	1
31	SCREW, 520, DIA PLT, SAC	SS	1077828	1
32	SHAFT, 520, NRYL, PI & SAC	NORYL	1077907	1
33	WASHER, LOCK, INTERNAL, #8	SS	1006351	1
34	SPRING RETAINER, 520	SS	1074986	1
35	CAP, LIMIT STOP, 520	NORYL	1074946	1
POSITION INDICATOR MODEL				
36	GUIDE HOUSING, 520	SS	1074970	1
37	O-RING, 2-106	BUNA	1071687	1
38	PLUG, GUIDE HOUSING, 520	SS	1074971	1
39	SHAFT, 520, PI & SAC	NORYL	1077907	1
40	O-RING, 2-013	BUNA	1071669	1
41	SCREW, 520, DIA PLT, PI	SS	1077826	1
42	WASHER, LOCK, INTERNAL, #8	SS	1006351	1

NOTE:
1. NORMALLY CLOSED CANNOT BE COMBINED WITH SPRING ASSIST CLOSED.
2. LIMIT STOP MODEL CANNOT BE COMBINED WITH SPRING ASSIST CLOSED OPTION.
3. POSITION INDICATOR MODEL FURNISHED WITH NORMALLY OPEN, SPRING ASSIST OPEN OPTION ONLY.

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 19 THRU 23	1071056 (K520-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO'S 29 THRU 35	1079602 (K520-SCCN)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 35 THRU 42	1079599 (K520-PICN)

REPAIR PARTS KIST	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMITED STOP) CONSIST OF ITEM NO'S 19 THRU 22	1074973 (520-LS)
INT. PARTS KIT (NORM. CLOSED) CONSIST OF ITEM NO'S 4,10,11,25,26,27,28	1079601 (520-RGN)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSIST OF ITEM NO'S 29 THRU 33	1081789 (520-SCN)
INT. PARTS KIT (POSITION INDICATOR) CONSIST OF ITEM NO'S 36 THRU 42	1081782 (520-PIN)

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1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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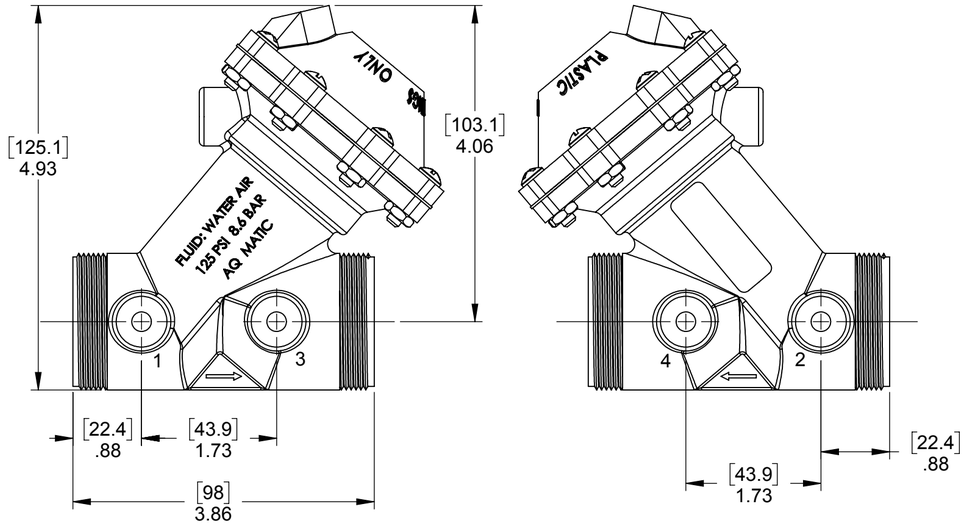
THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN	
CHECKED BY	
APPROVED	

AQ Matic

CATALOG SHEET, 520, VALVE
STANDARD MODEL

SIZE	DWG NO.	REV.
C	1078139	P
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 2 OF 2



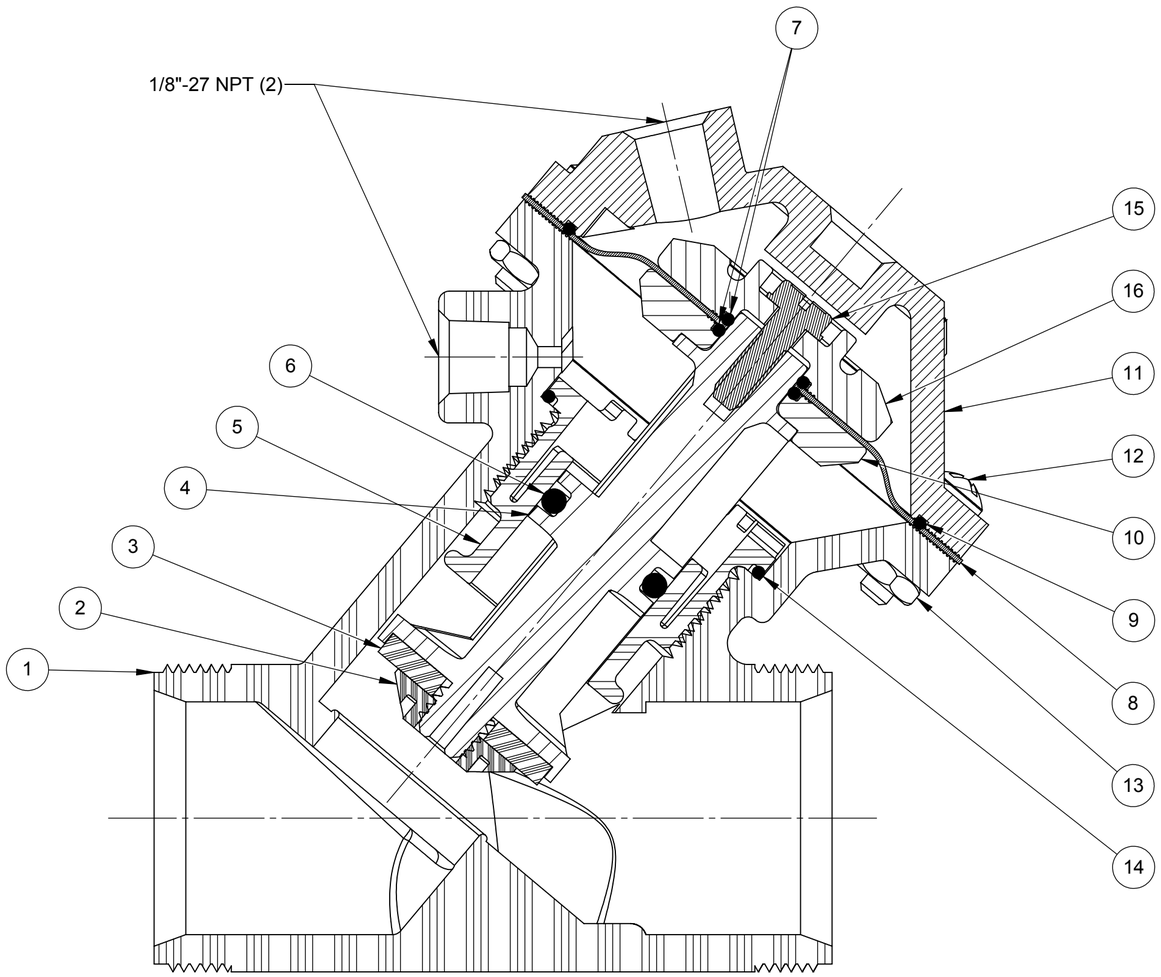
ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #5)	1075059 (521-Z)
TO HOLD SHAFT (ITEM #4) DURING ASSEMBLY/ DISASSEMBLY	1077837

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
2	PLATE, DISC	8 IN-LB
5	GUIDE, SHAFT	32 IN-LB
12 & 13	CA P SCREW & NUT	30 IN-LB
15	SCREW, CUTTING	35 IN-LB

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
102568	J	REDRAWN IN SOLIDWORKS:ITEM #1: WAS 1075007, ITEM #11: WAS 1075012 ITEM #37: WAS 1075010, 4- FORM # NOW DWG #	10/31/13	TJM
10369	K	ITEM #14- WAS: 1071942, 1071943, 1071944	12/12/14	TJM
1001	L	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/17/17	MGS
1287	M	CORRECT ERROR IN REPAIR PARTS TABLE	08/16/18	KJB
1507	N	UPDATE BRANDING, CORRECT ERRORS, ADD TORQUE TABLE	05/03/19	KJB

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, VALVE, 521	NORYL	43476	1
2	PLATE, DISC, 521	NORYL	1075845	1
3	DISC, 521	EPDM	1077814	1
		BUTYL	1077815	
		FKM	1077816	
4	SHAFT, 521	NORYL	1075842	1
5	GUIDE,SHAFT,521	NORYL	1075030	1
6	O-RING, 2-208	EPDM	1071743	1
		BUTYL	1071775	
		FKM	1071814	
7	O-RING, -014	EPDM	1071718	2
		FKM	1071788	
8	DIAPHRAGM, 521	BUNA	1075028	1
		FKM	1075029	
9	O-RING 2-805	BUNA	1071715	1
10	PLATE,DIAPHRAGM,521,LOWER	NORYL	43043	1
11	CAP, VALVE, 521	NORYL	43477	1
12	SCREW, 10-32 x 3/4", RND HD	SS	1072380	8
13	HEX NUT, 10-32	SS	1071648	8
14	O-RING, 2-029	EPDM	1081945	1
		BUTYL	43893	
		FKM	1081947	
15	SCREW, CUTTING #10-16 TYPE BT		1077783	1
16	PLATE,DIAPHRAGM,521,UPPER		43042	1

REPAIR PARTS		
DESCRIPTION	**PART NO.**	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3,6,7,8,9,14	1081792 (521-RAN) E.P.D.M. INCLUDES DIAPHRAGM 1075028 (521-FB)	1081791(521-RAJN) BUTYL INCLUDES DIAPHRAGM 1075028 (521-FB)
	1081796 (521-RAVN) FKM INCLUDES DIAPHRAGM 1075028 (521-FB)	1081795 (521-RAVFVN) E.P.D.M. INCLUDES DIAPHRAGM 1075029 (521-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,10,15,16	1079621 (K521-RFN)	



1070154 (K521-X200-14000)
NORMALLY OPEN (STANDARD)

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 2 FOR CONFIGURATION OPTIONS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

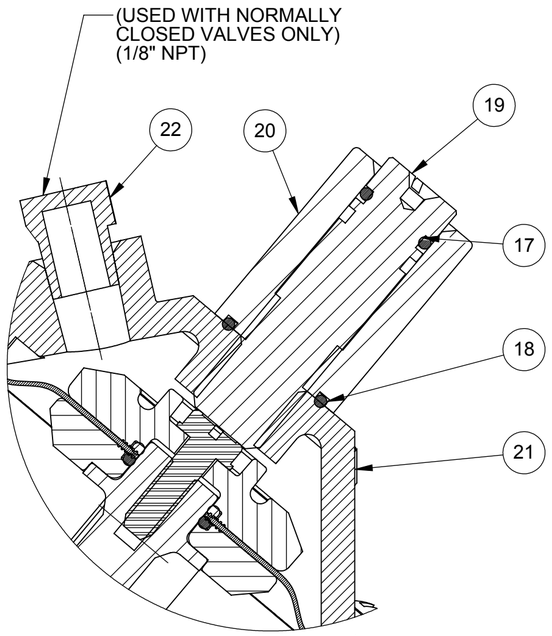
THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN ANH	8/29/13
CHECKED BY	
APPROVED	

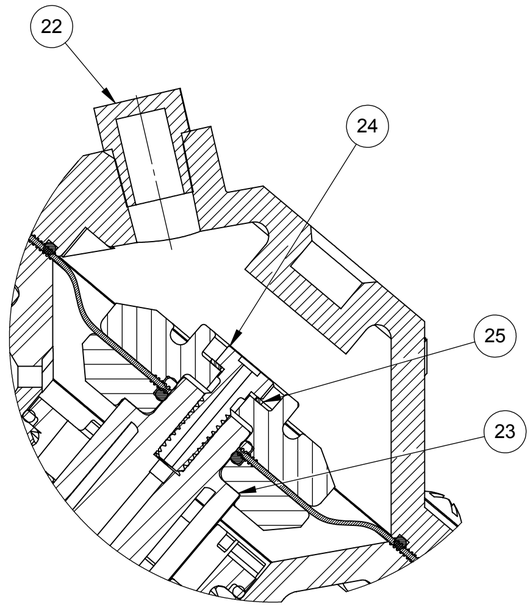
AQ Matic

CATALOG SHEET, 521, VALVE
STANDARD MODEL

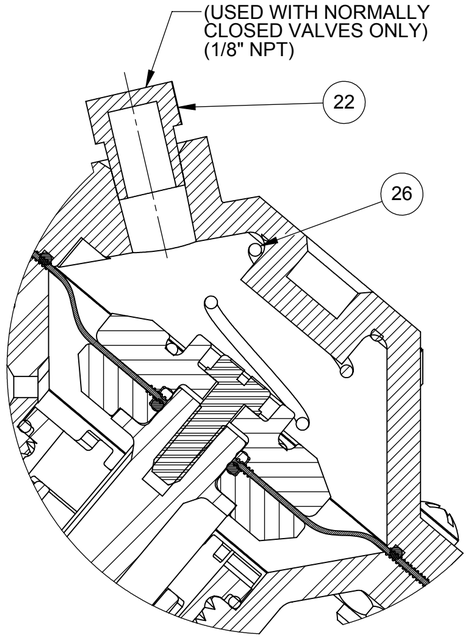
SIZE	DWG NO.	REV.
C	1077654	N
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 1 OF 2



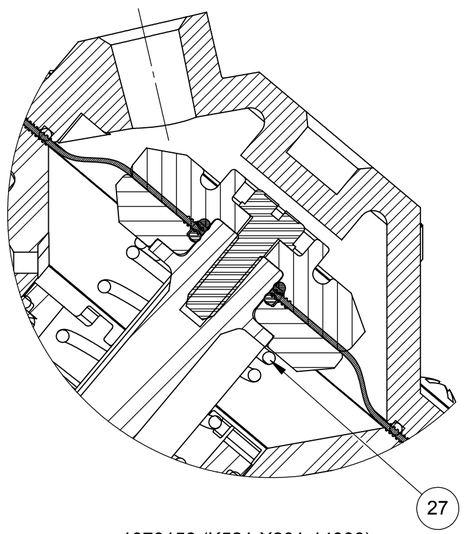
1070155 (K521-X210-14000)
LIMIT STOP



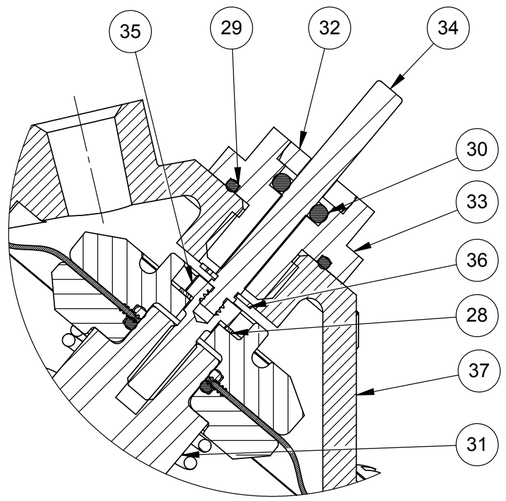
1070159 (K521-X230-14000)
NORMALLY CLOSED



1070157 (K521-X202-14000)
SPRING ASSIST CLOSED



1070158 (K521-X201-14000)
SPRING ASSIST OPEN



1071143 (K521-X221-14000)
POSITION INDICATOR

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES		

LIMIT STOP

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
17	O-RING,2-012	BUNA	1071668	1
18	O-RING,2-016	BUNA	1071671	1
19	LIMIT STOP SCREW	SS	1075058	1
20	LIMIT STOP NUT	SS	1075057	1
21	CAP, 521, LIMIT STOP	NORYL	43724	1
NORMALLY CLOSED MODEL				
22	MALE PIPE PLUGS,1/8"	HDPE	1071912	1
23	SHAFT, 521	NORYL	1077909	1
24	SCREW, 521, DIA PLT, NC	SS	1077830	1
25	WASHER, LOCK,INTERNAL,#10	SS	1078992	1
SPRING ASSIST CLOSED MODEL				
26	SPRING, COMPRESSION	SS	1075051	1
SPRING ASSIST OPEN MODEL				
27	SPRING, COMPRESSION	SS	1236766	1
POSITION INDICATOR MODEL				
28	WASHER, LOCK,INTERNAL,#10	SS	1078992	1
29	O-RING, 2-016	BUNA	1071671	1
30	O-RING, 2-106	BUNA	1071687	1
31	SHAFT, PI, 521	NORYL	1077911	1
32	PLUG, GUIDE HOUSING, 520	SS	1074971	1
33	GUIDE HOUSING, 521	SS	1075038	1
34	ROD, PI , 521	SS	1078062	1
35	SCREW, 521, DIA PLT, PI	SS	1077832	1
36	E-RING,	SS	1076200	1
37	CAP, 521, PI, LS	NORYL	43724	1

NOTE:
1. POSITION INDICATOR MODEL CANNOT BE COMBINED WITH NORMALLY CLOSED OR LIMIT STOP OPTIONS.
2. POSITION INDICATOR MODEL FURNISHED WITH SPRING ASSIST OPEN OPTION.

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 17 THRU 21	1071090 (K521-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 26	1075054 (521-SC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 27	1075055 (521-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 37	1079620 (K521-PICN)

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 17 THRU 20	1075040 (521-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF ITEM NO'S 2,5,10,16,23,24,25	1079622 (K521-RGN)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 26	1075054 (521-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 27	1075055 (521-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 36	1081790 (521-PIN)

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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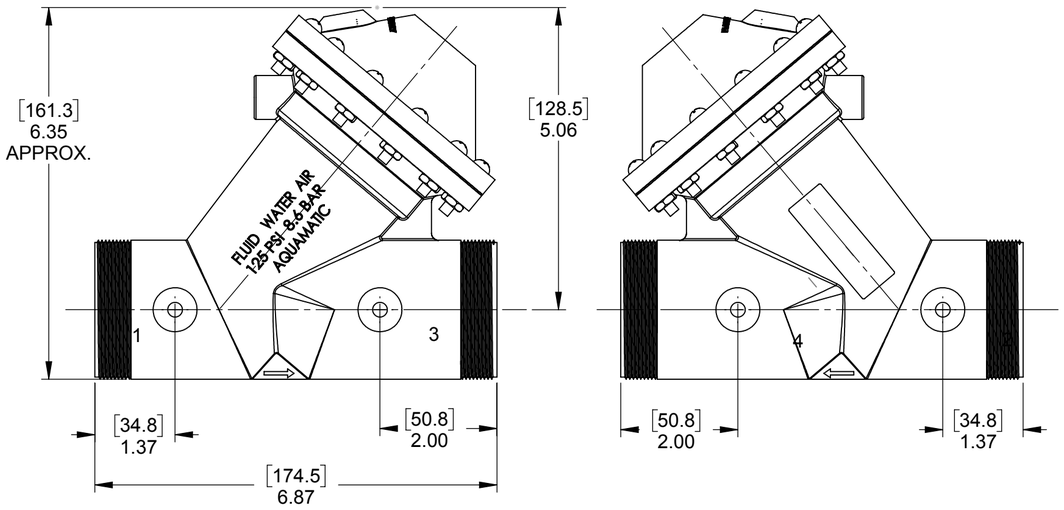
THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	02-22-13
CHECKED BY	
APPROVED	

AQ Matic

CATALOG SHEET, 521, VALVE STANDARD MODEL

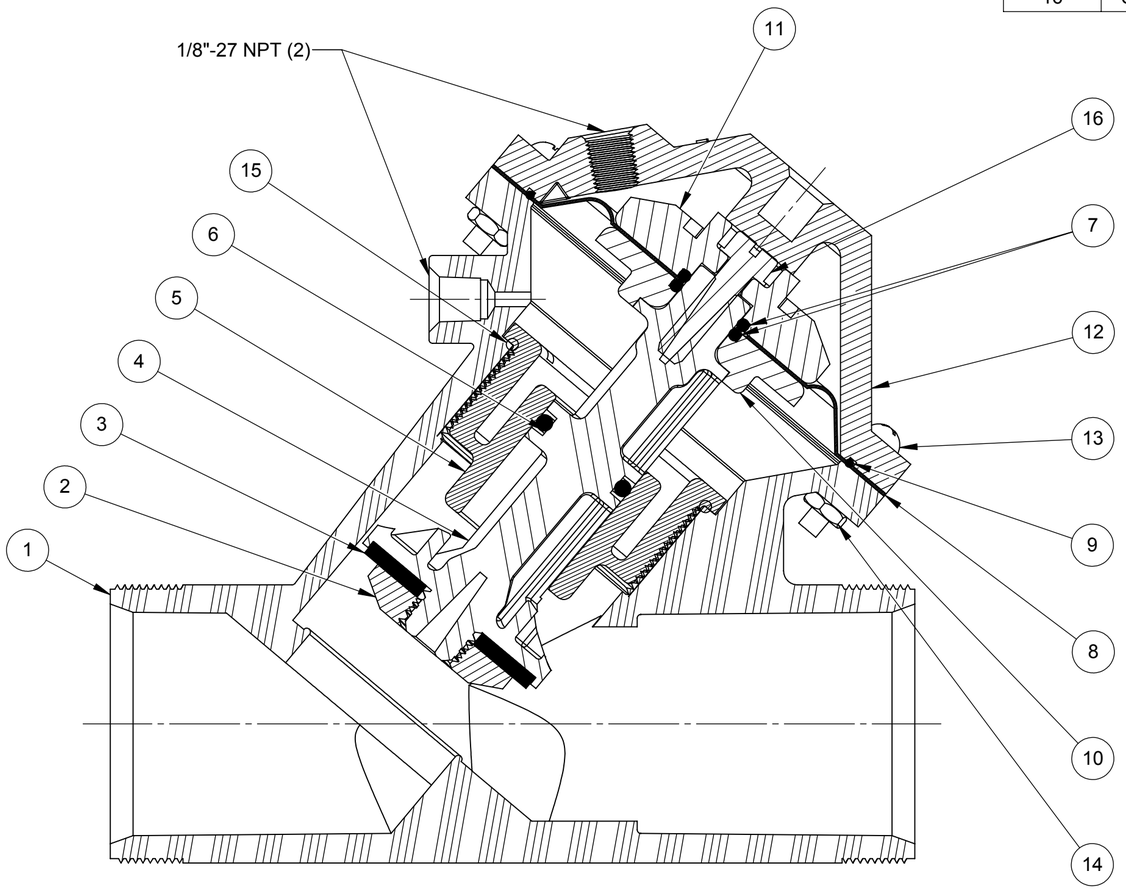
SIZE	DWG NO.	REV.
C	1077654	N
SCALE 1:2	SOLIDWORKS FORMAT	SHEET 2 OF 2



ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION & REMOVAL OF SHAFT GUIDE (ITEM #5)	1075143 (524-Z)
TO HOLD SHAFT (ITEM #4) DURING ASSEMBLY/ DISASSEMBLY	1077837

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
2	PLATE, DISC	24 IN-LB
5	GUIDE, SHAFT	80 IN-LB
13 & 14	CA P SCREW & NUT	30 IN-LB
16	SCREW, CUTTING	35 IN-LB

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
101699	J	REDRAWN IN SOLIDWORKS, DWG # NOW SAME AS FORM #	03/14/14	TJM
1001	K	AQ MATIC BRANDING UPDATE, AQ DRAWING TEMPLATE CONVERSION	01/17/17	MGS
1507	L	AQ MATIC BRANDING UPDATE, CORRECT ERRORS, ADD TORQUE TABLE	05/03/19	KJB



1070168 (K524-X200-14000)
NORMALLY OPEN (STANDARD)

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, VALVE, 524	NORYL	1075079	1
2	PLATE, DISC, 524	NORYL	1076198	1
3	DISC	EPDM	1075107	1
		BUTYL	1075108	
		FKM	1075109	
4	SHAFT, 524	NORYL	1076205	1
5	GUIDE,SHAFT,524	NORYL	1075106	1
6	O-RING, 2-210	EPDM	1071744	1
		BUTYL	1071776	
		FKM	1071815	
7	O-RING, 2-113	EPDM	1071728	2
8	DIAPHRAGM, 524	BUNA	1078393	1
		FKM	1075105	
9	O-RING, 2-043	BUNA	1071686	1
10	PLATE, DIAPHRAGM, LOWER, 524	NORYL	1076197	1
11	PLATE, DIAPHRAGM, UPPER, 524	NORYL	43041	1
12	CAP,524, VALVE	NORYL	1075086	1
13	SCREW, 10-32 X1", RND HD	SS	1072381	12
14	HEX NUT, 10-32	SS	1071648	12
15	O-RING, 2-137	EPDM	1071735	1
		BUTYL	1071771	
		FKM	1071807	
16	SCREW, CUTTING 1/4" TYPE BT	SS	1077101	1

REPAIR PARTS KITS		
DESCRIPTION	**PART NO.**	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3,6,7(2),8,9,15	1070274 (524-RAN) E.P.D.M. INCLUDES DIAPHRAGM 1075104 (524-FB)	1077592 (524-RAJN) BUTYL INCLUDES DIAPHRAGM 1075104 (524-FB)
	1070290 (524-RAVN) VITON INCLUDES DIAPHRAGM 1075104 (524-FB)	1077593 (524-RAVFVN) VITON INCLUDES DIAPHRAGM 1075105 (524-FV)
INT. PARTS KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,10,11,16	1070298 (K524-RFN)	

- SEE DRAWING 1081309 FOR UNION END CONNECTORS AND GROOVED ADAPTORS
- SEE DRAWING 1078150 FOR THREADED SOCKET WELD ENDS AND THREADED FLANGED ADAPTORS
- SEE SHEET 2 FOR CONFIGURATION OPTIONS

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2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

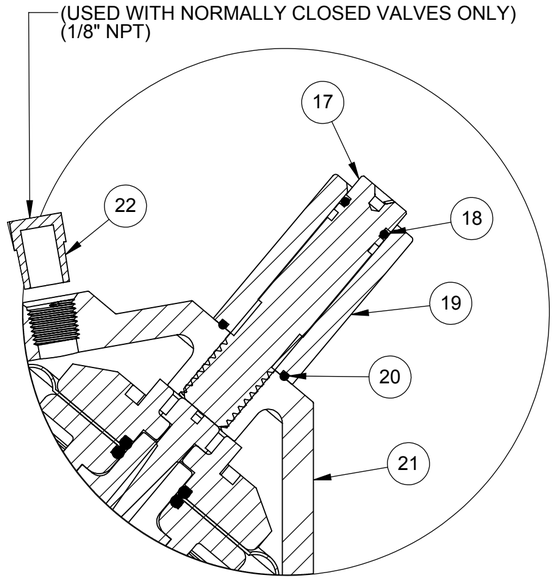
APPROVALS	DATE
DRAWN NE	02-28-13
CHECKED BY	
APPROVED	

AQ Matic

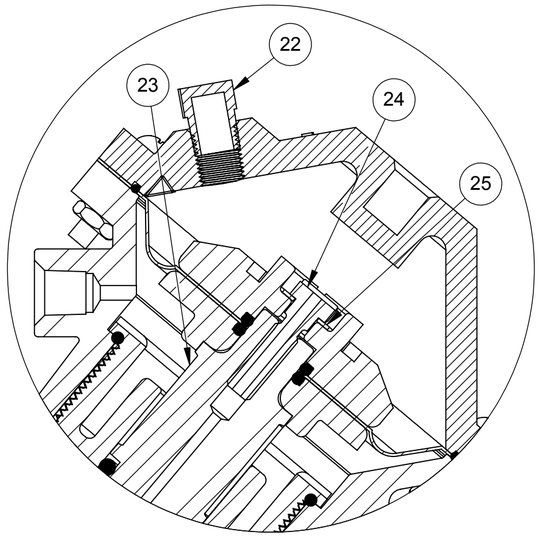
CATALOG SHEET, 524, VALVE
STANDARD MODEL

SIZE	DWG NO.	REV.
C	1077655	L
SCALE 1:2	SOLIDWORKS FORMAT	SHEET 1 OF 2

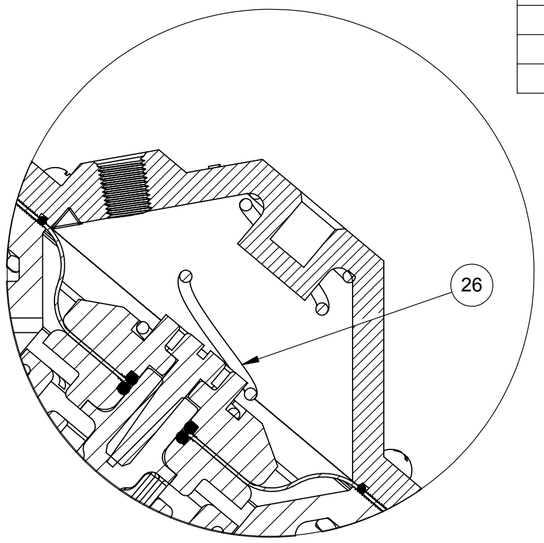
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET ONE FOR LIST OF CHANGES		



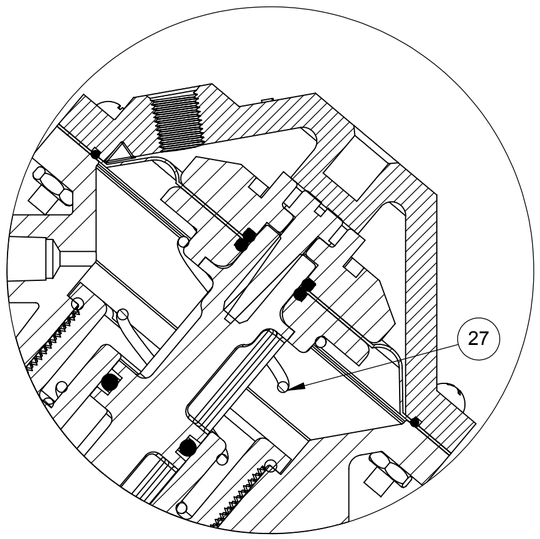
1070170 (K524-X210-14000)
LIMIT STOP



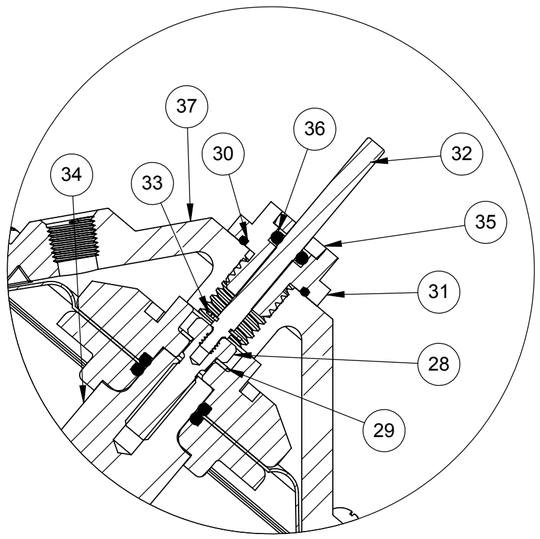
1070172 (K524-X230-14000)
NORMALLY CLOSED



1070171 (K524-X202-14000)
SPRING ASSIST CLOSED



1070169 (K524-X201-14000)
SPRING ASSIST OPEN



1071209 (K524-X221-14000)
POSITION INDICATOR

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
17	LIMIT STOP SCREW	SS	1075142	1
18	O-RING, 2-012	BUNA	1071668	1
19	LIMIT STOP NUT	SS	1075141	1
20	O-RING, 2-016	BUNA	1071719	1
21	CAP, LIMIT STOP, 524	NORYL	1075083	1
NORMALLY CLOSED MODEL				
22	MALE PIPE PLUG	HDPE	1071912	1
23	SHAFT, 524, 1/4 THD	NORYL	1076238	1
24	SHAFT, SCREW	SS	1076204	1
25	WASHER	SS	1076201	1
SPRING ASSIST CLOSED MODEL				
26	SPRING, COMPRESSION	SS	1267398	1
SPRING ASSIST OPEN MODEL				
27	SPRING, COMPRESSION	SS	1078692	1
POSITION INDICATOR MODEL				
28	SHAFT, SCREW	SS	1076203	1
29	WASHER	SS	1076201	1
30	O-RING, 2-016	BUNA	1071671	1
31	GUIDE HOUSING	SS	1075038	1
32	ROD, POS. INDICATOR, 524	SS	1076199	1
33	E-RING, RETAINING	SS	1076200	1
34	SHAFT, POS INDICATOR, 524	NORYL	1076239	1
35	PLUG, GUIDE HOUSING, 520	SS	1074971	1
36	O-RING, 2-106	BUNA	1071687	1
37	CAP, LIMIT STOP, 524	NORYL	1075083	1

NOTE:
1. POSITION INDICATOR MODEL CANNOT BE COMBINED WITH NORMALLY CLOSED OR LIMIT STOP OPTIONS.
2. POSITION INDICATOR MODEL FURNISHED WITH SPRING ASSIST OPEN OPTION.

- SEE DRAWING 1081309 FOR UNION END CONNECTORS AND GROOVED ADAPTORS
- SEE FORM 1078150 FOR THREADED SOCKET WELD ENDS AND THREADED FLANGED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 9, 17 THRU 21	1071161 (K524-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 26	1075124 (524-SC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 27	1075125 (524-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 37	1079643 (524-PICN)

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 17 THRU 20	1075111 (524-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF ITEM NO'S 2, 5,10,11,23,24,25	1076307 (K524-RGN)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 26	1075124 (524-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 27	1075125 (524-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 36	1077591 (524-PIN)

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3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN NE	02-28-13
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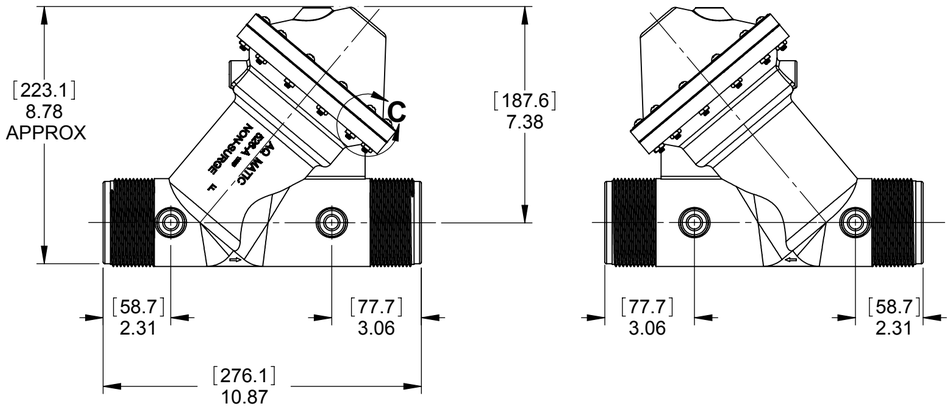
APPROVED	

AQ-Matic

CATALOG SHEET, 524, VALVE
STANDARD MODEL

SIZE	DWG NO.	REV.
C	1077655	L

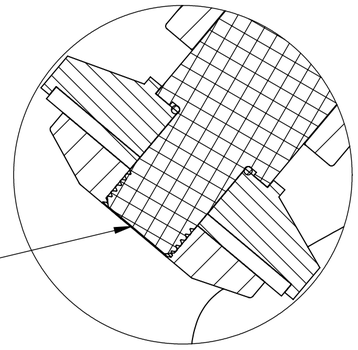
SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 2



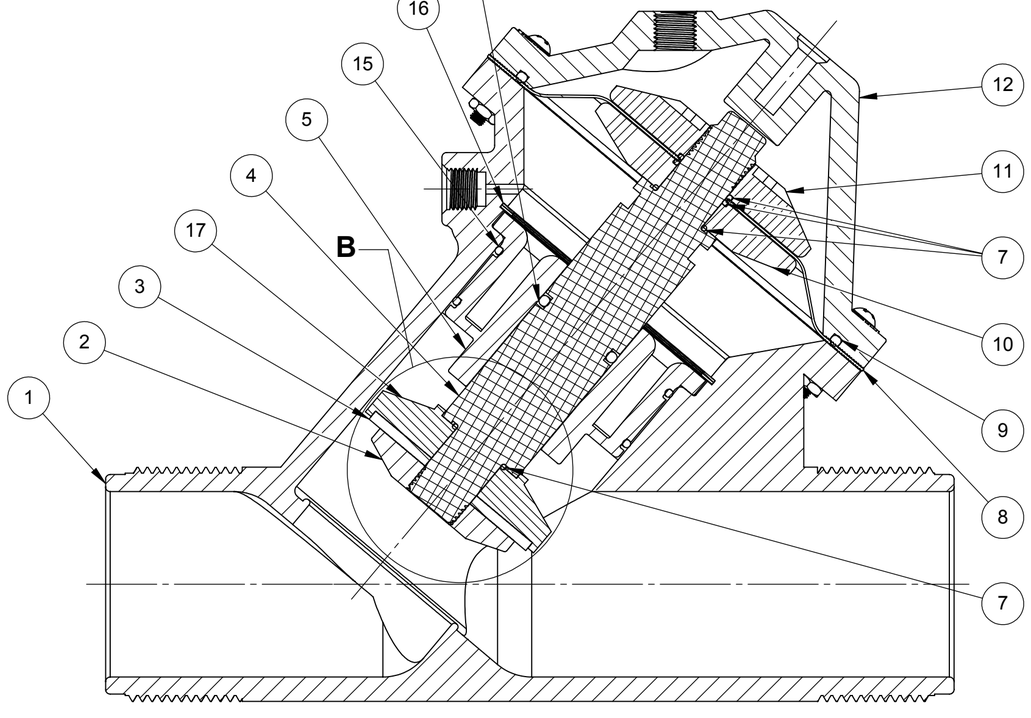
ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION & REMOVAL OF SHAFT (ITEM #4) (TOOL NOT SHOWN)	1077837
FOR INSTALLATION & REMOVAL OF UPPER DIAPHRAGM PLATE (ITEM #11) (TOOL NOT SHOWN)	1075224 (526-Z)

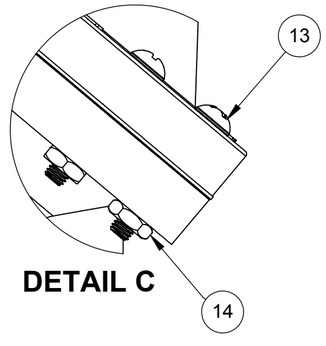
TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
2	PLATE, DISC	22.5 IN-LB
11	UPR. DIA. PLATE	40 IN-LB
13 & 14	CA P SCREW & NUT	32.5 IN-LB

DISC NUT/SHAFT TO BE FLUSH
AFTER COMPONENTS ARE TIGHTENED
TO 20-25 IN-LB [2.3-2.8 Nm]



DETAIL B





DETAIL C

1070180 (K526-X200-14000)
NORMALLY OPEN (STANDARD)

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
100401	L	1- WAS: 1075174,-NOW:43051 2-REM'D:1075172 NORYL SHAFT	03/30/12	TJM
101856	M	1-WAS 1071746- NOW: 1010140	03/19/13	TJM
103884	N	ITEM # 31- WAS 1074970, 2- UPDATED TITLE BLOCK	10/16/14	TJM
1001	O	AQ TEMPLATE UPDATE & VERIFIED PART NUMBERS	01/17/17	MGS
1507	P	REMOVE BR FROM DRW NUMBER, CORRECT MINOR ERRORS, ADD TORQUE TABLE	05/14/19	KJB

ITEM NO.	DESCRIPTION		PART NO.	QTY.
1	BODY, 526	NORYL	1075162	1
2	DISC PLATE	NORYL	1075176	1
3	DISC	E.P.D.M.	1075181	1
		BUTYL	1075182	
		FKM	1075183	
4	SHAFT	PVC	43119	1
5	SHAFT GUIDE	NORYL	1075178	1
6	O-RING, 2-214	E.P.D.M.	1010140	1
		BUTYL	1071778	
		FKM	1071817	
7	O-RING, 2-018	E.P.D.M.	1071673	4
		BUTYL	1071762	
		FKM	1071790	
8	DIAPHRAGM	BUNA	1075177	1
9	O-RING, 2-251	BUNA	1071713	1
10	LWR DIA. PLATE	NORYL	43051	1
11	UPR DIA. PLATE	NORYL	43050	1
12	CAP, 526	NORYL	1075167	1
13	SCREW, 10-32 x1 1/4", RND HD	SS	1072382	12
14	HEX NUT	SS	1071648	12
15	O-RING, 2-148	E.P.D.M	1071738	2
		BUTYL	1071773	
		FKM	1071810	
16	RETAINING RING	SS	1075180	1
17	DISC HOLDER	PVC	1075197	1

REPAIR PARTS KITS		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3,6,7(4),8,9,15(2)	1070275 (526-RA) EPDM INCLUDES DIAPHRAGM 1075177 (526-FB)	1070283 (526-RAJ) BUTYL INCLUDES DIAPHRAGM 1075177 (526-FB)
	1070291 (526-RAV) FKM INCLUDES DIAPHRAGM 1075177 (526-FB)	
INT. PARTS KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,10,11,17	1070299 (K526-RF)	

- SEE DRAWING 1081309 FOR THREADED SOCKET WELD ENDS AND THREADED FLANGED ADAPTORS
- SEE SHEET 2 FOR CONFIGURATION OPTIONS

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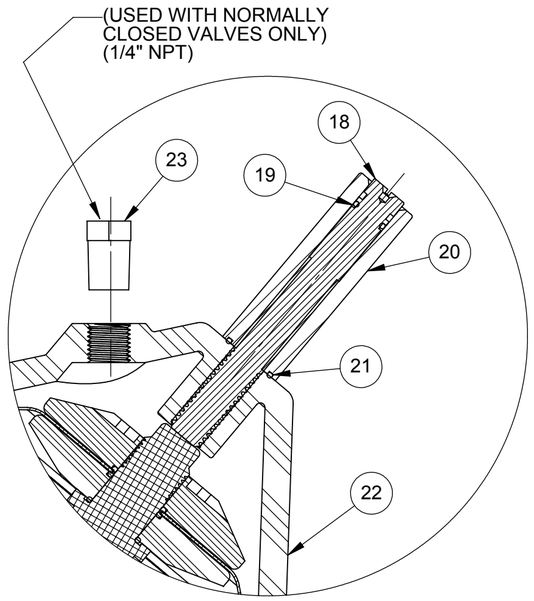
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

AQ Matic

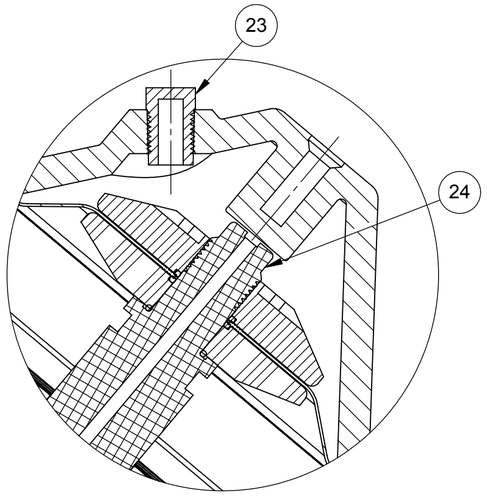
CATALOG SHEET, 526, VALVE
STANDARD MODEL

SIZE	DWG NO.	REV.
C	1077656	P
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 1 OF 2

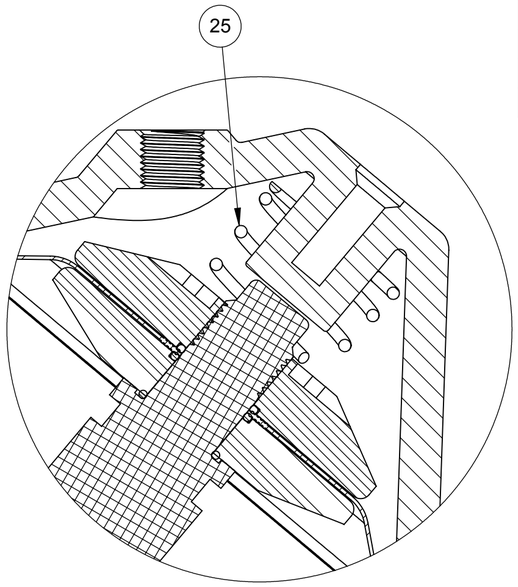
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR LIST OF CHANGES		



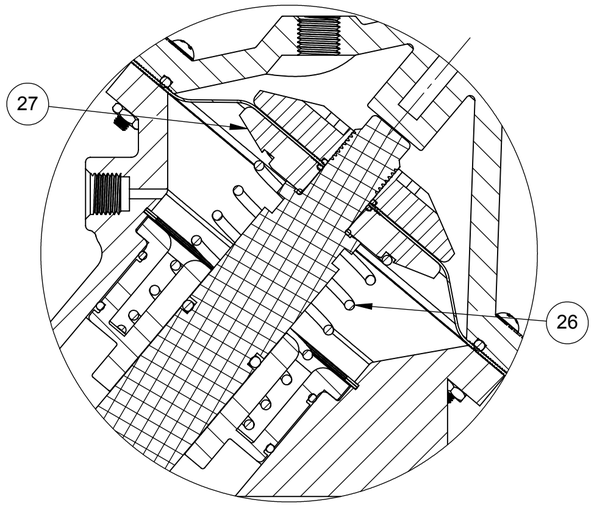
1070181 (K526-X210-14000)
LIMIT STOP



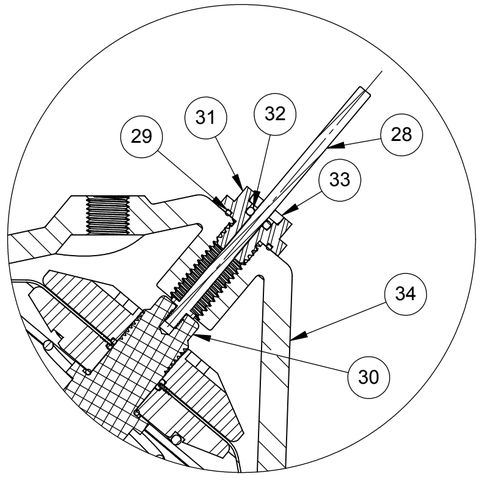
1071256 (K526-X230-14000)
NORMALLY CLOSED



1071246 (K526-X202-14000)
SPRING ASSIST CLOSED



1071242 (K526-X201-14000)
SPRING ASSIST OPEN



1071255 (K526-X221-14000)
POSITION INDICATOR

LIMIT STOP MODEL				
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
18	LIMIT STOP SCREW	SS	1075223	1
19	O-RING, 2-012	BUNA	1071668	1
20	LIMIT STOP NUT, SS	SS	1075222	1
21	O-RING, 2-016	BUNA	1071671	1
22	CAP, LIMIT STOP	NORYL	1075165	1
NORMALLY CLOSED MODEL				
23	MALE PIPE PLUGS	HDPE	1071913	1
24	SHAFT, VALVE, 526, NC	PVC	43143	1
SPRING ASSIST CLOSED MODEL				
25	SPRING, CONICAL	SS	1075202	1
SPRING ASSIST OPEN MODEL				
26	SPRING, COMPRESSION	SS	1267399	1
27	PLATE, DIAPHRAGM, 526, SA, LOWER	NORYL	1075175	1
POSITION INDICATOR MODEL				
28	ROD, PI, 526	SS	1075184	1
29	O-RING, 2-016	BUNA	1071671	1
30	SHAFT, VALVE, 526, PI	PVC	43142	1
31	GUIDE HOUSING,	SS	1075038	1
32	O-RING, 2-106, BUNA	BUNA	1071687	1
33	PLUG, GUIDE HOUSING, 520	SS	1074971	1
34	CAP, LIMIT STOP	NORYL	1075165	1

NOTES:

1. POSITION INDICATOR MODEL CANNOT BE COMBINED WITH NORMALLY CLOSED OR LIMIT STOP OPTIONS.
2. POSITION INDICATOR MODEL FURNISHED WITH SPRING ASSIST OPEN OPTION.

- SEE DRAWING 1081309 FOR THREADED SOCKET WELD ENDS AND THREADED FLANGED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

CONVERSION KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 18 THRU 22	1071225 (526-LSC)
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 25	1075200 (526-SC)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO'S 26 & 27	1071227 (526-SO)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 34	1079674 (K526-PIC)

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF NO'S 18 THRU 21	1075191 (526-LS)
INT. PARTS KIT (NORM. CLOSED) CONSISTS OF ITEM NO'S 2,5,10,11,17, 24	1071226 (K526-RG)
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 25	1075200 (526-SC)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO'S 26 & 27	1071227 (526-SO)
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 28 THRU 33	1081804 (526-PI)

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT, PART, OR ASSEMBLY DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH THE EU (EUROPEAN UNION) DIRECTIVE: RoHS DIRECTIVE 2011/65/EC,

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN	
CHECKED BY	
APPROVED	

AQMatic

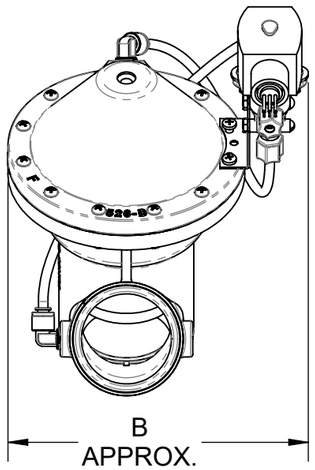
CATALOG SHEET, 526, VALVE
STANDARD MODEL

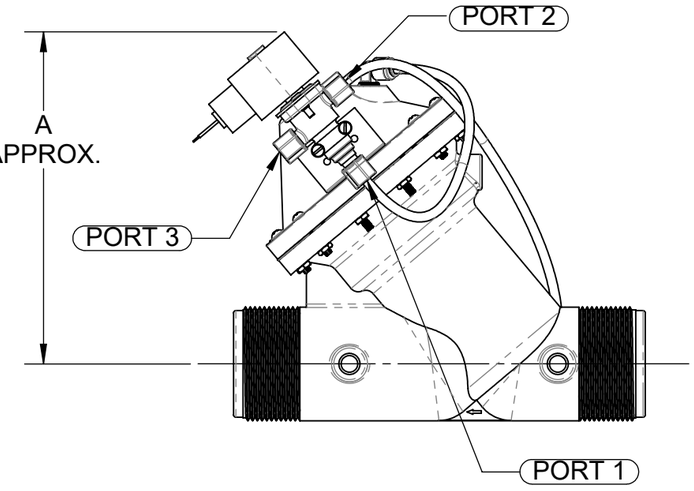
SIZE	DWG NO.	REV.
C	1077656	P
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 2 OF 2

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	
1	1	-	DIAPHRAGM VALVE - NORMALLY OPEN	
2	1	1075637	SOLENOID, ASCO	110V.60Hz.
		1075638	SOLENOID, ASCO	220V.50Hz.
		1075639	SOLENOID, ASCO	24V.60Hz.
		4510604	SOLENOID, ASCO, 24 VDC, N.O.	E.O.
		4510605	SOLENOID, ASCO, 24 VDC, N.C.	E.C.
3	1	1074783	BRACKET, SOLENOID MOUNTING	
4	2	1072377	SCREW, RD HD, 8-32 X 1/4	
5	3	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	
6	2	1078770	90° ELBOW, 1/4"NPT X 1/4T, PLS	526
		1071937	FITTING, ELBOW, 1/8NPT X 1/4T	520-524
7	N/A	1071936	TUBING, POLY 1/4" O.D. X .035	
8	2	3003551	SCREW, 10-32 X 1 1/2" SS	526
9	2	1071646	NUT, HEX, 8-32	

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
100876	C	REDRAWN IN SOLIDWORKS ADD DRY DRAIN VIEW	07/09/12	TJM
1092	D	AQ-MATIC REVIEW AND CORRECTIONS IMPLEMENTED	06/15/17	JJ
1507	E	CORRECT MINOR ERRORS	05/20/19	KJB
1789	F	ADDED P/N 4510604 & 4510605	10/22/20	PMJ
1820	G	VIEWS FOR EO & EODD RELINKED TO CORRECT MODEL	1/15/21	PMJ

NOTE:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
3. BOSS NO. 1 ON VALVE TAPPED 1/8" N.P.T. (520,521, 524) 1/4" N.P.T.(526)
4. SEE PAGE 2 FOR DRY DRAIN OPTION.
5. E.C. STANDS FOR ENERGIZED TO CLOSE, E.O. STANDS FOR ENERGIZED TO OPEN.



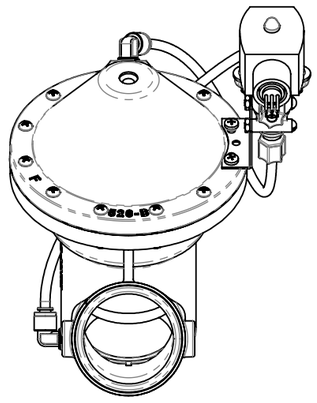


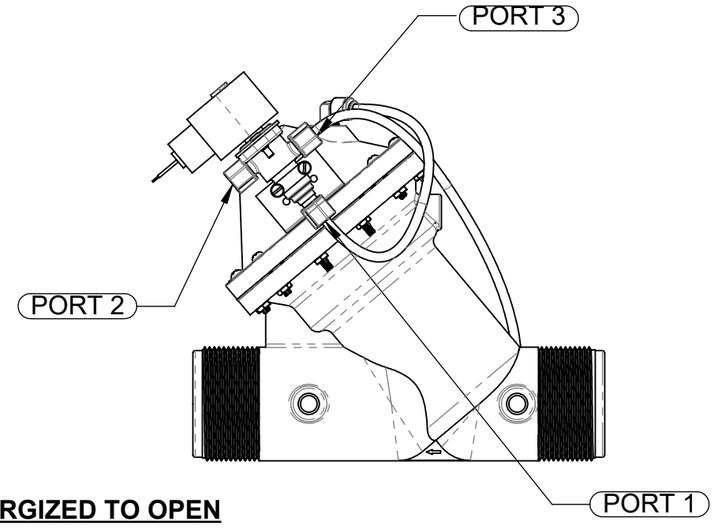
ENERGIZED TO CLOSE

SOLENOID ENERGIZED.
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED.
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

VALVE SERIES	PIPE SIZE	A	B
520	3/8",1/2"	5.87 / 149.1	4.12 / 104.6
521	3/4",1"	6.52 / 165.6	5.12 / 130.0
524	1-1/2",2"	7.62 / 193.5	6.25 / 158.75
526	2-1/2", 3"	9.62 / 244.3	7.87 / 200.0





ENERGIZED TO OPEN

SOLENOID DE-ENERGIZED.
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM

SOLENOID ENERGIZED.
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

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3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN	
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION
CATALOG SHEET, K520 - K526
SOLENOID OPERATED VALVES

SIZE	DWG NO.	REV.
B	1081312	G
SCALE 1:4	SOLIDWORKS FORMAT	SHEET 1 OF 3

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	
1	1	-	DIAPHRAGM VALVE - NORMALLY OPEN	
2	1	1075637	SOLENOID, ASCO, 120/60 VAC	110V.60Hz.
		1075638	SOLENOID, ASCO, 220/50 VAC	220V.50Hz.
		1075639	SOLENOID, ASCO, 24/60 VAC	24V.60Hz.
		4510604	SOLENOID, ASCO, 24 VDC, N.O.	E.O.
		4510605	SOLENOID, ASCO, 24 VDC, N.C.	E.C.
3	1	1074783	BRACKET, SOLENOID MOUNTING	
4	2	1072377	SCREW, RD HD, 8-32 X 1/4	
5	3	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	
6	3	1071937	FITTING, ELBOW, 1/8NPT X 1/4T	520-524
		1078770	FITTING, ELBOW, 1/4NPT X 1/4T	526
7	1	1071936	TUBING, POLY 1/4" O.D. X .035	
8	2	3003551	SCREW, 10-32 X 1 1/2" SS	
9	2	1071646	NUT, HEX, 8-32	

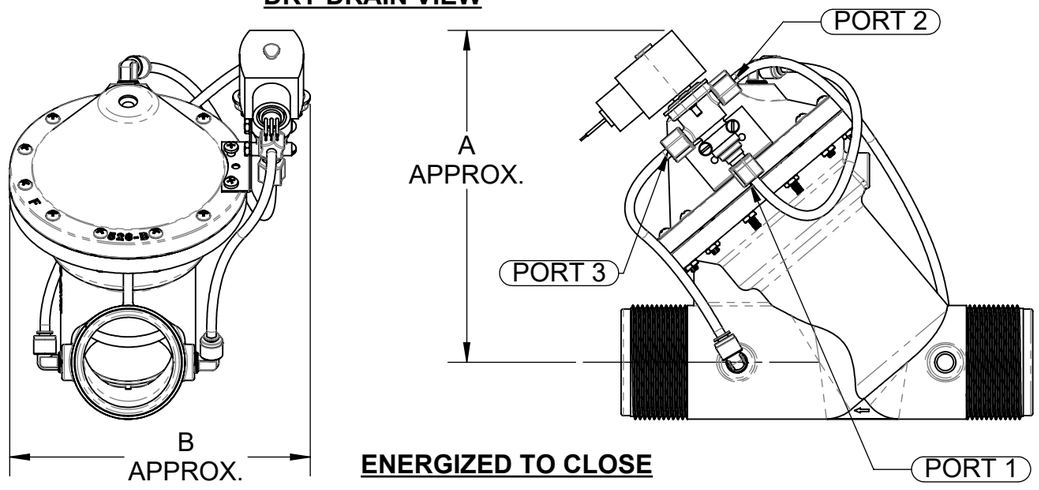
REVISIONS

ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES.		

DRY DRAIN OPTION

NOTE:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
3. BOSS NO. 1 AND NO. 4 ON VALVE TAPPED 1/8" N.P.T. (520,521, 524) 1/4" N.P.T.(526)
4. E.C. STANDS FOR ENERGIZED TO CLOSE, E.O. STANDS FOR ENERGIZED TO OPEN.

DRY DRAIN VIEW



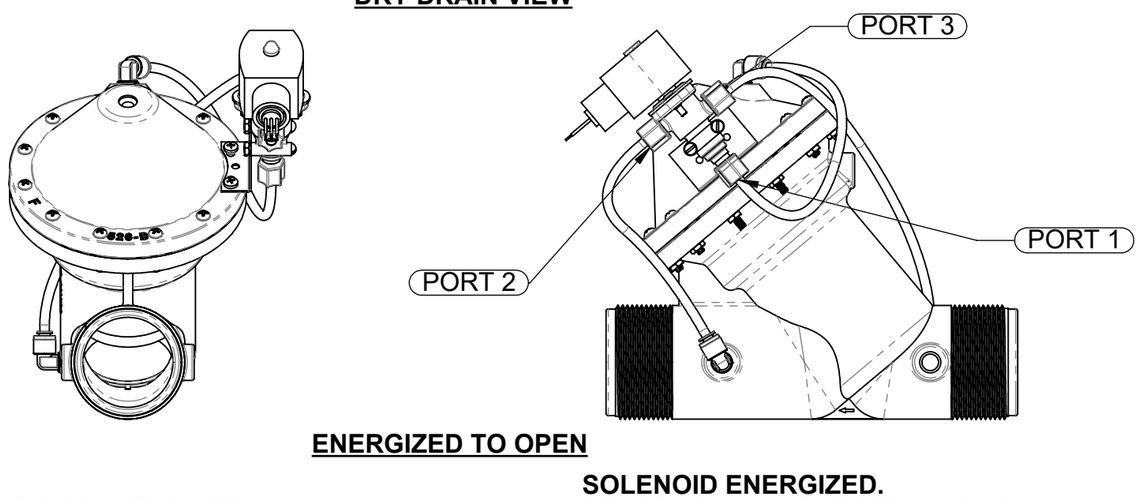
ENERGIZED TO CLOSE

SOLENOID ENERGIZED.
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED.
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 3 TO DRAIN. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

VALVE SERIES	PIPE SIZE	A	B
520	3/8",1/2"	5.87 / 149.1	4.12 / 104.6
521	3/4",1"	6.52 / 165.6	5.12 / 130.0
524	1-1/2",2"	7.62 / 193.5	6.25 / 158.75
526	2-1/2", 3"	9.62 / 244.3	7.87 / 200.0

DRY DRAIN VIEW



ENERGIZED TO OPEN

SOLENOID DE-ENERGIZED.
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE DIAPHRAGM VALVE.

SOLENOID ENERGIZED.
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 2 TO DRAIN. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

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THIRD ANGLE PROJECTION

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AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION
CATALOG SHEET, K520 - K526
SOLENOID OPERATED VALVES

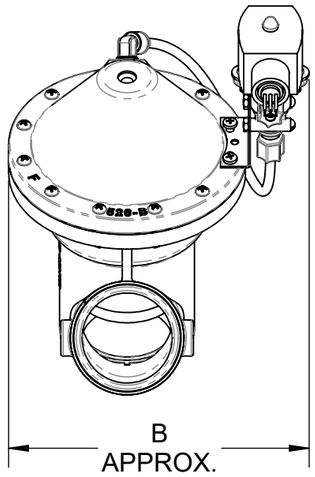
SIZE	DWG NO.	REV.
B		G

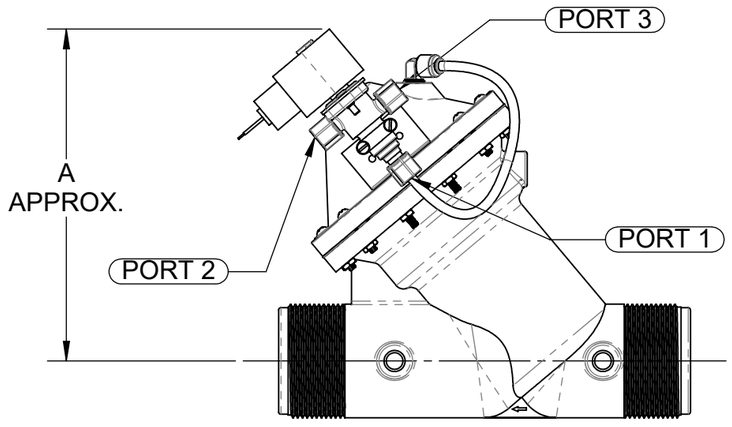
SCALE	SOLIDWORKS FORMAT	SHEET 2 OF 3
1:4		

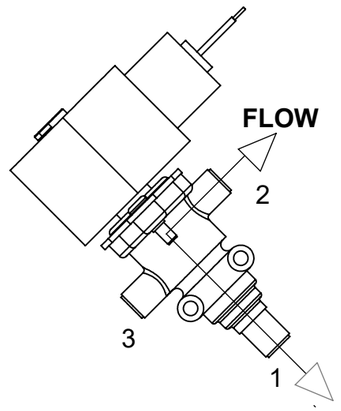
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	
1	1	-"-	DIAPHRAGM VALVE - NORMALLY OPEN	
2	1	1075637	SOLENOID, ASCO, 120/60 VAC	110V.60Hz.
		1075638	SOLENOID, ASCO, 220/50 VAC	220V.50Hz.
		1075639	SOLENOID, ASCO, 24/60 VAC	24V.60Hz.
3	1	1074783	BRACKET, SOLENOID MOUNTING	
4	2	1072377	SCREW, RD HD, 8-32 X 1/4	
5	3	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	
6	1	1071937	FITTING, ELBOW, 1/8NPT X 1/4T	520-524
		1078770	FITTING, ELBOW, 1/4NPT X 1/4T	526
8	2	3003551	SCREW, 10-32 X 1 1/2" SS	
8	2	1071646	NUT, HEX, 8-32	
12	1	1071936	TUBING, POLY 1/4" O.D. X .035	

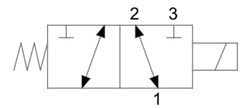
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES.		

NOTE:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN.

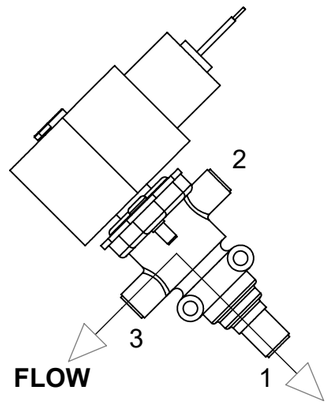


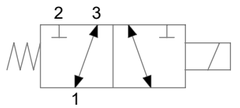






SOLENOID ENERGIZED





SOLENOID DE-ENERGIZED

CURRENT DRAIN (AMPERES)		
VOLTAGE	INRUSH	HOLDING
24V 60Hz	1.66	1.04
120V 60Hz	0.33	0.21
220V 50Hz	0.18	0.11

INDEPENDENT CONTROL PRESSURE

ENERGIZE TO OPEN
APPLY CONTROL PRESSURE AT SOLENOID PORT NO. 3 (PORT NO. 2 VENTED)

ENERGIZE TO CLOSE
APPLY CONTROL PRESSURE AT SOLENOID PORT NO. 2 (PORT NO. 3 VENTED)

CONTROL PRESSURE MUST BE EQUAL TO OR GREATER THAN LINE PRESSURE.

VALVE SERIES	PIPE SIZE	A	B
520	3/8",1/2"	5.87 / 149.1	4.12 / 104.6
521	3/4", 1"	6.52 / 165.6	5.12 / 130.0
524	1-1/2", 2"	7.62 / 193.5	6.25 / 158.75
526	2-1/2", 3"	9.62 / 244.3	7.87 / 200.00

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AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION
CATALOG SHEET, K520 - K526
SOLENOID OPERATED VALVES

SIZE	DWG NO.	REV.
B	1081312	G

SCALE	SOLIDWORKS FORMAT	SHEET 3 OF 3
1:4		

AQUAMATIC® K55 SERIES
COMPOSITE CONTROL VALVES

CONSTRUCTED OF CORROSION-RESISTANT MATERIALS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

The unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

All components can be serviced while the valve is in-line

Separate flow and control chambers permit positive closing without springs

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators

All internal parts in contact with media are made of composite materials

Seals are ethylene propylene for better chemical resistance*

K55 Series Valves are available in sizes from 1/2"- 2"

A variety of available end connectors make the valve compatible for 3/8"-3" pipe sizes

Adaptable to a wide variety of control devices

Isolated bonnet

Assures no cross connection between line & control fluid

OPTIONS

Normally open [standard]

Limit stop for flow control

Seal and diaphragm materials for special applications

Union End Connectors - Female socket weld connectors for easy installation and the ability to remove the valve without disrupting the service piping

Failsafe spring closed 30, 60, and 100 PSI

TYPICAL APPLICATIONS

Chemical Injection

Deionizers

Fertilizer Spray Equipment

Metal Recovery Systems

Mining Wastes

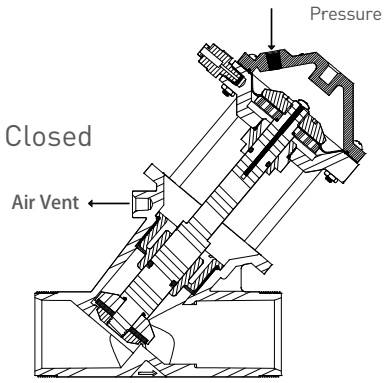
Process Water Systems

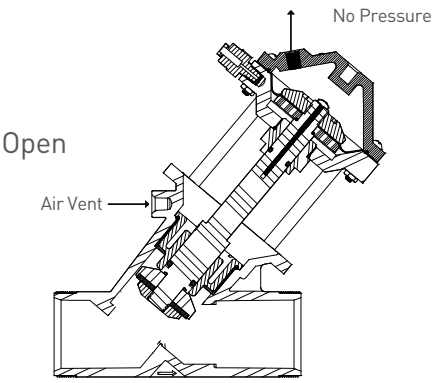
Water Treatment Systems

* Valves are NOT recommended for use with any aromatic, hydrocarbon-based media.

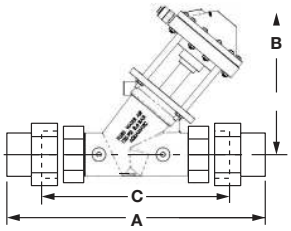
DIMENSIONS

MODEL #	PIPE SIZE	DIMENSIONS (APPROXIMATE)					
		A	B	C	D	E	F
K5520	1/2"	7" (177.8 mm)	3.94" (100.1 mm)	4.87" (123.7 mm)	–	–	–
K5521	1"	9" (228.6 mm)	5.58" (141.7 mm)	6.31" (160.3 mm)	–	–	–
K5524	1-1/2"	12.5" (317.5 mm)	7.94" (201.7 mm)	9.31" (135.0 mm)	–	–	–
K5524	2"	10.50" (266.7 mm)	7.94" (201.7 mm)	–	–	–	–
K5524	2"	10.5" (266.7 mm)	7.94" (201.7 mm)	–	–	–	–
K5520	1/2"	7" (177.8 mm)	3.94" (100.1 mm)	3.93" (99.8 mm)	–	–	–
K5521	1"	9" (228.6 mm)	5.58" (141.7 mm)	4.50" (114.3 mm)	–	–	–
K5524	1-1/2"	12.5" (336.5 mm)	7.94" (201.7 mm)	7.75" (196.8 mm)	–	–	–
K5524	2"	9" (226.6 mm)	7.94" (201.7 mm)	6.00" (152.4 mm)	.75" (19.05 mm)	4.75" (120.85 mm)	.688" (17.48 mm)

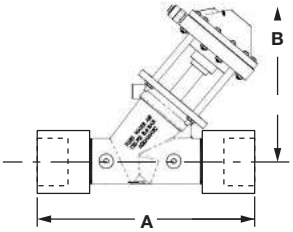




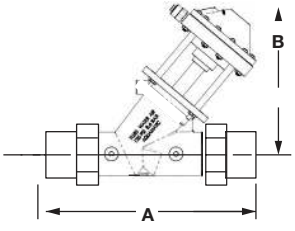
Union End Connectors



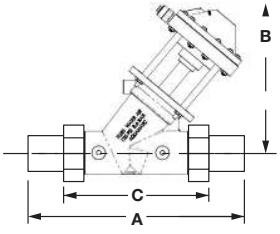
Female Socket Weld End Connectors



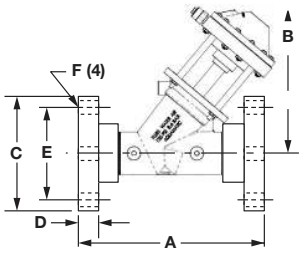
Male Socket Weld End Connectors



Grooved Adaptor Connectors



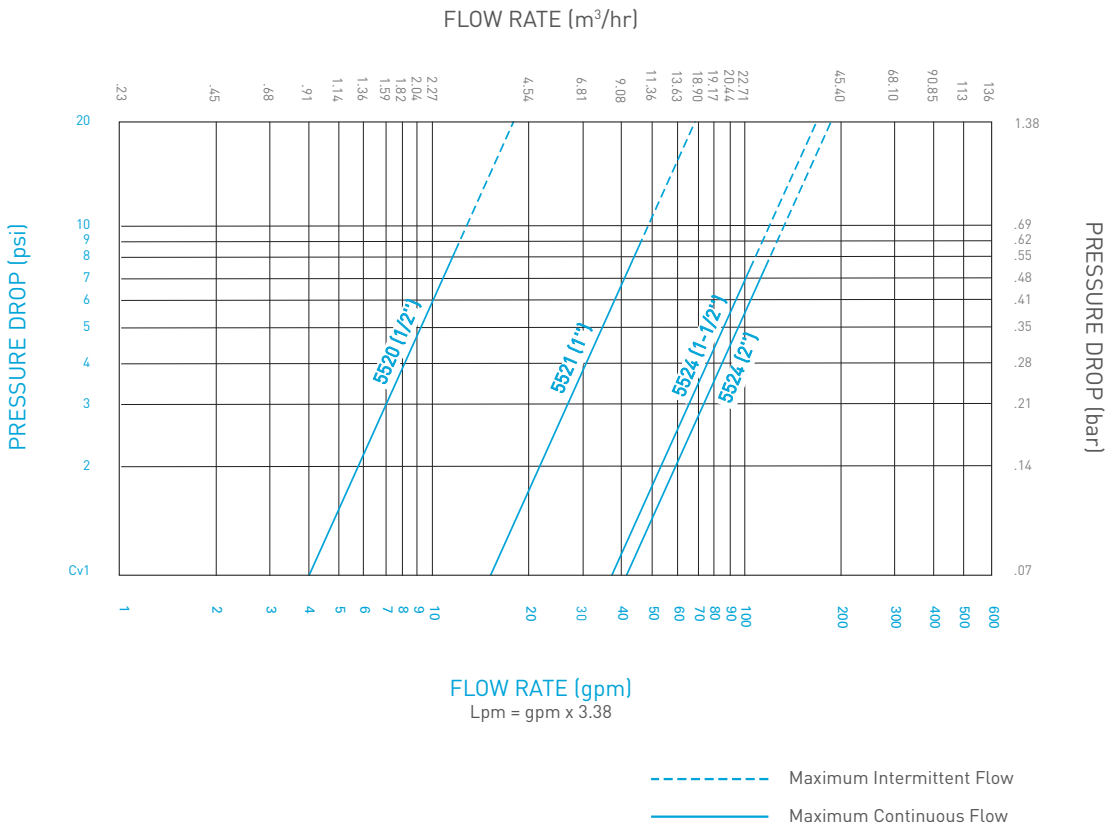
Flanged Socket Weld End Connectors



OPERATING SPECIFICATIONS

Max Pressure	125 psi (8.6 bar)
Max Temperature	140°F (60°C)

PERFORMANCE DATA



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P: 262–326–0100 | www.aq–matic.com | techsupport@aq–matic.com

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20160916 REV A SE2016

K55 SERIES ISOLATED BONNET DIAPHRAGM VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** K 5 5 _ - X 2 _ _ - 4 0 0 0

BODY SIZE (std)
0 = 1/2"
1 = 1"
4 = 1-1/2"

END CONNECTIONS (X std)
X = None

BODY & CAP MATERIAL (2 std)
2 = Noryl

VALVE OPTIONS (00 std)

00 = NO	04 = Spring Closed 60#	14 = LS, Spring Closed 60#
03 = Spring Closed 30#	05 = Spring Closed 100#	15 = LS, Spring Closed 100#
	10 = NO, LS	SX = Special Valve **

SEAL MATERIALS (1 std)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEALS	STATIC SEALS	KIT SERIES	TYPICAL USE
1	Buna-N	EP	EP	EP	RAE	Water
5	Buna-N	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAV	Acid
6	Buna-N	Butyl	Butyl	Butyl	RAJ	Caustic

INTERNAL PARTS (4 std)
4 = Noryl/PVC (140°F (60°C) Valve Rating)

DRILL & TAP BOSSES (0 std)
0 = None

SOLENOID OPTIONS (0 std)
0 = None

SOLENOID FEATURES (0 std)
0 = None

* To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a Normally Open 2" Plastic Valve Model K5524 with a Spring Assist Closed Option is designated as a K554-X202-14000.

** A special valve will have a custom drawing number (_ _ _ _ _ _ _)
and the item number format is (K55?-X2SX-_ _ _ _ _)
where the last 5 numbers (Far Right) are the last five digits of the drawing number.

REV.	ECO NO.	DESCRIPTION	BY/DATE
E	100997	Removed -02 & -12 valve options	TJM 8-Aug-12

42985

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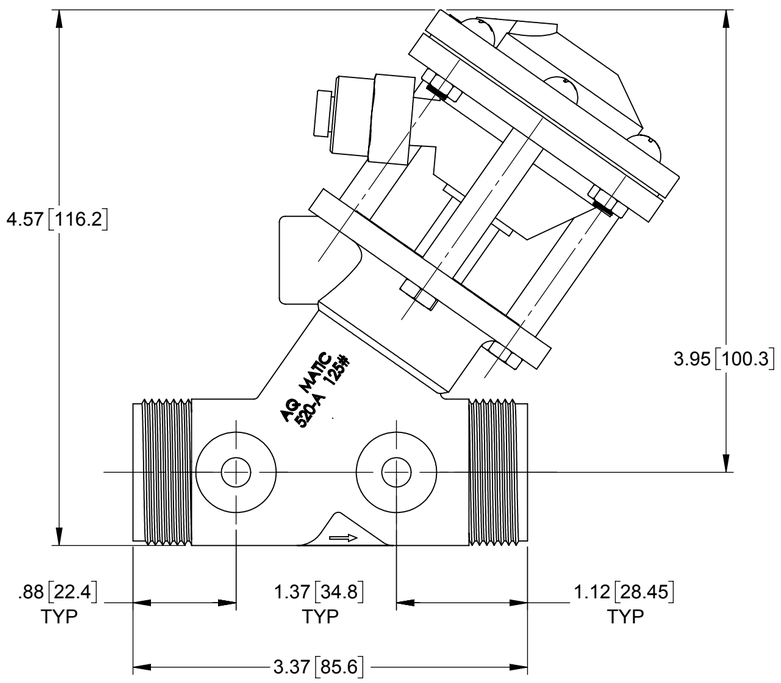
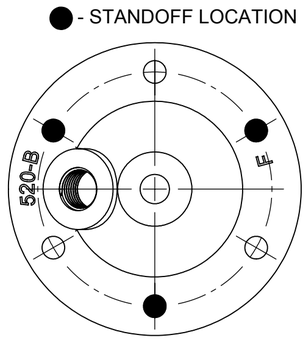
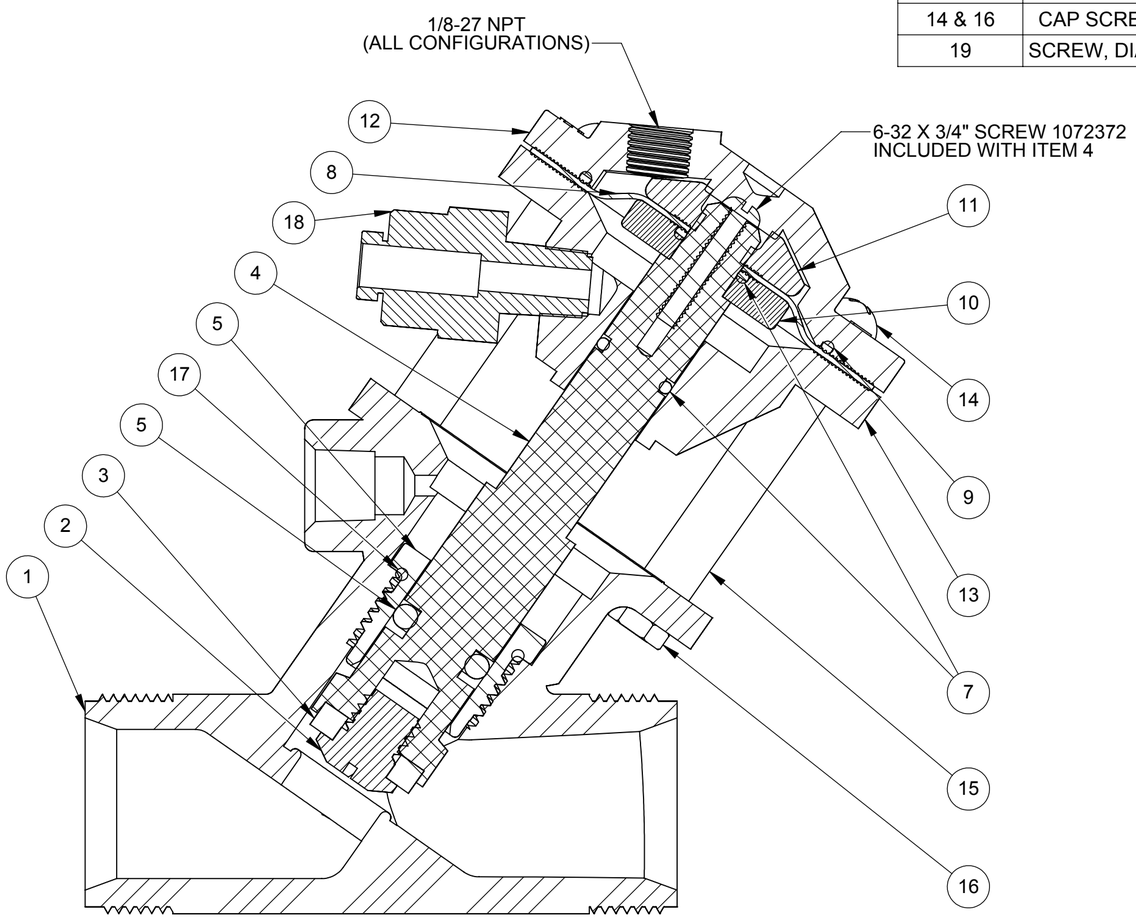
42985 REV E





ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALLATION AND REMOVAL OF SHAFT GUIDE & DIAPHRAGM PLATE (TOOL NOT SHOWN)	1074989

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
2	SCREW, PLATE, DISC	8 IN-LB
5	GUIDE, SHAFT	32 IN-LB
14 & 16	CAP SCREW & NUT	30 IN-LB
19	SCREW, DIAPHRAGM	20 IN-LB



1071402 (K550-X200-1400)
NORMALLY OPEN (STANDARD)

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
102124	J	REDRAWN IN SOLIDWORKS,FORM # NOW DWG #, WAS-1084013	06/25/13	TJM
1001	K	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/17/17	MGS
1431	L	VERIFIED PART NUMBERS BOM	02/19/19	TRK
1585	M	LOGO UPDATE, REMOVE BR FROM DRW #, FIX MINOR ERRORS, ADD TORQUE TABLE	11/14/19	KJB

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, 520, VALVE	NORYL	1074943	1
2	SCREW, DISC, PLATE, 520	NORYL	1077903	1
3	DISC	EPDM	1074966	1
		BUTYL	1074967	
		FKM	1074968	
4	SHAFT, K5520	PVC	1075335	1
5	GUIDE, SHAFT, 520	NORYL	1074964	1
6	O-RING, 2-204	EPDM	1071740	1
		BUTYL	1071774	
		FKM	1071812	
7	O-RING, 2-012	BUNA	1071688	2
8	DIAPHRAGM, 520	BUNA	1074962	1
9	O-RING, 2-030	EPDM	3015801	1
10	PLATE, DIAPHRAGM, LWR, 520	PVC	1075339	1
11	PLATE, DIAPHRAGM, UPR, 520	NORYL	1074958	1
12	CAP, VALVE, 520	NORYL	1074948	1
13	BOTTOM CAP, 520	PVC	1075334	1
14	SCREW, 10-32 X 5/8",RND HD	SS	1072379	6
15	STANDOFF	SS	1075338	3
16	HEX NUT, 10-32	SS	1071647	6
17	O-RING, -018	EPDM	1071720	1
		BUTYL	1071762	
		FKM	1071790	
18	CONNECTOR, 1/8 MNPT X 1/4T, PLS	ACETAL	1078767	1

REPAIR PARTS KITS			
DESCRIPTION	**PART NO.**		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 6, 7, 8, 9, 17	1075341 (5520-RAE) EPDM INCLUDES DIAPHRAGM 1074962	1075342 (5520-RAJ) BUTYL INCLUDES DIAPHRAGM 1074962	1075343 (5520-RAV) FKM INCLUDES DIAPHRAGM 1074962
INTERNAL PARTS KIT (NORMALLY OPEN) CONSISTS OF ITEM NO'S 2, 4, 5, 10, 11	1071432 (K5520-RF)		

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 2 FOR CONFIGURATION OPTIONS

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UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN MWL	06/25/13
CHECKED BY	
APPROVED	

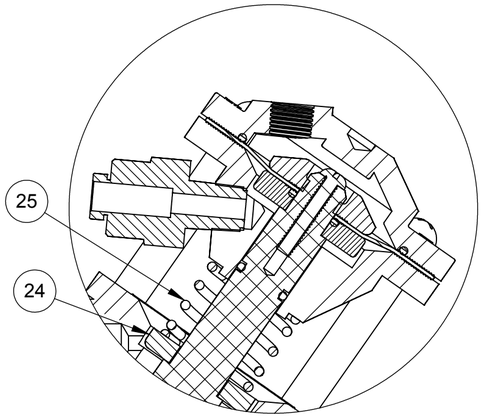
AQ Matic

CATALOG SHEET, 5520, VALVE

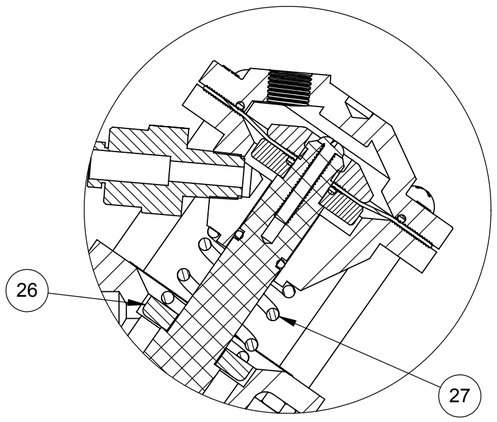
SIZE	DWG NO.	REV.
C	1077692	M

SCALE 1:1 | SOLIDWORKS FORMAT | SHEET 1 OF 2

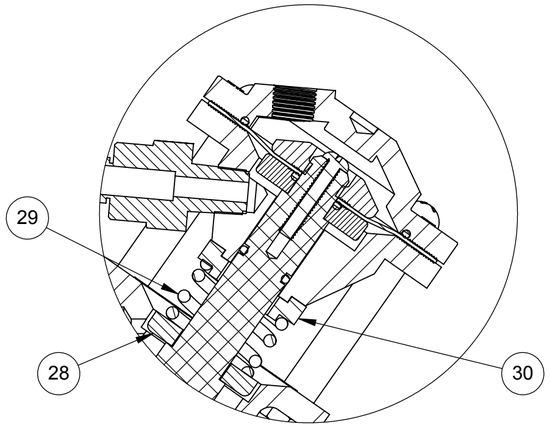
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR A LIST OF CHANGES.		



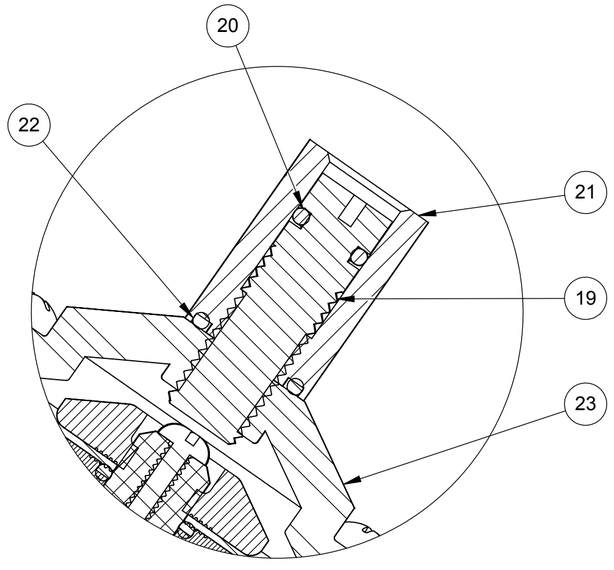
1071406 (K550-X203-14000)
FAILSAFE SPRING CLOSED 30 PSI



1071409 (K550-X204-14000)
FAILSAFE SPRING CLOSED 60 PSI



1071412 (K550-X205-14000)
FAILSAFE SPRING CLOSED 100 PSI



3020566 (K550-X210-14000)
LIMIT STOP

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INTERNAL PARTS KIT (LIMIT STOP) CONTAINS ITEM NO'S 19 THRU 22	1074973 (520-LS)

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION PARTS KIT (LIMIT STOP) CONTAINS ITEM NO'S 19 THRU 23	1071056 (K520-LSC)

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
19	SCREW, LS, 520	SS	1074988	1
20	O-RING, 2-010	BUNA	1071667	1
21	NUT, LS, 520	SS	1074987	1
22	O-RING, 2-013	BUNA	1071669	1
23	CAP, LS, 520	NORYL	1074946	1

FAILSAFE SPRING CLOSED - 30 PSI

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
24	RETAINER, SPRING, 520	SS	1075344	1
25	SPRING, COMPRESSION	SS	3007473	1

FAILSAFE SPRING CLOSED - 60 PSI

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
26	RETAINER, SPRING, 520	SS	1075344	1
27	SPRING, COMPRESSION	SS	1075053	1

FAILSAFE SPRING CLOSED - 100 PSI

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
28	RETAINER, SPRING, 520	SS	1075344	1
29	SPRING, COMPRESSION	SS	1075053	1
30	CENTERING COLLAR	SS	1075337	1

NOTE:

1. LIMIT STOP OPTION ONLY OFFERED ON FAILSAFE SPRING CLOSED MODELS.
2. FAILSAFE OPTION NOT OFFERED IN CONVERSION KIT FORM DUE TO SPECIAL ASSEMBLY REQUIREMENTS.

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN CONFIGURATION

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

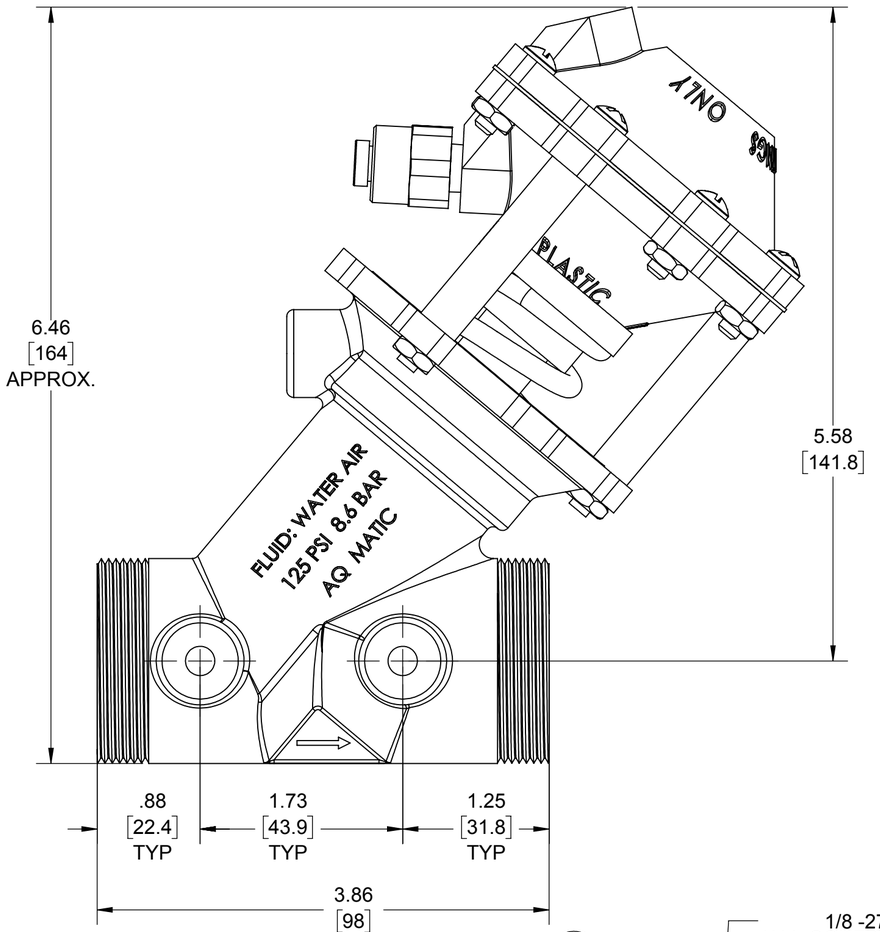
THIRD ANGLE PROJECTION

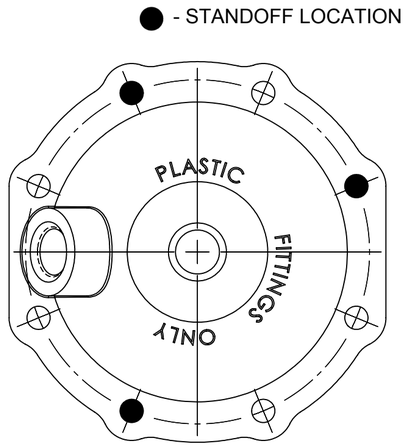
APPROVALS	DATE
DRAWN MWL	06/25/13
CHECKED BY	
APPROVED	

AQ Matic

CATALOG SHEET, 5520, VALVE

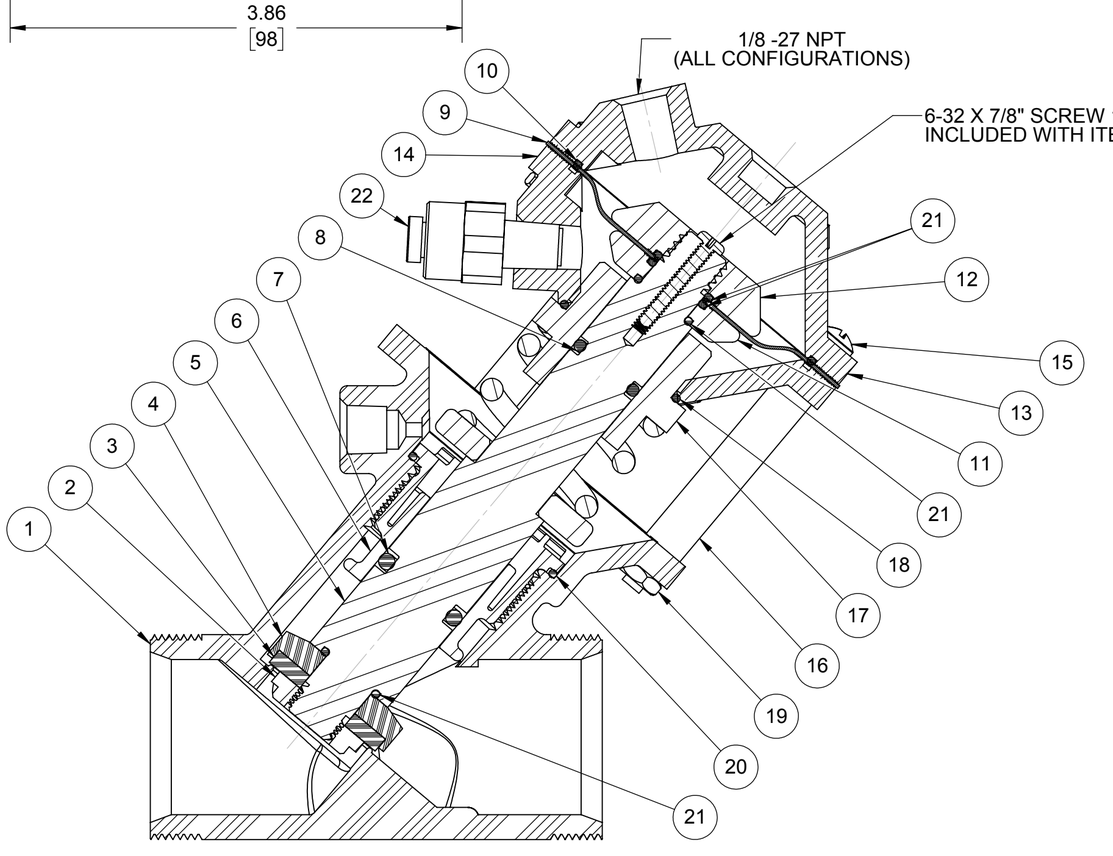
SIZE	DWG NO.	REV.
C	1077692	M
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 2 OF 2





ASSEMBLY TOOLS	
DESCRIPTION	**PART NO.**
FOR INSTALL & REMOVAL OF SHAFT GUIDE & DIAPHRAGM PLATE (TOOL NOT SHOWN)	1075059 (521-Z)

TORQUE TABLE		
ITEM #	**DESCRIPTION**	**TORQUED TO (+/- 10%)**
2	NUT, DISC PLATE	10 IN-LB
15 & 19	CAP SCREW & NUT	30 IN-LB
6	GUIDE, SHAFT	32 IN-LB
25	DIAPHRAGM SCREW	35 IN-LB



1071421 (K551-X200-14000)
NORMALLY OPEN

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
102658	H	REDRAWN IN SOLID WORKS: ITEM #1: WAS 1075007, ITEM #13: WAS 1075012 ITEM #14: WAS 1075348, ITEM #27: WAS 1075010, 5-FORM # NOW DWG #	10/31/13	TJM
103697	J	ITEM #20: WAS: 1071942, 1071943, 1071944	12/12/14	TJM
1001	K	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/16/17	MGS
1585	L	REMOVE BR FROM DRW #, FIX MINOR ERRORS, ADD TORQUE TABLE	11/14/19	KJB

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	BODY, 521, VALVE	NORYL	43476	1
2	NUT, DISC PLATE	PVC	1075358	1
3	DISC	EPDM	1075033	1
		BUTYL	1075034	
		FKM	1075036	
4	RETAINER, DISC	PVC	1075360	1
5	SHAFT, 5521	PVC	1075349	1
6	GUIDE, SHAFT, 521	NORYL	1075030	1
7	O-RING, 2-208	EPDM	1071743	1
		BUTYL	1071775	
		FKM	1071814	
8	O-RING, 2-112	BUNA	1071690	1
9	DIAPHRAGM, 521	BUNA	1075028	1
10	O-RING, 2-805	BUNA	1071715	1
11	PLATE, DIAPHRAGM, LWR, 5521	NORYL	43080	1
12	PLATE, DIAPHRAGM, UPR, 5521	NORYL	43081	1
13	CAP, VALVE, 521	NORYL	43477	1
14	CAP, LWR, 5521	NORYL	43725	1
15	SCREW, 10-32 X 3/4", RND HD	SS	1072380	8
16	STANDOFF	SS	1075354	3
17	GUIDE, SHAFT	PVC	1075357	1
18	O-RING, 2-025	BUNA	1071677	1
19	HEX NUT, 10-32	SS	1071648	8
20	O-RING, 2-029	EPDM	1081945	1
		BUTYL	43893	
		FKM	1081947	
21	O-RING, 2-014	EPDM	1071718	4
		BUTYL	1071760	
		FKM	1071788	
22	CONNECTOR, 1/8 MNPT X 1/4T	ACETAL	1078767	1
23	SPRING, COMPRESSION	SS	1075365	1

REPAIR PARTS KITS			
DESCRIPTION	**PART NO.**		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 7, 8, 9, 10, 18, 20, 21(4)	1075361 (5521-RAE) E.P.D.M. INCLUDES DIAMPHRAGM 1075028 (521-FB)	1075362 (5521-RAJ) BUTYL INCLUDES DIAPHRAGM 1075028 (521-FB)	1075363 (5521-RAV) FKM INCLUDES DIAPHRAGM 1075028 (521-FB)
INT. PART KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,6,11,12,17	1071433 (K5521-RF)		

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 2 FOR CONFIGURATION OPTIONS

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

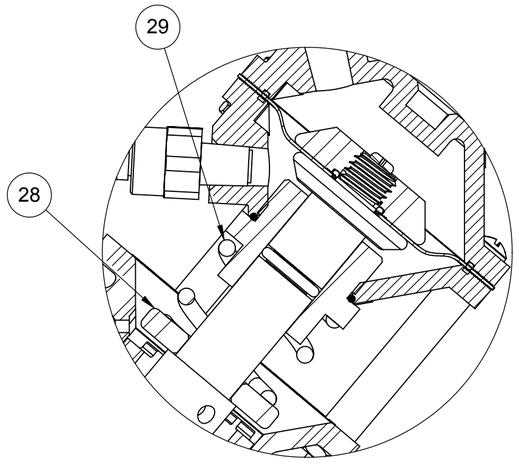
APPROVALS	DATE
DRAWN NE	08/29/12
CHECKED BY	
APPROVED	

AQ Matic

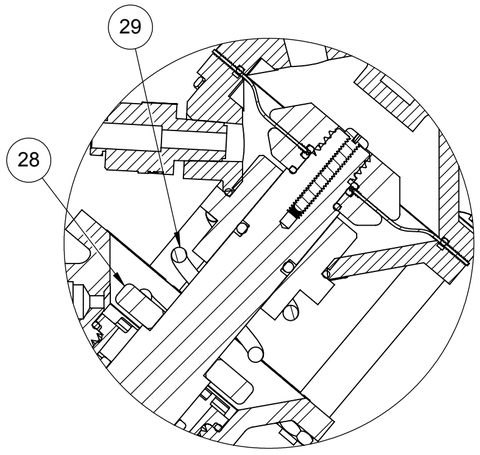
CATALOG SHEET, 5521, VALVE

SIZE	DWG NO.	REV.
C	1077693	L
SCALE 1:1	SOLIDWORKS FORMAT	SHEET 1 OF 2

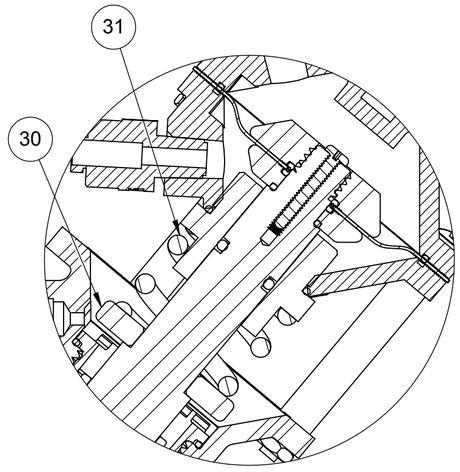
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR LIST OF CHANGES.		



1071423 (K551-X203-14000)
FAILSAFE SPRING CLOSED 30 PSI



1071424 (K551-X204-14000)
FAILSAFE SPRING CLOSED 60 PSI



1071427 (K551-X205-14000)
FAILSAFE SPRING CLOSED 100 PSI

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
21	SCREW, LS, 521	SS	1075058	1
22	O-RING, 2-012	BUNA	1071668	1
23	NUT, LS, 521	SS	1075057	1
24	O-RING, 2-016	BUNA	1071671	1
25	CAP, LS, 521	NORYL	43724	1
36	SHAFT, 5521		1075349	1

FAILSAFE SPRING CLOSED - 30 PSI

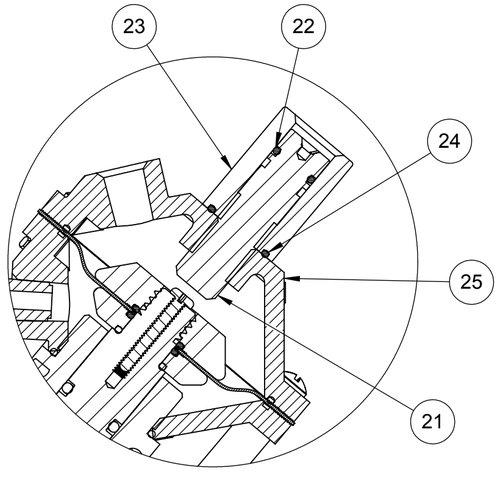
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
26	RETAINER, SPRING	PVC	1075351	1
29	SPRING, COMPRESSION	SS	1075366	1
32	SHAFT, 5521		1075349	1

FAILSAFE SPRING CLOSED - 60 PSI

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
28	RETAINER, SPRING	PVC	1075351	1
29	SPRING, COMPRESSION	SS	1075370	1
32	SHAFT, 5521		1075349	1

FAILSAFE SPRING CLOSED - 100 PSI

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
30	RETAINER, SPRING	PVC	1075351	1
31	SPRING, COMPRESSION	SS	1075365	1
32	SHAFT, 5521		1075349	1



1079761 (K551-X210-14000)
LIMIT STOP

REPAIR PARTS KITS	
DESCRIPTION	**PART NO.**
INT. PARTS KIT (LIMIT STOP) CONSIST OF ITEM NO'S 23 THRU 26	1075040 (521-LS)

CONVERSION KITS	
DESCRIPTION	**PART NO.**
CONVERSION PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 23 THRU 27	1071090 (K521-LSC)

NOTE:
1. LIMIT STOP OPTION ONLY OFFERED ON FAIL SAFE SPRING CLOSED MODELS.
2. FAILSAFE OPTION NOT OFFERED IN CONVERSION KIT FORM DUE TO SPECIAL ASSEMBLY REQUIREMENTS.
3. COMPONENTS/ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2002/95/EEC (RoHS) REQUIREMENTS.

- SEE DRAWING 1081309 FOR UNION END CONNECTORS & GROOVED ADAPTORS
- SEE SHEET 1 FOR STANDARD NORMALLY OPEN CONFIGURATION

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TOLERANCES:
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1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

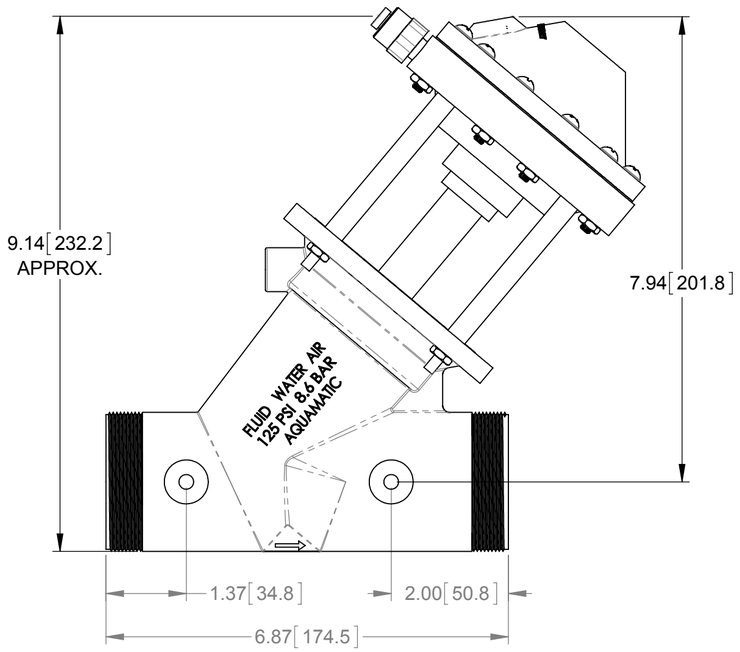
APPROVALS	DATE
DRAWN NE	08/29/12
CHECKED BY	
APPROVED	

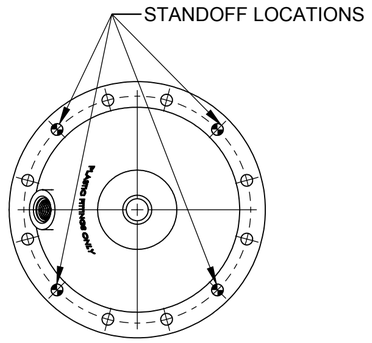
AQ Matic

CATALOG SHEET, 5521, VALVE

SIZE	DWG NO.	REV.
C	1077693	L

SCALE 1:1 | SOLIDWORKS FORMAT | SHEET 2 OF 2



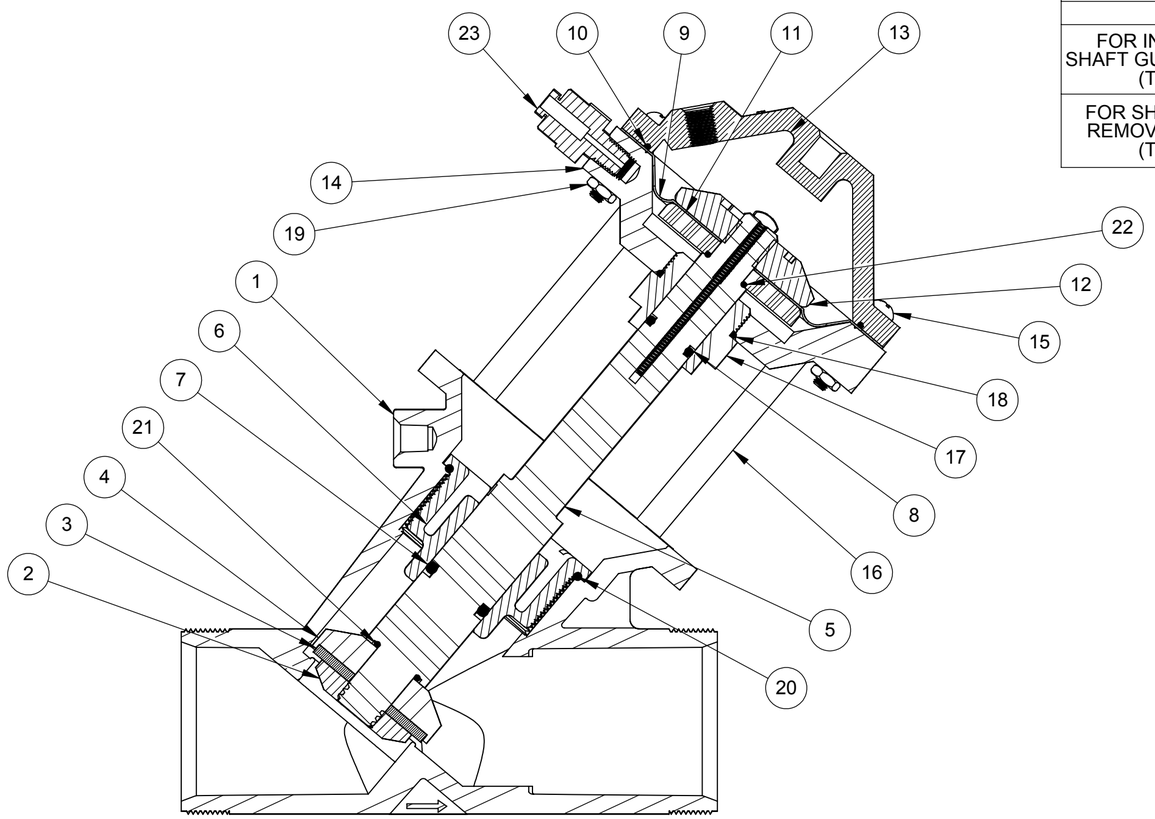


REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	102135	H	REDRAWN IN SOLIDWORKS, FORM # NOW DWG # (WAS-1084015)	06-27-13	TJM
	1001	J	AQ Matic update & verified part numbers	17JAN17	MGS

REPAIR PARTS KITS		
DESCRIPTION	PART NO.	
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3,7,8,9, 10,18, 20, 21, 22	1075377	1075378
	EPDM INCLUDES DIAPHRAGM 1075377	BUTYL INCLUDES DIAPHRAGM 1075104
	1075379 FKM INCLUDES DIAPHRAGM 1075104	
INT. PARTS KIT (NORM. OPEN) CONSISTS OF ITEM NO'S 2,4,5,6,11,12,17	1071434	

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
FOR INSTALL & REMOVAL OF SHAFT GUIDE & DIAPHRAGM PLATE (TOOL NOT SHOWN)	1075143
FOR SHAFT WHEN INSTALL. OR REMOVING DIAPHRAGM PLATE (TOOL NOT SHOWN)	1075060

ITEM NO.	DESCRIPTION		PART NUMBER	QTY
1	BODY, VALVE 524		1075079	1
2	PLATE, DISC, 524		1076198	1
3	DISC	EPDM	1075107	1
		BUTYL	1075108	1
		FKM	1075109	1
4	HOLDER, DISC, 5524		1075121	1
5	SHAFT (SERIES 5524),		1075372	1
6	GUIDE,SHAFT,524,BLACK		1075106	1
7	O-RING, 2-210	EPDM	1071744	1
		BUTYL	1071776	1
		FKM	1071815	1
8	O-RING, (EPDM) 2-113		1071728	1
9	DIAPHRAGM, 524, PURCHASED		1078393	1
10	O-RING, 2-043 NITRILE		1071686	1
11	PLATE,DIAPHRAGM,5524,LOWER		1075375	1
12	PLATE,DIAPHRAGM,5524,UPPER,BLK		1075101	1
13	CAP,524, VALVE		1075086	1
14	CAP, STANDARD BOTTOM		1075371	1
15	SCREW, RND HD, #10-32X1 1/4"LG		1072382	12
16	STANDOFF, 5524, SS		1075374	4
17	BUSHING, GUIDE		1075376	1
18	O-RING,2-025,NITRILE		1071677	1
19	HEX NUT, 10-32, SS		1071648	12
20	O-RING, 2-137	EPDM	1071735	1
		BUTYL	1071771	1
		FKM	1071807	1
21	O-RING, -016	EPDM	1071719	1
		BUTYL	1071761	1
		FKM	1071789	1
22	O-RING,2-015,NITRILE		1071670	1
23	CONNECTOR, 1/8 MNPT X 1/4T,PLS		1078767	1



1071435 (K554-X200-14000)
NORMALLY OPEN

REPAIR PARTS KITS			
DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3,7, 8, 9, 10, 19, 20, 21, 22	1075377 EPDM INCLUDES DIAPHRAGM 1075377	1075378 BUTYL INCLUDES DIAPHRAGM 1075104	1075379 FKM INCLUDES DIAPHRAGM 1075104
INTERNAL PARTS KIT CONSISTS OF ITEM NO'S 2, 4, 5, 6, 11, 12, 18	1071434		

SEE SHEET 1078150 FOR SOCKET WELD & FLANGED ADAPTORS
SEE SHEET 1078140 FOR SOCKET WELD & PIPE ADAPTORS

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN MWL	06-27-13
APPROVED	
CHECKED	

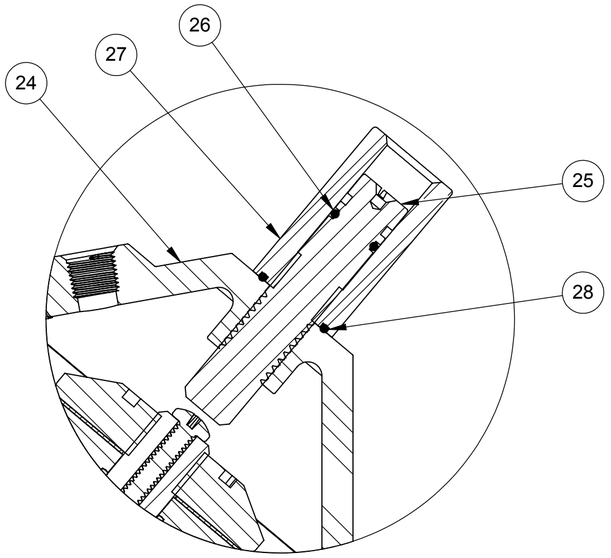
AQ Matic
Valve & Controls Company Inc.

TITLE: CATALOG SHEET, 5524

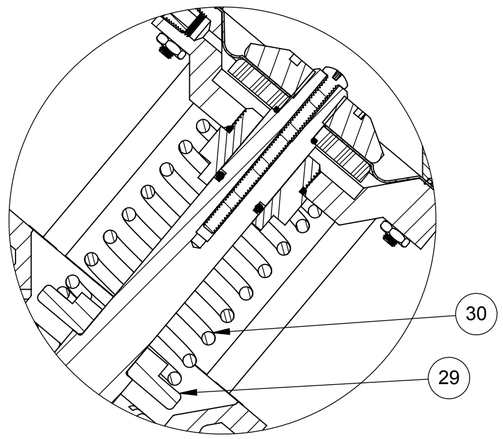
SIZE	DWG NO.	REV
B	BR1077694	J

SCALE 1:2 | SHEET 1 OF 2

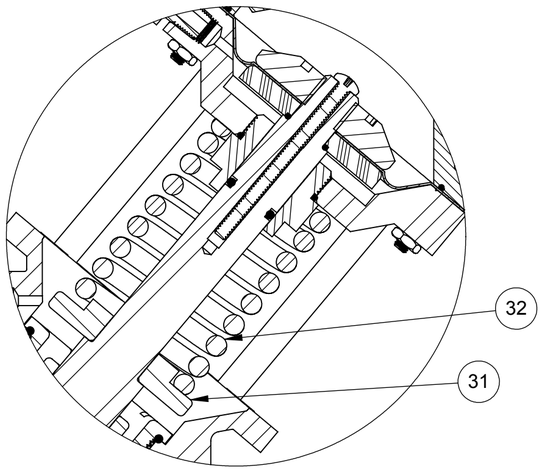
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES		



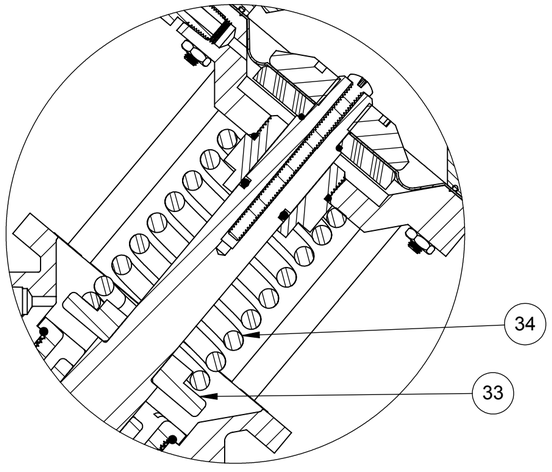
1079768 (K554-X210-14000)
LIMIT STOP



1071438 (K554-X203-14000)
FAILSAFE SPRING CLOSED 30 PSI



1071439 (K554-X204-14000)
FAILSAFE SPRING CLOSED 60 PSI



1071442 (K554-X205-14000)
FAILSAFE SPRING CLOSED 100 PSI

LIMIT STOP MODEL

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
24	CAP, LIMIT STOP,524	1075083	1
25	LIMIT STOP SCREW, SS	1075142	1
26	O-RING,2-012,BUNA	1071668	1
27	LIMIT STOP NUT, SS	1075141	1
28	O-RING,2-016,BUNA	1071671	1

FAILSAFE SPRING CLOSED - 30 PSI

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
29	RETAINER, SPRING, PVC	1075373	1
30	SPRING, COMPRESSION, SS	1077981	1

FAILSAFE SPRING CLOSED - 60 PSI

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
31	RETAINER, SPRING, PVC	1075373	1
32	SPRING, CMPRSN SERIES 4424	1267397	1

FAILSAFE SPRING CLOSED - 100 PSI

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
33	RETAINER, SPRING, PVC	1075373	1
34	SPRING, COMPRESSION	1077983	1

NOTE:
1. LIMIT STOP OPTION ONLY OFFERED ON FAIL SAFE SPRING CLOSED MODELS.
2. FAILSAFE OPTION NOT OFFERED IN CONVERSION KIT FORM DUE TO SPECIAL ASSEMBLY REQUIREMENTS.
3. LIMIT STOP CONVERSION KITS NOT OFFERED DUE TO FAIL SAFE OPTION ASSEMBLY REQUIREMENTS.

SEE SHEET 1078150 FOR SOCKET WELD & FLANGED ADAPTORS
SEE SHEET 1078140 FOR SOCKET WELD & PIPE ADAPTORS

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN	
APPROVED	
CHECKED	

AQ Matic
Valve & Controls Company Inc.

TITLE: CATALOG SHEET, 5524

SIZE B | DWG NO. BR1077694 | REV J

SCALE 1:2 | SHEET 2 OF 2

BR42888

AQUAMATIC® K53 SERIES

CONTROL VALVES

CORROSION-RESISTANT CONSTRUCTION WITHSTANDS HARSH MEDIA

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

Unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

All components can be serviced while the valve is in-line

Separate flow and control chambers permit positive closing without springs; and only nominal cost for spring assist opening for low-pressure and self- draining applications

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators

All internal parts in contact with media are made of composite materials*

Seals are ethylene propylene for better chemical resistance**

Two dynamic O-rings on the shaft, with a vent in between the O-rings, to prevent damage to the diaphragm

Female socket weld connectors for easy installation and the ability to remove the valve without disrupting the service piping

Valve bodies provided with molded pads that can be used to support the piping manifold

Cap held by a retaining ring, eliminating screws and nuts; no external metal parts to corrode in aggressive environment

Available in sizes from 1"-3"

A variety of end connectors are available to make the valve compatible in pipe sizes from 3/4"-3"

Adaptable to a wide variety of control devices

OPTIONS

Normally open [standard]

Externally normally closed†

Spring-assist closed

Spring-assist open

Fully adjustable Limit Stop from full-open to full-closed, with a Position Indicator to show the valve position

Seal and diaphragm materials for special applications†

TYPICAL APPLICATIONS

Chemical Injection

Deionizers

Desalinization

Detergent and Bleach Handling

Electronic Industry

Evaporation

Fertilizer Spray Equipment

Level Control Systems

Metal Recovery Systems

Mining Wastes

Process Water Systems

Water Treatment Systems

IAPMO R&T

Certified by IAPMO R&T to NSF/ANSI 61 and NSF/ANSI 372 for lead free compliance.

* Normally closed valve configurations are NOT recommended when used with corrosive fluids.

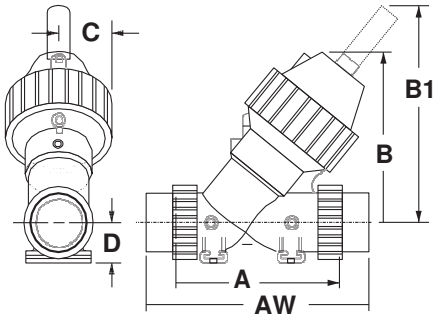
** Valves are NOT recommended for use with any aromatic, hydrocarbon-based media.

DIMENSIONS

MODEL #	PIPE SIZE	Cv*	WEIGHT (STANDARD VALVE)	WEIGHT (FAIL SAFE VALVE)	DIMENSIONS (APPROXIMATE)					
					A**	AW	B	B1	C	D
K531	0.75", 1.00" (20,25mm)	18.0 (15.6 Kv)	1.7 lbs (0.8 kg)	3.0 lbs (1.4 kg)	5.75" (146 mm)	8.12" (206 mm)	6.00" (152 mm)	8.62" (220 mm)	2.04" (52 mm)	1.38" (35 mm)
K534	1.5" (40 mm)	46.0 (39.8 Kv)	4.0 lbs (1.8 kg)	7.5 lbs (3.4 kg)	8.38" (213 mm)	11.00" (279 mm)	8.07" (205 mm)	13.46" (342 mm)	2.62" (67 mm)	1.96" (50 mm)
K535	2.0" (50 mm)	84.0 (72.6 Kv)	8.0 lbs (3.6 kg)	15.0 lbs (6.8 kg)	9.88" (251 mm)	12.88" (333 mm)	9.12" (232 mm)	14.28" (363 mm)	3.18" (81 mm)	2.18" (51 mm)
K537	3.0" (75 mm)	2000 (173.0 Kv)	11.5 lbs (5.2 kg)	27.0 lbs (12.3 kg)	11.13" (283 mm)	15.25" (387 mm)	11.41" (290 mm)	17.06" (433 mm)	3.79" (96 mm)	2.68" (68 mm)

*Cv is the flowrate in gallons per minute of water at 60°F at 1 psi pressure drop or (Kv) (flowrate in cubic meters per hour of water at (15.5°C) at 1 bar pressure drop).
**The "A" dimension is the distance between face to face seal surfaces.

(Models K531 - K537)

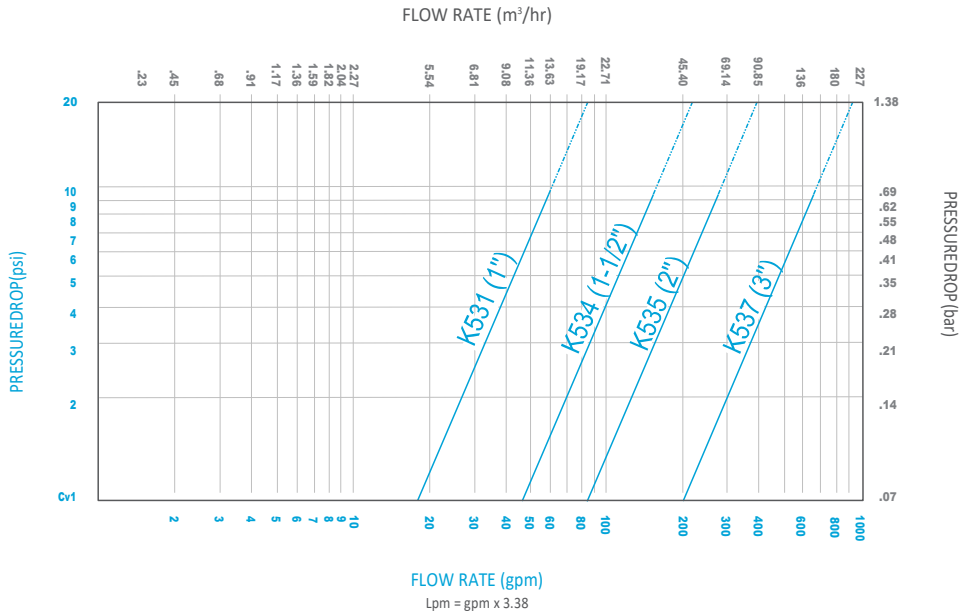


OPERATING SPECIFICATIONS

MaxPressure	125 psi (8.6 bar)
MaxTemperature†	140°F (60°C)

†IAPMO R&T NSF/ANSI 61 and NSF/ANSI 372 certifications are limited to restrictions below. Other options were not tested for certification:
Cold water applications below 73°F (23°C).
Normally Open valves.
EPDM seal material (seal option #1).

PERFORMANCE DATA



16605 West Victor Rd. New Berlin, WI 53151

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1163571 REV L AP2019

K53 SERIES DIAPHRAGM VALVE MASTER CHART

*** FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER:** **K 5 3 _ - X 2 _ _ - _ 4**

BODY SIZE (std)
- 1 = 1"
- 4 = 1-1/2"
- 5 = 2"
- 7 = 3"

END CONNECTIONS (X std)
- X = None

BODY & CAP MATERIAL (2 std)
- 2 = Noryl

VALVE OPTIONS (00 std) [XNC not valid with solenoid configurations]

00 = NO	05 = Spring Closed 100#	A2 = LS, PI, SAC
01 = NO, SAO	10 = NO, LS	B2 = XNC, SAC
02 = NO, SAC	11 = NO, LS, SAO	C2 = XNC, LS, SAC
03 = Spring Closed 30#	12 = NO, LS, SAC	D2 = XNC, LS, PI, SAC
04 = Spring Closed 60#	A1 = LS, PI, SAO	SX = Special Valve **

SEAL MATERIALS (1 std) (Option 6 not available on series 535 & 537 valves)
(Option 5 not available on XNC or solenoid EO or EC valves)

OPT.	OPERATING DIAPHRAGM	SEALING DISK	DYNAMIC SEALS	STATIC SEALS	KIT SERIES	TYPICAL USE
1	Buna-N	EP	EP	EP	RAE	Water
5	Buna-N	Fluoroelast.	Fluoroelast.	Fluoroelast.	RAVFB	Acid
6	Buna-N	Butyl	Butyl	Butyl	RAJ	Caustic

INTERNAL PARTS (4 std)
- 4 = Noryl/PVC (140°F (60°C) Valve Rating)

DRILL & TAP BOSSES (0 std [1/8" NPT std for K531/K534; 1/4" NPT std for K535/K537])

0 = None	3 = Boss #3	6 = Bosses #1,2
1 = Boss #1	4 = Boss #4	
2 = Boss #2	5 = Bosses #1,2,3,4	

SOLENOID OPTIONS (0 std)

0 = None	2 = Energize to Close (EC)	4 = EO w/ Dry Drain
1 = Energize to Open (EO)	3 = Independent pressure (IP)	5 = EC w/ Dry Drain

SOLENOID FEATURES (0 std) not valid with Independent Pressure (Option A)

0 = None	D = 115V/60HZ, NEMA 4	F= 24V/60HZ,NEMA 4
A = 24VDC	E = 220V/50HZ, NEMA 4	

* To create a valve number replace each "_" with the proper number or letter for the feature you desire. For example, a 2" Plastic Valve Model K535 with Externally Normally Closed and Spring Assist Closed Options is designated as a K535-X2B2-14000.

** A special valve will have a custom drawing number (_ _ _ _ _ _ _)
and the item number format is (K53?-X2SX-_ _ _ _ _)
where the last 5 numbers (Far Right) are the last five digits of the drawing number.

Valve Option Notes:

1. **Limit Stop &/or Position Indicator options can not be combined with 30#, 60#, or 100# Spring Closed Options.**
2. **Solenoid Option cannot be combined with NC valves.**

REV.	ECO NO.	DESCRIPTION	BY/DATE	
H	21190	Revised for Pentair ECN release	JJJ	17-Nov-09
J	21813	Revised line 27.	JJJ	5-Jan-10
K	1778	Removed Seal Material 2 & 4; Tap 7	JJJ	1-Oct-20
L	1789	ADDED 24VDC TO SOLENIOD	MM	15-Oct-20

42984

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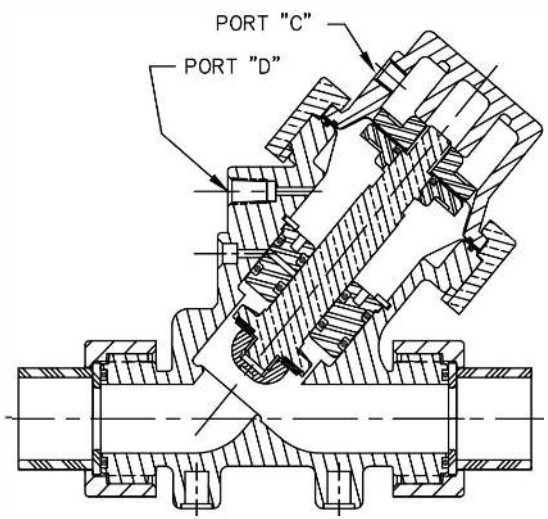
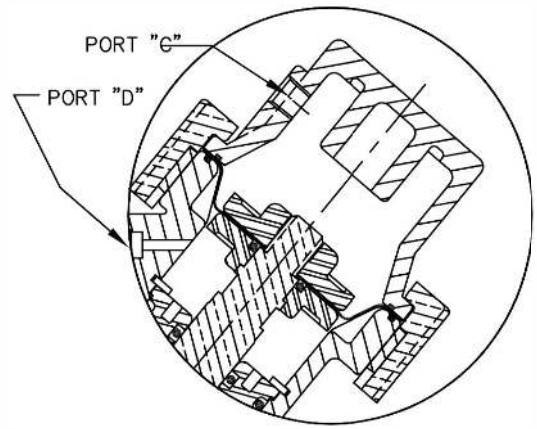
42984 REV L OCT 20

DIAPHRAGM VALVE CONFIGURATIONS - STANDARD MODEL



NORMALLY OPEN

LINE PRESSURE/FLOW AGAINST THE VALVE SEATING DISC WILL OPEN THE VALVE. CONTROL PRESSURE APPLIED TO THE TOP OF THE DIAPHRAGM (PORT "C") WILL CLOSE THE VALVE.

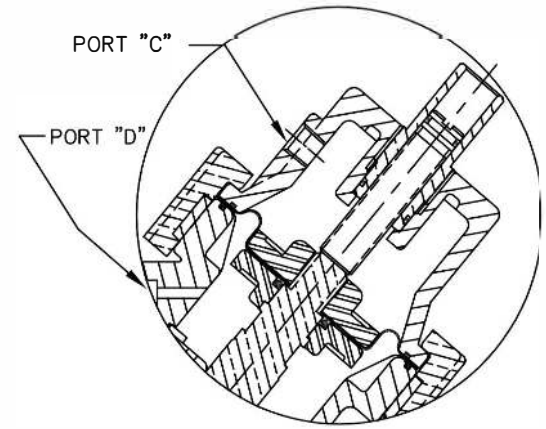


NORMALLY CLOSED

LINE PRESSURE AGAINST THE DISC, TRANSFERRED THRU AN EXTERNAL LINE TO PORT "C" AT THE TOP OF THE DIAPHRAGM, WILL CLOSE THE VALVE. CONTROL PRESSURE AT PORT "D" WILL OPEN THE VALVE. ADDITION OF "SPRING ASSIST CLOSED" FEATURE IS RECOMMENDED FOR THE FOLLOWING CONDITIONS:

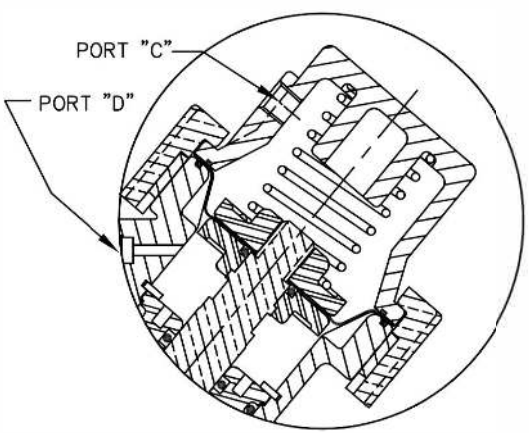
1. LOW PRESSURE AND/OR FLOW.
2. VALVE DISCHARGES TO ATMOSPHERE.

NORMALLY CLOSED FEATURE NOT RECOMMENDED FOR LINE MEDIA CONTAINING SOLIDS, HIGH TEMPERATURES OR OTHER MEDIA CONDITIONS WHICH MAY DAMAGE THE DIAPHRAGM.



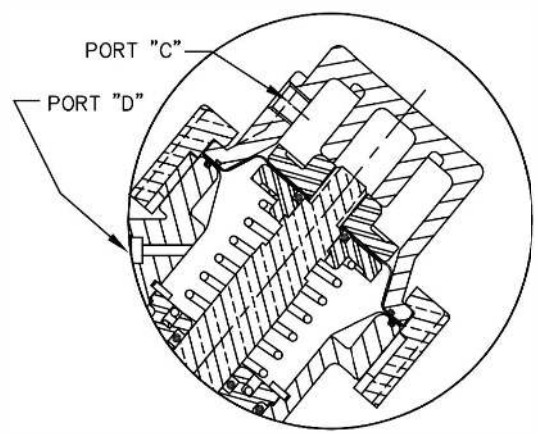
LIMIT STOP

INCLUDES AN ADJUSTMENT SCREW WHICH LIMITS THE VALVE STROKE. MAY BE USED TO CONTROL FLOW RATE, HOWEVER, FLOW RATE WILL VARY WITH CHANGES IN PRESSURE.



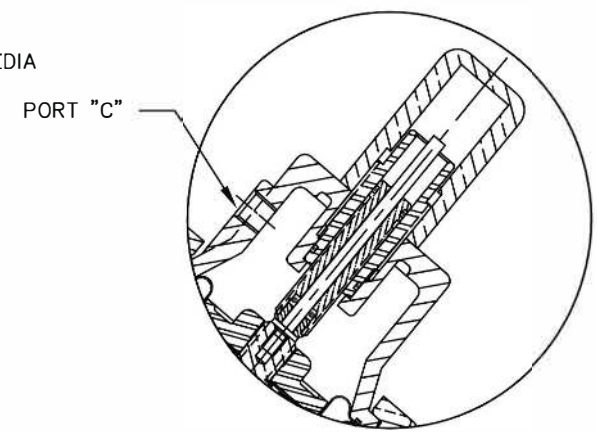
SPRING ASSIST CLOSED

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE CLOSURE IN THE ABSENCE OF LINE AND CONTROL PRESSURES.



SPRING ASSIST OPEN

SPRING SERVES AS AN ASSIST TO ASSURE FULL VALVE OPENING IN THE ABSENCE OF LINE AND CONTROL PRESSURES.



POSITION INDICATOR

INDICATOR ROD IS ATTACHED TO MAIN VALVE STEM TO SHOW POSITION OF VALVE. ONLY AVAILABLE WITH COMBINATION OF SPRING ASSIST AND LIMIT STOP OPTIONS.

FORM NO. 1078165

PRINTED IN U.S.A.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
C	NUMBER CONVERSION	1588	MSM	27NOV02	

AQ Matic
Valve & Controls Company Inc

SERIES 530 DIAPHRAGM VALVES

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	15JUN01	1084006

PLASTIC DIAPHRAGM VALVES (531 THRU 537)

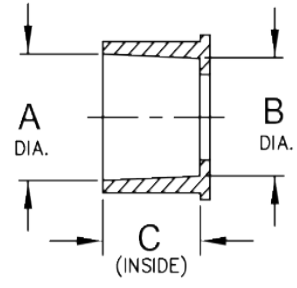
SERIES	PIPE SIZE	SEAT DIAMETER IN. / CM.	SEAT AREA SQ. IN. / SQ. CM.	DIAPHRAGM AREA SQ. IN. / SQ. CM.	TOTAL STROKE IN. / CM.	DIAPHRAGM CHAMBER (VOLUME) CUBIC IN. / CUBIC CM.	* Cv	** Kv	FLOW RATE @ 10 FT./SEC. (3 M./SEC.) NOTE 1 GAL./MIN. / CU.M/HR	FLOW RATE @ 20 FT./SEC. (6 M./SEC.) NOTE 2 GAL./MIN. / CU.M/HR	PRESSURE DROP @ 10 FT./SEC. (3 M./SEC.) NOTE 1 P.S.I. / bar	PRESSURE DROP @ 20 FT./SEC. (6 M./SEC.) NOTE 2 P.S.I. / bar
531	3/4",1"	1.062 / 2.70	.89 / 5.73	3.43 / 22.1	.86 / 2.18	6.21 / 102.0	18.0	16.0	27.7 / 6.3	55.3 / 12.6	2.3 / 0.16	9.4 / 0.65
534	1-1/2"	1.562 / 3.97	1.92 / 12.4	6.06 / 39.1	1.33 / 3.38	10.4 / 170.0	42.0	36.0	60 / 13.6	120 / 27.2	2.04 / 0.14	8.16 / 0.56
535	2"	2.062 / 5.24	3.34 / 21.5	8.82 / 56.9	1.75 / 4.45	25.3 / 414.0	84.0	72.0	104 / 23.4	208 / 46.8	1.53 / 0.11	6.13 / 0.42
537	3"	3.062 / 7.78	7.36 / 47.5	15.6 / 101.0	2.50 / 6.35	65.3 / 1070	200.0	172.0	230 / 52.2	460 / 104.4	1.32 / 0.09	5.3 / 0.36

* Cv – FLOWRATE (GAL./MIN.) OF WATER AT 60° F. AT 1 P.S.I. PRESSURE DROP

** Kv – FLOWRATE (CU. M./HR) OF WATER AT 15.5° C. AT 1 BAR PRESSURE DROP

NOTE 1: MAXIMUM CONTINUOUS VELOCITY THROUGH THE VALVE.

NOTE 2: MAXIMUM CONTINUOUS VELOCITY. EXTENDED SERVICE AT THIS VELOCITY MAY CAUSE CAVITATION.



TO DETERMINE FLOWRATE AT ANY GIVEN PRESSURE DROP, THE FOLLOWING FORMULAS CAN BE USED.

FOR WATER AND LIQUIDS:

$$Q = \frac{Cv\sqrt{\Delta P}}{\sqrt{e}}$$

FOR AIR AND GAS:

WHEN P2 < .5P1

$$Cv = \frac{CFM\sqrt{e}}{.5P1}$$

WHEN P2 > .5P1

$$Cv = \frac{CFM\sqrt{e}}{\sqrt{\Delta P\ P2}}$$

Q – FLOWRATE IN GAL./MIN.
ΔP – PRESSURE DROP (LB./SQ. IN.)
e – SPECIFIC GRAVITY (WATER = 1.00)

CFM – CU. FT./MIN. FLOW
e – SPECIFIC GRAVITY (AIR = 1.00)
P1 – INLET PRESSURE (LB./SQ. IN.)
P2 – OUTLET PRESSURE (LB./SQ. IN.)

FEMALE SOCKET WELD END CONNECTOR KITS

VALVE SERIES	STANDARD	PART NO.	DIAMETER A	DIAMETER B	DEPTH C
531	A.S.T.M. 3/4"	1070411 (K531-577)	1.062"	1.050"	1.18"
	A.S.T.M. 1"	1070412 (K531-060)	1.330"	1.312"	1.18"
	J.I.S. 25MM	1070413 (K531-061)	1.282"	1.234"	1.18"
	I.S.O. 25MM	1070414 (K531-062)	1.269"	1.269"	1.18"
534	A.S.T.M. 1-1/2"	1070419 (K534-060)	1.920"	1.81"	1.37"
	J.I.S. 40MM	1070420 (K534-061)	1.895"	1.829"	1.36"
	I.S.O. 40MM	1070421 (K534-062)	1.978"	1.955"	1.36"
535	A.S.T.M. 2"	1070425 (K535-060)	2.393"	2.341"	1.50"
	J.I.S. 50MM	1070426 (K535-061)	2.392"	2.274"	1.50"
	I.S.O. 50MM	1070427 (K535-062)	2.493"	1.931"	1.50"
537	A.S.T.M. 3"	1070431 (K537-060)	3.522"	3.492"	1.95"
	J.I.S. 80MM	1070432 (K537-061)	3.537"	3.470"	1.95"
	I.S.O. 75MM	1070433 (K537-062)	3.557"	3.535"	1.95"

NOTE: ALL CONNECTOR KITS CONTAIN (2) CONNECTORS, (ONE KIT REQ'D PER VALVE)

THE DATA PRESENTED HERE IS BELIEVED TO BE RELIABLE AND OFFERED AS SUGGESTION ONLY. ACTUAL RESULTS MAY VARY DEPENDING UPON APPLICATION.

AQ Matic
Valve & Controls Company Inc.

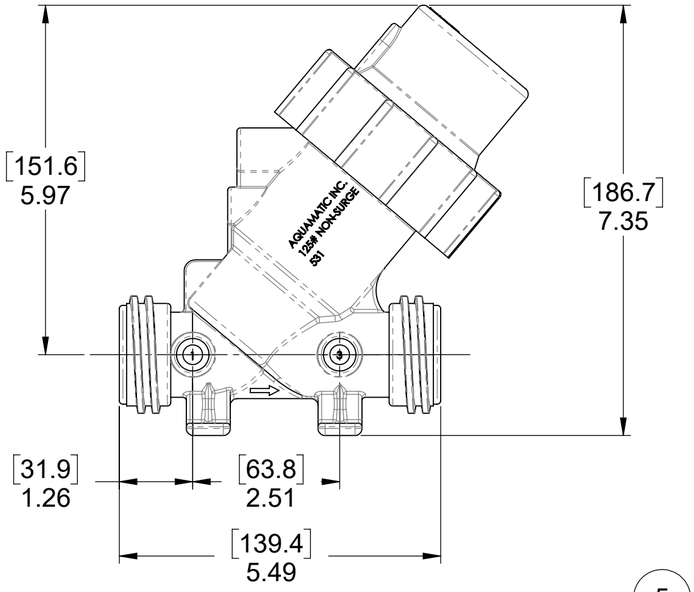
SERIES 530 DIAPHRAGM VALVES

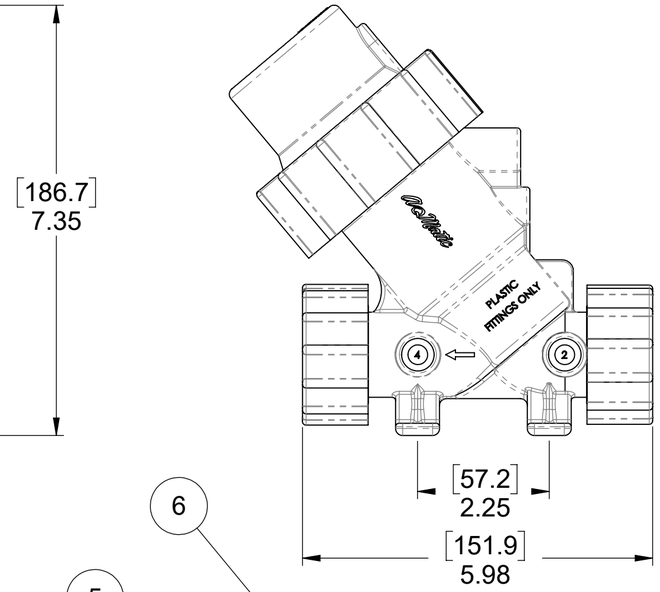
FORM NO. 1078165

REV	DESCRIPTION	ECO	DWN	DATE	APVD
C	NUMBER CONVERSION	1588	MSM	27NOV02	

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	14JUN01	1084006

DIAPHRAGM VALVE INFORMATION - STANDARD MODEL





[31.9] 1.26

[63.8] 2.51

[139.4] 5.49

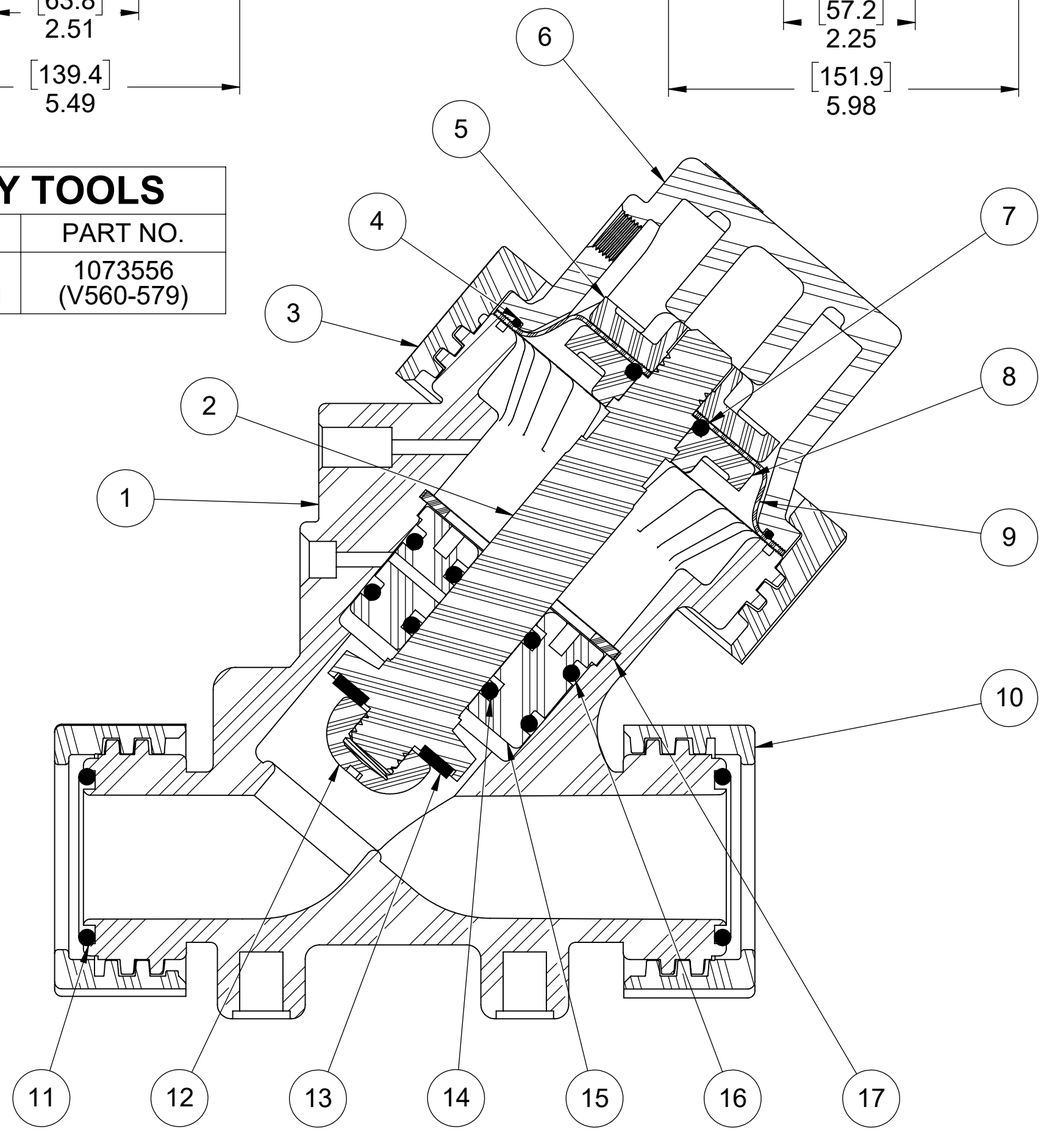
[57.2] 2.25

[151.9] 5.98

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
K	1001	AQ-MATIC UPDATE & VERIFIED PART NUMBERS	1/16/2017	MGS
L	1286	PUT LOGO ON VALVE BODY, CORRECT MINOR ERRORS	8/16/2018	KJB
M	1334	REMOVE 1073557 FROM ASSEMBLY TOOLS TABLE	9/14/2018	KJB
N	1716	1-PAPER SIZE B TO C, 2-REM'D: 1071796 1071787 1071789, 3-ITEMS RENUMBERED, 4- HATCHING PATTERNS CHANGED & CONSOLIDATED, 5-ADD'D MODEL NO'S	7/24/2020	PMJ

ASSEMBLY TOOLS

DESCRIPTION	PART NO.
LIMIT STOP TOOL TOOL NOT SHOWN	1073556 (V560-579)



1070304 (K531-X200-14000)
NORMALLY OPEN (STANDARD)

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS.

BOM TABLE

ITEM	DESCRIPTION		PART NO.	MODEL	QTY
1	BODY, 531, VALVE		1073287	V531-410K	1
2	SHAFT,531,NORYL,MCHD,RF		1073294	V531-530	1
3	NUT, SOCKET RETAINING, 535 PIPE		1073395	V535-080K	1
4	O-RING, 2-039	E.P.D.M.	1071685	ORB-039	1
5	PLATE, DIAPHRAGM, 531, UPPER		1073264	V531-040K	1
6	CAP, VALVE, 531		1073263	M531-021K	1
7	O-RING, 2-208	E.P.D.M.	1071700	ORB-208	1
		FKM	1071814	ORV-208	
8	PLATE, DIAPHRAGM, LWR, 531		1073265	V531-045K	1
9	DIAPHRAGM, K531	BUNA N	1073277	V531-100	1
10	NUT, RETAINING, 531		1073273	V531-080K	2
11	O-RING, 2-218	E.P.D.M.	1071748	ORE-218	2
		BUTYL	1071779	ORJ-218	
		FKM	1071819	ORV-218	
12	NUT, DISC RETAINING, 531		1073274	V531-093K	1
13	DISC	E.P.D.M.	1073279	V531-110	1
		BUTYL	1073280	V531-111	
		FKM	1073281	V531-112	
14	O-RING, 2-210	E.P.D.M.	1071744	ORE-210	2
		BUTYL	1071776	ORJ-210	
		FKM	1071815	ORV-210	
15	SHAFT GUIDE, 531		1073292	V531-491	1
16	O-RING, 2-223	E.P.D.M.	1071749	ORE-223	2
		BUTYL	1071780	ORJ-223	
		FKM	1071820	ORV-223	
17	RING, RETAINING, SERIES 531		1073312	V531-593	1

REPAIR PARTS KITS

DESCRIPTION	PART NO.		
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 4, 7, 9, 13, 14 (2), 16 (2)	**EPDM** 1070318 (531-RAE) INCLUDES DIAPHRAGM 1073277	**BUTYL** 1070326 (531-RAJ) INCLUDES DIAPHRAGM 1073277	**FKM** 1075228 (531-RAVFB) INCLUDES DIAPHRAGM 1073277
INTERNAL PARTS KIT CONSISTS OF ITEM NO'S 2, 5, 8, 12, 15, 17	1070342 (K531-RF)		

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DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	6/12/2020
CHECKED BY	
APPROVED	

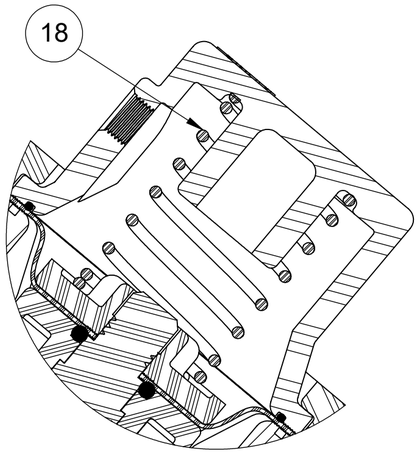
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, 531

SIZE	DWG NO.	REV.
C	1077688	N

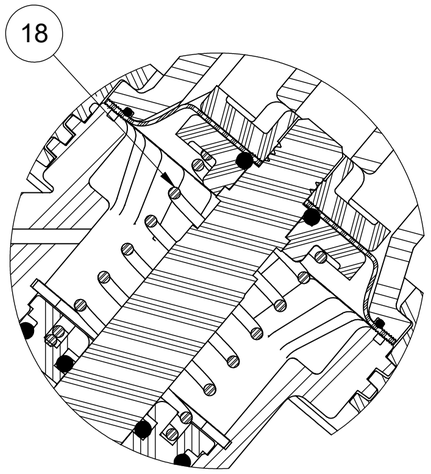
SCALE 1:1 | SOLIDWORKS FORMAT | SHEET 1 OF 2

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR LIST OF CHANGES		



1071286 (K531-X202-14000)

SPRING ASSIST CLOSED

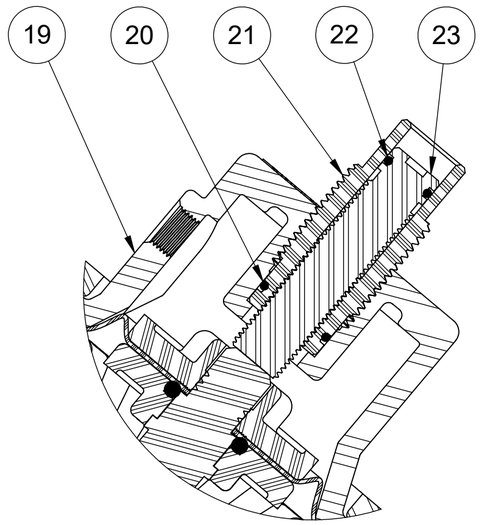


1071282 (K531-X201-14000)

SPRING ASSIST OPEN

SPRING ASSIST CLOSED & SPRING ASSIST OPEN MODELS

ITEM	DESCRIPTION	PART NO.	MODEL	QTY
18	SPRING, COMPRESSION	1073283	V531-170	1

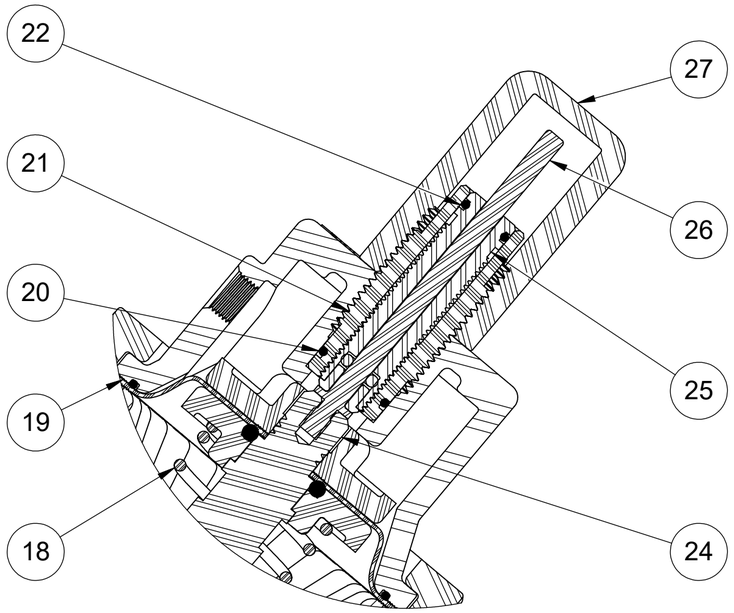


1070305 (K531-X210-14000)

LIMIT STOP

LIMIT STOP MODEL

ITEM	DESCRIPTION		PART NO.	MODEL	QTY
19	CAP, LIMIT STOP / POS. IND.		1073288	V531-421K	1
20	O-RING, 2-016	BUNA N	1071671	ORB-016	1
21	GUIDE, LS/PI, 531		1073303	V531-570	1
22	O-RING, 2-012	BUNA N	1071668	ORB-012	1
23	SCREW, LIMIT STOP, 531		1073308	V531-576	1



1071268 (K531-X2A1-14000)

LIMIT STOP / POSITION INDICATOR

(SPRING ASSIST OPEN SHOWN HERE)

LIMIT STOP / POSITION INDICATOR MODEL

ITEM	DESCRIPTION		PART NO.	MODEL	QTY
18	SPRING, COMPRESSION		1073283	V531-170	1
19	CAP, LIMIT STOP / POS. IND.		1073288	V531-421K	1
20	O-RING, 2-016	BUNA N	1071671	ORB-016	1
21	GUIDE, LS/PI, 531		1073303	V531-570	1
22	O-RING, 2-012	BUNA N	1071668	ORB-012	1
24	SHAFT,531,NORYL,PI,MCHD		1073295	V531-531	1
25	SCREW, LIMIT STOP, ASSY., 537		1073315	V531-700	1
26	ROD, PI, 531		1073298	V531-555	1
27	SIGHT GLASS, POS INDICATOR, 531		1073297	V531-550	1

REPAIR PARTS KITS

DESCRIPTION	PART NO.
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 18	1075229 (531-S)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 18	
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 20 THRU 23	1075226 (531-LS)
INT. PARTS KIT (LIMIT STOP / POS INDICATOR) CONSISTS OF ITEM NO'S 22, 24, 25, 26, 27	1075227 (531-PI)

CONVERSION KITS

DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 18	1075229 (531-S)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 18	
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 19 THRU 23	1071265 (K531-LSC)
CONVERSION KIT (LIMIT STOP / POS INDICATOR) CONSISTS OF ITEM NO'S 19 THRU 22 AND 24 THRU 27	1071266 (K531-PIC)

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

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TOLERANCES:
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1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	6/12/2020
CHECKED BY	
APPROVED	

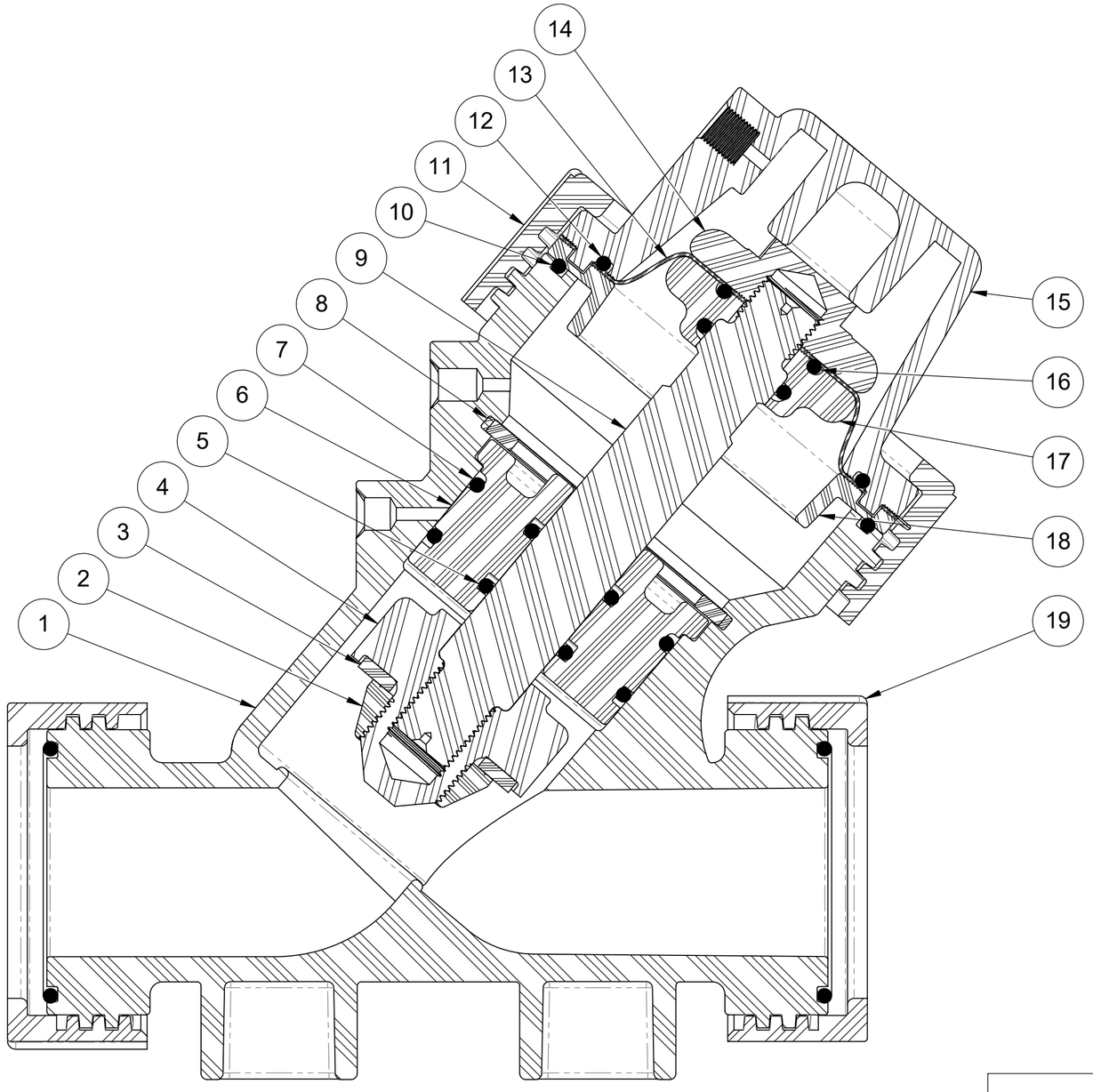
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, 531

SIZE	DWG NO.	REV.
C	1077688	N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 2

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
K		1-ITEM#11-REM'D; 1073334, 2-KIT#1070335 WAS: 1073334 DIAPHRAGM	11/11/2015	TJM
M		AQ-MATIC UPDATE & VERIFIED PART NUMBERS	1/20/2017	MGS
N		PUT LOGO ON VALVE BODY, CORRECT MINOR ERRORS	8/16/2018	KJB
P	1716	EXTERNAL REFERENCE REDRAW, REM'D 1073557 & 1071827, SECTION HATCHING UPDATE, BOM REORDERED	7/21/2020	PMJ

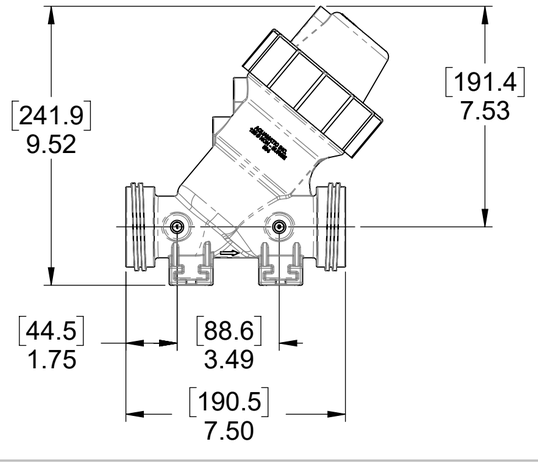


1070308 (K534-X200-14000)

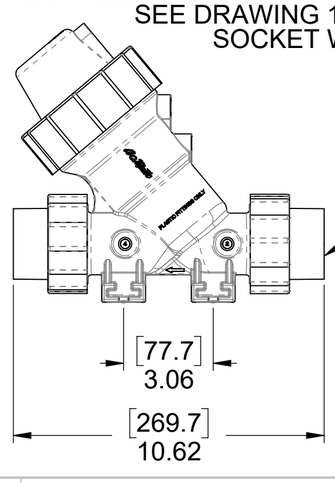
NORMALLY OPEN (STANDARD)

BILL OF MATERIALS

ITEM	PART NO	MODEL	DESCRIPTION		QTY
1	1073344	V534-410K	VALVE BODY		1
2	1073330	V534-093	PLATE, DISC, 534, PVC, MCHD		1
3	1073337	V534-110	DISC, 534	EPDM	1
	1073339	V534-112		FKM	
	1073338	V534-111		BUTYL	
4	1073353	V534-500	DISC HOLDER, 534		1
5	1071745	ORE-212	O-RING, 2-212	EPDM	3
	1071816	ORV-212		FKM	
	1071777	ORJ-212		BUTYL	
6	1073350	V534-491	GUIDE, SHAFT, 534		1
7	1071751	ORE-228	O-RING, 2-228	EPDM	4
	1071822	ORV-228		FKM	
	1071781	ORJ-228		BUTYL	
8	1073375	V534-593	RING, RETAINING, 534		1
9	1073360	V534-533	SHAFT, 534		1
10	1071709	ORB-240	O-RING, 2-240	BUNA N	1
11	1073458	V537-080K	NUT, RETAINING, 537		1
12	1071707	ORB-235	O-RING, 2-235	BUNA N	1
13	1073333	V534-100	DIAPHRAGM, SERIES 534		1
14	1073318	V534-040	PLATE, DIAPHRAGM, UPR, 534		1
15	1073317	V534-020K	CAP, VALVE, 534		1
16	1076766	ORB-214	O-RING, 2-214	BUNA N	1
17	1073320	V534-045	PLATE, DIAPHRAGM, LWR, 534		1
18	1073366	V534-551K	SUPPORT, DIAPHRAGM, 534		1
19	1073329	V534-080K	NUT, RETAINING, 534		2



CONNECTORS NOT FURNISHED WITH VALVE.
SEE DRAWING 1084006 FOR FEMALE SOCKET WELD CONNECTORS.



ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
LIMIT STOP TOOL (NOT SHOWN)	1073556 (V560-579)

REPAIR PARTS KITS

DESCRIPTION	PART NO.		
	EPDM	**FKM**	**BUTYL**
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 5, 7, 10, 12, 13, 16	1070319 (534-RAF) INCLUDES DIAPHRAGM 1073333	3003017 (534-RAVBF) INCLUDES DIAPHRAGM 1073333	1070327 (534-RAJ) INCLUDES DIAPHRAGM 1073333
INT. PARTS KIT CONSISTS OF ITEM NOS'S 2, 4, 6, 8, 9, 14, 17, 18	1070343 (K534-RF)		

SEE PAGE 2 FOR CONFIGURATION OPTIONS

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	7/21/2020
CHECKED BY	
APPROVED	

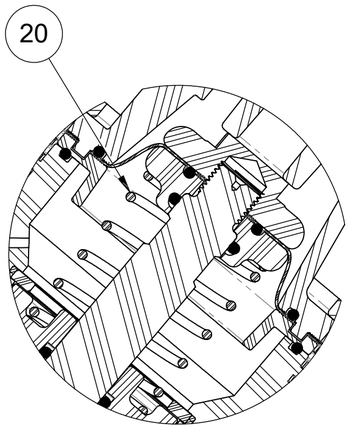
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, 534

SIZE C | DWG NO. 1077689 | REV. P

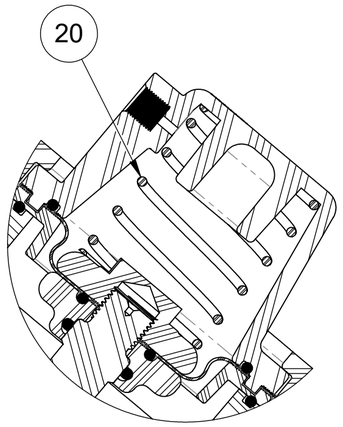
SCALE 1:1 | SOLIDWORKS FORMAT | SHEET 1 OF 2

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR LIST OF CHANGES		



1071329 (K534-X201-14000)

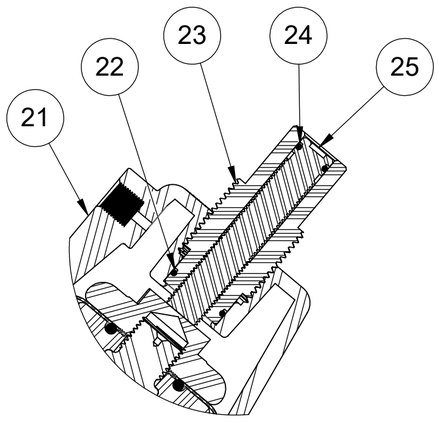
SPRING ASSIST OPEN



1071332 (K534-X202-14000)

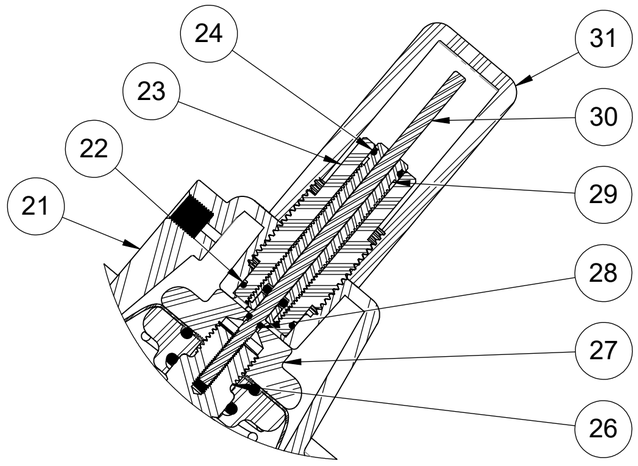
SPRING ASSIST CLOSED

SPRING ASSIST CLOSED MODEL & SPRING ASSIST OPEN MODEL				
ITEM	PART NO.	MODEL	DESCRIPTION	QTY
20	1073340	V534-170	SPRING, COMPRESSION, 534	1



1070309 (K534-X210-14000)

LIMIT STOP



1071313 (K534-X2A1-14000)

LIMIT STOP/ POSITION INDICATOR

LIMIT STOP MODEL					
ITEM	PART NO.	MODEL	DESCRIPTION		QTY
21	1073345	V534-420K	CAP, 1-12 VALVE LS/PI, V534		1
22	1071673	ORB-018	O-RING, 2-018	BUNA N	1
23	1073368	V534-570	GUIDE, LS/PI, 534		1
24	1071668	ORB-012	O-RING, 2-012	BUNA N	1
25	1073373	V534-576	SCREW, LIMIT STOP, 534		1

LIMIT STOP POSITION INDICATOR MODEL					
ITEM	PART NO.	MODEL	DESCRIPTION		QTY
21	1073345	V534-420K	CAP, 1-12 VALVE LS/PI, V534		1
22	1071673	ORB-018	O-RING, 2-018	BUNA N	1
23	1073368	V534-570	GUIDE, LS/PI, 534		1
24	1071668	ORB-012	O-RING, 2-012	BUNA N	1
26	1073362	V534-535	SHAFT, PI, 534		1
27	1073346	V534-442	PLATE, DIAPHRAGM, UPR, 534		1
28	1071666	ORB-006	O-RING, 2-006	BUNA N	1
29	1081128	V534-700	SCREW, LIMIT STOP, ASSY., 534		1
30	1073367	V534-555	ROD, PI, 534		1
31	1073365	V534-550	PI SIGHT GLASS, 534		1

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO. 20	1075233 (534-S)
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO. 20	
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO.'S 22 THRU 25	1075230 (534-LS)
INT. PARTS KIT (LIMIT STOP / POS. INDICATOR) CONSISTS OF ITEM NO.'S 22 THRU 24 & 26 THRU 31	1075231 (534-PI)

CONVERSION PARTS KITS	
DESCRIPTION	PART NO.
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 20	1075233 (534-S)
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO 20	
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO.'S 12 & 21 THRU 25	1071308 (K534-LSC)
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO.'S 12, 21 THRU 24 & 26 THRU 31	1071309 (K534-PIC)

SEE SHEET 1 FOR STANDARD NORMALLY OPEN MODEL

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THE COMPONENT OR PRODUCT DESCRIBED IN THIS DOCUMENT MUST COMPLY WITH RoHS 3 EU (EUROPEAN UNION) DIRECTIVE 2015/863

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	7/21/2020
CHECKED BY	
APPROVED	

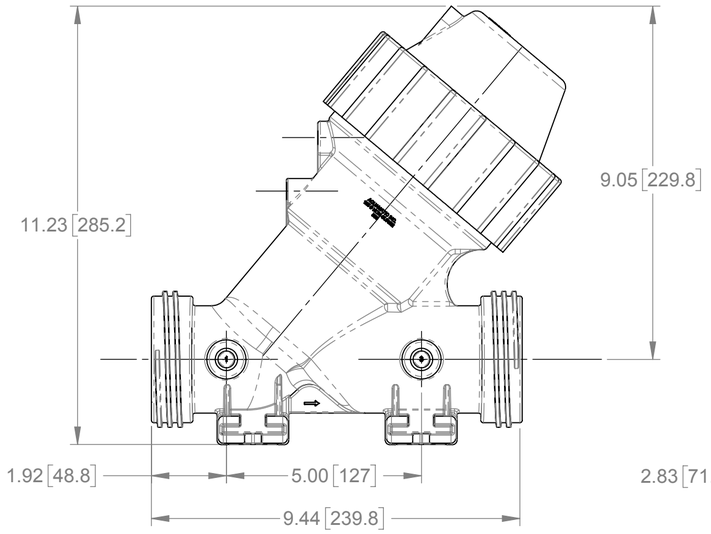
AQ-MATIC VALVES AND CONTROLS

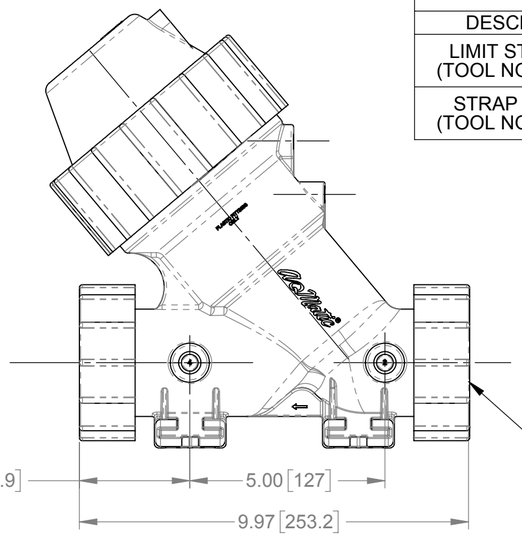
DESCRIPTION: CATALOG SHEET, 534

SIZE	DWG NO.	REV.
C	1077689	P

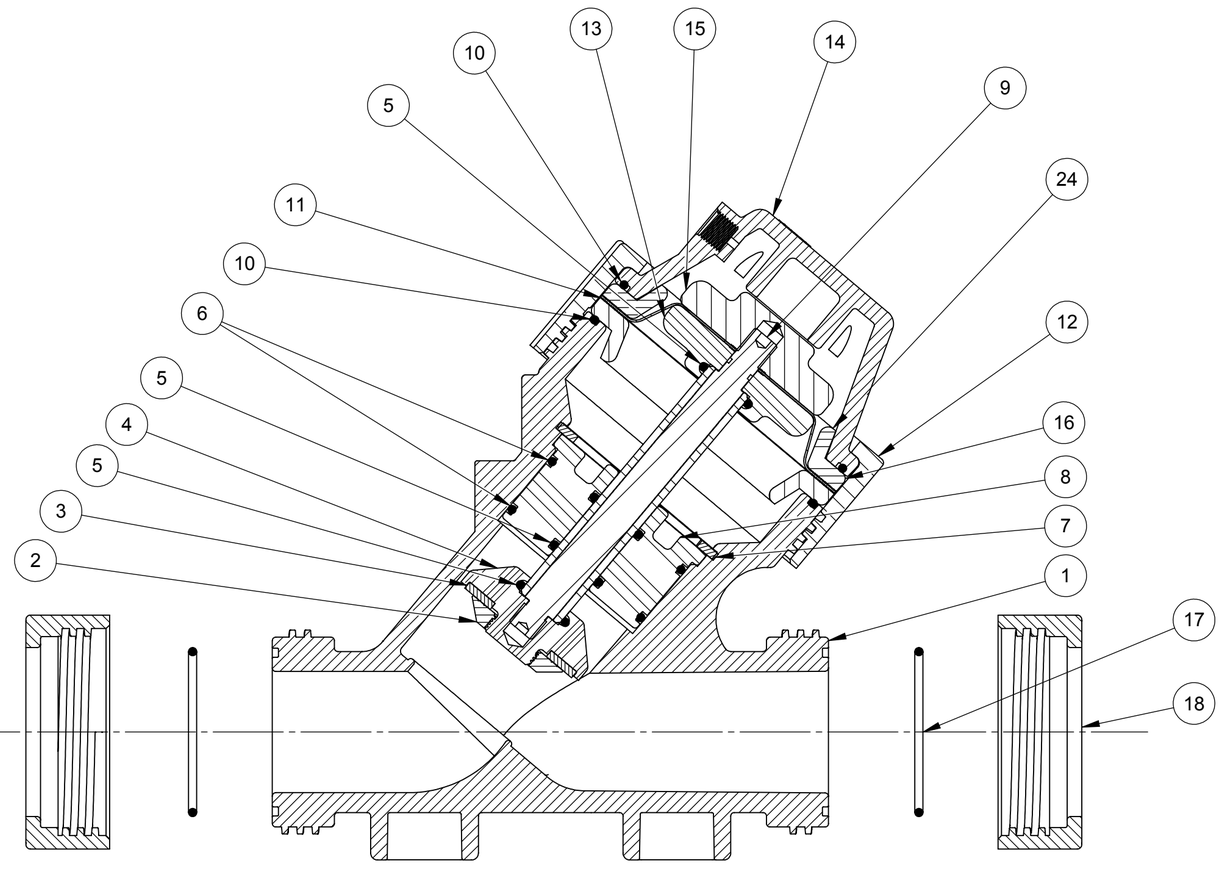
SCALE	SOLIDWORKS FORMAT	SHEET 2 OF 2
1:2		

ASSEMBLY TOOLS	
DESCRIPTION	PART NO.
LIMIT STOP TOOL (TOOL NOT SHOWN)	1073556
STRAP WRENCH (TOOL NOT SHOWN)	1073557





NOTE:
CONNECTORS NOT FURNISHED WITH VALVE.
SEE DWG. NO. 1078165 FOR FEMALE SOCKET WELD CONNECTORS.



1070312 (K535-X200-14000)
NORMALLY OPEN (STANDARD)

REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
	102159	H	REDRAWN IN SOLIDWORKS, 1-REM'D: BUTYL O-RINGS, 2-REM'D: TEFON COATED O-RINGS	04/17/14	TJM
	105094	J	1-ITEM #11- REM'D: FKM-1073400	11/12/15	TJM
	1001	K	AQ MATIC UPDATE & VERIFIED PART NUMBERS	01/16/17	MGS
	1286	L	PUT LOGO ON VALVE BODY, CORRECT MINOR ERRORS	08/16/18	KJB

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
1	VALVE BODY, SERIES 535		1073407	1
2	NUT, DISC RETAINING	PVC	1073396	1
3	DISC, V535	EPDM	1073401	1
		FKM	1073403	
4	HOLDER, DISC, 535	PVC	1073416	1
5	O-RING,-212	EPDM	1071745	4
		FKM	1071816	
6	O-RING, -232	EPDM	1071753	2
		FKM	1071825	
7	RING, RETAINING, SERIES 535		1073434	1
8	GUIDE, SHAFT, V535	PVC	1073413	1
9	ASSEMBLY, SHAFT, V535 / 2" VLV		1073439	1
10	O-RING, 2-248	BUNA	1071712	2
		FKM	1071833	
11	DIAPHRAGM, SERIES 535	BUNA	1073399	1
12	NUT, RETAINING, 535, NORYL		1073383	1
13	PLATE, LOWER DIAPHRAGM	PVC	1073386	1
14	CAP, K535		1073382	1
15	PLATE, DIAPHRAGM,535,UPR,PI	PVC	1073384	1
16	DIAPHRAGM, SUPPORT, K535		1073425	2
17	O-RING, -231	EPDM	1071752	2
		FKM	1071824	
18	NUT, SOCKET RETAINING, 535		1073395	2

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 5, 6, 10, 11, 17	1070320 E.P.D.M. INCLUDES DIAPHRAGM 1073399
	1082191 FKM INCLUDES DIAPHRAGM 1073399
INT. PARTS KIT CONSISTS OF ITEM NO'S 2, 4, 7, 8, 9, 13, 15, 16	1070344

SEE REVERSE SIDE FOR CONFIGURATION OPTIONS

COMPONENTS / ASSEMBLIES TO BE COMPLIANT AND COMPATIBLE WITH EUROPEAN UNION DIRECTIVE 2011/65/EEC (RoHS2) & REGULATION (EC)1907/2006 (REACH) REQUIREMENTS

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INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -2009
UNLESS OTHERWISE SPECIFIED:
ALL FINISHED MACHINED SURFACES 125 ✓ OR BETTER.
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN MWL	07-01-13
APPROVED	
CHECKED	

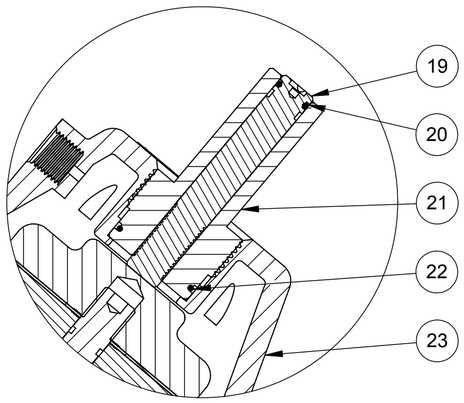
AQ Matic
Valve & Controls Company Inc.

TITLE
CATALOG SHEET, 535

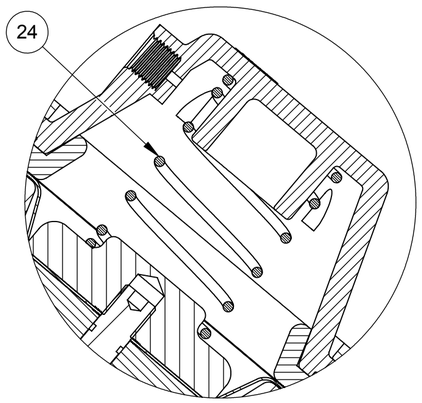
SIZE	DWG NO.	REV
B	1077690	L

SCALE 1:4 SHEET 1 OF 2

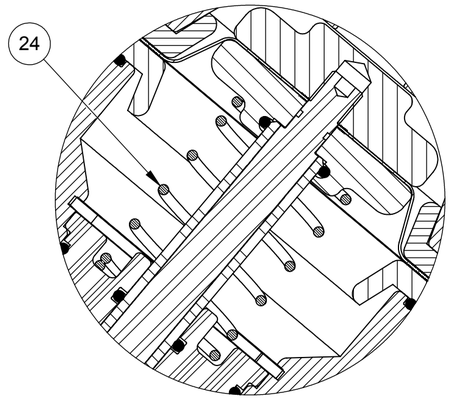
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
			SEE SHEET 1 FOR LIST OF CHANGES		



1070313 (K535-X210-14000)
LIMIT STOP



1071367 (K535-X202-14000)
SPRING ASSIST CLOSED



1071365 (K535-X201-14000)
SPRING ASSIST OPEN

REPAIR PARTS KITS	
DESCRIPTION	PART NO.
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 19 THRU 22	1075234
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 24	1075236
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO 24	1075236
INT. PARTS KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 25 THRU 32	1075235

CONVERSION KITS	
DESCRIPTION	PART NO
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NO'S 19 THRU 23	1071343
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 24	1075236
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO 24	1075236
CONVERSION KIT (POSITION INDICATOR) CONSISTS OF ITEM NO'S 25 THRU 33	1071344

LIMIT STOP MODEL

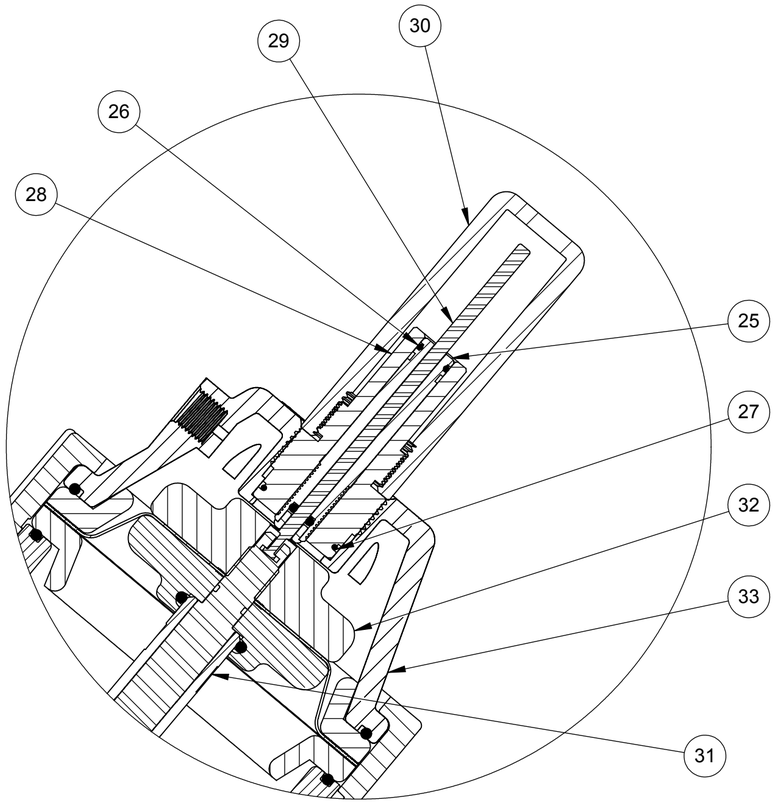
ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
19	SCREW, LIMIT STOP		1073432	1
20	O-RING,2-012,	BUNA	1071668	1
		FKM	1071787	1
21	GUIDE, LIMIT STOP , K535	PVC	1073428	1
22	O-RING,2-024,	BUNA	1071676	1
		FKM	1071791	1
23	CAP, 2" VALVE, LS/PI,V535		1073408	1

SPRING ASSIST CLOSED & SPRING ASSIST OPEN MODELS

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
24	SPRING, COMPRESSION	1073404	1

LIMIT STOP/POSITION INDICATOR MODEL

ITEM NO.	DESCRIPTION		PART NUMBER	QTY.
25	LS/PI SCREW, ASSY		1073437	1
26	O-RING,2-012,	BUNA	1071668	1
		FKM	1071787	
27	O-RING,2-024,	BUNA	1071676	1
		FKM	1071791	
28	GUIDE, LIMIT STOP , K535	PVC	1073427	1
29	INDICATOR, POSITION, K535		1073426	1
30	SIGHT GLASS, POS INDICATOR 535		1073424	1
31	SUB-ASSY, SHAFT, 535, PI / LS		1073438	1
32	PLATE,DIAPHRAGM,535,UPR,PI	PVC	1073409	1
33	CAP, 2" VALVE, LS/PI,V535		1073408	1



1071347 (K535-X221-14000)
LIMIT STOP/POSITION INDICATOR

SEE REVERSE SIDE FOR STANDARD NORMALLY OPEN MODEL

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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN MWL	07-01-13
APPROVED	
CHECKED	

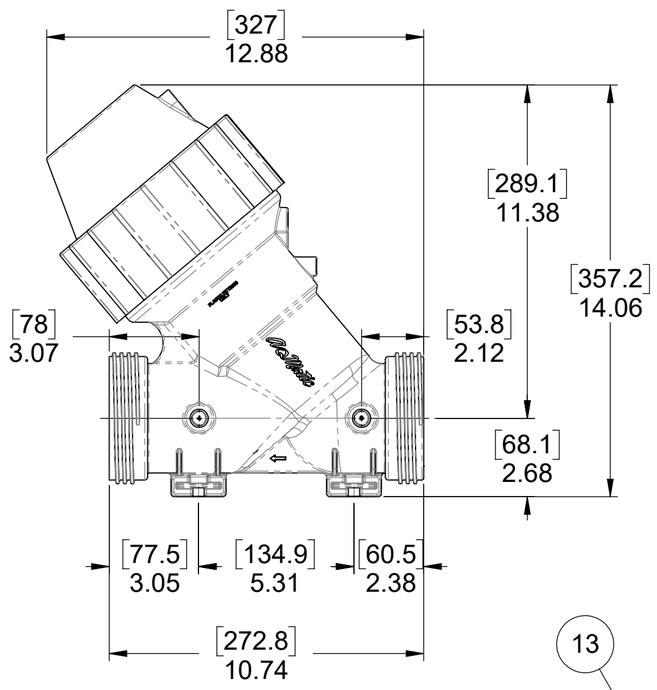
AQ Matic
Valve & Controls Company Inc.

TITLE: CATALOG SHEET, 535

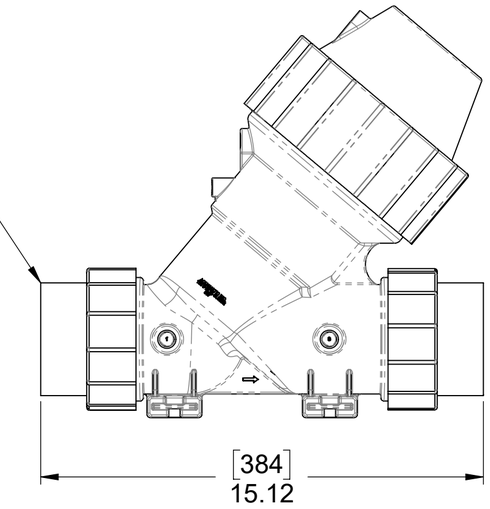
SIZE B | DWG NO. 1077690 | REV L

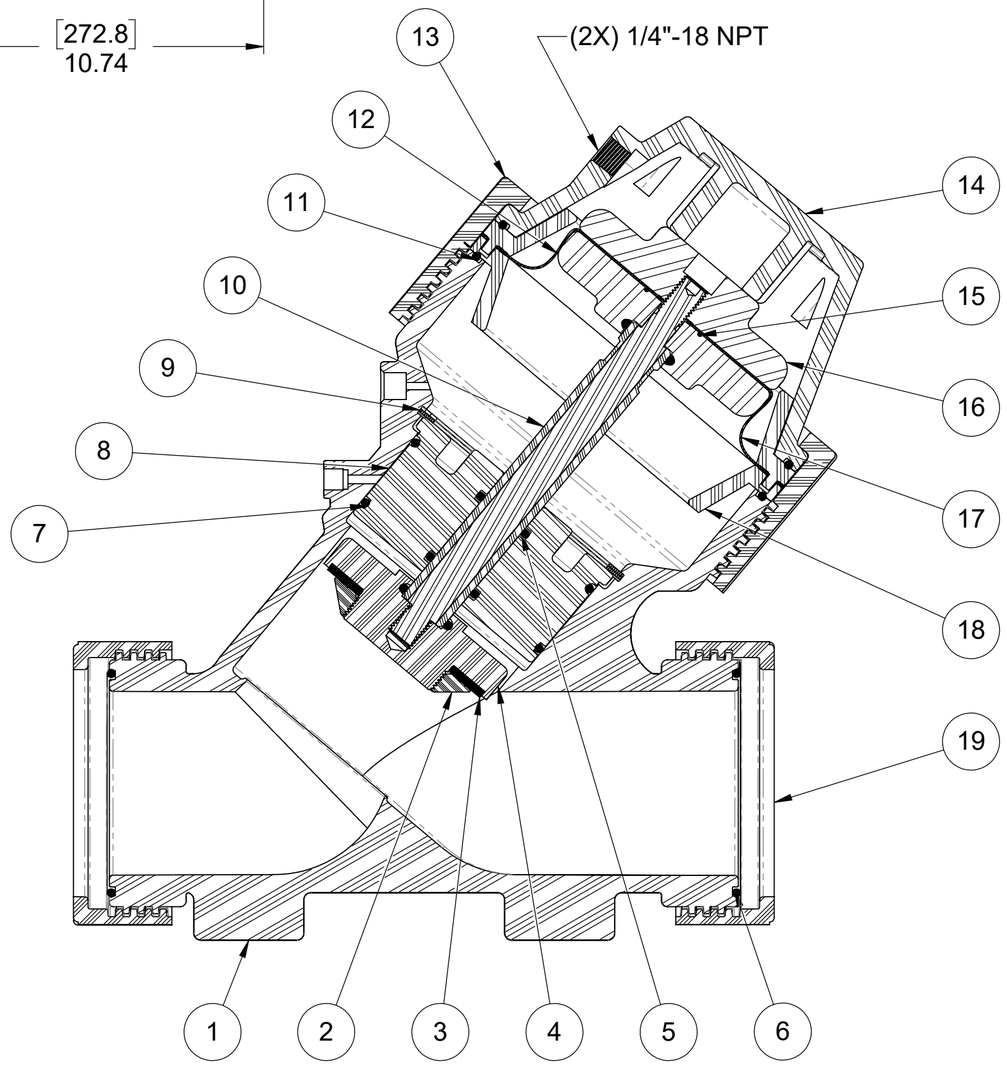
SCALE 1:4 | SHEET 2 OF 2

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
K		1-WAS: INSTALL WASHER SO THAT MARKINGS ARE SEATED FACE DOWN ON THE SHAFT FLANGE AND MARKS ARE NOT VISIBLE WHEN SEATED.	6/28/2013	TJM
L		1-ITEM #4- WAS:1073482, 2-REM'D: BR FROM PART #'S, 3-UPDATED TITLE BLOCK	8/11/2015	TJM
M	1001	AQ MATIC UPDATE & VERIFIED PART NUMBERS	1/17/2017	MGS
N	1764	REDRAWN W/ MODEL UPDATE, REM'D DETAIL A, REPLACED DIAPHRAGM PLATES, REM'ED DIAPHRAGM PLATE WASHER, REM'D STRAP WRENCH	9/14/2020	PMJ



NOTE:
CONNECTORS NOT FURNISHED WITH VALVE.
SEE DWG. NO. 1078165 FOR FEMALE SOCKETED WELD CONNECTORS.





NORMALLY OPEN
1070316 (K537-X200-14000)

BOM TABLE

ITEM NO	PART NO		DESCRIPTION	MATERIAL	QTY
1	1073472	V537-410K	BODY, 537, VALVE		1
2	1073459	V537-093	NUT, DISC PLATE, 537, MCHD		1
3	1073463	V537-110	DISC, 537	EPDM	1
	1073465	V537-112		FKM	
4	43361	V537-502	DISC HOLDER, 537		1
5	1071745	ORE-212	O-RING, 2-212	EPDM	4
	1071816	ORV-212		FKM	
6	1071756	ORE-239	O-RING, 2-239	EPDM	2
	1071829	ORV-239		FKM	
7	1071757	ORE-240	O-RING, 2-240	EPDM	2
	1071830	ORV-240		FKM	
8	1073478	V537-491	GUIDE, SHAFT, 537		1
9	1073505	V537-598	RING, RETAINING, 537		1
10	1073508	V537-702	SHAFT ASSY,537,PVC		1
11	1071714	ORB-259	O-RING, 2-259	BUNA	2
12	4510494	V537-447	K537 LOWER DIAPHRAGM PLATE		1
13	1073446	V537-030K	NUT, CAP RETAINING, 537		1
14	1073445	V537-020K	CAP, VALVE, 537		1
15	1071676	ORB-024	O-RING, 2-024	BUNA	1
16	4510495	V537-444	K537 UPPER DIAPHRAGM PLATE		1
17	1073462	V537-100	DIAPHRAGM, 537	BUNA	1
18	1073491	V537-702	DIAPHRAGM SUPPORT, K537		2
19	1073458	V537-080K	NUT, RETAINING, 537		2

REPAIR KITS

DESCRIPTION	PART NO
DIAPHRAGM & SEALS KIT CONSISTS OF ITEM NO'S 3, 5(4), 6(2), 7(2), 11(2), 15 & 17 BUNA DIAPHRAGM 1073462 (V537-100)	**EPDM** 1070321 (537-RAE)
	FKM 1070337 (537-RAVFB)
INT. PARTS KIT CONSISTS OF ITEM NO'S 2, 4, 8, 9, 10, 12, 16, 18(2)	1070345 (K537-RF)

ASSEMBLY TOOLS

DESCRIPTION	PART NO
LIMIT STOP TOOL (NOT SHOWN)	1073556 (V560-579)

SEE SHEET 2 FOR CONFIGURATION OPTIONS

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2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	9/14/2020
CHECKED BY	
APPROVED	

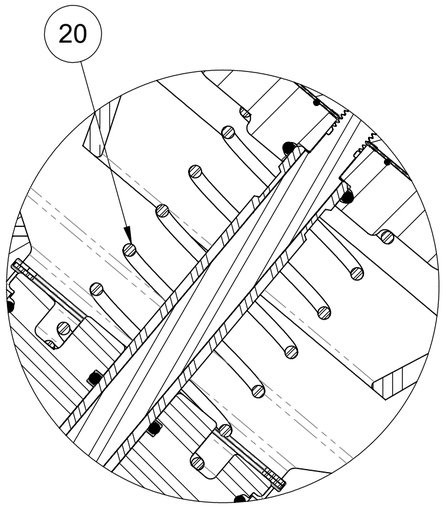
AQ-MATIC VALVES AND CONTROLS

DESCRIPTION
CATALOG SHEET
537 DIAPHRAGM VALVE

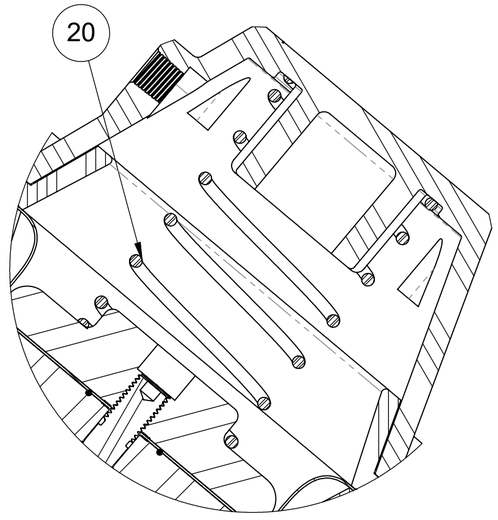
SIZE	DWG NO.	REV.
C	1077691	N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 1 OF 2

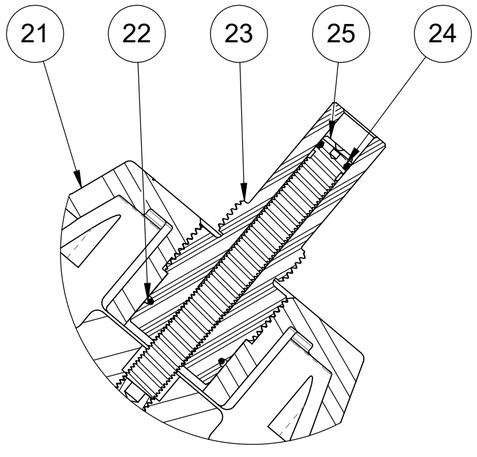
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR REVISION HISTORY		



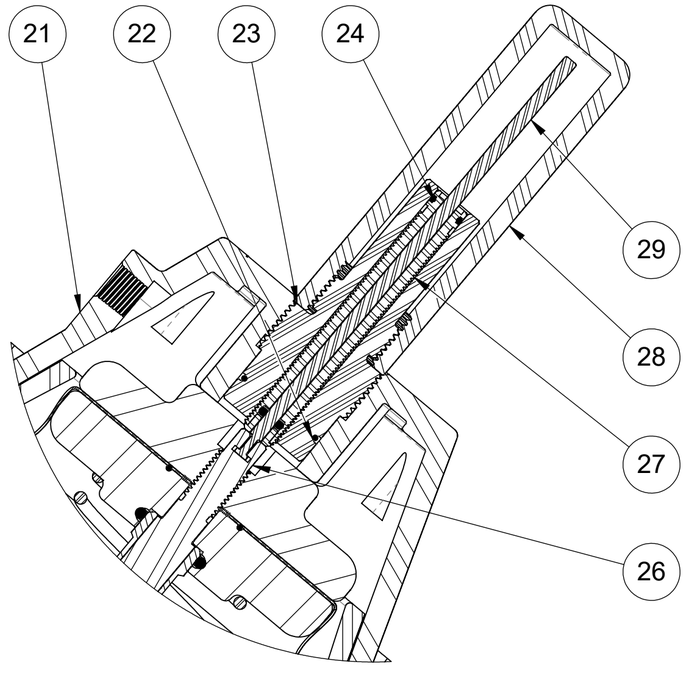
SPRING ASSIST OPEN
1071390 (K537-X201-14000)



SPRING ASSIST CLOSED
1071391 (K537-X202-14000)



LIMIT STOP
1070317 (K537-X210-14000)



LIMIT STOP / POSITION INDICATOR
1071380 (K537-X2A1-14000) - SPRING ASSIST OPEN
1071381 (K537-X2A2-14000) - SPRING ASSIST CLOSED

SPRING ASSIST OPEN OR CLOSED

ITEM NO	PART NO		DESCRIPTION	MATERIAL	QTY
20	1073467	V537-170	SPRING, COMPRESSION, 537		1

LIMIT STOP OPTION

ITEM NO	PART NO		DESCRIPTION	MATERIAL	QTY
21	1073473	V537-420K	CAP, 537, LS/PI		1
22	1071676	ORB-024	O-RING, 2-024	BUNA	2
23	1073493	V537-570	GUIDE, LS/PI, 537		1
24	1071668	ORB-012	O-RING, 2-012	BUNA	1
25	1073498	V537-576	SCREW, LIMIT STOP, 537		1

LIMIT STOP WITH POSITION INDICATOR

ITEM NO	PART NO	MODEL	DESCRIPTION		QTY
21	1073473	V537-420K	CAP, 537, LS/PI		1
22	1071676	ORB-024	O-RING, 2-024	BUNA	2
23	1073493	V537-570	GUIDE, LS/PI, 537		1
24	1071668	ORB-012	O-RING, 2-012	BUNA	1
26	1073507	V537-701	SHAFT, 537, PVC, PI		1
27	1073506	V537-700	SCREW, LIMIT STOP, ASSY., 537		1
28	1073489	V534-550	PI SIGHT GLASS, 537		1
29	1073492	V537-555	ROD, PI, 537		1

REPAIR KITS

DESCRIPTION	KIT NUMBER	
INT. PARTS KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 20	1075239	537-S
INT. PARTS KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO 20		
INT. PARTS KIT (LIMIT STOP) CONSISTS OF ITEM NOS 22, 23, 24, 25	1075237	537-LS
INT. PARTS KIT (LIMIT STOP / POS. INDICATOR) CONSISTS OF ITEM NOS 16, 22, 23, 24, 26, 27, 28, 29	1081805	537-PI

CONVERSION KITS

DESCRIPTION	KIT NUMBER	
CONVERSION KIT (SPRING ASSIST CLOSED) CONSISTS OF ITEM NO 20	1075239	537-S
CONVERSION KIT (SPRING ASSIST OPEN) CONSISTS OF ITEM NO 20		
CONVERSION KIT (LIMIT STOP) CONSISTS OF ITEM NOS 11, 16, 21, 22, 23, 24, 25	1071377	537-LSC
CONVERSION KIT (LIMIT STOP / POS. INDICATOR) CONSISTS OF ITEM NOS 11, 16, 21, 22, 23, 24, 26, 27, 28, 29	1071378	537-PIC

SEE SHEET 1 FOR NORMALLY OPEN MODEL

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	9/14/2020
CHECKED BY	
APPROVED	

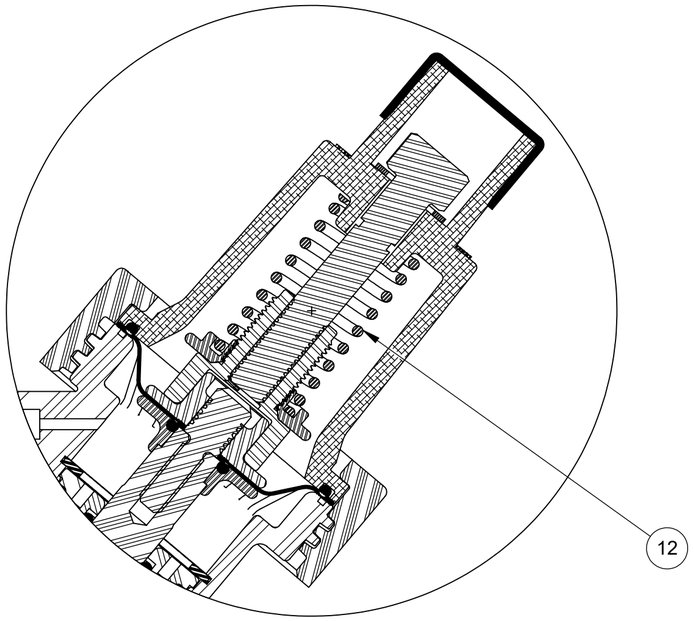
AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET
537 DIAPHRAGM VALVE

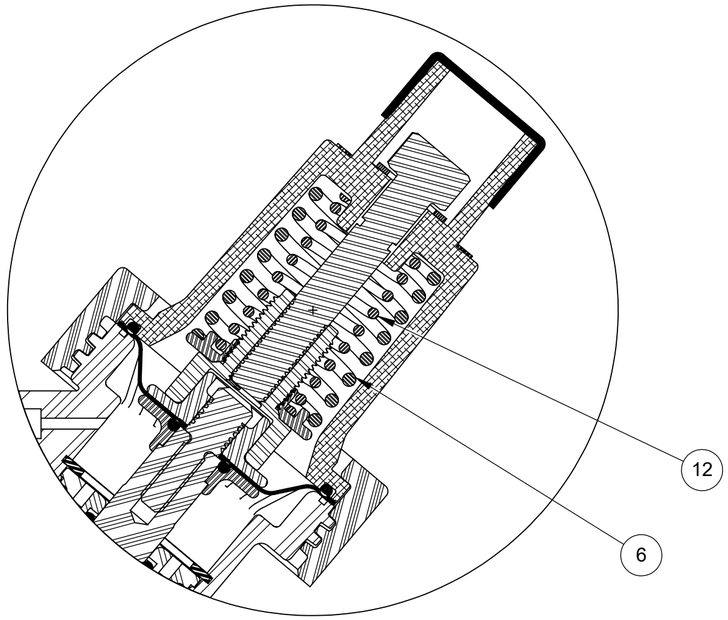
SIZE	DWG NO.	REV.
C	1077691	N

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 2

REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
1280	M	CORRECTED REPAIR KIT-100# CALLOUT, UPDATE DW # TO 1084008	07/31/18	KJB
1499	N	UPDATED ITEM NO. 11 PART NO.: WAS 1242718 NOW 1071744	06/17/19	KJB
1628	P	CORRECT MINOR ERRORS, STANDARDIZE LAYOUT	01/15/20	PMJ
1846	R	MODEL NUMBERS ADDED, HATCHING UPDATED	2/22/2021	PMJ
1857	S	INSTRUCTIONS FOR REPAIR KITS ADDED	3/4/2021	PMJ



1079700 (K531-X203-14000) (30 PSI - 2 BAR)
FAILSAFE CLOSED



1071294 (K531-X205-14000) (100 PSI - 7 BAR)
FAILSAFE CLOSED

NOTE:
REPLACEMENT COMPONENTS UNIQUE TO FAILSAFE DESIGN ARE AVAILABLE AS A REPAIR KIT ONLY. SEE SHEET 2 FOR KIT DETAILS.

1071291 (K531-X204-14000) (60 PSI - 4 BAR)
FAILSAFE CLOSED

ITEM NO.	PART NUMBER	MODEL	DESCRIPTION		1079700 QTY.	1071291 QTY.	1071294 QTY.
1	1073287	V531-410K	BODY, 531, VALVE	NORYL	1		
2	1071700	ORB-208	O-RING, 2-208	BUNA	1		
3	1071705	ORB-232	O-RING, 2-232	BUNA	1		
4	1071748	ORE-218	O-RING, 2-218	EPDM	2		
5	1071749	ORE-223	O-RING, 2-223	EPDM	2		
6	1073284	V531-171	SPRING, COMPRESSION	SS	-	1	
7	1073274	V531-093K	NUT, DISC RETAINING, 531	NORYL	1		
8	1073277	V531-100	DIAPHRAGM, 531	BUNA	1		
9	1073279	V531-110	DISC	EPDM	1		
10	1073273	V531-080K	NUT, RETAINING, 531	NORYL	2		
11	1071744	ORE-210	O-RING, 2-210	EPDM	2		
12	1073285	V531-172	SPRING, 531 (FS30 & FS100)	SS	1		
13	1073289	V531-172	PLATE, UPPR DPHRGM (FAILSAFE)	SS	1		
14	1073312	V531-593	RING, RETAINING, SERIES 531	NORYL	1		
15	1073290	V531-446	PLATE, LWR DPHRGM (FAILSAFE)	SS	1		
16	1073311	V531-592	SCREW, FAILSAFE, 531	SS	1		
17	1073313	V531-596	BASE, SPRING SUPPORT	SS	1		
18	1073314	V531-597	RING, RETAINER (FOR ADJUST FS)	SS	1		
19	1073296	V531-532	SHAFT, 531, FAILSAFE	NORYL, SS	1		
20	1073293	V531-495K	VALVE CAP, 531 FAILSAFE	ALUM	1		
21	1073395	V535-080K	NUT, SOCKET RETAINING, 535 PIPE	NORYL	1		
22	1073596	WAS-0025	WASHER, (1.00X.686X.060)	SS	1		
23	1073292	V531-491	SHAFT GUIDE, 531	PVC	1		
24	1071483		CAP PLUG, 1-1/2 X 1"	LDPE	1		

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2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TMS	05/21/10
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

CATALOG SHEET, 531 FAILSAFE, VALVE

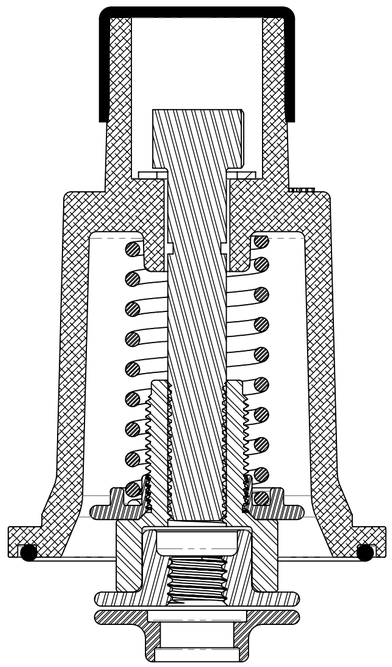
SIZE	DWG NO.	REV.
C	1084008	S

SCALE 3:4 | SOLIDWORKS FORMAT | SHEET 1 OF 2

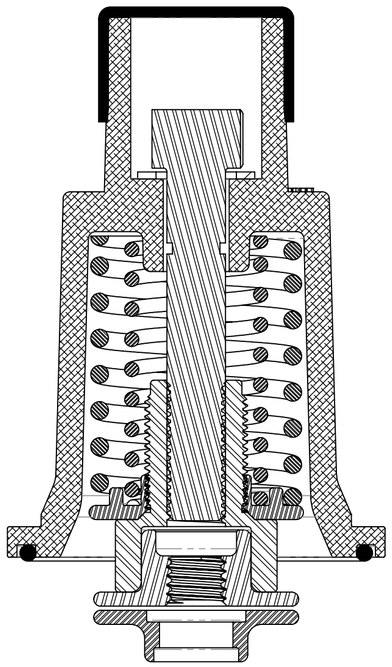
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE SHEET ONE FOR A LIST OF CHANGES.		

CAP REPLACEMENT INSTRUCTIONS:

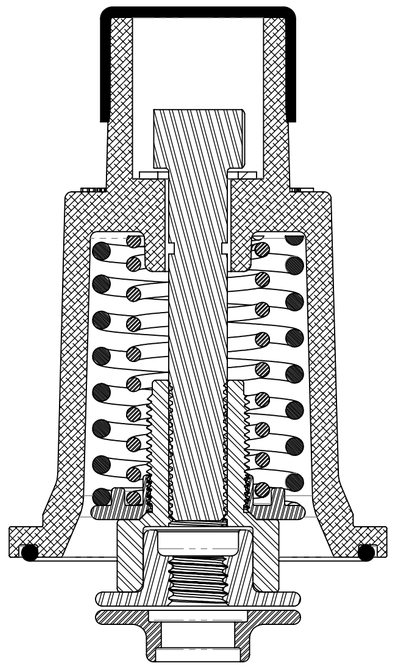
1. TURN SCREW (16) OF OLD CAP CLOCKWISE UNTIL SPRINGS ARE FULLY COMPRESSED.
2. UNSCREW CAP NUT (21) AND REMOVE OLD CAP ASSEMBLY.
3. PLACE O-RING (3) INTO BOTTOM GROOVE IN CAP ASSEMBLY.
4. PLACE NEW CAP ASSEMBLY ON VALVE AND TIGHTEN CAP NUT (21).
5. TURN SCREW (16) OF NEW CAP COUNTERCLOCKWISE UNTIL CONTACT IS MADE WITH UPPER DIAPHRAGM PLATE (13) WHILE IN CLOSED POSITION.



1071263 (K531-FS3)
REPAIR KIT - 30#



1071264 (K531-FS6)
REPAIR KIT - 60#



1071262 (K531-FS1)
REPAIR KIT - 100#

REPAIR KITS	
REPAIR KIT NO.	**PART NUMBERS INCLUDED**
1071263 (K531-FS3)	3,12,13,15,16,17,18,22,24
1071264 (K531-FS6)	3,6,12,13,15,16,17,18,22,24
1071262 (K531-FS1)	3,6,12,13,15,16,17,18,22,24

VALVE SERIES	30# FAILSAFE #TURNS UP FROM BOTTOM	60# FAILSAFE #TURNS UP FROM BOTTOM	100# FAILSAFE #TURNS UP FROM BOTTOM
531	**7**	**0**	**9**

NOTES:
1. REPAIR KIT IS TO BE SHIPPED TO CUSTOMER IN A FULLY COMPRESSED STATE.

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2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TMS	05/21/10
CHECKED BY	
APPROVED	

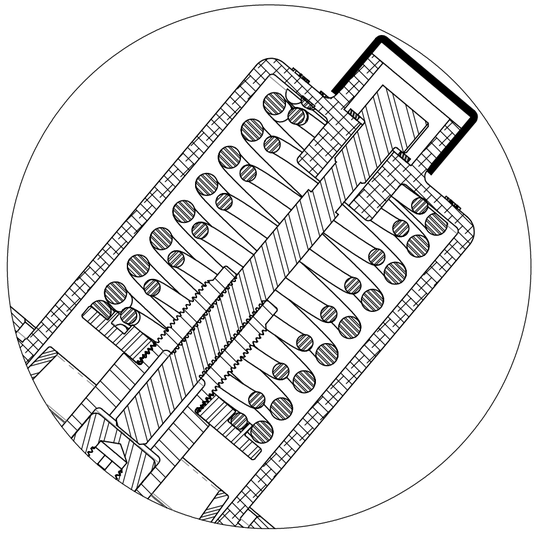
AQ-MATIC VALVES AND CONTROLS

CATALOG SHEET, 531 FAILSAFE, VALVE

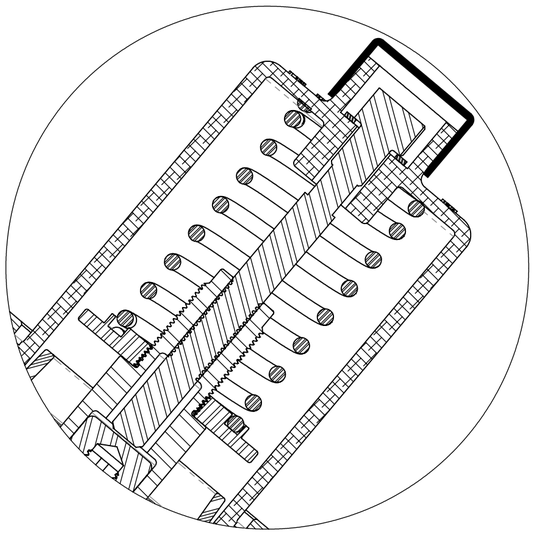
SIZE	DWG NO.	REV.
C	1084008	S

SCALE 1:1	SOLIDWORKS FORMAT	SHEET 2 OF 2

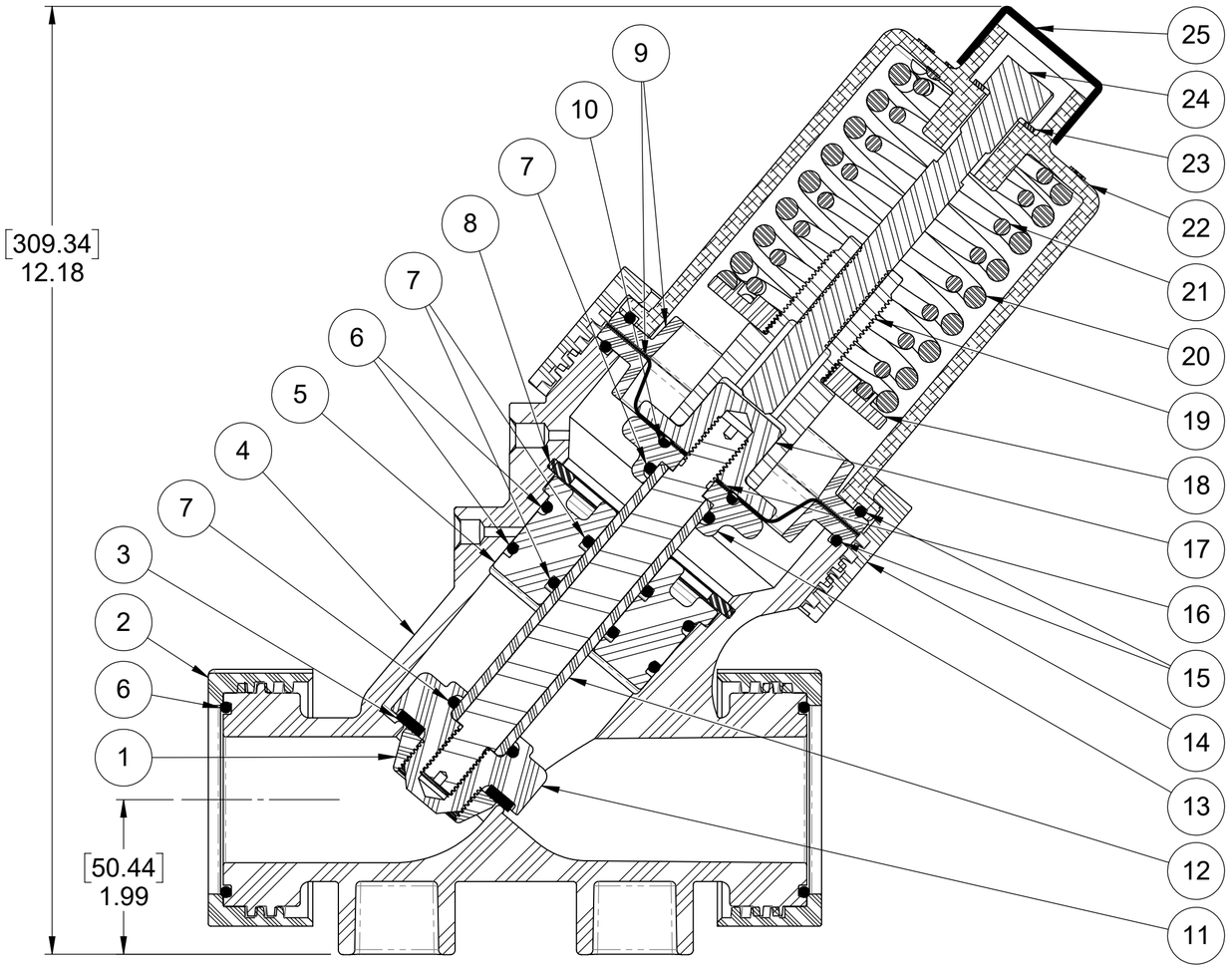
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
H		RELEASE INTO THE SYSTEM	5/19/2010	MHM
J	1848	REDRAWN INTO AQ TEMPLATE	2/23/2021	PMJ
K	1857	REPAIR KIT INSTRUCTIONS ADDED	3/4/2021	PMJ



1071334 (K534-X204-14000)
(60 PSI - 4 BAR)
FAILSAFE CLOSED



1079718 (K534-X203-14000)
(30 PSI - 2 BAR)
FAILSAFE CLOSED



1071335 (K534-X205-14000)
(100 PSI - 7 BAR)
FAILSAFE CLOSED

NOTE:
REPLACEMENT COMPONENTS UNIQUE TO FAILSAFE DESIGN ARE AVAILABLE AS A REPAIR KIT ONLY. SEE SHEET 2 FOR KIT DETAILS.

ITEM NO.	PART NO.	MODEL	DESCRIPTION	1079718 30 LBS. QTY.	1071334 60 LBS. QTY.	1071335 100 LBS. QTY.
1	1073330	V534-093	PLATE, DISC, 534, PVC, MCHD	1		
2	1073329	V534-080K	NUT, RETAINING, 534	2		
3	1073337	V534-110	DISC, 534	1		
4	1073344	V534-410K	VALVE BODY	1		
5	1073350	V534-491	GUIDE, SHAFT, 534	1		
6	1071751	ORE-228	O-RING, 2-228	4		
7	1071745	ORE-212	O-RING, 2-212, EPDM	4		
8	1073375	V534-593	RING, RETAINING, 534	1		
9	1073366	V534-551K	SUPPORT, DIAPHRAGM, 534	2		
10	1076766	ORB-214	O-RING, 2-214	1		
11	1073355	V534-502	HOLDER, DISC, FS, 534	1		
12	1073379	V534-702	SHAFT ASSEMBLY, FS, 534	1		
13	1073349	V534-448	PLATE, DIAPHRAGM, LWR, FS, 534	1		
14	43073		NUT, FS, 534	1		
15	1071709	ORB-240	O-RING, 2-240	2		
16	1073335	V534-100	DIAPHRAGM, SERIES 534	1		
17	1073348	V534-444	PLATE, DIAPHRAGM, UPR, FS, 534	1		
18	1073377	V534-597	RING, SPRG RETAINER, 534	1		
19	1073376	V534-596	BASE, SPRING RETAINER	1		
20	1073341	V534-171	SPRING, COMPRESSION	-	1	
21	1073342	V534-172	SPRING, COMPRESSION	1		
22	1073352	V534-495K	CAP, FS, 534	1		
23	1073596	WAS-0025	WASHER, (1.00X.686X.060)	1		
24	1073374	V534-592	SCREW, FS, 534	1		
25	1071483		CAP PLUG, 1-1/2 X 1"	1		

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TOLERANCES:
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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	2/23/2021
CHECKED BY	
APPROVED	

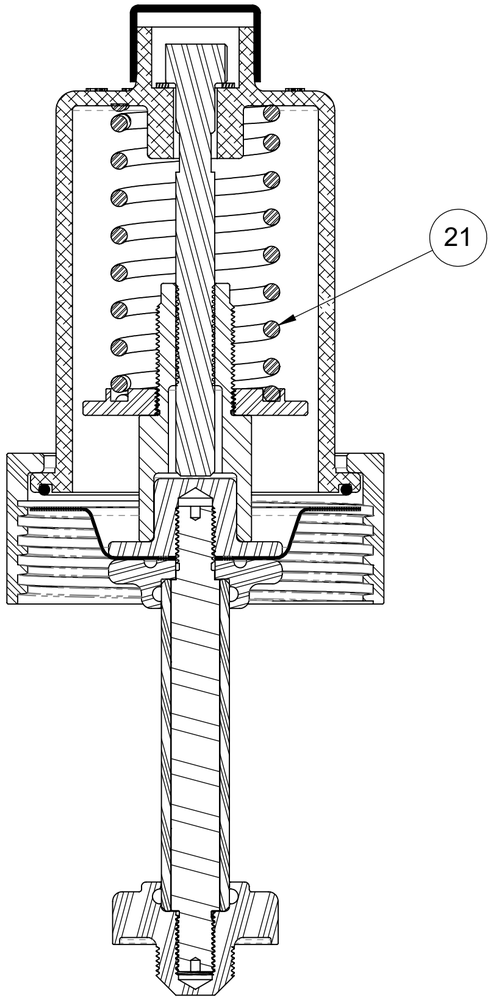
AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET
K534 FAILSAFE

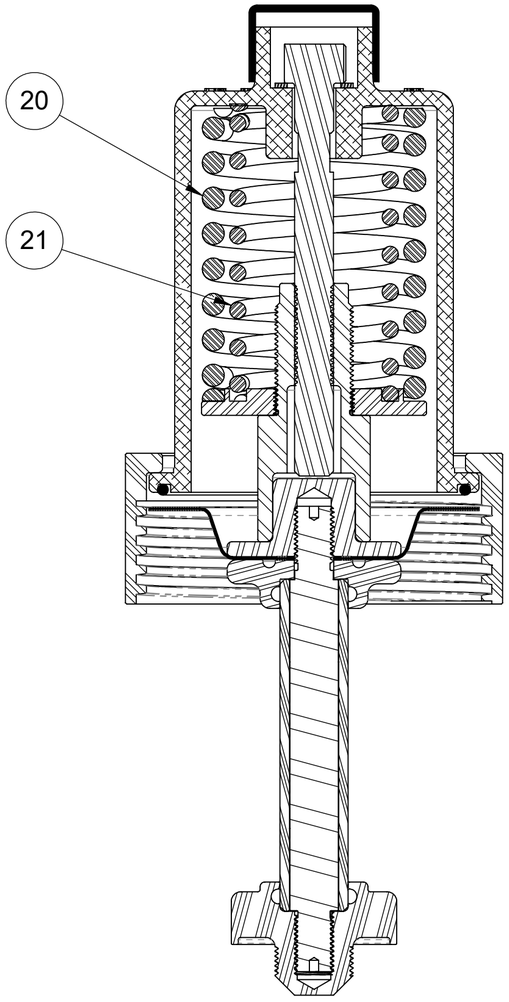
SIZE	DWG NO.	REV.
C	1078167	K

SCALE 2:3 | SOLIDWORKS FORMAT | SHEET 1 OF 2

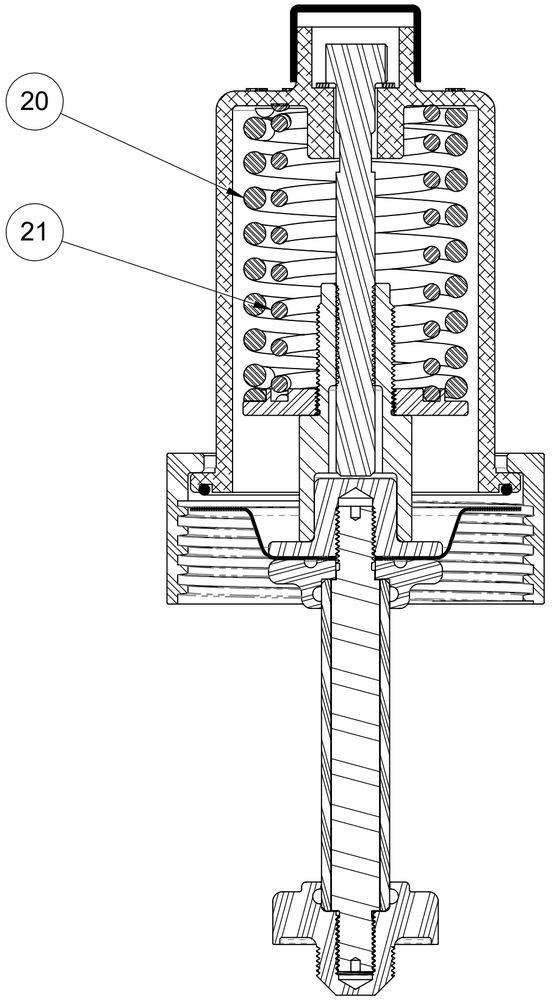
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR REVISION HISTORY		



1071306 (K534-FS3)
REPAIR KIT - 30 LBS.



1071307 (K534-FS6)
REPAIR KIT - 60 LBS.



1071305 (K534-FS1)
REPAIR KIT - 100 LBS.

CAP REPLACEMENT INSTRUCTIONS:
1. TURN SCREW (24) OF OLD CAP CLOCKWISE UNTIL SPRINGS ARE FULLY COMPRESSED.
2. UNSCREW CAP NUT (14) AND REMOVE OLD CAP ASSEMBLY.
3. PLACE O-RING (15) INTO BOTTOM GROOVE IN CAP ASSEMBLY.
4. PLACE NEW CAP ASSEMBLY ON VALVE AND TIGHTEN CAP NUT (14).
5. TURN SCREW (24) OF NEW CAP COUNTERCLOCKWISE UNTIL CONTACT IS MADE WITH UPPER DIAPHRAGM PLATE (17) WHILE IN CLOSED POSITION.

NOTES:
1. REPLACEMENT COMPONENTS UNIQUE TO FAILSAFE DESIGN ARE AVAILABLE AS A REPAIR KIT ONLY. SEE SHEET 2 FOR KIT DETAILS.
2. REPAIR KIT IS TO BE SHIPPED TO CUSTOMER IN A FULLY COMPRESSED STATE.

REPAIR KITS

ITEM NO.	PART NO.	MODEL	DESCRIPTION	1071306 K534-FS3 30 LBS. QTY.	1071307 K534-FS6 60 LBS. QTY.	1071305 K534-FS1 100 LBS. QTY.
11	1073355	V534-502	HOLDER, DISC, FS, 534	1		
12	1073379	V534-702	SHAFT ASSEMBLY, FS, 534	1		
13	1073349	V534-448	PLATE, DIAPHRAGM, LWR, FS, 534	1		
14	43073		NUT, FS, 534	1		
15	1071709	ORB-240	O-RING, 2-240	1		
16	1073335	V534-100	DIAPHRAGM, SERIES 534	1		
17	1073348	V534-444	PLATE, DIAPHRAGM, UPR, FS, 534	1		
18	1073377	V534-597	RING, SPRG RETAINER, 534	1		
19	1073376	V534-596	BASE, SPRING RETAINER	1		
20	1073341	V534-171	SPRING, COMPRESSION	-	1	
21	1073342	V534-172	SPRING, COMPRESSION	1		
22	1073352	V534-495K	CAP, FS, 534	1		
23	1073596	WAS-0025	WASHER, (1.00X.686X.060)	1		
24	1073374	V534-592	SCREW, FS, 534	1		
25	1071483		CAP PLUG, 1-1/2 X 1"	1		

VALVE SERIES	30 LBS. FAILSAFE #TURNS UP FROM BOTTOM	60 LBS. FAILSAFE #TURNS UP FROM BOTTOM	100 LBS. FAILSAFE #TURNS UP FROM BOTTOM
534	2	5	13

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3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	2/23/2021
CHECKED BY	
APPROVED	

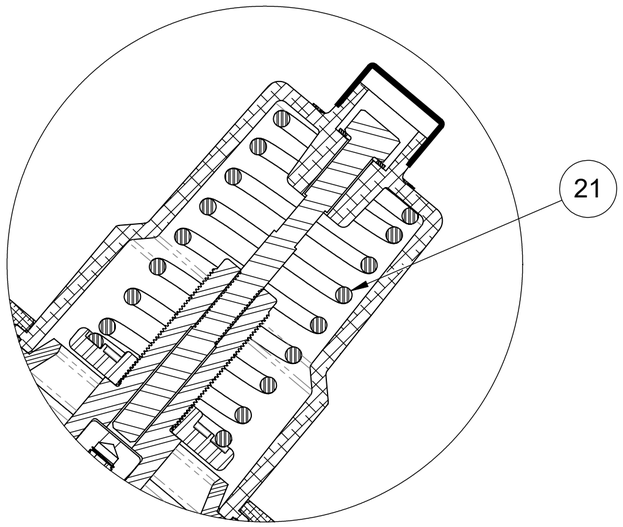
AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET
K534 FAILSAFE

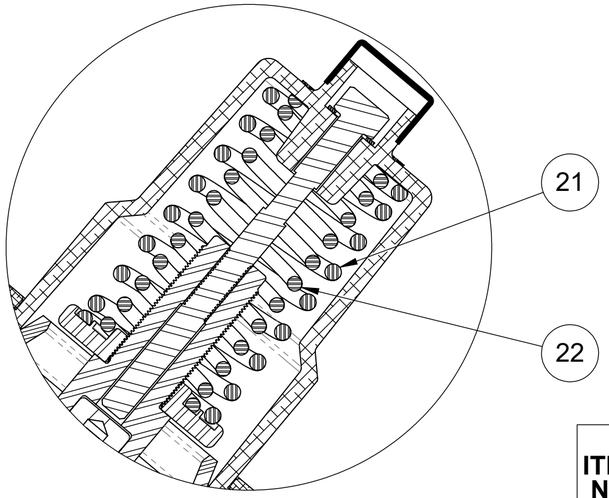
SIZE	DWG NO.	REV.
C	1078167	K

SCALE 2:3 | SOLIDWORKS FORMAT | SHEET 2 OF 2

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
E		REDRAWN IN SOLIDWORKS: 1-ADD'D:BR1071745: 2-REM'D:BR1071483	5/18/2010	MHM
F		1-ADD'D:43307	10/21/2011	TMS
G	1001	AQ MATIC UPDATE & VERIFIED PART NUMBERS	1/27/2017	MGS
H	1845	REDRAWN IN NEW TEMPLATE, ADD'D MODEL NO'S	2/22/2021	PMJ
J	1857	REPAIR KIT INSTRUCTIONS ADDED	3/4/2021	PMJ

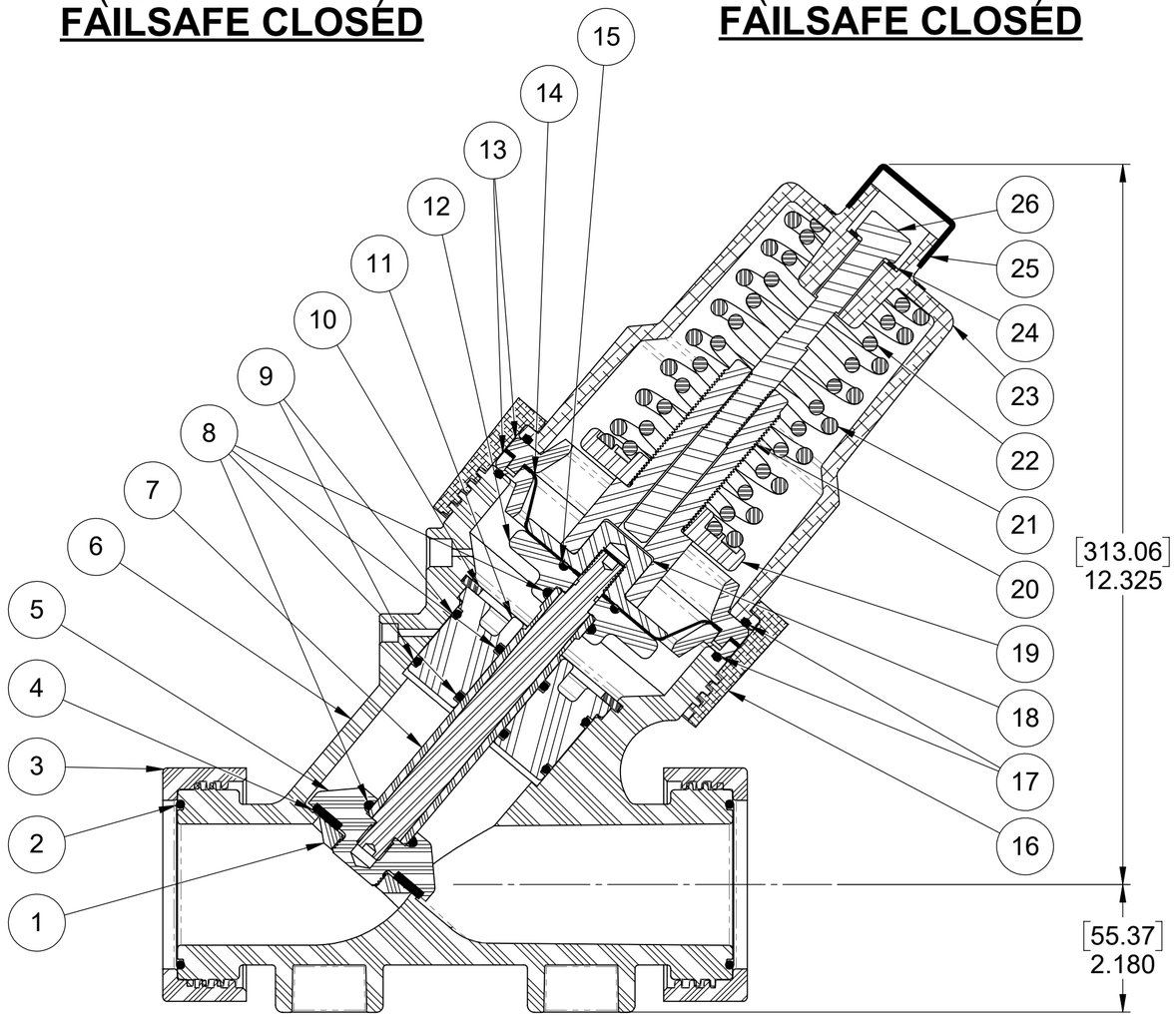


1076665 (K535-X203-14000)
(30 PSI - 2 BAR)
FAILSAFE CLOSED



1071368 (K535-X204-14000)
(60 PSI - 4 BAR)
FAILSAFE CLOSED

NOTE:
REPLACEMENT COMPONENTS UNIQUE TO FAILSAFE DESIGN ARE AVAILABLE AS A REPAIR KIT ONLY. SEE SHEET 2 FOR KIT DETAILS.



1071371 (K535-X205-14000) (100 PSI - 7BAR)
FAILSAFE CLOSED

ITEM NO.	PART NO.		DESCRIPTION	1076665 30 PSI QTY.	1071368 60 PSI QTY.	1071371 100 PSI QTY.
1	1073396	V535-093	NUT, DISC RETAINING, 535	1		
2	1071752	ORE-231	O-RING, 2-231	2		
3	1073395	V535-080K	NUT, SOCKET RETAINING, 535	2		
4	1073401	V535-110	DISC, 535	1		
5	1073416	V535-500	HOLDER, DISC, 535	1		
6	1073407	V535-410K	BODY, 535, VALVE	1		
7	1073439	V535-702	ASSEMBLY, SHAFT, 535	1		
8	1071745	ORE-212	O-RING, 2-212, EPDM	4		
9	1071753	ORE-232	O-RING, 2-232	2		
10	1073434	V535-593	RING, RETAINING, 535	1		
11	1073413	V535-491	GUIDE, SHAFT, 535	1		
12	1073412	V535-448	PLATE, DIAPHRAGM, LWR, FS, 535	1		
13	1073425	V535-551K	SUPPORT, DIAPHRAGM, 535	2		
14	1073399	V535-100	DIAPHRAGM, 535	1		
15	1076766	ORB-214	O-RING, 2-214	1		
16	43307		NUT, FS, 535	1		
17	1071712	ORB-248	O-RING, 2-248	2		
18	1073411	V535-444	PLATE, DIAPHRAGM, UPR, FS, 535	1		
19	1073436	V535-597	RING, SPRG RETAINER, 535	1		
20	1073435	V535-596	BASE, SPRING RETAINER	1		
21	1073405	V535-171	SPRING, COMPRESSION	1		
22	1073406	V535-172	SPRING, COMPRESSION	-	1	
23	1073415	V535-495K	CAP, FS, 535	1		
24	1073596	WAS-0025	WASHER, (1.00X.686X.060)	1		
25	1071483		CAP PLUG, 1-1/2 X 1"	1		
26	1073433	V535-592	SCREW, FS, 535	1		

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M -1994

UNLESS OTHERWISE SPECIFIED:
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CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	2/19/2021
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET
535 FAILSAFE VALVE

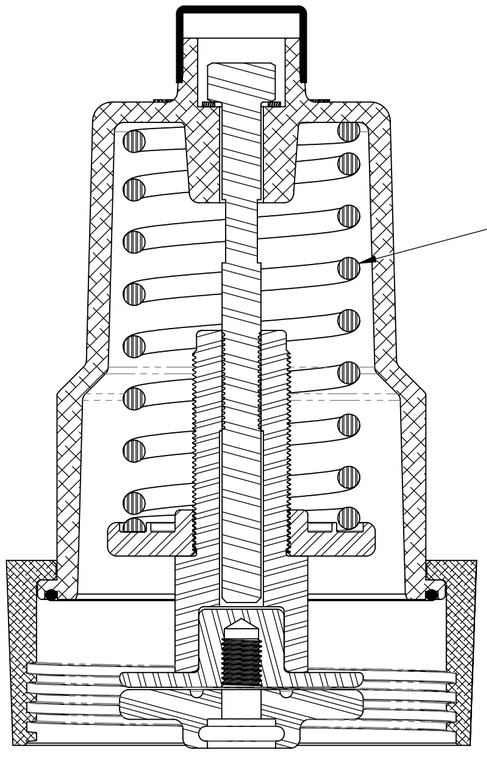
SIZE	DWG NO.	REV.
C	1084011	J

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 1 OF 2

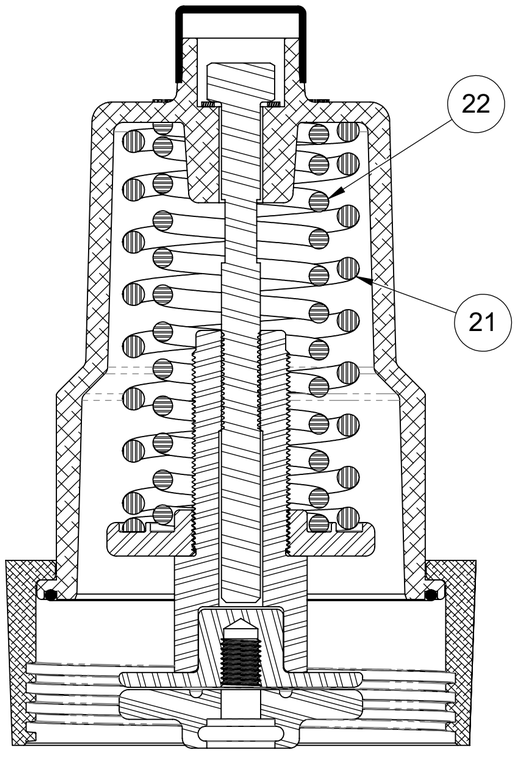
REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR REVISION HISTORY		

REPAIR KITS						
ITEM NO.	PART NO.		DESCRIPTION	1071341 30 LBS. QTY.	1071342 30 LBS. QTY.	1071340 30 LBS. QTY.
14	1073412	V535-448	PLATE, DIAPHRAGM, LWR, FS, 535	1		
15	43307		NUT, FS, 535	1		
16	1071712	ORB-248	O-RING, 2-248	1		
17	1073411	V535-444	PLATE, DIAPHRAGM, UPR, FS, 535	1		
18	1073436	V535-597	RING, SPRG RETAINER, 535	1		
19	1073435	V535-596	BASE, SPRING RETAINER	1		
20	1073405	V535-171	SPRING, COMPRESSION	1		
21	1073406	V535-172	SPRING, COMPRESSION	-	1	
22	1073415	V535-495K	CAP, FS, 535	1		
23	1073596	WAS-0025	WASHER, (1.00X.686X.060)	1		
24	1071483		CAP PLUG, 1-1/2 X 1"	1		
25	1073433	V535-592	SCREW, FS, 535	1		

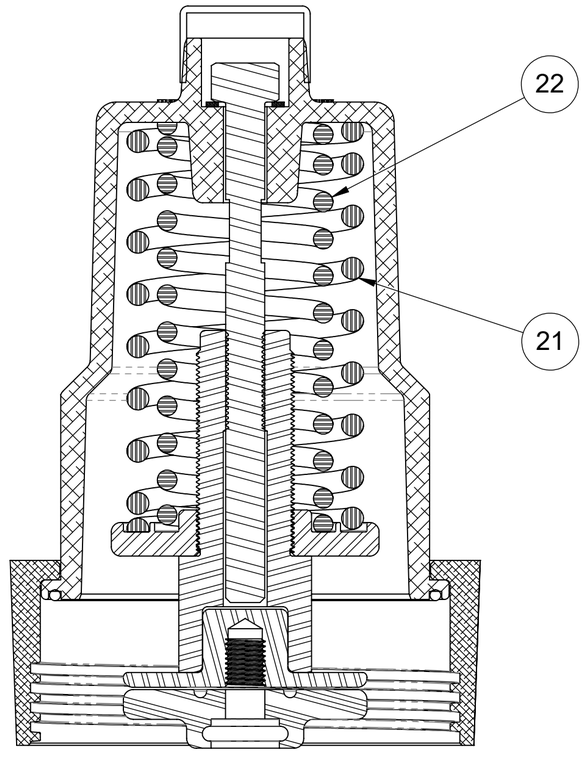
CAP REPLACEMENT INSTRUCTIONS:
1. TURN SCREW (25) OF OLD CAP CLOCKWISE UNTIL SPRINGS ARE FULLY COMPRESSED.
2. UNSCREW CAP NUT (15) AND REMOVE OLD CAP ASSEMBLY.
3. PLACE O-RING (16) INTO BOTTOM GROOVE IN CAP ASSEMBLY.
4. PLACE NEW CAP ASSEMBLY ON VALVE AND TIGHTEN CAP NUT (15).
5. TURN SCREW (25) OF NEW CAP COUNTERCLOCKWISE UNTIL CONTACT IS MADE WITH UPPER DIAPHRAGM PLATE (17) WHILE IN CLOSED POSITION.



1071341 (K535-FS3)
REPAIR KIT - 30 LBS.



1071342 (K535-FS6)
REPAIR KIT - 60 LBS.



1071340 (K535-FS1)
REPAIR KIT - 100 LBS.

VALVE SERIES	30 LBS. FAILSAFE # TURNS UP FROM BOTTOM	60 LBS. FAILSAFE # TURNS UP FROM BOTTOM	100 LBS. FAILSAFE # TURNS UP FROM BOTTOM
535	6	0	12

NOTES:
1. REPAIR KIT IS TO BE SHIPPED TO CUSTOMER IN A FULLY COMPRESSED STATE.

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THIRD ANGLE PROJECTION

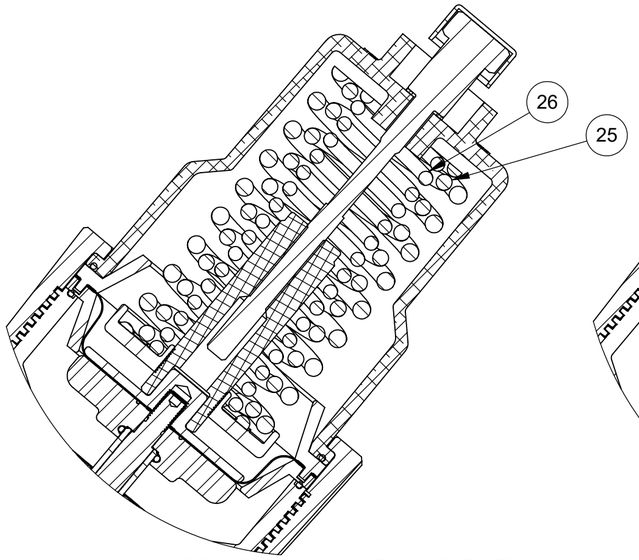
APPROVALS	DATE
DRAWN PMJ	2/19/2021
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

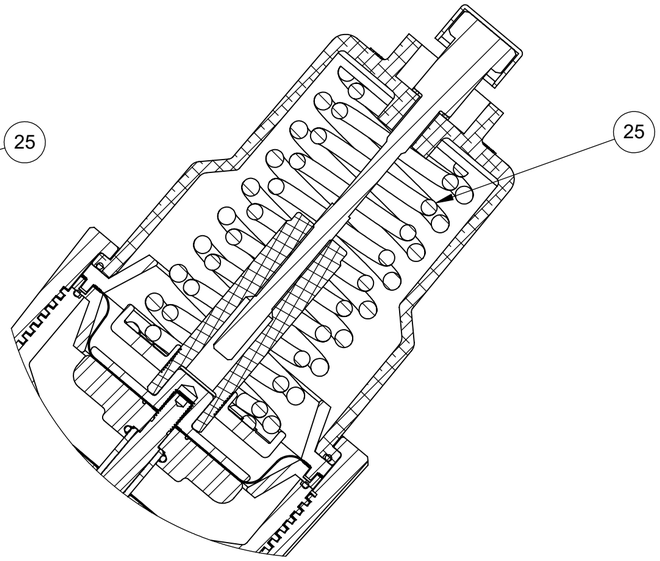
DESCRIPTION: 535 FAILSAFE VALVE

SIZE C | DWG NO. 1084011 | REV. J

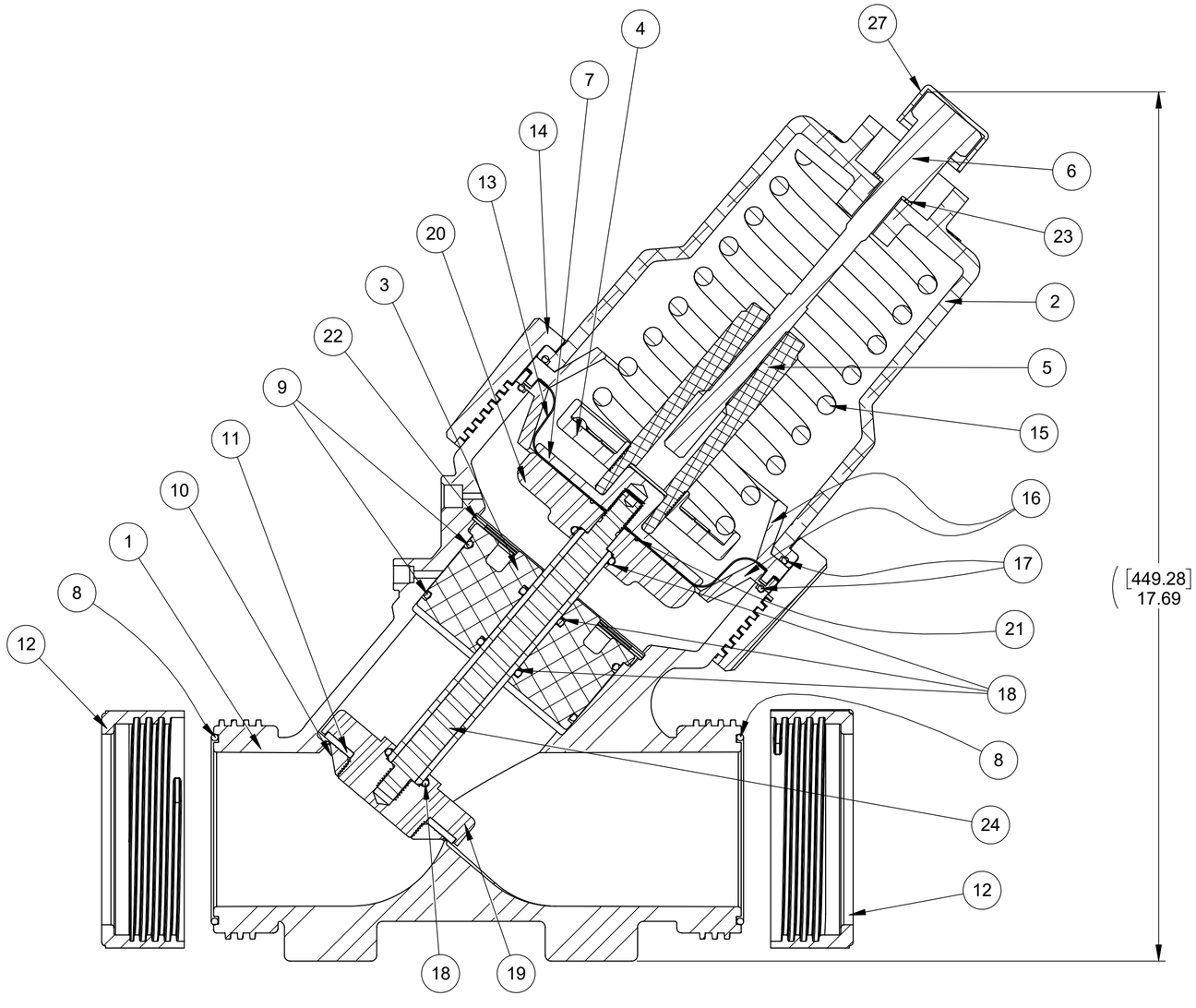
SCALE 2:3 | SOLIDWORKS FORMAT | SHEET 2 OF 2



1071396 (K535-X205-14000) (100 PSI - 7 BAR)
FAILSAFE CLOSED



1071393 (K535-X204-14000) (60 PSI - 4 BAR)
FAILSAFE CLOSED



1071392 (K537-X203-14000) (30 PSI - 2 BAR)
FAILSAFE CLOSED

REVISIONS

ECN	REV.	DESCRIPTION	DATE	APP'D
1834	F	REMOVE BR1073477, ADD 4510494, UPDATE DRAWING	1/28/21	TRK
1857	G	INSTRUCTIONS FOR REPAIR KITS ADDED.	3/4/21	PMJ

ITEM NO.	100PSI - 7BAR 1071396 QTY.	60PSI- 4BAR 1071393 QTY.	30PSI- 2BAR 107392 QTY.	MATERIAL	DESCRIPTION	PART NUMBER
1	1	1	1	NORYL	BODY, 537, VALVE	1073472 (V537- 410K)
2	1	1	1	ALUMINUM	CAP, FAILSAFE	1073480 (V537-495)
3	1	1	1	PVC	GUIDE, SHAFT, 537	1073478 (V537-491)
4	1	1	1	SS	RING, SPRING RETAINER	1073504 (V537-597)
5	1	1	1	SS	BASE, SPRING RETAINER	1073503 (V537-596)
6	1	1	1	SS	SCREW, FAILSAFE	1073501 (V537-592
7	1	1	1	SS	PLATE, UPPER DIAPGM, FAIL SAFE	1073476 (V537-444)
8	2	2	2	EPDM	O-RING, 2-239	1071756 (ORE-239)
9	2	2	2	EPDM	O-RING, 2-240	1071757 (ORE-240)
10	1	1	1	PVC	NUT, DISC, PLATE, 537	1073459 (V537-093)
11	1	1	1	EPDM	DISC, 537	1073463 (V537-110)
12	2	2	2	NORYL	NUT, RETAINING, 537	1073458 (V537-080K)
13	1	1	1	NITRILE	DIAPHRAGM	1073462 (V537-100)
14	1	1	1	ALUMINUM	NUT, CAP RETAINING, 537 FAILSAFE	43293
15	1	1	1	SS	COMPRESSION SPRING	1073468 (V537-171)
16	2	2	2	NORYL	DIAPHRAGM SUPPORT, K537	1073491 (V537-551K)
17	2	2	2	NITRILE	O-RING, 2-259	1071714 (ORB-259)
18	4	4	4	EPDM	O-RING, 2-212	1071745 (ORE-212)
19	1	1	1	ULTEM	HOLDER, DISC, 537	43361
20	1	1	1	SS	K537 LOWER DIAPHRAGM PLATE	4510494
21	1	1	1	FKM	O-RING, 2-024	1071676
22	1	1	1	SS	RING, RETAINING, 537	1073505 (V537-598)
23	1	1	1	SS	WASHER, 1.00 X .686 X .06	1073596 (WAS-0025)
24	1	1	1	PVC (OUTER) / SS (INNER)	SHAFT (ASSEMBLE)	1073508 (V537-702)
25	1	1		SS	COMPRESSION SPRING	1073469 (V537-093)
26	1			SS	COMPRESSION SPRING	1073470 (V537-173)
27	1	1	1	PLASTIC	CAP PLUG, 1-1/2 X 1"	1071483

NOTE:
REPLACEMENT COMPONENTS UNIQUE TO FAILSAFE DESIGN ARE AVAILABLE AS A REPAIR KIT ONLY. SEE SHEET 2 FOR KIT DETAILS.

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3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	1/28/21
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, K537 FAIL SAFE

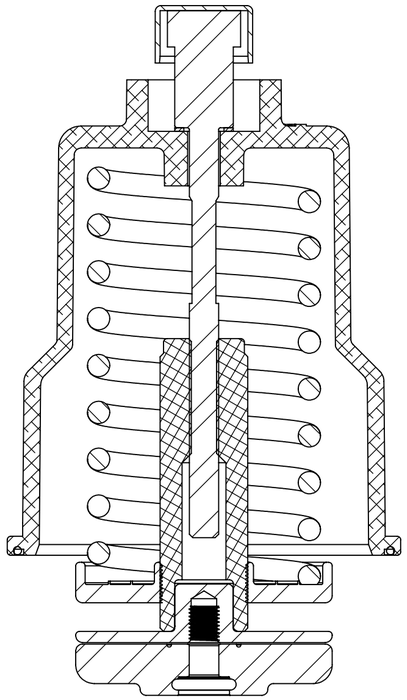
SIZE C | DWG NO. 1078168 | REV. F

SCALE 1:4 | SOLIDWORKS FORMAT | SHEET 1 OF 2

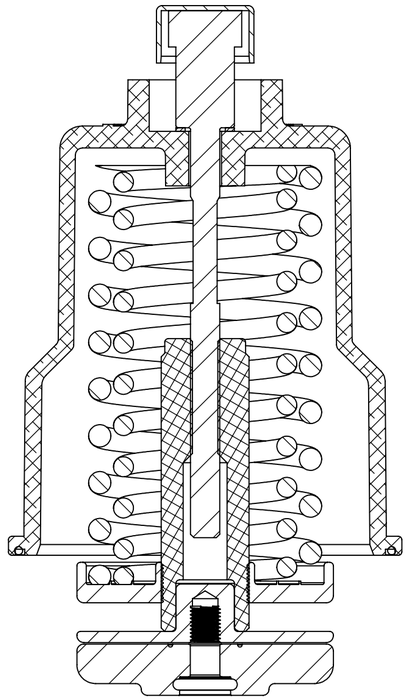
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APP'D
		SEE PG. 1 FOR REVISION UPDATES		

CAP REPLACEMENT INSTRUCTIONS:

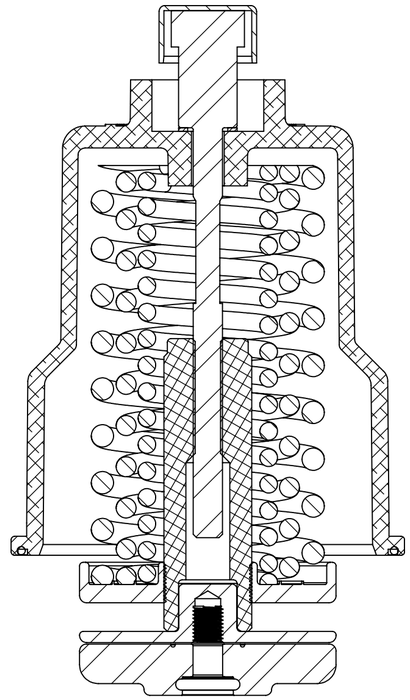
1. TURN SCREW (6) OF OLD CAP CLOCKWISE UNTIL SPRINGS ARE FULLY COMPRESSED.
2. UNSCREW CAP NUT (14) AND REMOVE OLD CAP ASSEMBLY.
3. PLACE O-RING (17) INTO BOTTOM GROOVE IN CAP ASSEMBLY.
4. PLACE NEW CAP ASSEMBLY ON VALVE AND TIGHTEN CAP NUT (14).
5. TURN SCREW (6) OF NEW CAP COUNTERCLOCKWISE UNTIL CONTACT IS MADE WITH UPPER DIAPHRAGM PLATE (7) WHILE IN CLOSED POSITION.



1071375 (K537-FS3)
REPAIR KIT - 30#



1071376 (K537-FS6)
REPAIR KIT - 60#



1071374 (K537-FS1)
REPAIR KIT - 100#

REPAIR KITS	
REPAIR KIT NO.	PART NUMBERS INCLUDED. SOLD AS ASSEMBLY ONLY.
1071375 (K537-FS3)	INCLUDES ITEM #'S: 2, 4, 5, 6, 7, 14, 15, 17(2), 20, 23, 27
1071376 (K537-FS6)	INCLUDES ITEM #'S: 2, 4, 5, 6, 7, 14, 15, 17(2), 20, 23, 25, 27
1071374 (K537-FS1)	INCLUDES ITEM #'S: 2, 4, 5, 6, 7, 14, 15, 17(2), 20, 23, 26, 27

VALVE SERIES	30# FAILSAFE #TURNS UP FROM BOTTOM	60# FAILSAFE #TURNS UP FROM BOTTOM	100# FAILSAFE #TURNS UP FROM BOTTOM
537	14	12	14

NOTES:

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3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN TRK	1/28/21
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: CATALOG SHEET, K537 FAIL SAFE

SIZE C | DWG NO. 1078168 | REV. F

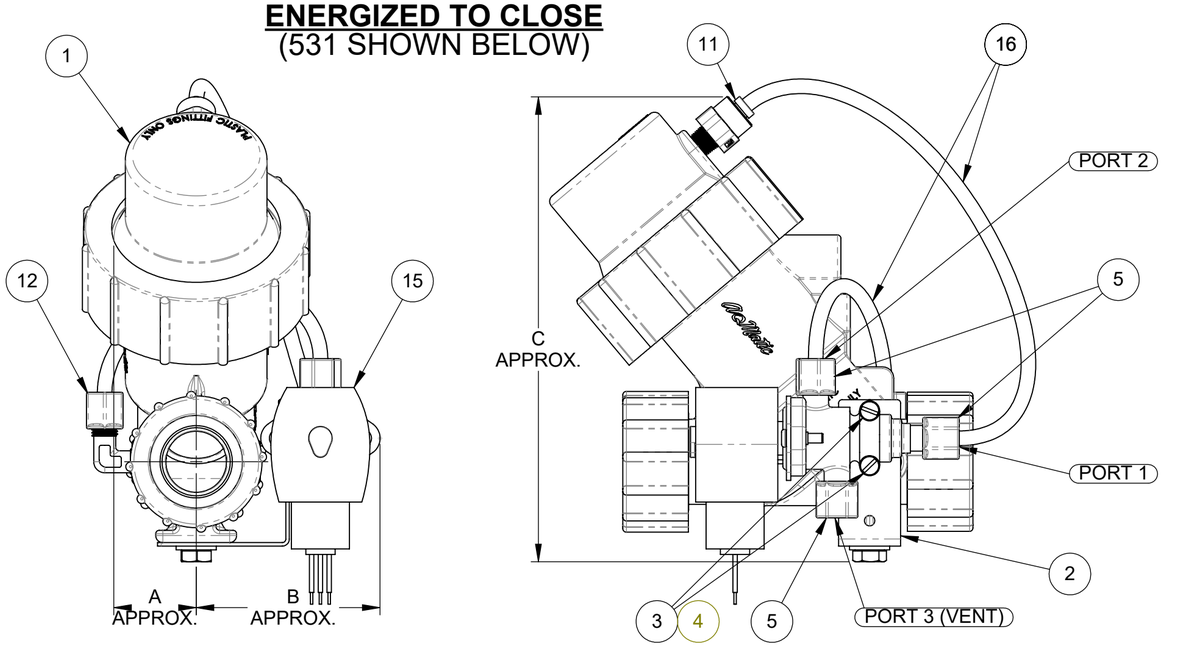
SCALE 1:4 | SOLIDWORKS FORMAT | SHEET 2 OF 2

ITEM NO	PART NO	DESCRIPTION	531 EC QTY	531 EO QTY	534 EC QTY	534 EO QTY	535 EC QTY	535 EO QTY	537 EC QTY	537 EO QTY	UNIT
1	-	NORMALLY OPEN K53X SERIES VALVE	1	1	1	1	1	1	1	1	EACH
2	1073272	SOLENOID MOUNTING BRACKET	1	1	1	1	1	1	1	1	EACH
3	1072377	SCREW, RD HD, 8-32 X 1/4	2	2	2	2	2	2	2	2	EACH
4	1071646	NUT, HEX, 8-32	2	2	2	2	2	2	2	2	EACH
5	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	3	3	3	3	3	3	3	3	EACH
6	1072354	SCREW, HEX HD, 5/16 X 5/8, SS	1	1	-	-	-	-	-	-	EACH
7	1073282	INSERT,HEADED KNURLED, 5/16-18	1	1	-	-	-	-	-	-	EACH
8	1073598	WASHER, FLAT, 5/16"	1	1	1	1	1	1	1	1	EACH
9	1072355	SCREW, HEX HD, CAP, 5/16-18	-	-	1	1	1	1	1	1	EACH
10	1071655	HEX NUT, 5/16"-18, 18-8SS	-	-	1	1	1	1	1	1	EACH
11	1078767	CONNECTOR, 1/8 MNPT X 1/4T	1	1	1	1	-	-	-	-	EACH
12	1071937	FITTING, ELBOW, 1/8NPT X 1/4T	1	1	1	1	-	-	-	-	EACH
13	1071941	CONNECTOR, 1/4 MNPT X 1/4T	-	-	-	-	1	1	1	1	EACH
14	1078770	FITTING, ELBOW, 1/4NPT X 1/4T	-	-	-	-	1	1	1	1	EACH
15	1075637	SOLENOID, ASCO, 120/60 VAC	1	1	1	1	1	1	1	1	EACH
	1075638	SOLENOID, ASCO, 220/50 VAC									
	1075639	SOLENOID, ASCO, 24/60 VAC									
	4510604	SOLENOID, ASCO, 24 VDC, N.O.	-	1	-	1	-	1	-	1	
	4510605	SOLENOID, ASCO, 24 VDC, N.C.	1	-	1	-	1	-	1	-	
16	1071936	TUBING, POLY 1/4" O.D. X .035"	12	12	16	16	17	17	20	20	INCHES
			7	7	9	9	9	9	11	10	

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
A		INITIAL RELEASE	06/21/2001	JWB
B		NUMBER CONVERSION	12/19/2002	APVD
C	1695	REDRAWN IN AQ TEMPLATE, CORRECTED BOM ERRORS	4/14/2020	PMJ
D	1789	ADDED SOLENOID P/N 4510604, 4510605	10/21/2020	PMJ

NOTES:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
3. BOSS NO. 1 ON VALVE TAPPED 1/8" N.P.T. (531, 534) OR 1/4" N.P.T. (535, 537)
4. DRY DRAIN OPTIONS DETAILED ON SHEET 2.
   INDEPENDANT CONTROL PRESSURE OPTIONS DETAILED ON SHEET 3.
5. EC STANDS FOR ENERGIZED TO CLOSE.
   EO STANDS FOR ENERGIZED TO OPEN.

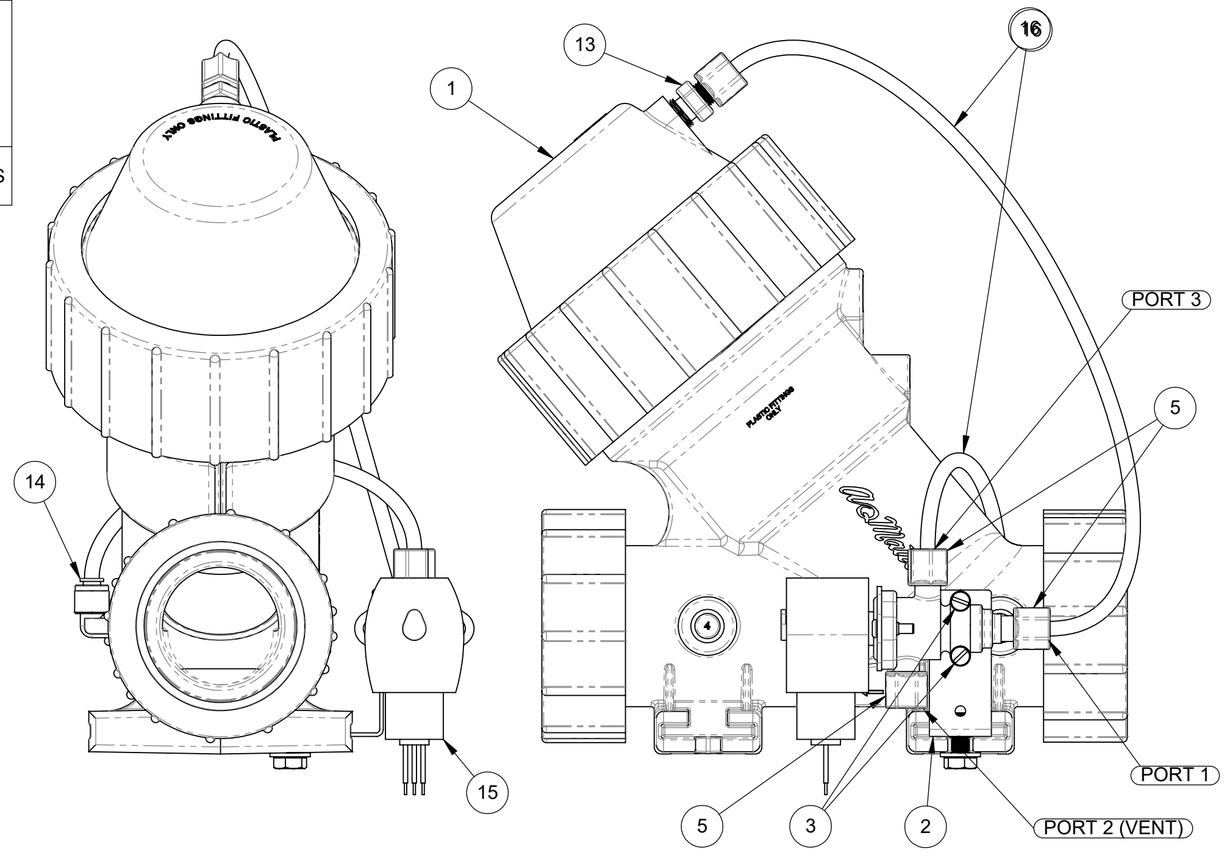
ENERGIZED TO CLOSE
(531 SHOWN BELOW)



SOLENOID ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE VALVE.

SOLENOID DE-ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 3 TO DRAIN. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

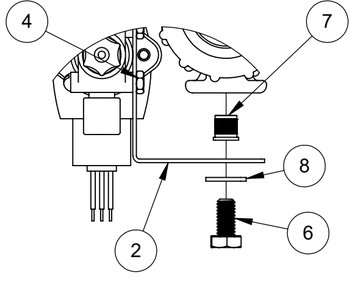
ENERGIZED TO OPEN
(535 SHOWN BELOW)



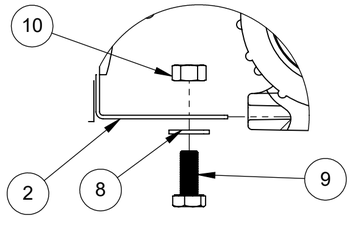
SOLENOID ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 2 TO DRAIN. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE VALVE.

DETAIL A
531 MOUNTING



DETAIL B
534-537 MOUNTING



VALVE SERIES	PIPE SIZE	A [MM] IN.	B [MM] IN.	C [MM] IN.
531	1"	[36] 1.41	[80] 3.14	[202] 7.94
534	1-1/2"	[62] 2.45	[108] 4.24	[255] 10.05
535	2"	[76] 2.98	[110] 4.33	[310] 12.21
537	3"	[99] 3.91	[96] 3.8	[377] 14.83

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	4/14/2020
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION: K531-K537 SOLENOID OPERATED VALVES

SIZE	DWG NO.	REV.
C	1078170	D

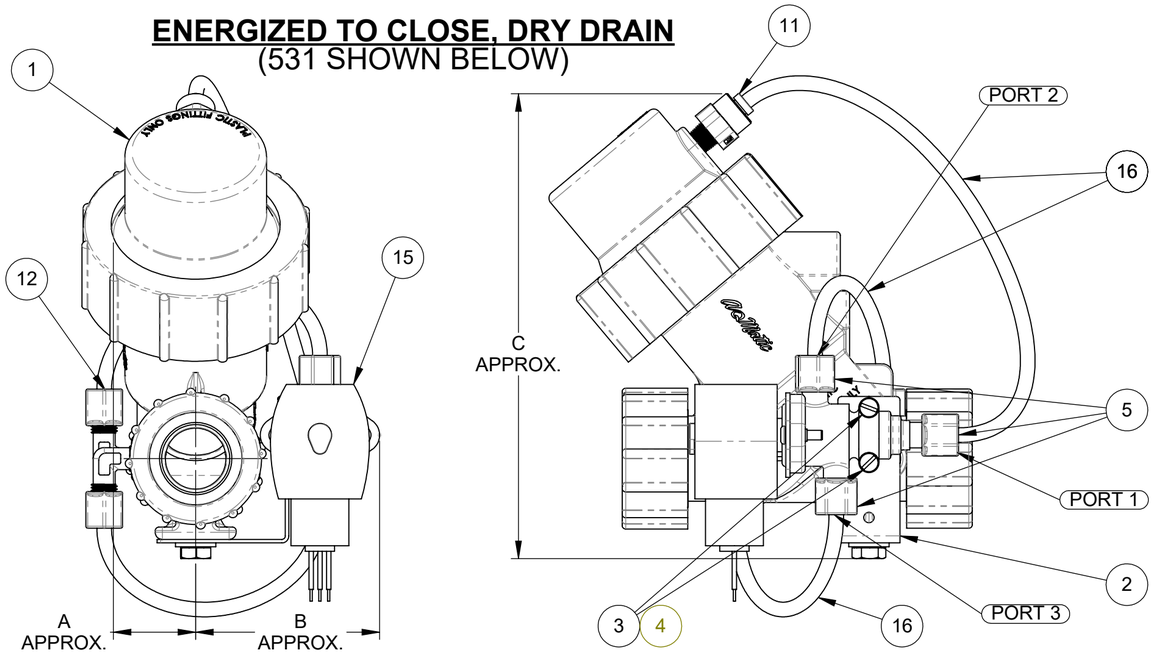
SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 1 OF 3

ITEM NO	PART NO	DESCRIPTION	531 ECDD	531 EODD	534 ECDD	534 EODD	535 ECDD	535 EODD	537 ECDD	537 EODD	UNIT
1	-	NORMALLY OPEN K53X SERIES VALVE	1	1	1	1	1	1	1	1	EACH
2	1073272	SOLENOID MOUNTING BRACKET	1	1	1	1	1	1	1	1	EACH
3	1072377	SCREW, RD HD, 8-32 X 1/4	2	2	2	2	2	2	2	2	EACH
4	1071646	NUT, HEX, 8-32	2	2	2	2	2	2	2	2	EACH
5	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	3	3	3	3	3	3	3	3	EACH
6	1072354	SCREW, HEX HD, 5/16 X 5/8, SS	1	1	-	-	-	-	-	-	EACH
7	1073282	INSERT,HEADED KNURLED, 5/16-18	1	1	-	-	-	-	-	-	EACH
8	1073598	WASHER, FLAT, 5/16"	1	1	1	1	1	1	1	1	EACH
9	1072355	SCREW, HEX HD, CAP, 5/16-18	-	-	1	1	1	1	1	1	EACH
10	1071655	HEX NUT, 5/16"-18, 18-8SS	-	-	1	1	1	1	1	1	EACH
11	1078767	CONNECTOR, 1/8 MNPT X 1/4T	1	1	1	1	-	-	-	-	EACH
12	1071937	FITTING, ELBOW, 1/8NPT X 1/4T	2	2	2	2	-	-	-	-	EACH
13	1071941	CONNECTOR, 1/4 MNPT X 1/4T	-	-	-	-	1	1	1	1	EACH
14	1078770	FITTING, ELBOW, 1/4NPT X 1/4T	-	-	-	-	2	2	2	2	EACH
15	1075637	SOLENOID, ASCO, 120/60 VAC	1	1	1	1	1	1	1	1	EACH
	1075638	SOLENOID, ASCO, 220/50 VAC									
	1075639	SOLENOID, ASCO, 24/60 VAC									
	4510604	SOLENOID, ASCO, 24 VDC, N.O.	-	1	-	1	-	1	-	1	
	4510605	SOLENOID, ASCO, 24 VDC, N.C.	1	-	1	-	1	-	1	-	
16	1071936	TUBING, POLY 1/4" O.D. X .035"	12	12	16	16	17	17	20	20	INCHES
			7	7	9	9	9	9	10	10	
			8	7	6	6	7	7	9	9	

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR CHANGE LOG		

NOTES:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
3. BOSSES ON VALVE TAPPED 1/8" N.P.T. (531, 534) OR 1/4" N.P.T. (535, 537)
4. STANDARD OPTIONS DETAILED ON SHEET 1.
   INDEPENDANT CONTROL PRESSURE OPTIONS DETAILED ON SHEET 3.
5. ECDD STANDS FOR ENERGIZED TO CLOSE, DRY DRAIN.
   EODD STANDS FOR ENERGIZED TO OPEN, DRY DRAIN.
6. 531 VALVES ARE TAPPED IN BOSSES 1 & 3.
   534 - 537 VALVES ARE TAPPED IN BOSSES 1 & 4.
7. DRY DRAIN OPTION REQUIES DOWNSTREAM SIDE OF VALVE TO BE AT ATMOSPHERIC PRESSURE WHEN VALVE IS CLOSED.

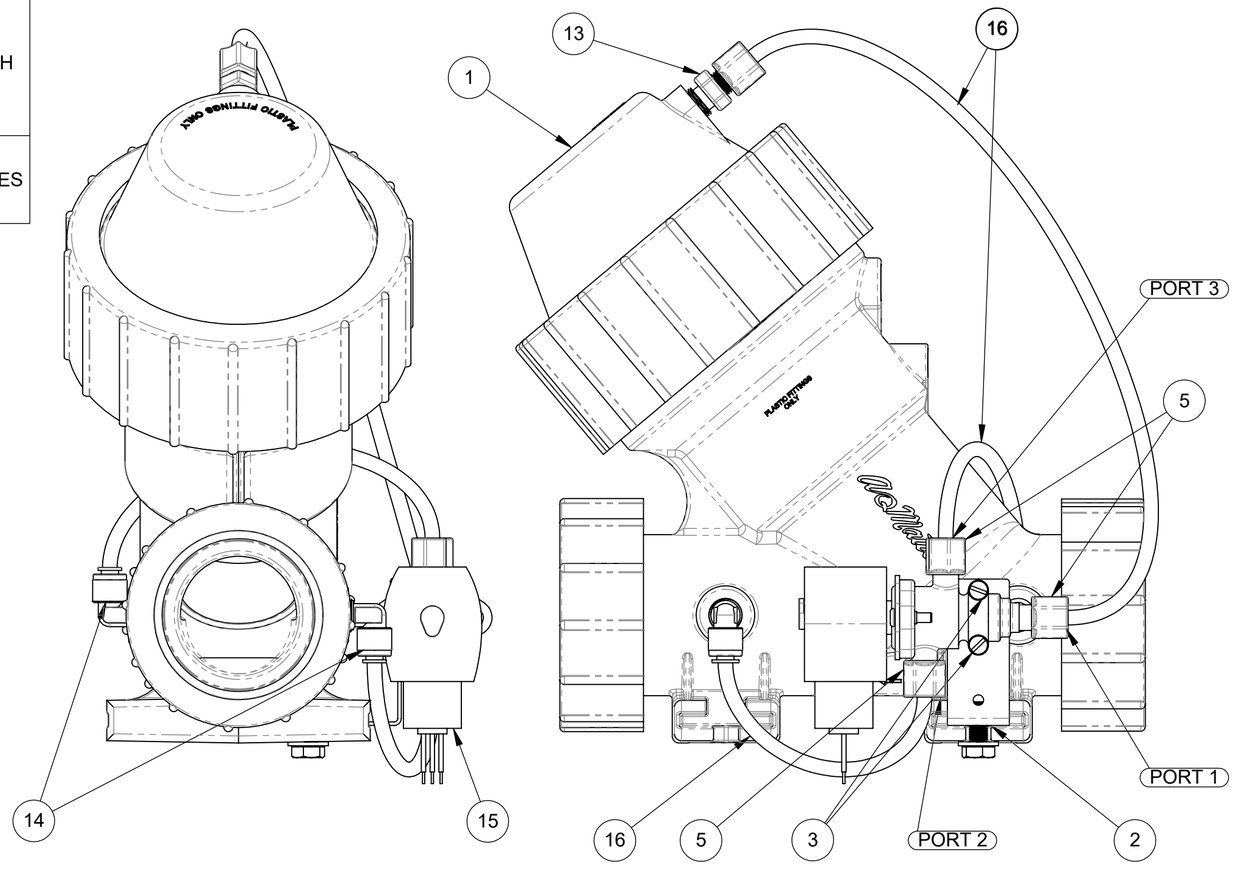
ENERGIZED TO CLOSE, DRY DRAIN
(531 SHOWN BELOW)



SOLENOID ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 2 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE VALVE.

SOLENOID DE-ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 3 TO DOWNSTREAM. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

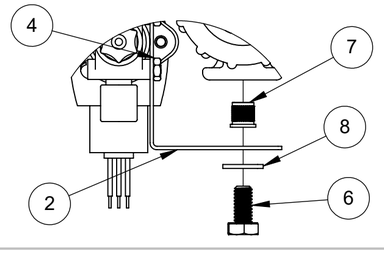
ENERGIZED TO OPEN
(535 SHOWN BELOW)



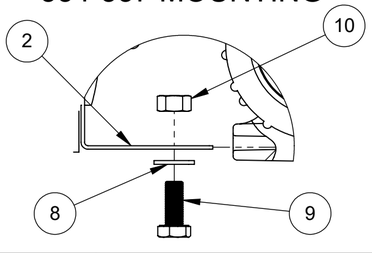
SOLENOID ENERGIZED:
PRESSURE FROM UPPER DIAPHRAGM CHAMBER IS VENTED, THROUGH SOLENOID PORT 1 TO PORT 2 TO DOWNSTREAM. UPSTREAM PRESSURE OPENS THE DIAPHRAGM VALVE.

SOLENOID DE-ENERGIZED:
UPSTREAM PRESSURE, FROM SOLENOID PORT 3 TO PORT 1, IS APPLIED TO UPPER DIAPHRAGM CHAMBER TO CLOSE THE VALVE.

DETAIL A
531 MOUNTING



DETAIL B
534-537 MOUNTING



VALVE SERIES	PIPE SIZE	A [MM] IN.	B [MM] IN.	C [MM] IN.
531	1"	[36] 1.41	[80] 3.14	[202] 7.94
534	1-1/2"	[108] 4.24	[62] 2.45	[264] 10.38
535	2"	[110] 4.33	[76] 2.98	[310] 12.21
537	3"	[99] 3.91	[96] 3.78	[377] 14.83

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DIMENSIONS ARE IN INCHES [mm]
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	4/14/2020
CHECKED BY	
APPROVED	

AQ-MATIC VALVES AND CONTROLS

DESCRIPTION: K531-K537 SOLENOID OPERATED VALVES

SIZE	DWG NO.	REV.
C	1078170	D

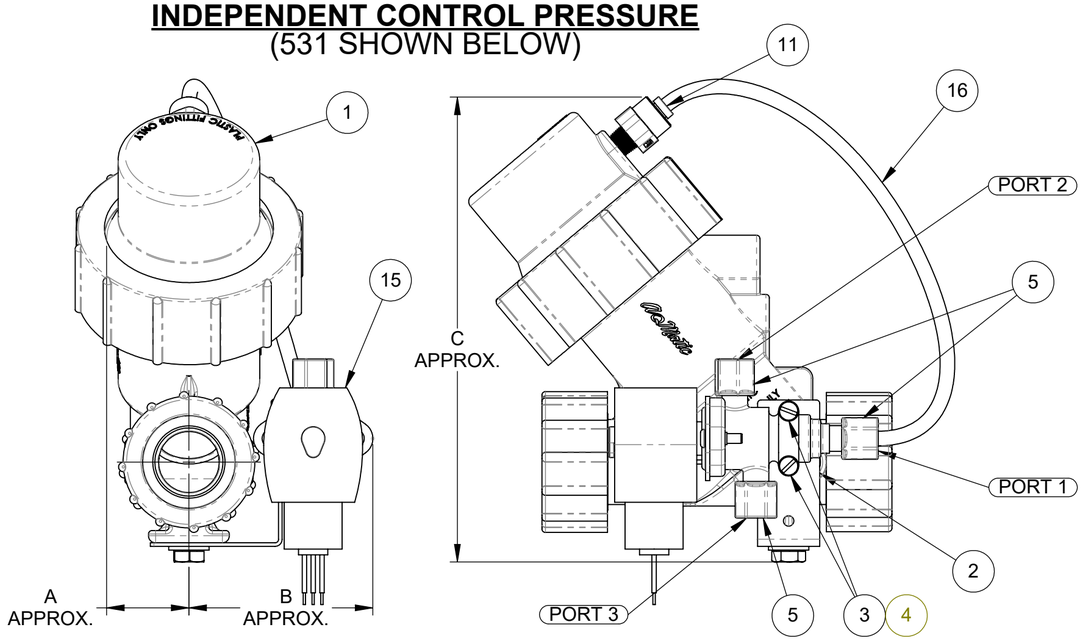
SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 2 OF 3

ITEM NO	PART NO	DESCRIPTION	531 IP QTY	534 IP QTY	535 IP QTY	537 IP QTY	UNIT
1	-	NORMALLY OPEN K53X SERIES VALVE	1	1	1	1	EACH
2	1073272	SOLENOID MOUNTING BRACKET	1	1	1	1	EACH
3	1072377	SCREW, RD HD, 8-32 X 1/4	2	2	2	2	EACH
4	1071646	NUT, HEX, 8-32	2	2	2	2	EACH
5	1071939	NUT & SLEEVE ASSEMBLY, 1/4" TUBE	3	3	3	3	EACH
6	1072354	SCREW, HEX HD, 5/16 X 5/8, SS	1	-	-	-	EACH
7	1073282	INSERT,HEADED KNURLED, 5/16-18	1	-	-	-	EACH
8	1073598	WASHER, FLAT, 5/16"	1	1	1	1	EACH
9	1072355	SCREW, HEX HD, CAP, 5/16-18	-	1	1	1	EACH
10	1071655	HEX NUT, 5/16"-18, 18-8SS	-	1	1	1	EACH
11	1078767	CONNECTOR, 1/8 MNPT X 1/4T	1	1	-	-	EACH
13	1071941	CONNECTOR, 1/4 MNPT X 1/4T	-	-	1	1	EACH
15	1075637	SOLENOID, ASCO, 120/60 VAC	1	1	1	1	EACH
	1075638	SOLENOID, ASCO, 220/50 VAC					
	1075639	SOLENOID, ASCO, 24/60 VAC					
16	1071936	TUBING, POLY 1/4" O.D. X .035"	12	16	17	20	INCHES

REVISIONS				
REV	ECN	DESCRIPTION	DATE	APP'D
		SEE SHEET 1 FOR CHANGE LOG		

NOTES:
1. LENGTH OF TUBING VARIES WITH EACH SIZE OF DIAPHRAGM VALVE.
2. DIAPHRAGM VALVE IS NORMALLY OPEN, PRESSURE TO CLOSE.
3. BOSS NO. 1 ON VALVE TAPPED 1/8" N.P.T. (531, 534) OR 1/4" N.P.T. (535, 537)
4. STANDARD OPTIONS DETAILED ON SHEET 1.
   DRY DRAIN OPTIONS DETAILED ON SHEET 2.
5. IP STANDS FOR INDEPENDENT PRESSURE.

INDEPENDENT CONTROL PRESSURE
(531 SHOWN BELOW)

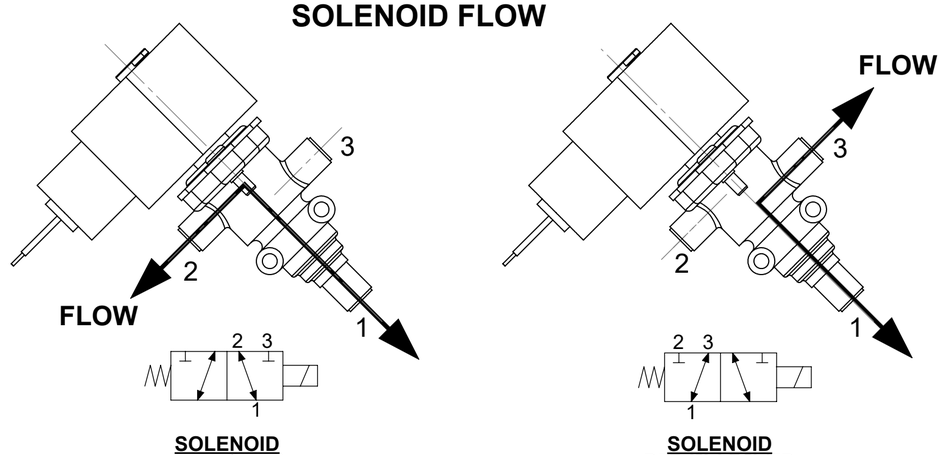


ENERGIZE TO OPEN
APPLY CONTROL PRESSURE
AT SOLENOID PORT NO. 3.
(PORT NO. 2 VENTED)

ENERGIZE TO CLOSE
APPLY CONTROL PRESSURE
AT SOLENOID PORT NO. 2.
(PORT NO. 3 VENTED)

CONTROL PRESSURE MUST BE EQUAL
TO OR GREATER THAN LINE PRESSURE

SOLENOID FLOW

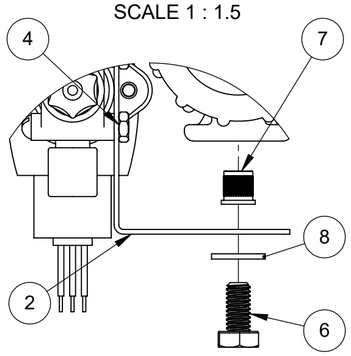


SOLENOID ENERGIZED

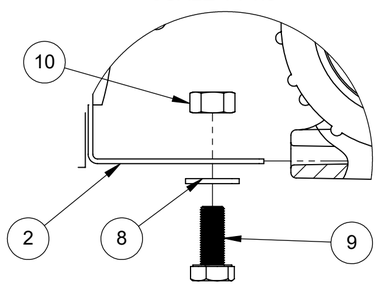
SOLENOID DE-ENERGIZED

CURRENT DRAIN (AMPERES)		
VOLTAGE	INRUSH	HOLDING
24V 60Hz	1.66	1.04
120V 60Hz	0.33	0.21
220V 50Hz	0.18	0.11

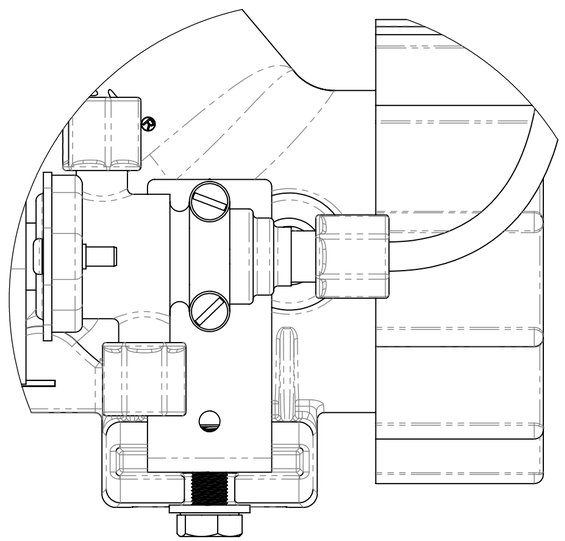
DETAIL A
531 MOUNTING
SCALE 1 : 1.5



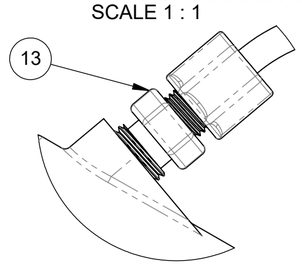
DETAIL B
534 - 537 MOUNTING
SCALE 1 : 1.5



DETAIL C
534 - 537 MOUNTING
SCALE 1 : 1



DETAIL D
535 - 537 CAP FITTING
SCALE 1 : 1



VALVE SERIES	PIPE SIZE	A [MM] IN.	B [MM] IN.	C [MM] IN.
531	1"	[80] 3.14	[49] 1.94	[202] 7.94
534	1-1/2"	[108] 4.24	[62] 2.45	[264] 10.38
535	2"	[110] 4.33	[76] 2.98	[310] 12.21
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TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .100 [2.54]
2 PLACE .XX: ± .010 [0.25]
3 PLACE .XXX: ± .005 [0.13]

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THIRD ANGLE PROJECTION

APPROVALS	DATE
DRAWN PMJ	4/14/2020
CHECKED BY	
APPROVED	

AQ-MATIC
VALVES AND CONTROLS

DESCRIPTION
K531-K537 SOLENOID OPERATED VALVES

SIZE	DWG NO.	REV.
C	1078170	D

SCALE 1:2 | SOLIDWORKS FORMAT | SHEET 3 OF 3

AQUAMATIC® STAGER
PILOT VALVES

IDEAL FOR CONTROL OF DIAPHRAGM VALVES

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

Stagers are motor-driven rotary multiport pilot valves, which are used to control a set of diaphragm valves in a predefined sequence

Constructed of durable, noncorroding, self-lubricating material for long and trouble-free operation

Control pressure to the stager, either hydraulic or pneumatic, must be constant and equal to or greater than the line pressure in the system

Electrical stagers are available for use in 120 VAC, 220 VAC, 12 VAC and 24 VAC configurations

All stagers can be manually operated if power is not available

OPTIONS

Supplied with a maximum of two extra auxiliary cams and switches [SPDT] for electrical outputs in any position

Supplied in a NEMA-rated enclosure or without enclosure

TYPICAL APPLICATIONS

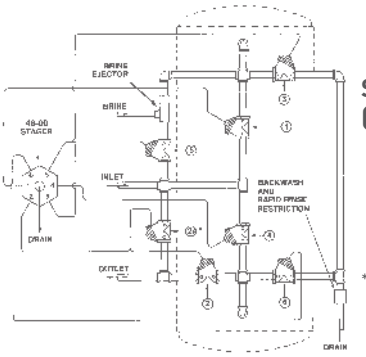
Condensate Polishers

Deionizers

Water Treatment Systems

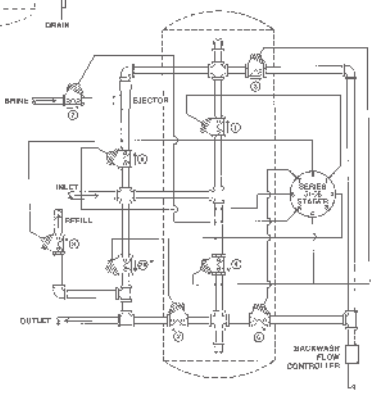
OPERATING SPECIFICATIONS

Max Pressure	125 psi (8.6 bar)	
Max Temperature	150°F (65°C)	
Body Material	Model 48 & 51: Model 58:	Brass PVC
Internal Gasket	Neoprene	
Stem Plate	PTFE	
Control Ports	Model 48: Model 51: Model 58:	6 8 16
Inlet Port Size NPT	Model 48 & 51: Model 58:	1/8" 1/4"
Drain Port Size NPT	Model 48 & 51: Model 58:	1/8" 1/4"
Control Port Size NPT	Model 48, 51, 58:	1/8"
Power Usage in Watts	Model 48 & 51: Model 58:	4.0 max 3.5 max



Stager (Model 48-00)

*Valve 2A required for raw water bypass only.



Stager (Model 51-06)

STANDARD STAGER PROGRAMS

STAGER DESIGNATION	NUMBER OF POSITION	APPLICATION	SUGGESTED PIPING DWG
48-00	4	4 Position Softener	1078271
48-01	3	3 Position Filter	1078272
48-83	4	3 Tank Sequential Filter, Backwash Only	1078276
48-84	5	4 Tank Sequential Filter, Backwash Only	1078277
48-85	6	5 Tank Sequential Filter, Backwash Only	1078278
51-06	6	6 Position Softener, Timed Brine and Refill	1078279
51-07	5	5 Position Softener, Timed Brine	1078280
51-09	5	5 Position Softener, Timed Brine Refill	1078281
51-10	5	2 Tank Sequential Filter, Backwash and Rinse	1078282
51-86	7	6 Tank Sequential Filter, Backwash Only	1078286
51-87	8	7 Tank Sequential Filter, Backwash Only	1078287
58-00	9	2 Bed Deionization	1078290
58-02	9	2 Bed Deionization with De-Gasifier	1078291
58-03	7	3 Tank Sequential Filter, Backwash and Rinse	1078288
58-04	8	4 Tank Sequential Filter, Backwash and Rinse	1078289
58-10	10	Mixed Bed Deionization	1078292
58-TA	8	2 Tank Alternating Softeners	1078293
58-TB	10	2 Tank Alternating Softeners, with Timed Brine	1078294

16605 West Victor Rd. New Berlin, WI 53151
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STAGER MASTER CHART

FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER: R - -

USAGE
- 0 Stager **not used in controller** (Wire harness included)
- C Stager **is used in controller** (Wire harness not included) [Not for individual Sale]

STAGER Rotary Pilot Stager Series to be Provided
- 48 6 Port (Brass)
- 51 8 Port (Brass)
- 58 16 Port (PVC)

PROGRAM Stager Program to be Provided
- *00 - 99 STANDARD
- **SS SPECIAL Program per Drawing Indicated
- TA Twin Alternating Softener (Model 48, and 58 Only)
- ^TB Twin Alternating Softener (w/ Timed Brine Pos. & switch output)
- ^TR Twin Alternating Softener (w/ Timed Refill Pos. & switch output)

* Two character designation from standard stager drawing.
** Special Drawing number placed in last 5 digits of product number.
(Special Drawing number also used for Aux. Sw. notched in more than 1 position)
^ For model 58 stagers ONLY

ENCLOSURE N.E.M.A. Rating of Panel & Enclosure to be Provided
- 7 NEMA 4 Mounting Plate w/Gasket on Stagers
- F NEMA 4X Fiberglass Panel & Enclosure

ELECTRICAL Power Required to Operate Device
- 1 115 Volts / **60 Hertz** for 48 & 51 Stagers
  115 Volts **50 or 60 Hertz** for 58B Stagers
- 2 220 Volts / **50 or 60 Hertz** for ALL STAGERS
- 5 24 Volts / 50 or 60 Hertz (**for 48 & 51 Stagers Only)**
- 9 12 Volts / 50 or 60 Hertz for ALL STAGERS
- N 24 Volts / 50 or 60 Hertz **(for 48 & 51 Stagers Only) NXT Cam & Wire Harness**

1st AUX. SWITCH First Extra Switch to be provided on Rotary Pilot Stager (Unless Special Drawing Number is Assigned)
- 0 NONE (Not valid for use with AQ Matic controllers)
- *^A to R CAM POSITION Switch is to be active (I & O not used)
- S SERVICE Return (**Homing**) (For AQ Matic Controllers, MUST be "S") W Status Lights Cam (48, & 58 Stagers w/TA Program only)
- Z BLANK CAM (no notches)

* Use a Letter to indicate Cam position Not a Number.
^ Use SPECIAL DRAWING number if active in more than 1 position.

2nd AUX. SWITCH Second Extra Switch to be provided on Rotary Pilot Stager (Unless Special Drawing Number is Assigned)
- 0 NONE
- *^A to R CAM POSITION Switch is to be active (I & O not used)
- S SERVICE Return (Homing) **(Not for 48-TA)**
- T TIMED SWITCH OUTPUT (58-TB, signal in Pos. 2 & 7)
  TIMED SWITCH OUTPUT (58-TR, signal in Pos. 4 & 9)
- Z BLANK CAM (no notches)

* Use a Letter to indicate Cam position Not a Number.
^ Use SPECIAL DRAWING number if active in more than 1 position.

PRESSURE Program of Stager (Unless Special Drawing Number is Assigned)
- 0 STANDARD (Vent to open)
- 1 INVERTED (Pressure to open)

- 0 (unless Special Drawing number is assigned)

REVISION Stager Revision Level (Unless Special Drawing Number is Assigned)
- **B** 48 and 51 Series Rotary Pilot Stagers
- **C** 58 Series Rotary Pilot Stagers

Rev.	DESCRIPTION	BY	DATE	ECN NO.
G	Added NXT Motor & Cam Option	TLE	25-Nov-14	103975

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REV G NOV 14

STAGER MODEL NUMBER SELECTION

PROGRAM (SEE STAGER PROGRAM CHARTS)

*00 - 99 = STANDARD
**SS = SPECIAL Program per Drawing Indicated
TA = Twin Alternating Softener (Model 48, 58 and 59 Only)
^TB = Twin Alternating Softener (w/ Timed Brine Pos. & switch output, **962 only**)

* Two character designation for standard stager program.
** Special Drawing number placed in last 5 digits of model number.
(Special Drawing number also used for Aux. Sw. notched in more than 1 position)
^ For models 58 and 59 stagers used in 962 Stager Controller ONLY

ELECTRICAL Power Required to Operate Device

1 = 115 Volts / **60 Hertz** for 48 & 51 Stagers
115 Volts **50 or 60 Hertz** for 58, 59 & 96 Stagers
2 = 220 Volts / **50 or 60 Hertz** for ALL STAGERS
5 = 24 Volts / 50 or 60 Hertz for ALL STAGERS
* 9 = 12 Volts / 50 or 60 Hertz for ALL STAGERS

* ***(Option 9 is ONLY valid if used with a 962 stager controller)***

2nd AUX. SWITCH (SEE STAGER PROGRAM CHARTS) Second Extra Switch to be provided on Stager (Unless Special Drawing Number is Assigned)

0 = NONE
*^A to R=CAM POSITION Switch is to be active (I & O not used)
S = SERVICE Return (Homing)
T = TIMED BRINE OUTPUT (58-TB & 59-TB Only, signal in Pos. 2 & 7)
Z = BLANK CAM (no notches)

* Use a Letter to indicate Cam position Not a Number.
^ Use SPECIAL DRAWING number if active in more than 1 position.

R 0 ? ? -- ? ? ? ? -- ? ? ? ? ?

STAGER Rotary Pilot Stager Series to be Provided

48 = 6 Port (Brass)
51 = 8 Port (Brass)
58 = 16 Port (PVC)
59 = 16 Port (Brass)
96 = 8 Port High Pressure (Brass) (250 PSI)

ENCLOSURE N.E.M.A. Rating of Enclosure to be Provided

1 = NEMA 1 Std. Enclosure
4 = NEMA 4 Std. Enclosure
7 = NONE (NEMA 4 Mounting Plate w/Gasket Provided)
F = NEMA 4X Fiberglass Panel & Enclosure

1st AUX. SWITCH (SEE STAGER PROGRAM CHARTS) First Extra Switch to be provided on Stager (Unless Special Drawing Number is Assigned)

0 = NONE (Not valid for use with 962 controller)
*^A to R = CAM POSITION Switch is to be active (I & O not used)
S = SERVICE Return (**Homing**) (For 962 Controller, MUST be "S")
W = Status Lights Cam (48, 58 & 59 Stagers w/TA Program only)
Z = BLANK CAM (no notches)

* Use a Letter to indicate Cam position Not a Number.
^ Use SPECIAL DRAWING number if active in more than 1 position.

0 (Unless Special Drawing Number is Assigned)

PRESSURE Program of Stager (Unless Special Drawing Number is Assigned)

0 = STANDARD (Vent to open)
1 = INVERTED (Pressure to open)

REVISION Stager Revision Level (Unless Special Drawing Number is Assigned)

B = 48 and 51 Stagers
C = 58, 59, and 96 Series Stagers

SERIES 48 STANDARD STAGER PROGRAMS

STAGER PROGRAM	# POS.		PORTS VENTED IN POSITION 0 A	1 B	2 C	3 D	4 E	5 F	REF. DWG NO.	FUNCTION
00	4	POSITION	SVC	----	BW	----	BSR	FR	4800PRGM	4 POS. SOFTENER
		PORTS VENTED	1, 2	----	3, 4	----	5, 6	1, 6		
01	3	POSITION	SVC	----	BW	----	----	FR	4801PRGM	3 POS. FILTER
		PORTS VENTED	1, 2	----	3, 4	----	----	1, 6		
03	4	POSITION	SVC	----	BW	----	BSR	FR	4803PRGM	4 POS. SOFTENER (BUTTERFLY CAM)
		PORTS VENTED	1, 2	----	3, 4	----	5, 6	1, 6		
04	2	POSITION	SVC	----	BW	----	----	----	4804PRGM	2 POS. FILTER
		PORTS VENTED	1, 2	----	3, 4	----	----	----		
12	4	POSITION	SVC	----	BW -or- ASC	BSR -or- BW	----	FR	4812PRGM	4 POS. FILTER W/ AIR SCOUR -OR- 4 POS. UPFLOW SOFTENER
		PORTS VENTED	1, 2	----	3, 4	4, 5	----	1, 6		
83	4	POSITION	BW2	BW3	----	----	SVC	BW1	4883PRGM	3 TANK SEQUENTIAL FILTER
		PORTS VENTED	2	3	----	----	6	1		
84	5	POSITION	BW2	BW3	BW4	----	SVC	BW1	4884PRGM	4 TANK SEQUENTIAL FILTER
		PORTS VENTED	2	3	4	----	6	1		
85	6	POSITION	BW2	BW3	BW4	BW5	SVC	BW1	4885PRGM	5 TANK SEQUENTIAL FILTER
		PORTS VENTED	2	3	4	5	6	1		
TA	2	POSITION	SVCA	----	SVCB	----	----	----	48TAPRGM	2 TANK ALTERNATOR
		PORTS VENTED	1	----	2	----	----	----		
TB	2	POSITION	SVCA	SVCB	SVCA	SVCB	SVCA	SVCB	48TAPRGM	2 TANK ALTERNATOR
		PORTS VENTED	1	2	1	2	1	2		

ASC = AIR SCOUR
BSR = BRINE / SLOW RINSE
BW = BACKWASH
FR = FAST RINSE
SVC = SERVICE
SVCA = SERVICE UNIT A
SVCB = SERVICE UNIT B

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Valve & Controls Company Inc.

SERIES 48, 51, 58, 59 & 96 STAGERS
MODEL SELECTION & PROGRAMS

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	10MAY01	1078031

STAGER MODEL NUMBER SELECTION

SERIES 58 STANDARD STAGER PROGRAMS

STAGER PROGRAM	# POS.		PORTS VENTED IN POSITION 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	REF. DWG NO.	FUNCTION
			A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R		
00	9	POSITION	SVC	----	----	CBW	----	----	INJ	CSR	CFR	ABW	----	----	ADR	ASR	AFR	----	5800PRGM	2 BED DI UNIT
		PORTS VENTED	1,15,16	----	----	2,3	----	----	5,6,7	6,7	1,7	1,10	----	----	1,11,12,13	1,12,13	1,13,15	----		
01	5	POSITION	SVC	----	----	----	----	----	----	----	----	----	DRD	ASC	----	BW	----	FR	5801PRGM	5 POSTION FILTER, DOUBLE ACTING VALVES
		PORTS VENTED	3,4,5,6,7,8, 9,10	----	----	----	----	----	----	----	----	----	7,8,9,10,11, 12,13,14	5,8,9,10,11, 12,14,15	----	1,5,6,7,10, 11,12,16	----	2,3,5,6,7,8, 9,12		
02	9	POSITION	SVC	----	----	CBW	----	----	CDR	CSR	CFR	ABW	----	----	ADR	ASR	AFR	----	5802PRGM	2 BED DI UNIT, OUTLET VALVE ON CATION UNIT
		PORTS VENTED	1,2,3,16	----	----	4	----	----	6,7,8	7,8	1,8	1,3,11	----	----	1,3,12,13,14	1,3,13,14	1,3,14,16	----		
03	7	POSITION	SVC	----	BW1	FR1	----	----	BW2	FR2	----	----	BW3	FR3	----	----	----	----	5803PRGM	3 TANK SEQUENTIAL FILTER, BW & FAST RINSE
		PORTS VENTED	2,4,6,7, 9,11	----	1,6,7,9,11	2,6,7,9, 11,12	----	----	2,4,5,9,11	2,4,6,9, 11,16	----	----	2,3,4,6,7	2,4,6,7,9,10	----	----	----	----		
04	9	POSITION	SVC	----	BW1	FR1	----	----	BW2	FR2	----	----	BW3	FR3	----	----	BW4	FR4	5804PRGM	4 TANK SEQUENTIAL FILTER, BW & FAST RINSE
		PORTS VENTED	2,4,6,7,9,11, 14,15	----	1,6,7,9,11, 14,15	2,6,7,9, 11,12,14,15	----	----	2,4,5,9,11, 14,15	2,4,6,9, 11,14,15,16	----	----	2,3,4,6,7, 14,15	2,4,6,7,9,10, 14,15	----	----	2,4,6,7,9, 11,13	2,4,6,7,8,9, 11,14		
07	10	POSITION	SVC	----	BW	----	INJ	DISP	FR	DRN	----	AM	AMD	----	REF	----	----	FNR	5807PRGM	MIXED BED DI, SIMULTANEOUS REGENERATION
		PORTS VENTED	11,12	----	1,13	----	1,3,15,16	1,3,16	1,3,11	3,7	----	5,7	3,5,7	----	7,11	----	----	10,11		
10	11	POSITION	SVC	----	BW	SET	----	CDR	CSR	----	ADR	ASR	AFR	----	DRD	AM	----	FNR	5810PRGM	MIXED BED DI UNIT
		PORTS VENTED	15,16	----	1	(NONE)	----	4,5,9	5,9	----	7,8,9	8,9	9,10	----	9,12	12,13	----	14,15		
TA	8	POSITION	SVCA	----	----	BWA	BSRA	----	----	FRA	SBA	----	----	----	----	BWB	BSRB	FRB	58TAPRGM	TWO UNIT ALTERNATING SOFTENER
		PORTS VENTED	1,2,8,16	----	----	6,8,11	5,7,8,11	----	----	7,8,11,16	8,11,16	----	----	----	----	2,13,16	1,2,15,16	2,8,15,16		
TB *	10	POSITION	SVCA	----	----	BWA	----	BRD	SR	FRA	SBA	----	----	BWB	----	BRD	SR	FRA	58TBPRGM	TWO TANK ALTERNATOR W/ TIMED BRINE
		PORTS VENTED	6,14,16	----	----	1,2,6,8	----	4,5,6,8	4,5,6,8	5,6,8,14	6,8,14	----	----	9,10,14,16	----	12,13,14,16	12,13,14,16	**6,13,14,16**		

* TB PROGRAM FOR USE WITH SERIES 962 CONTROLLER ONLY.

SERIES 51 STANDARD STAGER PROGRAMS

STAGER PROGRAM	# POS.		PORTS VENTED IN POSITION 0	1	2	3	4	5	6	7	REF. DWG NO.	FUNCTION
			A	B	C	D	E	F	G	H		
06	6	POSITION	SVC	----	BW	----	BRD	SR	FR	REF	5106PRGM -or- 9606PRGM	6 POSITION SOFTENER (TIMED DRAW & REFILL)
		PORTS VENTED	1, 2	----	4	----	5, 6, 7	6, 7	1, 7	1, 2, 8		
07	5	POSITION	SVC	----	BW	----	BRD	SR	FR	----	5107PRGM -or- 9607PRGM	5 POSITION SOFTENER (TIMED DRAW)
		PORTS VENTED	1, 2	----	4	----	5, 6, 7	6, 7	1, 7	----		
09	5	POSITION	SVC	----	----	BW	BSR	----	FR	REF	5109PRGM -or- 9609PRGM	5 POSITION SOFTENER (TIMED REFILL)
		PORTS VENTED	1, 3	----	----	4	5, 7	----	1, 7	1, 8		
10	5	POSITION	SVC	----	BW	FRA	----	----	BW2	FRB	5110PRGM -or- 9610PRGM	2 TANK SEQUENTIAL FILTER (BW & FR)
		PORTS VENTED	1, 2, 5, 6	----	5, 6, 7	1, 5, 6, 8	----	----	1, 2, 3	1, 2, 4, 5		
11	7	POSITION	SVC	----	DRD	----	ASC	BW	----	FR	5111PRGM -or- 9611PRGM	FILTER WITH AIR SCOUR
		PORTS VENTED	2,3	----	1,4	----	4,6,7	4,7,8	----	1,2		
12	6	POSITION	SVC	BW	----	BRD	DISP	RECL	FR	----	5112PRGM -or- 9612PRGM	BRINE RECYCLE SOFTENER
		PORTS VENTED	1,8	2	----	4,5	4,5	5,6	4,8	----		
86	7	POSITION	SVC	BW1	BW2	BW3	BW4	BW5	BW6	----	5186PRGM -or- 9686PRGM	6 TANK SEQUENTIAL FILTER
		PORTS VENTED	8	1	2	3	4	5	6	----		
87	8	POSITION	BW1	BW2	BW3	BW4	BW5	BW6	BW7	SVC	5187PRGM -or- 9687PRGM	7 TANK SEQUENTIAL FILTER
		PORTS VENTED	1	2	3	4	5	6	7	8		

ABW = ANION BACKWASH
ADR = ANION DRAW
AM = AIR MIX
AMD = AIR MIX & DRAIN DOWN
ASC = AIR SCOUR
ASR = ANION SLOW RINSE
AFR = ANION FAST RINSE
BW = BACKWASH
BWA = BACKWASH UNIT A
BWB = BACKWASH UNIT B
BRD = BRINE DRAW
BSR = BRINE / SLOW RINSE
BSRA = BRINE / SLOW RINSE UNIT A
BSRB = BRINE / SLOW RINSE UNIT B
CBW = CATION BACKWASH
CDR = CATION DRAW
CFR = CATION FAST RINSE
CSR = CATION SLOW RINSE
DRD = DRAIN DOWN
DISP = DISPLACE
FR = FAST RINSE
FRA = FAST RINSE UNIT A
FRB = FAST RINSE UNIT B
FNR = FINAL RINSE
INJ = INJECT
RECL = RECLAIM
REF = REFILL
SBA = STANDBY UNIT A
SBB = STANDBY UNIT B
SET = SETTLE
SR = SLOW RINSE
SVC = SERVICE
SVCA = SERVICE UNIT A
SVCB = SERVICE UNIT B

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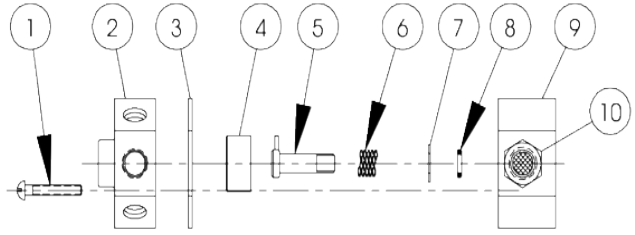
SERIES 48, 51, & 58 STAGERS
MODEL SELECTION & PROGRAMS

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	10MAY01	1078031

SERIES 51 & 58 STAGER PROGRAMS

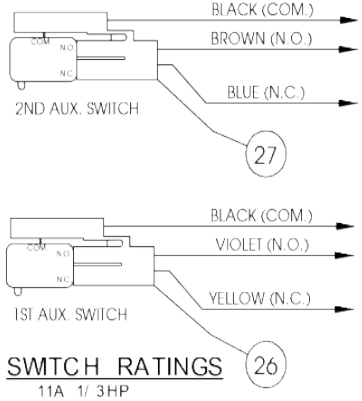
SERIES 48 STAGER ASSEMBLY

PILOT CONTROL ASSEMBLY



OPTIONAL AUX. SWITCHES

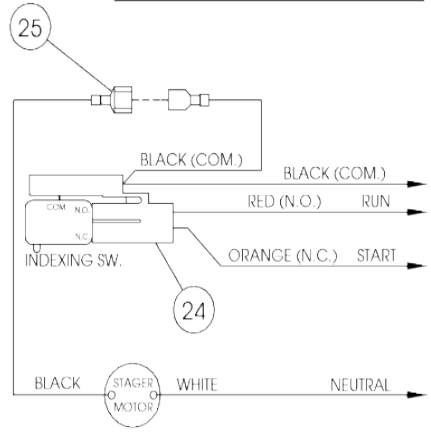
MAXIMUM OF TWO (2)



SWITCH RATINGS

11A 1/ 3HP
125, 250, 277 VAC
1/ 2A 125 VDC
1/ 4A 250 VDC
4A 125 VAC L

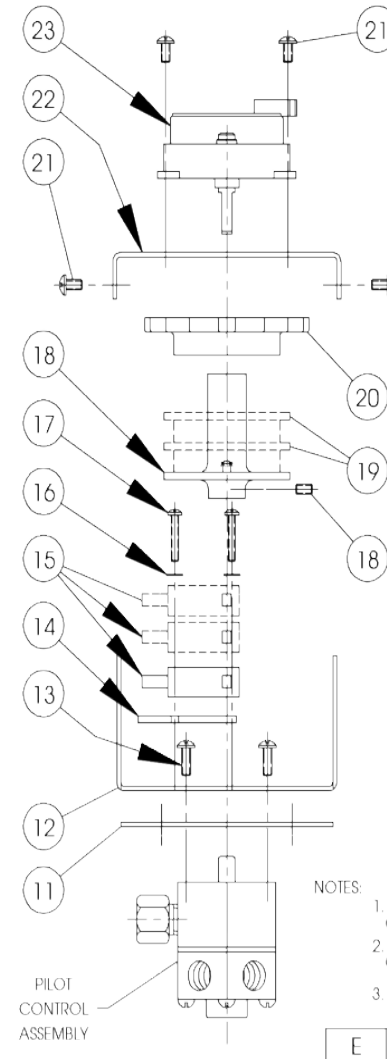
STANDARD WIRING



INTERNAL PARTS KITS

STAGER PROGRAM	INTERNAL PARTS KITS STD. PROGRAMS	INTERNAL PARTS KITS INVERTED PROGRAMS
48-00	1074817 (48-IAB)	1077585 (E) (48-IABI)
48-01		
48-03		
48-04		
48-11		
48-12		
48-TA		
48-83	1081593 (48-IA-83)	1081594 (48-IA-83I)
48-84		
48-85		
48-TB	1077584 (48-IA-TB)	
48-SP	1084816 (48-IA-SP)	SPECIFY DWG. NO. WHEN ORDERING THESE PARTS

* INTERNAL PARTS KITS INCLUDE ITEM NOS. 3, 4, 6, 7 & 8 ALONG WITH A SMALL PACKET OF SILICON COMPOUND



NO.	DESCRIPTION		PART NO.	QTY.
1	RD HD. MACH. SCR. (6-32 X 7/8")		1075759 (SCS-0075)	3
2	BACKPLATE		PER PROGRAM	1
3	GASKET (SEE NOTE 3)		1084171	1
4	STEMPLATE (SEE NOTE 3)		PER PROGRAM	1
5	STEMSHAFT		1070448	1
6	SPRING (SEE NOTE 3)		1076234	1
7	WASHER (SEE NOTE 3)		1074074 (41-F)	1
8	O-RING (SEE NOTE 3)		1071667 (ORB-010)	1
9	BONNET		1074793 (48-B)	1
10	FILTERED INLET (1/8" N.P.T.)		1074825 (48-Q)	1
11	MOUNTING PLATE GASKET		1075737	1
12	BOTTOM MOUNTING BRACKET		1070437	1
13	PAN HD. MACH. SCR. (6-32 X 3/8")		1072371 (SCS-0070)	4
14	INSULATOR		1075455 (58B019)	1
15	SWITCH		1075499 (58013)	1-3
16	LOCKWASHER (NO. 4)		1073593 (WAS-0015)	2
17	PAN HD. MACH. SCREW (4-40 THREAD)	1 SWITCH	1072369 (SCS-0064)	2
		2 SWITCHES	1075757 (SCS-0065)	
		3 SWITCHES	1072389 (SCS-0151)	
18	48-00 INDEXING CAM 48-01 INDEXING CAM 48-03 INDEXING CAM 48-TA INDEXING CAM ALL OTHERS (SEE NOTE 1) *CAMS INCLUDE 6-32 SET SCREW		1076245 1076244 1076246 1077932 1076243	1
19	AUXILIARY CAM (SEE NOTE 2)		1075451 (58B017)	0-2
20	THUMB WHEEL		1075454 (58B018)	1
21	TAPTITE SCREW (6-32 X 1/4")		1075746	6
22	MOTOR MOUNTING BRACKET		1070436	1
23	MOTOR (4 WATTS MAX.)	115VAC 60HZ	1075748	1
		230VAC 50/60HZ	1075749	
		24VAC 50/60HZ	1075750	
		12VAC 50/60HZ	1075753	
24	WIRE HARNESS (STANDARD)		1075464 (58B030)	1
25	MALE CONNECTOR		1075498 (58012)	1
26	WIRE HARNESS (1ST AUX. SWITCH)		1075501 (58015)	1
27	WIRE HARNESS (2ND AUX. SWITCH)		1075502 (58016)	1

NOTES:

1. STAGER PROGRAM MUST BE SPECIFIED WHEN ORDERING THIS PART.
2. MUST SPECIFY IN WHICH POSITION(S) SWITCH OUTPUT(S) ARE REQUIRED.
3. SUPPLIED AS A KIT ONLY.

REV.	DESCRIPTION	ECO	DATE	APVD
E	1-WAS: 1081595	22341	12APR10	TLE
D	ITEM NO. 3 WAS P/N 1074842	NONE	15SEP03	

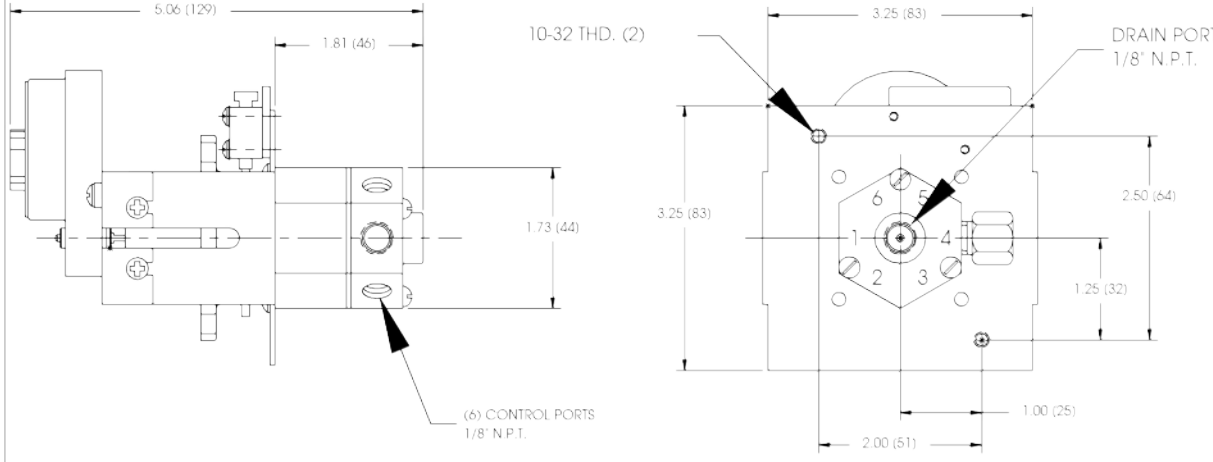
AQ Matic

SERIES 48 STAGER ASSEMBLY
ASSEMBLY DRAWING

SCALE	DRAWN	DATE	DWG. NO.
3/8	MSM	11APR01	1077882

Form No. 1077881

SERIES 48 PROGRAMS AND MOUNTING INFORMATION



NO.	DESCRIPTION		PART NO.	QTY.
1	STAGER ASSEMBLY		R048-____-____B	1
2	ENCLOSURE	NEMA 4XFG	1077969	1
3	PAN HEAD MACHINE SCREW 10-32 x 1/2" LONG		1075758 (510-BU)	2
4	LOCKWASHER (NO. 10)		1073588 (WAS-0005)	2

NOTE:

1. STAGERS CAN BE MANUALLY ADVANCED BY ROTATING THE CAM CLOCKWISE.
2. PIPING SCHEMATICS AVAILABLE UPON REQUEST.
3. ALL STAGERS EXCEPT 48-03 & 48-TA SUPPLIED WITH NOTCHED CAM FOR PULSE OUTPUT TYPE TIMERS. 48-03 & 48-TA SUPPLIED WITH BUTTERFLY CAM FOR "UP/DOWN" OUTPUT TYPE TIMERS.

INCHES (MILLIMETERS)

SERIES NO.	PORTS VENTED IN POSITION						DESCRIPTION
	A	B	C	D	E	F	
48-00	1,2 (SVC)	-	3,4 (BW)	-	5,6 (BR)	1,6 (FR)	4 POS. SOFTENER
48-01	1,2 (SVC)	-	3,4 (BW)	-	-	1,6 (FR)	3 POS. FILTER
48-03	1,2 (SVC)	-	3,4 (BW)	-	5,6 (BR)	1,6 (FR)	4 POS. SOFTENER (SEE NOTE 3)
48-04	1,2 (SVC)	-	3,4 (BW)	-	-	-	2 POS. FILTER
48-12	1,2 (SVC)	-	3,4 (BW)	4,5 (BR)	-	1,6 (FR)	4 POS. SOFTENER W/UPFLOW BRINE
48-83	2 (BW)	3 (BW)	-	-	6 (SVC)	1 (BW)	3 TANK SEQUENTIAL FILTER
48-84	2 (BW)	3 (BW)	4 (BW)	-	6 (SVC)	1 (BW)	4 TANK SEQUENTIAL FILTER
48-85	2 (BW)	3 (BW)	4 (BW)	5 (BW)	6 (SVC)	1 (BW)	5 TANK SEQUENTIAL FILTER
48-TA	1	-	2	-	-	-	2 TANK ALTERNATOR (SEE NOTE 3)
48-TB	1	2	1	2	1	2	2 TANK ALTERNATOR

REV.	DESCRIPTION	ECO	DATE	APVD
E	1-WAS 1081585	22341	12APR10	TLE
D	ITEM NO. 3 WAS P/N 1074842	NONE	15SEP03	

AQ Matic

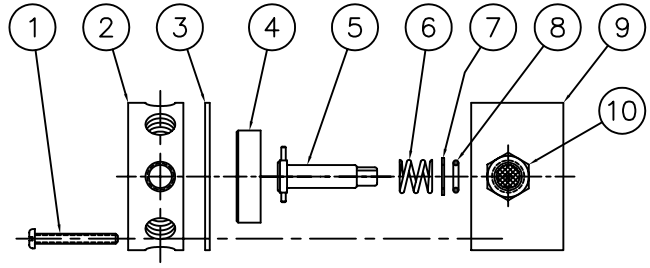
SERIES 48 STAGER
PROGRAMS AND MOUNTING DRAWING

SCALE	DRAWN	DATE	DWG. NO.
N/A	MSM	11Apr01	1077882

Form No. 1077881

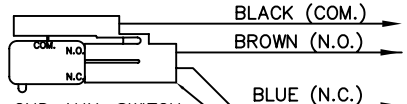
Form No. 1077803

PILOT CONTROL ASSEMBLY

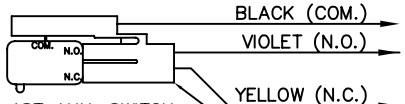


OPTIONAL AUX. SWITCHES

MAXIMUM OF TWO (2)



BLACK (COM.)
BROWN (N.O.)
BLUE (N.C.)
2ND AUX. SWITCH
27

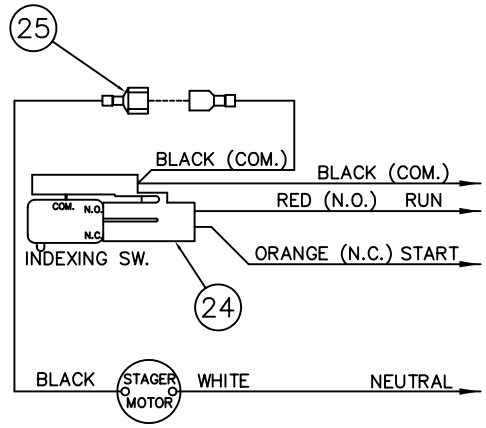


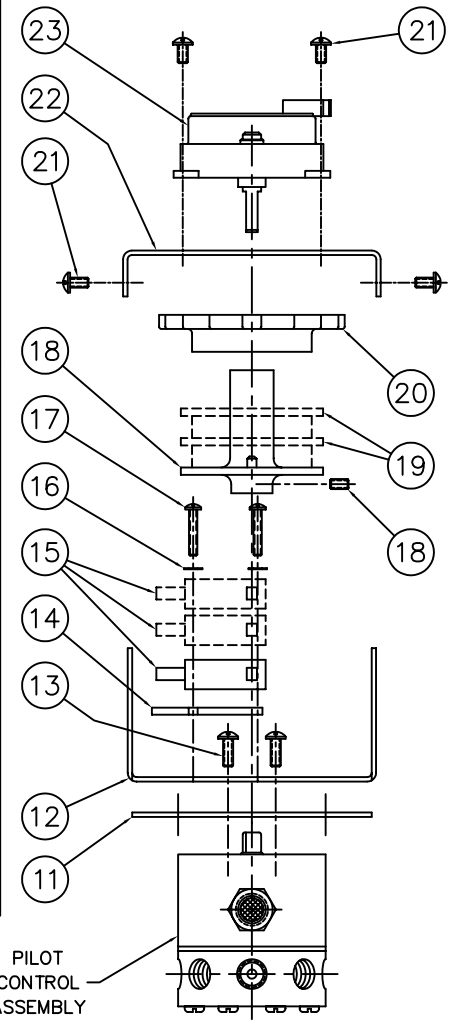
BLACK (COM.)
VIOLET (N.O.)
YELLOW (N.C.)
1ST AUX. SWITCH
26

SWITCH RATINGS

11A 1/3HP
125, 250, 277 VAC
1/2A 125 VDC
1/4A 250 VDC
4A 125 VAC L

STANDARD WIRING





NO.	DESCRIPTION		PART NO.	QTY.
1	PAN HD. MACH. SCR. (6-32 X 1 1/8")		1075760 (SCS-0076)	4
2	BACKPLATE		PER PROGRAM	1
3	GASKET (SEE NOTE 3)		1075675 (96034)	1
4	STEMPLATE (SEE NOTE 3)		PER PROGRAM	1
5	STEMSHAFT		1070438	1
6	SPRING (SEE NOTE 3)		1075242 (54-S)	1
7	WASHER (SEE NOTE 3)		1075241 (54-R)	1
8	O-RING (SEE NOTE 3)		1071716 (ORE-011)	1
9	BONNET		1074883 (51-B)	1
10	FILTERED INLET (1/8" N.P.T.)		1074825 (48-Q)	1
11	MOUNTING PLATE GASKET		1075674 (96B050)	1
12	BOTTOM MOUNTING BRACKET		1077824	1
13	PAN HD. MACH. SCR. (6-32 X 3/8")		1072371 (SCS-0070)	2
14	INSULATOR		1075455 (58B019)	1
15	SWITCH		1075499 (58013)	1-3
16	LOCK WASHER (NO. 4)		1073593 (WAS-0015)	2
17	PAN HD. MACH. SCREW (4-40 THREAD)	1 SWITCH	1072369 (SCS-0064)	2
		2 SWITCHES	1075757 (SCS-0065)	
		3 SWITCHES	1072389 (SCS-0151)	
18	INDEXING CAM (SEE NOTE 1)		1076243	1
	SET SCREW (6-32)			1
19	AUXILIARY CAM (SEE NOTE 2)		1075451 (58B017)	0-2
20	THUMB WHEEL		1075454 (58B018)	1
21	TAPTITE SCREW (6-32 X 1/4")		1075746	6
22	MOTOR MOUNTING BRACKET		1070436	1
23	MOTOR (4 WATTS MAX.)	115VAC 60HZ	1075748	1
		230VAC 50/60HZ	1075749	
		24VAC 50/60HZ	1075750	
		12VAC 50/60HZ	1075753	
24	WIRE HARNESS (STANDARD)		1075464 (58B030)	1
25	MALE CONNECTOR		1075498 (58012)	1
26	WIRE HARNESS (1ST AUX. SWITCH)		1075501 (58015)	1
27	WIRE HARNESS (2ND AUX. SWITCH)		1075502 (58016)	1

NOTES:

1. STAGER PROGRAM MUST BE SPECIFIED WHEN ORDERING THIS PART.
2. MUST SPECIFY IN WHICH POSITION(S) SWITCH OUTPUT(S) ARE REQUIRED.
3. SUPPLIED AS A KIT ONLY.

INTERNAL PARTS KITS

STAGER PROGRAM	INTERNAL PARTS KITS STD. PROGRAMS	INTERNAL PARTS KITS INVERTED PROGRAMS
51-06	1074888 (51-IA-00)	
51-07		
51-09		
51-10	1074890 (51-IA-10)	
51-11	1074891 (51-IA-11)	
51-12	1074892 (51-IA-12)	
51-86	1074893 (51-IA-86)	1077587 (51-IA-86I)
51-87		
51-SP	1074887 (51-IA-SP)	SPECIFY DWG. NO. WHEN ORDERING THESE PARTS

* INTERNAL PARTS KITS INCLUDE ITEM NOS. 3, 4, 6, 7 & 8 ALONG WITH A SMALL PACKET OF SILICON COMPOUND

REV.	DESCRIPTION	ECO	DATE	APVD
C	NUMBER CONVERSION	1588	13DEC02	

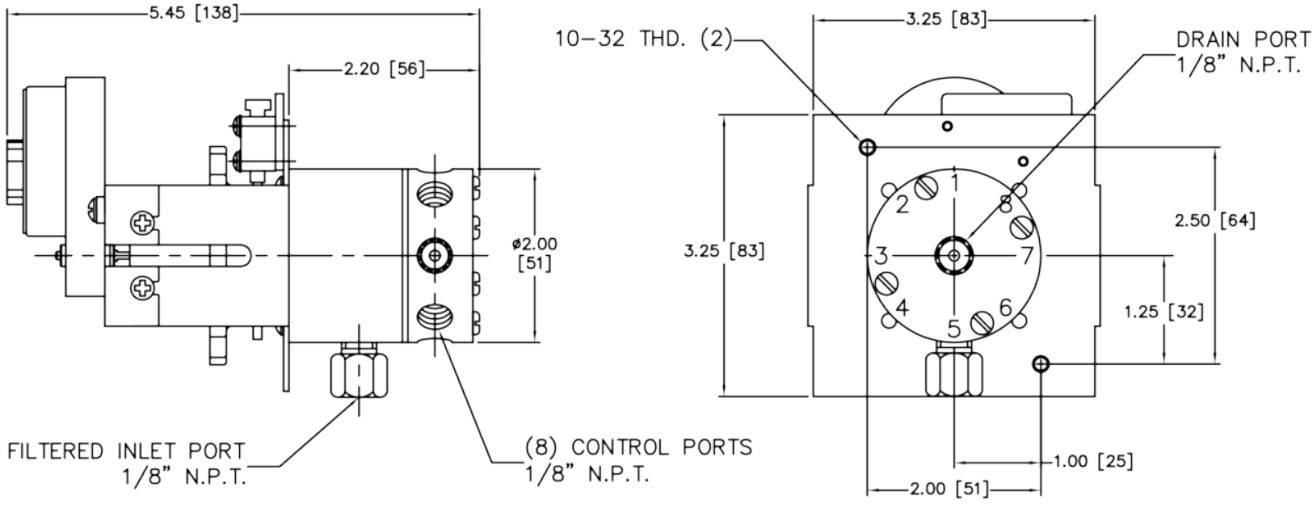
AQMatic
16605 West Victor Rd
New Berlin, WI 53151
262-326-0100
www.aq-matic.com

SERIES 51 STAGER ASSEMBLY ASSEMBLY DRAWING

SCALE	DRAWN	DATE	DWG. NO.
3/8	MSM	19Feb01	1077770

SERIES 51 STAGER ASSEMBLY

SERIES 51 PROGRAMS AND MOUNTING INFORMATION



NO.	DESCRIPTION		PART NO.	QTY.
1	STAGER ASSEMBLY		R051-___-___B	1
2	ENCLOSURE			1
		NEMA 4XFG	1077970	
3	PAN HEAD MACHINE SCREW 10–32 x 1/2" LONG		1075758 (510–BU)	2
4	LOCKWASHER (NO. 10)		1073588 (WAS–0005)	2

NOTE:

1. STAGERS CAN BE MANUALLY ADVANCED BY ROTATING THE CAM CLOCKWISE.
2. PIPING SCHEMATICS AVAILABLE UPON REQUEST.

INCHES [MILLIMETERS]

SERIES NO.	PORTS VENTED IN POSITION								DESCRIPTION
	A	B	C	D	E	F	G	H	
51–06	1,2(SVC)	–	4(BW)	–	5,6,7(BR)	6,7(SR)	1,7(FR)	1,2,8(BR REF)	TIMED BR. & REFILL SOFT.
51–07	1,2(SVC)	–	4(BW)	–	5,6,7(BR)	6,7(SR)	1,7(FR)	–	TIMED BRINE SOFTENER
51–09	1,3(SVC)	–	–	4(BW)	5,7(BR/SR)	–	1,7(FR)	1,8(REF)	TIMED REFILL SOFTENER
51–10	1,2,5,6(SVC)	–	5,6,7(BW1)	1,5,6,8(FR1)	–	–	1,2,3(BW2)	1,2,4,5(FR2)	2 TANK SEQ. FILTER
51–11	2,3(SVC)	–	1,4(DR)	–	4,6,7(AS)	4,7,8(BW)	–	1,2(FR)	FILTER WITH AIR SCOUR
51–12	1,8(SVC)	2(BW)	–	4,5(BR)	4,5(DSP)	5,6(REC)	4,8(FR)	–	BRINE RECYCLE SOFT.
51–86	1(BW)	2(BW)	3(BW)	4(BW)	5(BW)	6(BW)	7(SVC)	–	6 TANK SEQ. FILTER
51–87	1(BW)	2(BW)	3(BW)	4(BW)	5(BW)	6(BW)	7(BW)	8(SVC)	7 TANK SEQ. FILTER

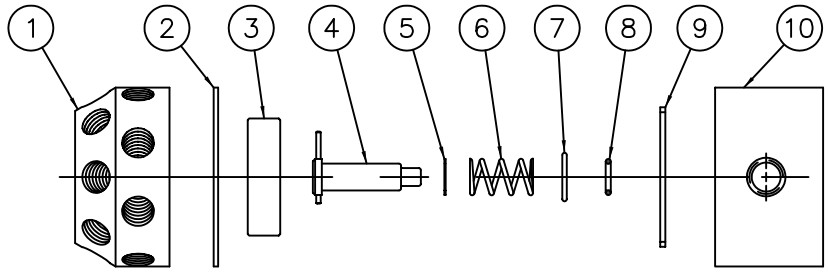
REV.	DESCRIPTION	ECO	DATE	APVD
D	NUMBER CONVERSION	1588	13DEC02	

AQ Matic
Valve & Controls Company Inc.

SERIES 51 STAGER
PROGRAMS AND MOUNTING DRAWING

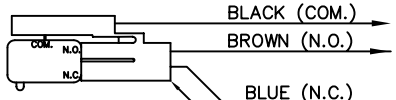
SCALE	DRAWN	DATE	DWG. NO.
N/A	MSM	19Feb01	1077770

PILOT CONTROL ASSEMBLY

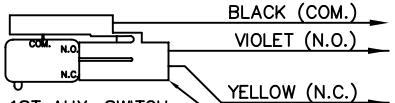


OPTIONAL AUX. SWITCHES

MAXIMUM OF TWO (2)



BLACK (COM.)
BROWN (N.O.)
BLUE (N.C.)
2ND AUX. SWITCH
27

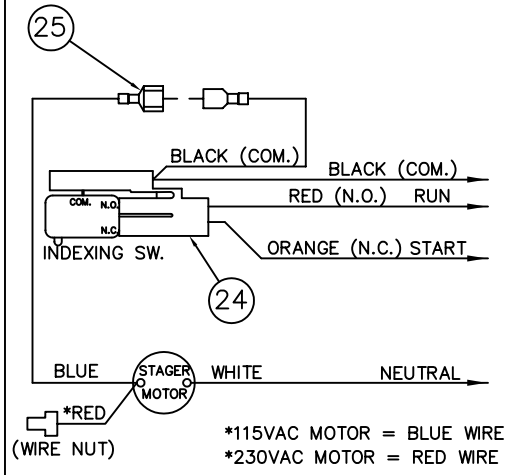


BLACK (COM.)
VIOLET (N.O.)
YELLOW (N.C.)
1ST AUX. SWITCH
26

SWITCH RATINGS

11A 1/3HP
125, 250, 277 VAC
1/2A 125 VDC
1/4A 250 VDC
4A 125 VAC L

STANDARD WIRING

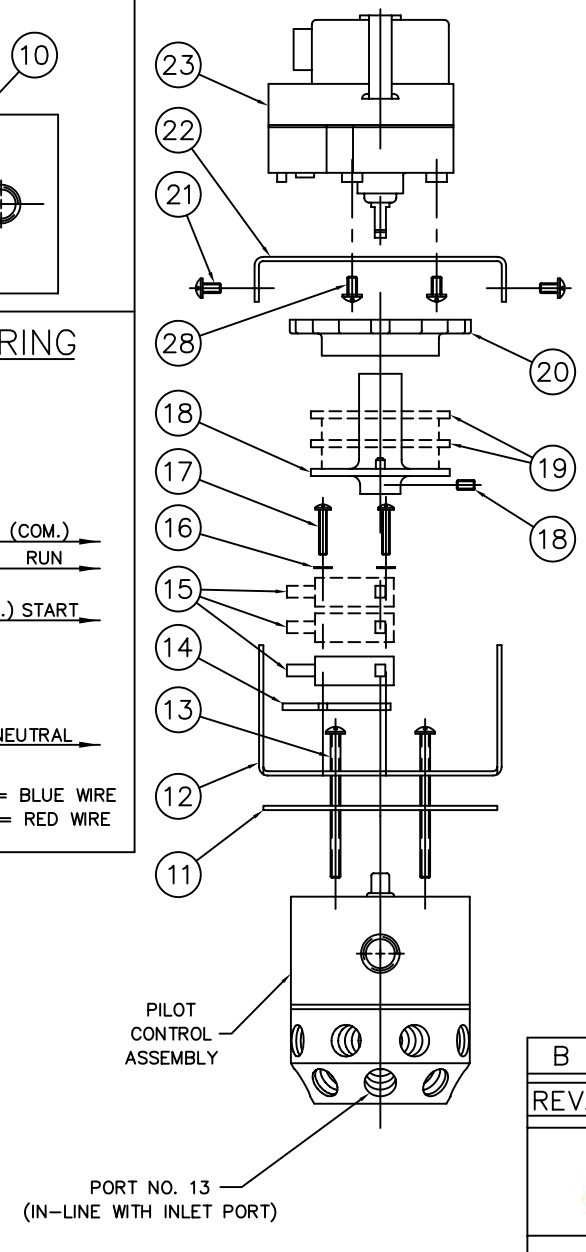


*115VAC MOTOR = BLUE WIRE
*230VAC MOTOR = RED WIRE

INTERNAL PARTS KITS

STAGER PROGRAM	INTERNAL PARTS KITS STD. PROGRAMS	INTERNAL PARTS KITS INVERTED PROGRAMS
58–00	1075411 (58–IA–00)	
58–01	1075412 (58–IA–01)	
58–02	1075413 (58–IA–02)	
58–03	1075414 (58–IA–03)	
58–07	1075415 (58–IA–07)	
58–10	1075416 (58–IA–10)	
58–TA	1075409 (58–IA–TA)	1075410 (58–IA–TAI)
58–TB	1081806 (58–IA–TB)	
58–SP	1075408 (58–IA–SP)	SPECIFY DWG. NO. WHEN ORDERING THESE PARTS

* INTERNAL PARTS KITS INCLUDE ITEM NOS. 2, 3, 5, 6, 7, 8 & 9 ALONG WITH A SMALL PACKET OF SILICON COMPOUND



NO.	DESCRIPTION		PART NO.	QTY.
1	BACKPLATE		PER PROGRAM	1
2	BACKPLATE GASKET (SEE NOTE 3)		1084170 (58–KZ)	1
3	STEMPLATE (SEE NOTE 3)		PER PROGRAM	1
4	STEMSHAFT		1070439	1
5	WASHER (SEE NOTE 3)		1075395 (58–AH)	1
6	SPRING (SEE NOTE 3)		1075424 (58–S)	1
7	INSERT (SEE NOTE 3)		1075406 (58–DA)	1
8	O–RING (SEE NOTE 3)		1071668 (ORB–012)	1
9	O–RING (SEE NOTE 3)		1075425 (58–T)	1
10	BONNET		1075404 (58–B)	1
11	MOUNTING PLATE GASKET		1075407 (58–DC)	1
12	BOTTOM MOUNTING BRACKET		1070437	1
13	PAN HD. MACH. SCR. (8–32 X 2")		1072378 (SCS–0087)	4
14	INSULATOR		1075455 (58B019)	1
15	SWITCH		1075499 (58013)	1–3
16	LOCKWASHER (NO. 4)		1073593 (WAS–0015)	2
17	PAN HD. MACH. SCREW (4–40 THREAD)	1 SWITCH	1072369 (SCS–0064)	2
		2 SWITCHES	1075757 (SCS–0065)	
		3 SWITCHES	1072389 (SCS–0151)	
18	INDEXING CAM (SEE NOTE 1) (CAM INCLUDES 6–32 SET SCREW)		1076243	1
19	AUXILIARY CAM (SEE NOTE 2)		1075451 (58B017)	0–2
20	THUMB WHEEL		1075454 (58B018)	1
21	TAPTITE SCREW (6–32 X 1/4")		1075746	4
22	MOTOR MOUNTING BRACKET		1070436	1
23	MOTOR	115VAC 60HZ	1075434 (58B000)	1
		230VAC 50/60HZ		
		24VAC 50/60HZ	1075438 (58B004)	
		12VAC 50/60HZ	1075779	
24	WIRE HARNESS (STANDARD)		1075464 (58B030)	1
25	MALE CONNECTOR		1075498 (58012)	1
26	WIRE HARNESS (1ST AUX. SWITCH)		1075501 (58015)	1
27	WIRE HARNESS (2ND AUX. SWITCH)		1075502 (58016)	1
28	SCREW (M3 X 0.5 X 6)		1072396 (SCS–0167)	3

NOTES:
1. STAGER PROGRAM MUST BE SPECIFIED WHEN ORDERING THIS PART.
2. MUST SPECIFY IN WHICH POSITION(S) SWITCH OUTPUT(S) ARE REQUIRED.
3. SUPPLIED AS A KIT ONLY.

REV.	DESCRIPTION	ECO	DATE	APVD
B	NUMBER CONVERSION	1588	20DEC02	

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16605 West Victor Rd
New Berlin, WI 53151
262-326-0100
www.aq-matic.com

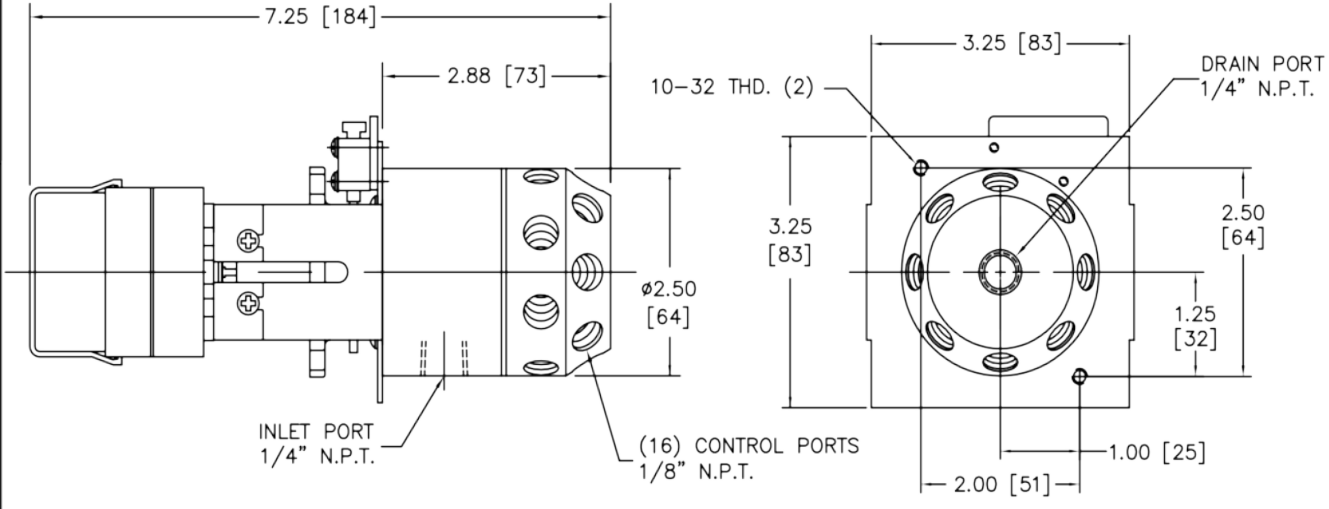
SERIES 58 STAGER ASSEMBLY DRAWING

SCALE	DRAWN	DATE	DWG. NO.
3/8	MSM	03May01	1077898

Form No. 1077897

SERIES 58 STAGER ASSEMBLY

SERIES 58 PROGRAMS AND MOUNTING INFORMATION



NO.	DESCRIPTION		PART NO.	QTY.
1	STAGER ASSEMBLY		R058-___-___C	1
2	ENCLOSURE	NEMA 1	1075422 (58-R)	1
		NEMA 4	1075423 (58-RA)	
		NEMA 4XFG	1073665 (ZENC0409)	
3	PAN HEAD MACHINE SCREW 10-32 x 1/2" LONG		1075758 (510-BU)	2
4	LOCKWASHER (NO. 10)		1073588 (WAS-0005)	2

NOTE:

1. STAGERS CAN BE MANUALLY ADVANCED BY ROTATING THE CAM CLOCKWISE.
2. PIPING SCHEMATICS AVAILABLE UPON REQUEST.

INCHES [MILLIMETERS]

SERIES NO.	DESCRIPTION
58-00	2 COLUMN DEIONIZER
58-01	FILTER (DOUBLE ACTING VALVES)
58-02	2 COLUMN DEIONIZER (CATION OUTLET VALVE)
58-03	3 TANK SEQUENTIAL FILTER
58-04	4 TANK SEQUENTIAL FILTER
58-07	MIXED BED DEIONIZER (SIMULTANEOUS REGEN.)
58-10	MIXED BED DEIONIZER
58-TA	2 TANK ALTERNATOR
58-TB	2 TANK ALTERNATOR WITH TIMED BRINE
58-SP	CUSTOM PROGRAM

Form No. 1077897

REV.	DESCRIPTION	ECO	DATE	APVD
D	NUMBER CONVERSION	1588	20DEC02	

AQ Matic
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SERIES 58 STAGER
PROGRAMS AND MOUNTING DRAWING

SCALE	DRAWN	DATE	DWG. NO.
N/A	MSM	04May01	1077898

AQUAMATIC® 962 SERIES
STAGER CONTROLS

SOPHISTICATED ELECTRONICS FOR SUPERIOR PROGRAMMING

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

Remote lockout input combine an AquaMatic stager with a 962 series electronic control, mounted and prewired in a NEMA-rated enclosure

Can be used simultaneously with time clock, meter immediate, or meter delayed regeneration types

Allows monitoring of flow and volume information in remote signal start applications

Control and stager automatically synchronize to the service position

Up to 15 programmable timed regeneration cycles are available [0-255 minutes]

Accepts input from variety of flow sensors

During a power outage, critical operating information is stored in memory

Can be programmed to lock capacity value

Key data [peak flow, average daily usage] is retrievable from memory

Programmable regeneration types for increased flexibility

Selected reserve options

- Fixed reserve: the reserve is fixed at a programmable percentage of the total capacity
- Variable reserve: the control monitors daily water usage and at the programmed time of regeneration, calculates the average water used for each day of the week

OPTIONS

Battery Backup

Contact closure [dry or powered] during a cycle or cycles

SPDT relay for additional signal

SPECIFICATIONS

NEMA 4XFG Fiberglass Enclosure

115 VAC 50/60 Hz and 230 VAC 50/60 Hz

U.S. or Metric Units of Measure

APPLICATIONS

SINGLE UNIT CONTROLS	MODEL NUMBER	DESCRIPTION
Typical Softeners and Filters	E948*	962 Control w/Model 48, 6 port stager
More Complex Softeners and Filters	E951*	962 Control w/Model 51, 8 port stager
MULTIPLE UNIT CONTROLS	**MODEL NUMBER**	**DESCRIPTION**
Twin-Alternating Softeners and Filters (with timed brine switch output)	E958-TB	962 Control w/Model 58-TB, 16 port stager
Twin-Alternating Softeners	E958-TA	962 Control w/Model 58-TA, 16 port stager
Sequential Filters (backwash only)	E948	962 Control w/Model 48, 6 port stager
2 Unit Sequential Filters (backwash and rinse)	E951	962 Control w/Model 51, 8 port stager
3 or 4 Unit Sequential Filters	E958	962 Control w/Model 58, 16 port stager

*Two-tank and three-tank parallel systems can be controlled by individual controls provided with lockout feature (lockout feature is void when using the added relay output option).

AQ Matic

16605 West Victor Rd. New Berlin, WI 53151

P: 262–326–0100 | www.aq–matic.com | techsupport@aq–matic.com

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1221446 REV C MA2016

962 ELECTRONIC STAGER CONTROLLER MASTER CHART

FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER: E 9 ___ - ___ F - ___ ___ ___ ___ ___

CONTROLLER Electronic Controller Series to be Provided
9 = 962 (Battery Backup Capable)*

STAGER Rotary Pilot Stager Series to be Provided
48 = 6 Port (Brass)
51 = 8 Port (Brass)
58 = 16 Port (PVC)

PROGRAM Stager Program to be Provided
*00 - 99 = STANDARD
**SS = SPECIAL per Drawing Indicated
TA = Twin Alternating Softener (w/ Service Lights on front panel)
^TB = Twin Alternating Softener (w/ Timed Brine Pos. & switch output)
-or- Twin Alternating Filter skipping steps 2,3,7 & 8.
^TR = Twin Alternating Softener (w/Timed Refill pos. & switch output)
* Two character designation from standard stager drawing.
** Special Drawing number placed in last 5 digits of product number.
^ Tank In Service is indicated via the 6 digit display of the 962 controller.

ENCLOSURE N.E.M.A. Rating of Panel & Enclosure to be Provided
F = NEMA 4X Fiberglass Panel & Enclosure

ELECTRICAL Power Required to Operate Device (Field Configurable)
1 = 115 Volts / 50 or 60 Hertz
2 = 220 Volts / 50 or 60 Hertz

1st AUX. SWITCH First Extra Switch to be provided on Rotary Pilot Stager (Unless Special Drawing Number is Assigned)
S = SERVICE Return (Homing) (**Not** for 58-**TA** Stagers)
W = Status Lights Cam (58-**TA** Stagers only)

2nd AUX. SWITCH Second Extra Switch to be provided on Rotary Pilot Stager (Unless Special Drawing Number is Assigned)
0 = NONE (Not Valid for 58 TA or TB Stagers)
*A to R = CAM POSITION Switch is to be active (I & O not used)
**S = SERVICE Return (Homing) (58-TA Stagers only)
T = Timed Switch Output (for 58 TB & TR Stagers only)
* Use a Letter to indicate Cam position Not a Number.
**Option "S" Standard on 58 Stagers w/TA Program Only.

PRESSURE Program of Stager (Unless Special Drawing Number is Assigned)
0 = STANDARD (Vent to open)
1 = INVERTED (Pressure to open)

RELAY OUTPUT OPTION (Provides additional relay output during Regeneration) (Unless Special Drawing Number is Assigned)
0 = NONE
R = Relay Output Option (**For Single Tank & Twin Alt. Only**)
(Provides a dry or powered set of contacts during Service / Regen.)
SPDT
Coil: 12VAC
Contacts: 15A/120VAC/28VDC, 10A/240VAC

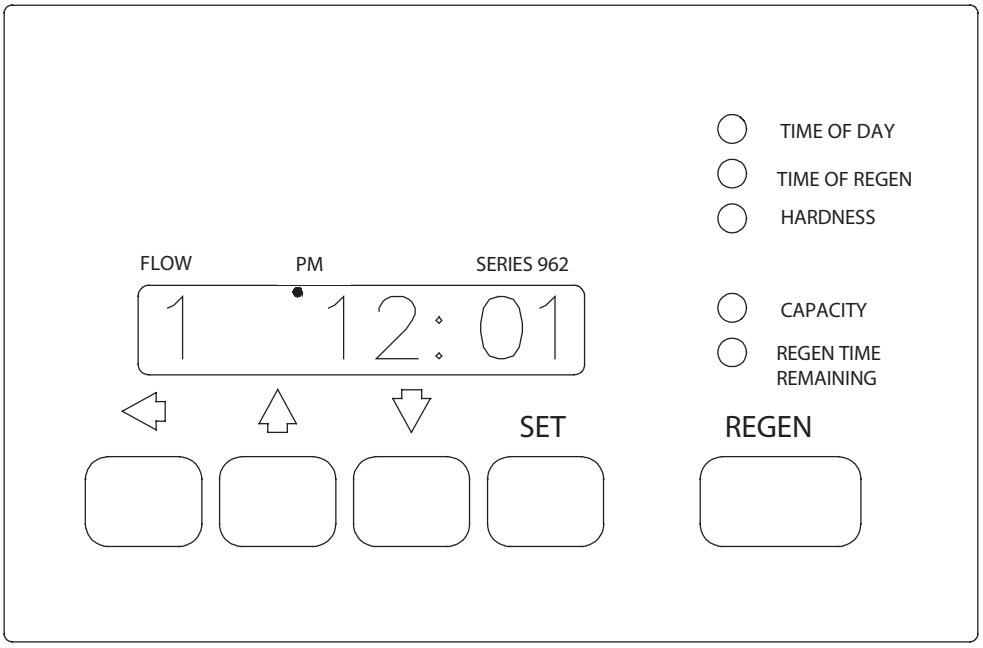
****Relay also sold as kit p/n: 1077737, kit includes (1)Relay, (1)Socket & Mounting Hardware**

STAGER REVISION (Unless Special Drawing Number is Assigned)
B = 48 and 51 Series Stagers
C = 58 Series Stagers

REV	ECN	DESCRIPTION	BY/DATE
C		Formatted for Pentair ECN	JJJ 17-Nov-09
D	1778	Remove 59 & 96 stagers	MM 1-Oct-20

Series 962
Electronic Stager Control

Operation Manual



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- Double Regeneration
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- Selectable Reserve Options
- U.S. or Metric Units of Measure
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Caution and Warning Symbols

The following international symbols appear in this manual to highlight caution and warning messages.

Cautions

Not heeding these messages could result in personal injury and/or damage to equipment.

Caution: This symbol indicates caution messages (Refer to User Manual).

Warnings

Not heeding these messages could result in serious personal injury.

Warning: This symbol is intended to alert the user to the presence of "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Specifications

Warning: Class I equipment - The composite enclosure used in this equipment does not automatically provide grounding between conduit connections. Use grounding bushing and jumper wires as part of the installation. **To avoid electric shock, grounding must be installed by the customer as part of the installation. Installation should be completed by qualified electricians and in accordance with the requirements of all state and local electrical codes as well as the National Electrical Code (NEC). A separate ground post has been provided inside this equipment enclosure and is indicated by the NEC ground symbol as shown below.**

NEC Ground Symbol

Warning: Overcurrent Protection - This equipment is not supplied with built in overcurrent protection (fuses or circuit breakers). An external switch and/or circuit breaker must be installed by a qualified electrician in accordance with all state and local electrical codes as well as the National Electrical Code (NEC). The external switch and/or circuit breaker must be in close proximity to this equipment and in easy reach of the operator. It must be clearly marked to indicate that it is the disconnecting device for this equipment. Recommend fuse size is 1 AMP.

Voltage Range: 230/115VAC (+/- 10%)

Frequency Range: 50/60Hz

Max. Rated Power: 4 Watts

Pollution Degree: 2

Overvoltage Category: II

Altitude: 6500 Ft. (2000 Meters)

Max. Rated Fluid (Air/Water) Pressures

Model E948	Model E951	Model E958/ E959
125 psi (8.6 bar)	125 psi (8.6 bar)	125 psi (8.6 bar)

NEMA 4X Enclosure: Intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water; undamaged by the formation of ice on the enclosure. The enclosure door must be kept tightly closed using all fasteners provided. ***Any modifications to this enclosure (i.e., added holes for cable entry/ mounting, conduit connections...etc.) may void the intended NEMA 4X rating. NEMA 4 and UL rated fittings should be used when modifying the enclosure***.

Relative Humidity Operating Range:

Temperature Range	Allowed Relative Humidity
0^{o}C to 37^{o}C (32^{o}F to 99^{o}F)	10% to 100% Condensing
38^{o}C to 55^{o}C (100^{o}F to 131^{o}F)	10% to 75% Non-Condensing

Inputs

Terminal Strip 1 (TB1) High Voltage

TB1, Terminal #1: Line Voltage Input

TB1, Terminal #4: Neutral Input

TB1, Terminal #6: Input to Aux. Switch Common

Optional Relay Inputs

Relay Terminal #6: Relay Common Input

Terminal Strip 2 (TB2) Low Voltage

TB2, Terminal #11: Turbine Meter Ground Input

TB2, Terminal #12: Turbine Meter Shield Input

TB2, Terminal #13: Turbine Meter Signal Input

TB2, Terminal #17: Delayed Start Input (Dry Contact)

TB2, Terminal #18: Delayed Start Input (Dry Contact)

TB2, Terminal #19: Lockout Input (Dry Contact)

TB2, Terminal #20: Lockout Input (Dry Contact)

Outputs

Terminal Strip 1 (TB1) High Voltage

TB1, Terminal #7: Aux. Switch N.C. Output

TB1, Terminal #8: Aux. Switch N.O. Output

Optional Relay Outputs

Relay Terminal #2: Relay N.C. Output

Relay Terminal #3: Relay N.O. Output

Terminal Strip 2 (TB2) Low Voltage

TB2, Terminal #14: Turbine Meter +12VDC Output

TB2, Terminal #12: Turbine Meter Shield Input

TB2, Terminal #13: Turbine Meter Signal Input

Series 962 Electronic Stager Controls

The Series 962 Electronic Stager Controls provide sophisticated, demand-based water conditioning by combining a microprocessor with a flow meter to electronically monitor the amount of water used. This fully programmable series of controls provide the ability to fine tune the operation to meet the application requirements. There are several 962 Stager models available.

Single Unit Controls	Model No.
Basic Softeners & Filters	E948
Complex Softeners & Filters	E951

Multiple Unit Controls	Model No.
Twin Alternating Softeners & Filters	E958-TA E958-TB
Sequential Filters (Backwash Only)	E948
2 Unit Sequential Filters	E951
3 or 4 Unit Sequential Filters	E958

Special Features of the Series 962 Control

Memory Retention

During a power outage, critical operating information is stored in nonvolatile memory. This information includes the time of day, water usage, all programming data and the number of days since the last regeneration. When power is restored, the information is returned to the microprocessor and operation resumes as if an outage never occurred. The time of day will be late by the length of the power outage. The time of day should be reset after an extended power outage. No other reprogramming is necessary. An optional backup battery will allow the control to keep track of time and water usage for up to 8 hours during a power outage. **The control will not initiate a regeneration while on battery backup.**

Programmable Cycles

The control is flexible in defining the appropriate cycles of operation.

Double Regeneration

For single tank applications, the control automatically calls for a second regeneration the following day if the current operation cycle exceeds the programmed capacity by 150% or more.

Capacity Setting Lockout

The control can be programmed to lock the capacity so it cannot be altered after installation.

Selectable Reserve Options

To meet the application requirements, the control allows selection of one of two reserve types:

Fixed Reserve - The reserve is fixed at a programmable percentage (30% factory preset) of the total capacity.

Variable Reserve - The controller monitors the daily water usage and at the programmed time of regeneration, calculates the average water used for each day of the week. The reserve capacity is set to 120% of the average water usage for the next day.

U.S. or Metric Units of Measure

To meet your display and programming requirements, the 962 Stager uses grains per gallon of hardness and kilograins of capacity for U.S. units; or parts per million of hardness and kilograms of capacity as gallons or cubic meters.

Calendar Override

If the volume of water used has not caused a regeneration, the 962 Stager can be set to regenerate every one to thirty days.

Manual Regeneration

A separate **REGEN** button is provided for manual regenerations. A double manual regeneration feature is included that allows back-to-back regenerations.

Operating Histories

Important operating data is stored in memory and is retrievable upon demand.

The historical data includes peak flow data as well as average daily water usage for each day of the week.

Remote Regeneration

A set of input terminals with a programmable delay are provided as a standard feature of the 962 Stager that allows regeneration to be initiated from a remote location. This feature can be used to facilitate remote manual regeneration requirements or assist in further automating the control system such as the use of a differential pressure switch.

Selectable Automatic Regenerations

There are four automatic regeneration methods; “delayed with immediate override”, “delayed only”, “day of week”, and “calendar override”. Immediate regeneration is used to start an automatic regeneration immediately when the capacity remaining in a tank is reduced to zero. Delayed regeneration is used to start an automatic regeneration at a predetermined time of day when the capacity remaining is below a defined reserve. The reserve capacity may be fixed or variable. The variable reserve is determined by past usage history. Regeneration can be accomplished based on the day of the week at a specific time of day or after programmable number of days since the last regeneration.

Optional Battery Backup

An optional backup battery can be provided so that the Time of Day and water usage will be maintained for up to **8 hours** during a power outage. All 962 Stager controls are provided as “Battery Backup Capable”. If the optional battery backup is provided with the Series 962, make sure that it is properly connected.

BATTERY BACKUP CONNECTIONS

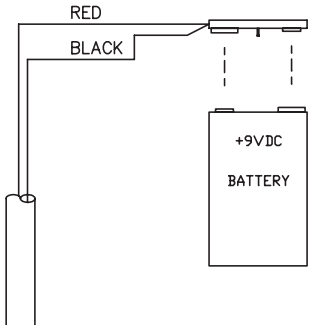

Figure 1

Flow Rate Display

In the normal operating mode the series 962 Stager control will alternate between **Capacity Remaining** (gallons or m^3) and **Flow Rate** (gallons per minute or m^3/hr). In the event of power loss, (including battery power) the display will alternate between **Time of Day** and **Capacity Remaining** once power has been restored. The control will remain in this display mode until the Time of Day is reset or until any button is pressed. The flow rate display is indicated by a small L.E.D. in the top left corner of the display. When P19 is set to “4” (user defined pulse equivalent) flow rate will not be displayed.

Programming the Series 962 Stager Control

This section contains common aspects of programming the 962 control and retrieving historical operating data. A label provided with the control should be filled out with programming parameters on system start-up.

Factory Default Values

Factory default values are shown on Table 1. **Capacity and Hardness values are set to 0 and must be changed to appropriate values before the control will operate. “Err 4” will be displayed until a valid number is entered for each of these items.**

Program Levels

The Series 962 Stager controls have been designed to facilitate different levels of programming requirements. Level I includes program variables that are frequently referenced by users, operators, installers and service personnel. They are accessible without the requirement of codes. Level II includes variables that are most typically used at the time of installation and initial setup. They are accessible only with access codes. Level III locations are used primarily for accessing operation history information. Level IV locations are used to set the regeneration days of the week. Level III and IV parameters also require access codes. Programming levels are further defined in Tables I, II, and III.

Levels	Access Code
I	None Required
II	Press and hold the (↑) and (↓) arrow buttons for 3 seconds
III	Press and hold the (←) and (↑) arrow buttons for 3 seconds
IV	Press and hold the (←) and (↓) arrow buttons for 3 seconds

Level I Programming

Level I program values are identified by the legend on the faceplate of the control. A green LED is illuminated when a Level I "P" value is displayed. Following are the Level I “P” values:

- Time of Day P1
- Time of Regeneration P2
- Hardness P3
- Capacity P5

P4 is skipped on the 962 Stager Programing.

Setting Time of Day

Press the **SET** button. The display will show the time of day with the minutes digit blinking. Press the UP (↑) arrow button to increase the number or the DOWN (↓) arrow button to decrease the number. To skip the number without changing, press the LEFT (←) arrow button. The first digit will stop flashing and the next digit will start flashing. When the far left digit is reached, pressing the LEFT (←) arrow button returns the flashing to the far right digit. Continue changing numbers until the desired Time of Day is obtained. Press the **SET** button to enter the value. The PM indicator will toggle when the “tens digit” of the hours is increased. The far left digit is used to indicate the day of week. Number 1 being Sunday and number 7 being Saturday.

The time of Regeneration, Hardness, and Capacity are set in a similar manner.

Level II Programming

The control will automatically enter Level II programming if P19 or P20 have not been set.

Press and hold the (↑) and (↓) arrow buttons for 3 seconds to enter the Level II programming mode. The display will show the letter “P” in the far left display digit. The parameter “P-number” is displayed in the far right display digit. See Table 1 for Level I and II programming values.

Changing a Program Value

Once the P value you want to change is displayed, press the (←) arrow button to display the current entry for that value. To change or modify the value, press the **SET** button. The digit on the right hand side of the display will begin to flash. Use the (↑) or (↓) arrow buttons to select the desired entry. Once the desired entry is obtained, press the (←) button to move to the next digit and change as needed. Once you have completed the appropriate changes, press the **SET** button. When you press the **SET** button the new entry is stored and the control automatically scrolls to the next P value. If a beep sounds, the new entry was not accepted. Table 1 lists the range available for a specific program value.

Level III Programming

Press and hold the (←) and (↑) arrow buttons for 3 seconds to enter the Level III programming mode. The display will show the letter “L” in the far left display digit. The parameter “L-number” is displayed in the far right display digit. The **SET** button is inactive except for L4. If **SET** is pressed when L4 is displayed, Peak Flow is reset to zero. If **SET** is pressed when any other location is displayed the control will beep.

Level IV Programming

Press and hold the (←) and (↓) arrow buttons for 3 seconds to enter the Level IV programming mode. Level IV programming is used to enter the user defined cycle times and day of week regeneration. All controllers have default settings for 4 cycle softener operation. **The operation type is determined by the value that is programmed in “P17” and must be changed if not being used as a 4 cycle conditioner.**

Entering "C" Values

"C" values are used to define a specific number of cycles to meet the application needs and are accessible through level IV programming mode.

Example: If the control is used in a system that has a total of 10 cycles of operation, select 6 for P17 and program C1-C10 for the amount of time desired for each cycle (up to 255 minutes).

Each "C" value represents 1 position of the rotary pilot stager that is being used. A maximum of 15 cycles may be used, each programmable from 0-255 minutes.

While the controller is in regeneration the display will show a “C” value in the far left display and the time remaining (in minutes) for that “C” value.

Example: [C1 15] = 15 min remaining in C1.

Entering “d” Values (Regeneration Days)

“d” values are used to start a regeneration on a certain day of the week. There are seven “d” values numbered from 1 to 7, with 1 representing Sunday and 7 representing Saturday. Set a 1 in “d7” to initiate an automatic regeneration every Saturday at the Time of Regeneration (P2). The automatic regenerations will occur at the time set in P2 regardless of the capacity remaining in the system. A value of “0” indicates no regeneration on that day. The default value is “0” for all “d” values.

Viewing a Program Value

Programmed values may be viewed at any time. Program values may not be changed during a regeneration.

Level I - To locate and display a P value in Level I press the (↑) or (↓) arrow button until the desired value is displayed. Level I parameters are indicated by the legend on the face plate of the control.

Level II - To locate and display a P value in Level II, simultaneously press the (↑) and (↓) arrow buttons for 3 seconds to gain access. Press the (↑) or (↓) arrow buttons until the desired location is displayed. Press (←) to display the value in the P location.

Level III - To locate and display an L value in Level III, simultaneously press the (←) and (↑) arrow buttons for 3 seconds to gain access an then press the (↑) or (↓) arrow buttons until the desired location is displayed. Press (←) to display the value in the L location.

Level IV - To locate and display a "d" value in Level IV, simultaneously press the (←) and (↓) arrow buttons for 3 seconds to gain access and then press the (↑) or (↓) arrow buttons until the desired location is displayed. Press (←) to display the value in the "d" location.

Manual Regeneration

To initiate a manual regeneration, simply press and hold the **REGEN** button for 3 seconds. If an immediate second regeneration is desired, wait for at least **one minute** after the first regeneration begins and then press and hold the **REGEN** button for 3 seconds. A second regeneration will be performed immediately following the first. The display will freeze and only show the Regeneration Time Remaining as an indication that the second regeneration will be initiated. When the first regeneration is complete, the second regeneration will begin and the display will alternate between Flow Rate and Regeneration Time Remaining. The second regeneration will be performed on the offline tank in twin alternating applications.

Lock-Out Feature

The lock-out feature may also be used to prevent regenerations when a signal is present at the lock-out terminals. Two or more 962 controls can be connected together (see Figure 2) to prevent one from regenerating while another is in regeneration. This signal can also come from external equipment that can provide a dry contact closure. (CONNECTION MUST BE A DRY CONTACT).

NOTE: When using the Relay Output Option the lockout feature cannot be used.

Flow Sensor Select Options

P19 is used to select the flow sensor type. Numbers 1 and 2 are for the Autotrol 1 inch and 2 inch turbine type flow sensors. The number in P20 will be ignored when P19 is programmed with a 1 or 2.

Other flow sensors can be used by entering a "3" in P19 and entering the correct "K-factor" in P20. The K-factor is defined as pulses per gallon for U.S. units or pulses per liter for metric units. The K-factor can be obtained from the flow sensor manufacturer.

If a "4" is entered in P19 then the definition of the number in P20 becomes gallons or liters per pulse depending on the units of measure selected.

Capacity Based Regeneration Start Options

The following is an explanation of the regeneration start options for single tank 962 Stager controls.

At the time of regeneration (time set in P2) the control will check to see if a regeneration should start. This check depends on the value programmed in P15.

P15 = 0 or 2 Variable Reserve

The control calculates an average water usage for each day of the week when it is using variable reserve. A regeneration will start if the capacity remaining is less than 1.2 times the average water usage for the next day.

P15 = 1 or 3 Fixed Reserve

The reserve capacity is calculated using the fixed reserve capacity programmed in P16. The value in P16 is the percentage of the calculated system capacity used for the reserve.

Example: If the programmed capacity is 10,000 grains and the hardness is 10 grains/gallon the calculated system capacity is 1000 gallons. The reserve capacity is 300 gallons if the fixed reserve is set to 30%. A regeneration will start if the capacity remaining at the time of regeneration is less than 300 gallons.

The parameter P15 is also used to select immediate regenerations or delayed regenerations only.

P15 = 0 or 1 Delayed Regeneration Only

Automatic regenerations will occur at the time of regeneration only. The control will delay the start of regeneration until the time of regeneration even if the capacity remaining is reduced to zero gallons.

P15 = 2 or 3 Immediate Regeneration Override

In addition to delayed regenerations automatic regenerations will occur at any time during the day if the capacity remaining reaches zero.

Immediate Regeneration Only Option

Automatic regenerations performed at the time of regeneration (P2) can be eliminated by setting the control for fixed reserve with immediate regeneration override (P15 = 3) and setting the reserve capacity percentage (P16) to 0%. This will create a reserve capacity of zero gallons and override the Time of Regeneration (P2) to allow for an immediate regeneration. **These are the preferred settings for a Twin Alternating softener system**.

Advance Cycle Function

While in a regeneration cycle, you can advance the stager to the next cycle by pressing and holding the left arrow key (←) for 3 seconds. The stager and controller will then advance to the next regeneration cycle.

Cancel Regeneration Function

To cancel (abort) a regeneration, press and hold the left arrow (←) and **SET** keys for 3 seconds. The control will display an ERROR 3 and return the stager to the service (Home) position. Once in the service position, ERROR 3 will be cleared.

Press and hold the (↑) and (↓) arrow buttons to access Level II.

Table 1 - Level I and II Parameters

Parameter		Range of Values[a]	Minimum Increments	Default	Units of Measure	Notes
Name	Description					
P1	Day of week and time of day	(1-7) 1:00-12:59 AM or PM (1-7) 0:00 -23:59	(1 day) 1 minute	None	hour:minute	Range depends on value selected for P13. For day of week, SUN=1, MON=2, TUE=3, WED=4, THU=5, FRI=6, SAT=7
P2	Time of day to start regeneration	1:00-12:59 AM or PM 0:00-23:59	1 minute	2:00 am	hour:minute	Range depends on value selected for P13. Use only if P15 = 1
P3	Hardness of water	3-250 30-2500	1 10	0 0	grains/gallon ppm	Unit of measure depends value selected for P12
P4						Not Used
P5	Capacity of unit	1-5100 .1-510.0	1 .1	0	kilograins[b] kilograms[b]	Unit of measure depends on value selected for P12
P6						Not Used
P7						Not Used
P8						Not Used
P9	Backwash time	1-30	1	14	minutes	If P17=6 or 9, Do not program P9
P10	Rinse/Draw time	1-125	1	40	minutes	If P17=3, 6, or 9, Do not program P10
P11	Rinse time	1-19	1	4	minutes	If P17=6 or 9, Do not program P11
P12	Units of measure	0-1	1	0		0 = US, 1 = Metric
P13	Clock mode	0-1	1	0		0 = 12 hour clock 1 = 24 hour clock
P14	Calendar override	0-30	1	0	days	0 = no calendar override
P15	Reserve Type	0-3	1	0		0 = Variable reserve, 1 = fixed reserve, 2 = variable reserve with immediate regeneration, 3 = fixed reserve with immediate regen
P16	Initial average usage or fixed reserve	0-70	1	30	% of capacity	Description depends on value entered for P15
P17	Operation type[c]	3-9	1	4		0 - 2 = Not Used, 3 = 3 cycle filter 4 = 4 cycle softener, 5 = 4 cycle (180/182) butterfly config., 6 = User defined cycle times[d]., 9 = User defined (58-TB & 58-TR only).[d]
P18	Capacity change lock-out	0-1	1	0		0 = None, 1 = Capacity change locked-out
P19	Flow sensor select	1-4	1	3		1 = 1.0” Autotrol turbine, 2 = 2.0” Autotrol turbine, 3 = User defined K-factor (PPG), 4 = User defined pulse equivalent (GPP)
P20	K-factor or pulse equivalent	0.01-255.00	.01	0.01		Number used for meter K-factor or pulse equivalent
P21	Remote regeneration switch delay	1-254	1	60	seconds	Time remote switch must be active to start a regeneration

a. All parameters must be set within acceptable range of values or ERR4 will be displayed.
b. See Table 2 for conversions.
c. When using options 6 or 9 programming “C” values per Table 3 eliminates the need to program P9 through P11.
d. Program “C” values per Table 4.

Table 2 Conversions

To Convert Capacity in	Into Capacity in	Multiply by
kilograms (kg)	kilograins (kgr)	15.43
kilograins (kgr)	kilograms (kg)	0.0648
moles of $CaCO_3$	kilograms (kg)	0.10
equivalents of $CaCO_3$	kilograms (kg)	0.05

Press and hold the (←) and (↑) arrow buttons to access Level III.

Table 3 Level III History Data

Location	Range	Description
L 1	1-7	Day of week (Sun=1, Sat=7)
L 2	0-255	Days since last regeneration
L 3	1:00-12:59/0:00-23:59	Time that peak flow occurred
L4[a]	0-200/0-50.0	Peak flow gallons per minute/cubic meters (M^3) per hour since location reset
L 5	0-655360/0-6553.6	Water used today in gallons/M^3 since time of regeneration
L 6	0-655360/0-6553.6	Water used since last regeneration in gallons/M^3
L 7	0-655360/0-6553.6	Average water usage for Sunday in gallons/M^3
L 8	0-655360/0-6553.6	Average water usage for Monday in gallons/M^3
L 9	0-655360/0-6553.6	Average water usage for Tuesday in gallons/M^3
L 10	0-655360/0-6553.6	Average water usage for Wednesday in gallons/M^3
L 11	0-655360/0-6553.6	Average water usage for Thursday in gallons/M^3
L 12	0-655360/0-6553.6	Average water usage for Friday in gallons/M^3
L 13	0-655360/0-6553.6	Average water usage for Saturday in gallons/M^3
L 14	0-999990/0-99999.9	Total water used since NOVRAM test in gallons/M^3 (LSD)
L 15	0-167/0-16	Total water used since NOVRAM test in gallons/M^3 x 10^6 (MSD)

a. Press and hold SET for 5 seconds to reset.

Press and hold the (←) and (↓) arrow buttons to access Level IV.

Table 4 Level IV Parameters

#	Description of Parameter	Range of Values	Minimum Increment	Default	Notes
C1	Position 1 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C2	Position 2 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C3	Position 3 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C4	Position 4 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C5	Position 5 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C6	Position 6 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C7	Position 7 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C8	Position 8 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C9	Position 9 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C10	Position 10 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C11	Position 11 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C12	Position 12 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C13	Position 13 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C14	Position 14 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
C15	Position 15 Cycle Time	0 min -255 min	1 min	0	Stager Cycle (P17=6 or 9)
d1	Sunday	0-1	1	0	0 = no day of week regen this day
d2	Monday	0-1	1	0	0 = no day of week regen this day
d3	Tuesday	0-1	1	0	0 = no day of week regen this day
d4	Wednesday	0-1	1	0	0 = no day of week regen this day
d5	Thursday	0-1	1	0	0 = no day of week regen this day
d6	Friday	0-1	1	0	0 = no day of week regen this day
d7	Saturday	0-1	1	0	0 = no day of week regen this day

Note: The number of “C” values MUST equal exactly the number of stager regeneration cycles.

Example: If the parameter “Position 5 Cycle Time” is programmed then C1 through C4 must also be programmed.

Table 5 “C” Level Program Values for Select Stager Configurations

#	48-83	51-09	51-10	51-86	59-00	59-03	58-04	58-TB
C1	BW1 Time	BW Time	BW1 Time	BW1 Time	BW1 Time	BW1 Time	BW1 Time	BW Time
C2	BW2 Time	BR/SR Time	FR1 Time	BW2 Time	Draw1 Time	FR1 Time	FR1 Time	Draw Time
C3	BW3 Time	FR Time	BW2 Time	BW3 Time	SR1 Time	BW2 Time	BW2 Time	SR Time
C4	0	Refill Time	FR2 Time	BW4 Time	FR1 Time	FR2 Time	FR2 Time	FR Time
C5	0	0	0	BW5 Time	BW2 Time	BW3 Time	BW3 Time	0
C6	0	0	0	BW6 Time	Draw2 Time	FR3 Time	FR3 Time	0
C7	0	0	0	0	Rinse2 Time	0	BW4 Time	0
C8	0	0	0	0	FR2 Time	0	FR4 Time	0
C9	0	0	0	0	0	0	0	0
C10	0	0	0	0	0	0	0	0
C11	0	0	0	0	0	0	0	0
C12	0	0	0	0	0	0	0	0
C13	0	0	0	0	0	0	0	0
C14	0	0	0	0	0	0	0	0
C15	0	0	0	0	0	0	0	0

Table 6 Error Code Identification

Error Code	Description
1	Data stored in NOVRAM has been corrupted and is incorrect
2	Home switch (SW 2) closed when it should be open
3	Home switch (SW 2) open when it should be closed
4	One or more parameters are below the minimum value in Table I
5	System capacity less than 10 gallons or 0.1 m^3 (Capacity is set too low or Hardness is set too high)

Table 7 Installation Programmed Values Chart

Installation Date:					
"P" Value	**Description**	**Install Values**	**"C"/"d" Value**	**Description**	**Install Values**
P1	Day of week/Time of day		C1	Position 1 Cycle Time	
P2	Time of regeneration		C2	Position 2 Cycle Time	
P3	Hardness of water		C3	Position 3 Cycle Time	
P4	Not used		C4	Position 4 Cycle Time	
P5	Capacity of unit		C5	Position 5 Cycle Time	
P6	Not used		C6	Position 6 Cycle Time	
P7	Not used		C7	Position 7 Cycle Time	
P8	Not used		C8	Position 8 Cycle Time	
P9	Backwash time		C9	Position 9 Cycle Time	
P10	Rinse/Draw time		C10	Position 10 Cycle Time	
P11	Purge time		C11	Position 11 Cycle Time	
P12	Units of measure		C12	Position 12 Cycle Time	
P13	Clock Mode		C13	Position 13 Cycle Time	
P14	Calendar override		C14	Position 14 Cycle Time	
P15	Reserve type		C15	Position 15 Cycle Time	
P16	Initial average value or fixed reserve capacity		d1	Regenerate on Sunday	
P17	Operation type		d2	Regenerate on Monday	
P18	Capacity change lock out		d3	Regenerate on Tuesday	
P19	Turbine select		d4	Regenerate on Wednesday	
P20	K-factor or pulse equivalent		d5	Regenerate on Thursday	
P21	Remote regeneration switch delay		d6	Regenerate on Friday	
P22	Factory use only. Do not program.		d7	Regenerate on Saturday	

Parallel Operation

The 962 Stager control can be used for twin and triple tank applications, operating in a parallel mode. Parallel systems can be implemented with up to three individual controls by using the lock-out feature. Each control will provide a lock-out signal when it is in regeneration. This lock-out signal will prevent other controls from starting a regeneration when the controls are connected as in Figure 2.

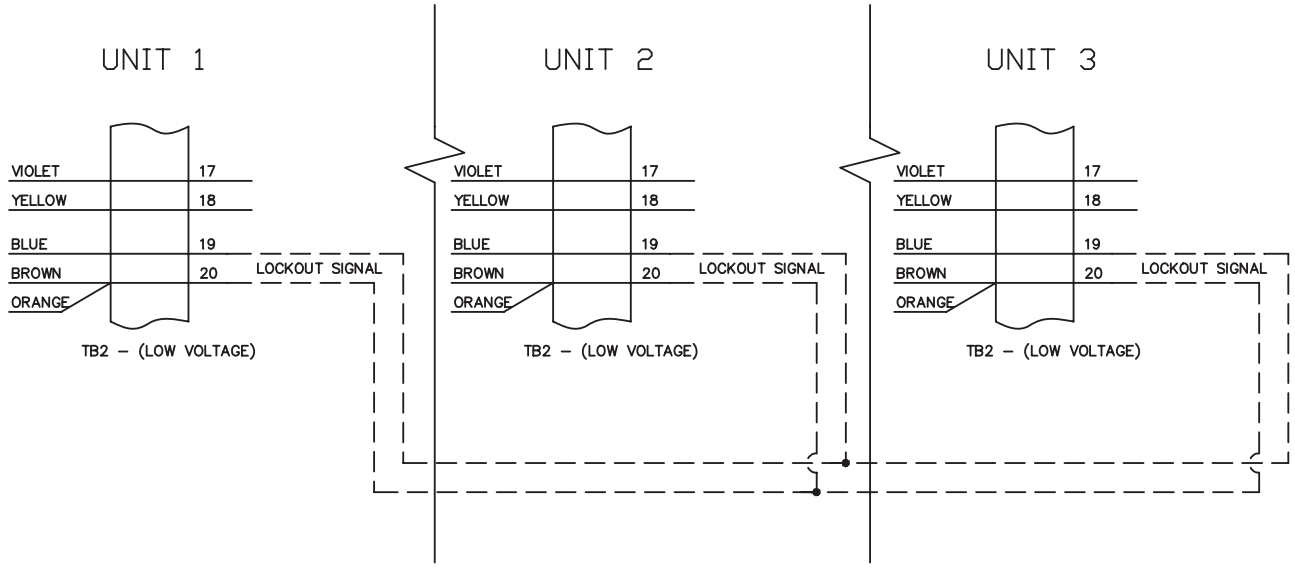

Figure 2 Parallel/Interlock Connections

NOTE: The lockout feature is void when using the relay output option.

Twin Alternating using a model 58-TA stager

The 962 Stager control can be used for Twin Alternating applications by combining a single 962 controller with a single model 58-TA Twin Alternating stager. The alternating of the system is performed by the stager and is independent of the controller. When using a model 58-TA, the “Tank in Service” is indicated by two NEMA 4 rated door-mounted lights that are operated by the stagers second auxiliary switch. **When using a model 58-TA Twin Alternating stager, P17 must be set to a 4 or 6 depending on the number of positions**.

Twin Alternating using a model 58-TB stager (Timed Brine)

The 962 Stager control can be used for Twin Alternating applications that require a timed brine draw (using 58-TR Stager). These Stagers do not use door-mounted lights to indicate the “Tank in Service”. The controller will display the “Tank in Service” in the left-most digit of the 6-digit display. It will display a 1 or 2 depending on which tank is in service. Flow is also displayed during this time. If any error condition occurs, the “Tank in Service” display will be set to a 2 by default. The controller will reset the display to the proper tank in service once a regeneration is performed on any tank. **When using a model 58-TB or 58-TR Twin Alternating stager, P17 must be set to a 9**.

Flow Sensor Connections

The 962 Stager control may be connected to a number of different flow sensing devices. Figure 3 shows the connections for the Autotrol turbine type flow sensor. Figure 4 shows the connections for the Signet flow sensor. Most of the flow sensors that are used will be wired similarly, though the wire colors may vary.

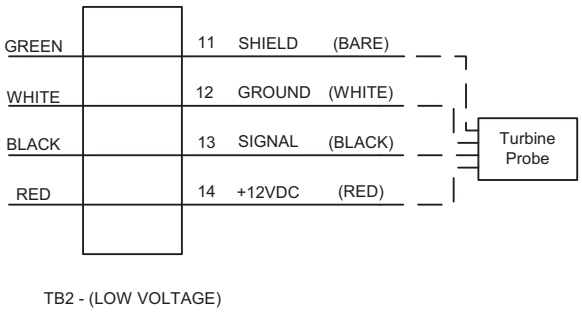

Figure 3 Autotrol Flow Sensor Connections

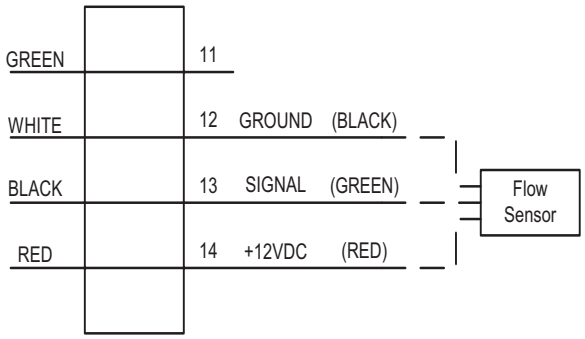

Figure 5 Fleck Flow Sensor Connections

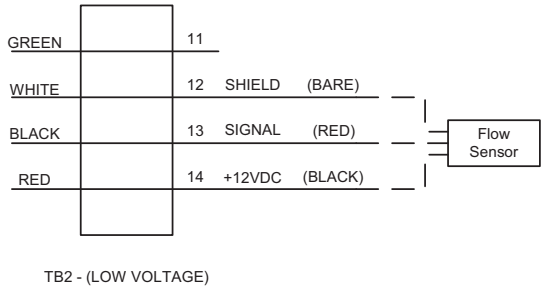

Figure 4 Signet Flow Sensor Connections

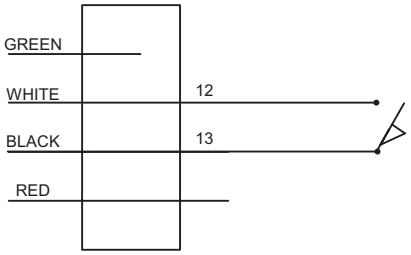

Figure 6 Pulse Transmitter 2 Wire Connection

AC Power Wiring

The 962 Stager controls have standard voltage configurations of 115 VAC 50/60 Hz, or 230 VAC 50/60 Hz. Power requirements must be specified when ordering. For 115 VAC jumpers are placed between terminals 1 and 3 and 2 and 4. For 230VAC jumpers are placed between terminals 2 and 3 only, Figure 5. Line voltage and neutral inputs are always on terminals 1 and 4 respectively.

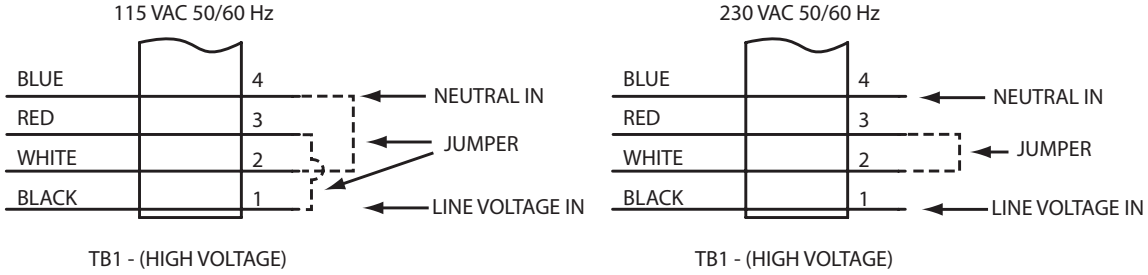

Figure 7 AC Power Connections

Remote Regeneration

A set of terminals with a programmable delay (P21) are provided as a standard feature of the 962 control, Figure 6. This feature allows for a regeneration to be initiated from a remote location. This feature can also be used to accommodate a differential pressure switch input or any dry contact closure from external equipment. Programmable value “P21” is used to monitor this input for the amount of time that is programmed (in seconds).

P21 is the length of time (in seconds) that the remote input signal will be ignored before starting a regeneration. THE CONNECTION MUST BE A NO VOLTAGE DRY CONTACT.

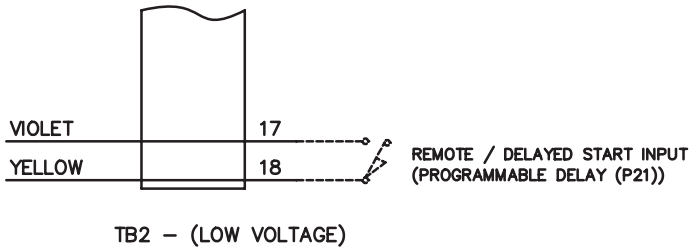

Figure 8 Remote Regeneration Start Connections

Relay Output Option

A single pole double throw (SPDT) relay may be added for outputs during Regeneration and Service mode. The relay output option is available on single unit and Twin Alternating models only. This feature may not be used however, with the parallel multi-tank systems using the lockout feature. The contacts of this relay are supplied as "Dry Contacts” (un-powered). See Figures 7 and 8 for wiring information.

NOTE: The lockout feature is void when using the relay output option.

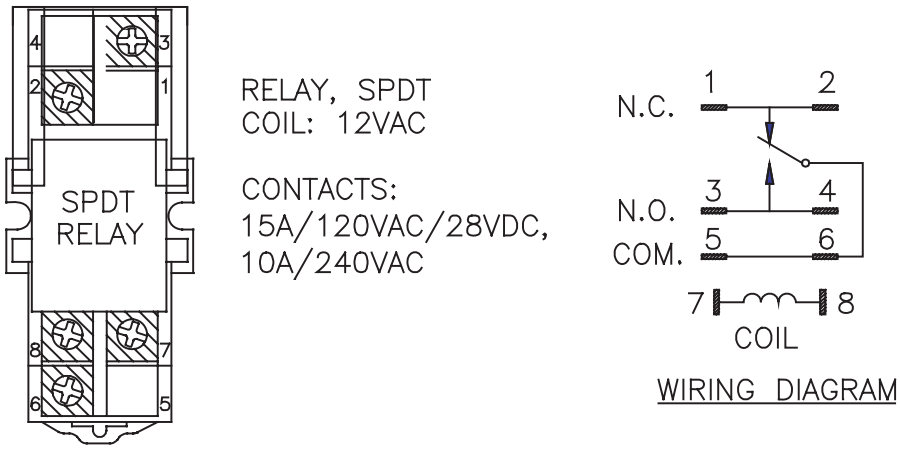

Figure 9 Relay Output Option

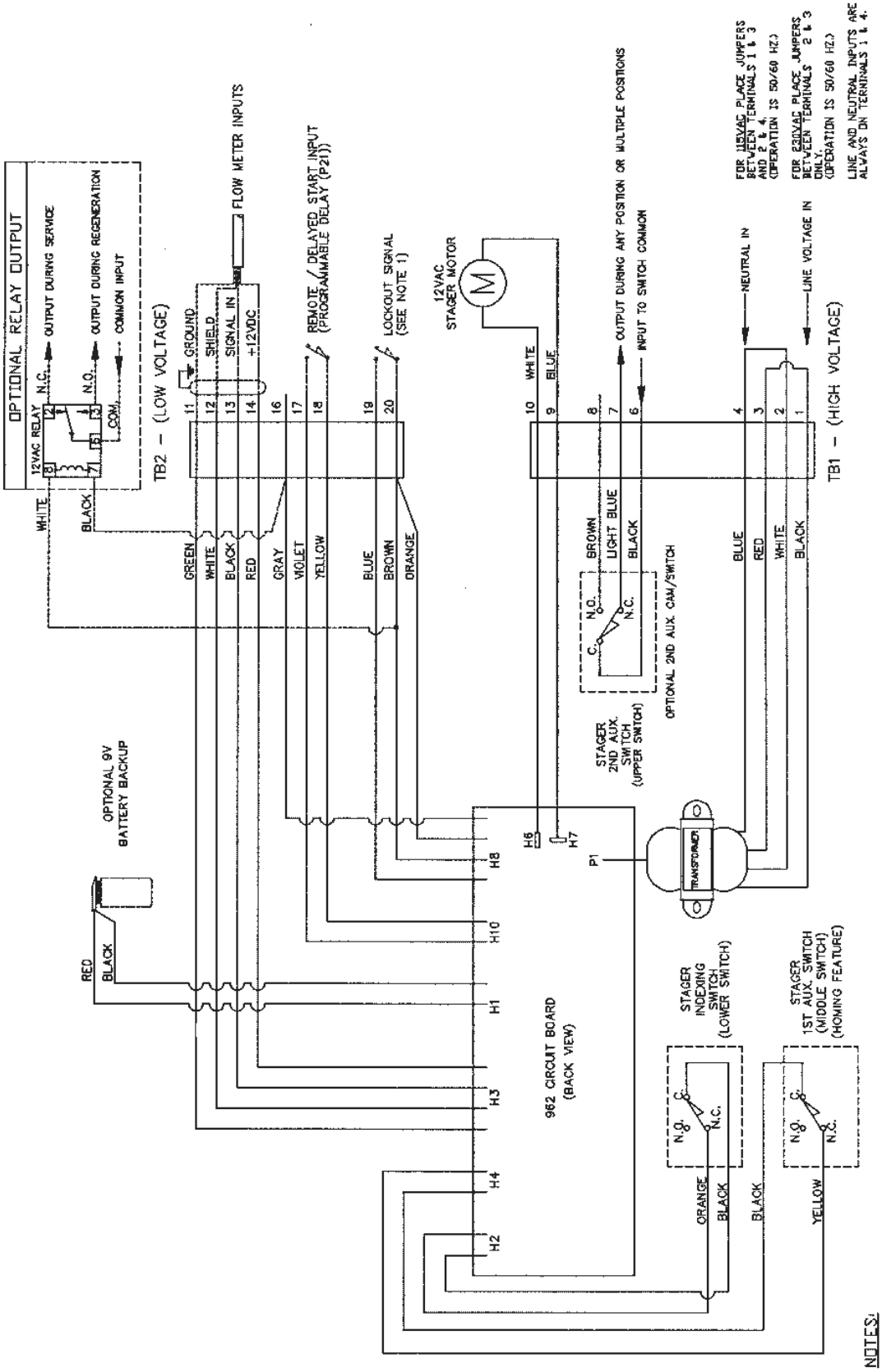

Figure 10 E948/E951 Standard Wiring Design

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1076301 Rev. H MA2016

AQUAMATIC® NX48 AND NX51 SERIES
COMMERCIAL STAGER CONTROLLERS

FULL-FUNCTION PROGRAMMING WITH CAPABILITY TO LINK MULTIPLE STAGERS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

LED Status Indicator
- Solid Blue: In Service
- Flashing Blue: Regen Queued
- Solid Green: Regen
- Flashing Green: Standby
- Solid Red: Error

Auxiliary inputs and outputs
- Remote signal start input (certain system types)
- Remote Lockout Input
- Programmable relay output/ chemical pump output

Front panel diagnostics button
- Flow rate
- Peak flow rate
- Totalizer
- Hours between last two regenerations
- Hours since last regeneration
- Adjustable volume remaining
- Valve position
- Software version

2x16 character backlit LCD display

Networks up to four stagers

Field-configurable for system types

Time of day can be automatically copied to the remaining controllers

Can be used simultaneously with time clock, meter immediate, or meter delayed regeneration types

Allows monitoring of flow and volume information in remote signal start applications

Control and stager automatically synchronize to the service position

Accepts input from a variety of flow sensors

During a power outage, critical operating information is stored in memory

Programmable regeneration types for increased flexibility

Reserve is fixed at a programmable percentage of the total capacity

Easy installation with plug-in wiring harnesses

OPTIONS

3-way universal solenoid installed

Auxiliary micro switch cam with signal in service or backwash

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43037 REV F MA2017

NXT ELECTRONIC STAGER CONTROLLER MASTER CHART

FILL IN PROPER DESIGNATIONS TO DETERMINE PRODUCT NUMBER: **N X - T - S B**

CONTROLLER Electronic Controller Series to be Provided
NX = NXT Stager Control

STAGER & PROGRAM Rotary Pilot Stager to be Provided
48-00 = Softener or Filter, 6 Port (Brass)
51-06 = Softener, Timed Brine Draw & Fill, 8 Port (Brass)
51-10 = Two Tank Filter w/ Sequential Regeneration, 8 Port (Brass)
51-S0 = Softener, N.O. In/Out, N.C. All other valves, 8 Port (Brass)

COMM CABLE CAT 6 Communication Cable to be Provided
0 = Less Communication Cable
1 = With 25 ft (7.6 m) CAT 6 Communication Cable
This cable used to connect up to 4 NXT Stager Controls
One less cable is required than number of controls in system

TRANSFORMER Electrical transformer to be Provided
0 = Less transformer *(Customer must supply 24VAC to controller)*
T = Transformer Mounted Inside Enclosure; 24VAC, 40 VA Output
Accepts 115V, 208V, or 240V 50/60 Hz Input Voltages

1st AUX. SWITCH First Extra Switch to be provided on Rotary Pilot Stager
S = SERVICE Return (Homing) on all NXT Stager Controls

2nd AUX. SWITCH Second Extra Switch to be provided on Rotary Pilot Stager
0 = NONE
*A to R = CAM POSITION Switch is to be active (I & O not used)
1 = 51-10 Stager with Notch in both Backwash Positions
2 = 51-10 Stager with Notch in both Rinse Positions
* Use a Letter to indicate Cam position Not a Number.

PRESSURE Program of Stager
0 = STANDARD (Vent to open)
1 = INVERTED (Pressure to open)

SOLENOID Used to keep a tank in stand-by position
0 = NONE
S = Solenoid included
Only Used for systems:
Twin Alternating System 7
Multiple Tank Alternating System 9
Demand Recall (Progressive Flow) System 14

STAGER REVISION
B = 48 and 51 Series Stagers

REV	ECO DESCRIPTION	BY/DATE
A	Initial Release	J. Josetti
B	Transformer Update	J. Josetti 23-May-17

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4510677 REV B

NX48 and NX51 NXT Stager Controller

Service Manual

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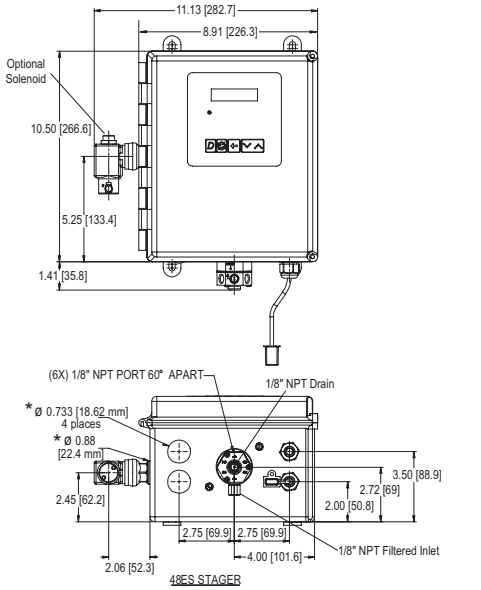
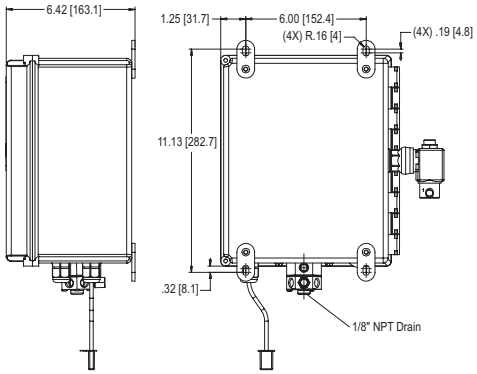
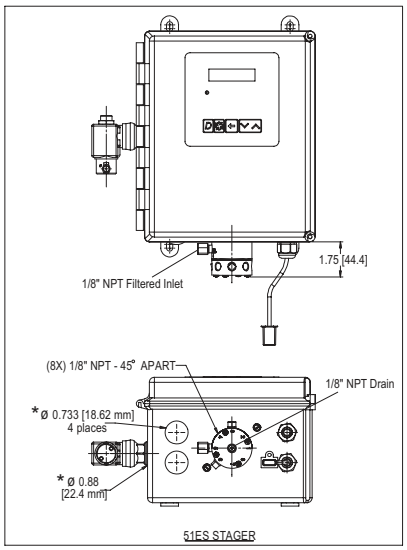
IMPORTANT PLEASE READ:

- The information, specifications and illustrations in this manual are based on the latest information available at the time of printing. The manufacturer reserves the right to make changes at any time without notice.
- This manual is intended as a guide for service of the controller only. System installation requires information from a number of suppliers not known at the time of control manufacture. This product should be installed by a plumbing professional.
- This product must be installed in compliance with all state and municipal plumbing and electrical codes. Permits may be required at the time of installation.
- If daytime operating pressure exceeds 80 psi, nighttime pressures may exceed pressure limits. A pressure reducing valve must be installed if pressure exceeds 125 psi.
- Do not install the unit where temperatures may drop below 32°F (0°C) or above 110°F (43°C).
- Do not place the unit in direct sunlight. Black units will absorb radiant heat increasing internal temperatures.
- Do not strike the controller or any of the components.
- Warranty of this product extends to manufacturing defects. Misapplication of this product may result in failure to properly condition water, or damage to product.
- A prefilter should be used on installations in which free solids are present.
- Correct and constant voltage must be supplied to the controller to maintain proper function.

NXT STAGER DIMENSIONS







***NOTE: Drill as required. These holes will only be drilled at factory if required.**

Figure 1

SYSTEM SPECIFICATIONS 48 AND 51 NXT SERIES

Generic Meter Guidelines

- Open collector output
- Pulse rate generated must not exceed 100 pulses per second (100 Hz), or 6,000 pulses per minute
- Support for meter outputs in the range of 1-255 gallons (25.5 m^3) for every 1-255 pulses
  Example: 35 gallons/100 pulses
  (=3.5 gallons/10 pulses, = 0.35 gallons/1 pulse)
- Meter must operate at 5 VDC

Electrical Rating

- 115 VAC ±20% input, 24 VAC output w/40 VA (maintain input voltage in this range)
- 230 VAC ±20% input, 24 VAC output w/40 VA (maintain input voltage in this range)
- Max Rated Power 15W

Humidity

- 95% RH, non-condensing

Temperature

- Maximum control fluid temperature 140°F (60°C)
- Operate where ambient temperatures are above 32°F and below 110°F

Pressure

- Maximum control fluid pressure 125 psi (8.5 bar)
- Control fluid can be either water or air and must be equal to or greater than system pressure.

SYSTEM DEFINITIONS

System Number	System Description	# of Tanks/ Controls	Type	Service Outlet Valve Controlled by...	Operation Discussion
4	Single Unit	1	Time Clock: No Meter Immediate: One Meter Delayed: One Meter Remote Signal Start: No Meter	Stager (no solenoid required)	Single tank configuration. During Regeneration no water available to service unless optional bypass valve #2A installed.
5	Interlocked	2, 3, or 4	Immediate: All Meters Remote Signal Start: No Meter	Stager (no solenoid required)	All tanks in parallel supplying treated water. Each unit in the system will have its own flow meter/sensor input. The control will delay the start of Regeneration if another unit is already in Regeneration. Once that unit has completed a Regeneration cycle, and has returned to Service,the unit with longest regeneration queue time will begin Regeneration. No more than one unit will be in Regeneration at a time.
6	Series Regeneration	2, 3, or 4	Immediate: One Meter Delayed: One Meter Remote Signal Start: No Meter	Stager (no solenoid required)	All tanks in parallel supplying treated water. Only #1 control will monitor flow meter/ sensor input. When a regeneration is required for the system, it will regenerate valve address #1 first, immediately followed by #2, then #3, then #4 if installed. No more than one unit will be in Regeneration at a time.
7	Twin Alternating	2	Immediate: One Meter Remote Signal Start: No Meter	Solenoid (plug stager port 2)	One tank online supplying treated water, one tank in Standby. Only #1 control will monitor its flow meter/sensor input. Regeneration of a unit will begin after the other control has left Standby and returned to Service. When the Regeneration cycle is complete, the regenerated unit will enter Standby. Standby on each tank is controlled by a solenoid connected to the service outlet valve of that tank.
9	Multiple Tank Alternating	2, 3, or 4	Immediate: All Meters Remote Signal Start: No Meter	Solenoid (plug stager port 2)	One, two, or three tanks online supplying treated water, one tank in Standby. Meter/ sensor input is required on each tank. Regeneration of a unit will begin after the other control has left Standby and returned to Service. When the Regeneration cycle is complete, the regenerated unit will enter Standby. Standby on each tank is controlled by a solenoid connected to the service outlet valve of that tank.
14	Demand Recall	2, 3, or 4	Immediate: All Meters	Solenoid (plug stager port 2)	Meter input is required on each tank. Unit #1 will begin In Service with #2, #3, and #4 (if installed) will begin in Standby. At least one unit is In Service at all times. When flow rate to the Primary Service Unit increases to a user specified rate, the next unit in sequence will move from Standby to Service. As the flow rate falls below the user specified rate subsequent tanks will return to Standby. When the Primary Service Unit regenerates, the next unit in sequence will become the new Primary Service Unit. As each units capacity is reached the controller will initiate a Regeneration of that unit. Depending on the number of units in the system, and flow rate demand the regenerated unit will then be placed either into Standby or Service. Only one unit will be in Regeneration at a time.

SYSTEM OPERATION IN SERVICE (SYSTEM 14-DEMAND)

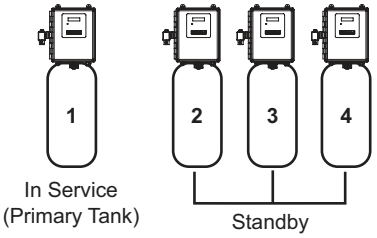
The system operates as part of a multi-tank regeneration system. This example applies to either a 2, 3 or 4 tank system.

Each tank in the system will have an active flow meter input, even in Standby.

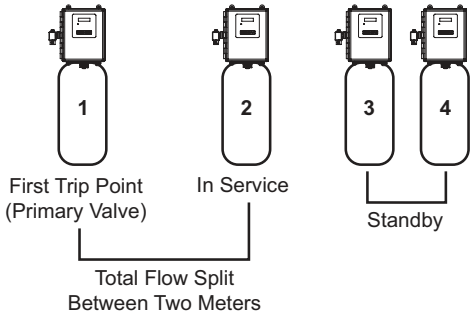
The number of tanks In Service depends on the flow rate.

Examples of a Four-Unit System:

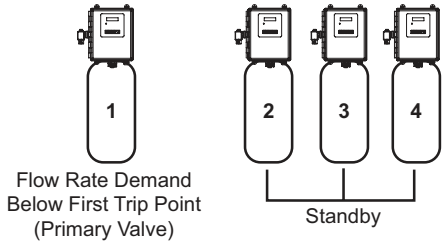
1. One Tank is In Service at all times (the "primary tank").



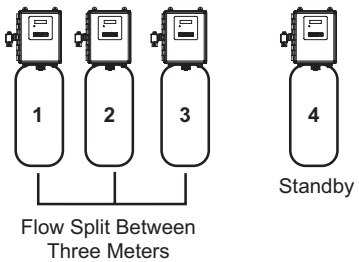
2. The total flow rate to the primary tank increased past the first trip point programmed rate. The flow stayed past the trip point delayed time. The next tank (least volume remaining) changes from Standby to In Service. This then splits the total flow between two meters.



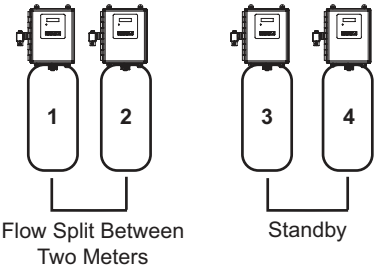
3. The flow rate demand decreased below the first trip point. The tank returns to Standby.



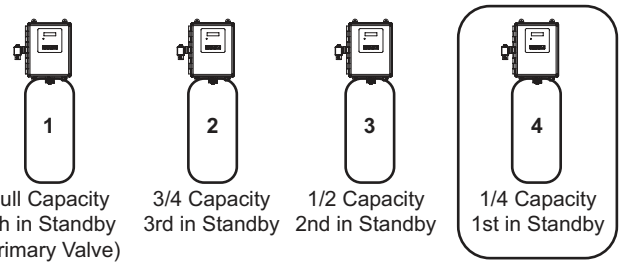
4. Total flow rate demand increased past a second trip point programmed rate. The second and third tank (least volume remaining) changes from Standby to In Service. The total flow is split between the three meters.



5. The third tank returns to Standby as demand decreases past the second trip point.

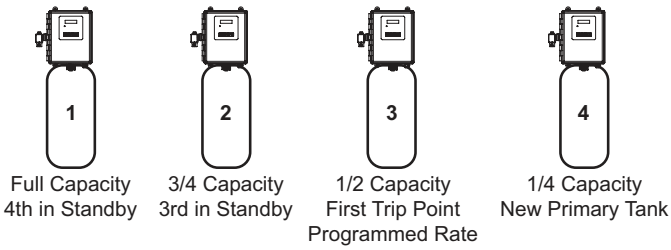


6. Tanks return to Standby due to decreased total flow rate and trip points programmed. The tank with the most remaining volume will be the first to go into Standby.



7. The primary tank regenerates. The next tank with the least remaining volume becomes the new primary tank. The tank with the next least volume remaining will be the first trip point programmed rate. Tanks continue operating in this order.

System Operation in Regeneration:



If two tanks are In Service and both reach Volume Remaining = 0, the other two tanks will shift from Standby to In Service. The lead tank with Volume Remaining = 0 will start Regeneration. The second tank with Volume Remaining = 0 will enter Standby. If flow increases past the trip point a third tank needs to enter In Service. The tank in Standby with Volume Remaining = 0 will shift into In Service to maintain a steady flow. Operating for extended periods in this mode may degrade the water quality.

TIMER DISPLAY FEATURES

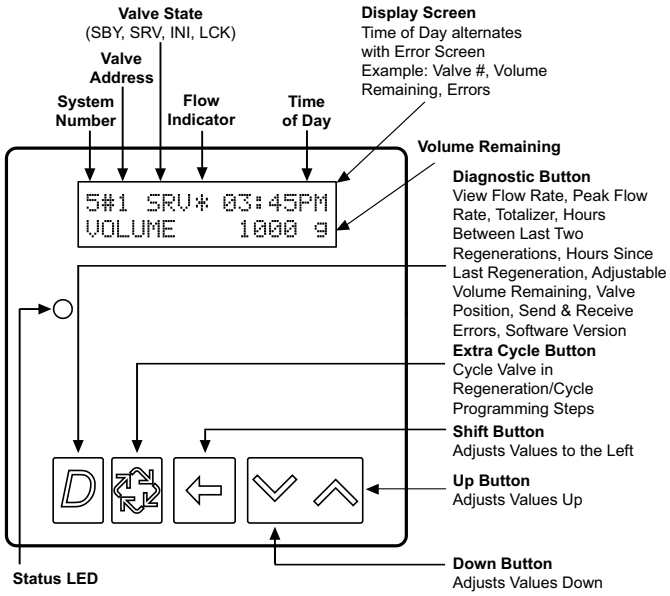


Figure 1

Valve State

INI (Initializing) - INI will display on the screen for 30 to 45 seconds when initializing after a power failure reset or programming.

RGQ (Regeneration Queued) -RGQ indicates that the reserve has been entered in a delayed system and regeneration has been queued. When in the main screen, press the Extra Cycle button to toggle service (SRV) with RGQ.

Service (SRV) - SRV will display when the unit is In Service.

LCK (Lock) - Lock will be displayed when contact closure is applied across the interlock terminals on the circuit board. See the “Network/Communication Cables & Connections” section of this manual.

LED Status Lights

Blue LED - Illuminates while the unit is In Service and no errors exist. The unit will always be In Service unless a regeneration trigger has occurred (green LED light will be displayed). A blinking blue light indicates the timer is In Service, and queued for regeneration.

Green LED - Illuminates when the unit is in Regeneration mode. A blinking green light indicates the timer is in Standby, and not in Regeneration.

Red LED- Illuminates when there is an error.

Flow Indicator

A rotating line (appearing as a rotating star shape) will display on the screen when flow is going through the meter.

NETWORK/COMMUNICATION CABLES & CONNECTIONS

Use a CAT5 Network/Communication cable.

Connect the network/communication cable to either port before programming.

The maximum cable length between timers is 100 feet.

Connect units together from one communication port to the next communication port. The order is not important.

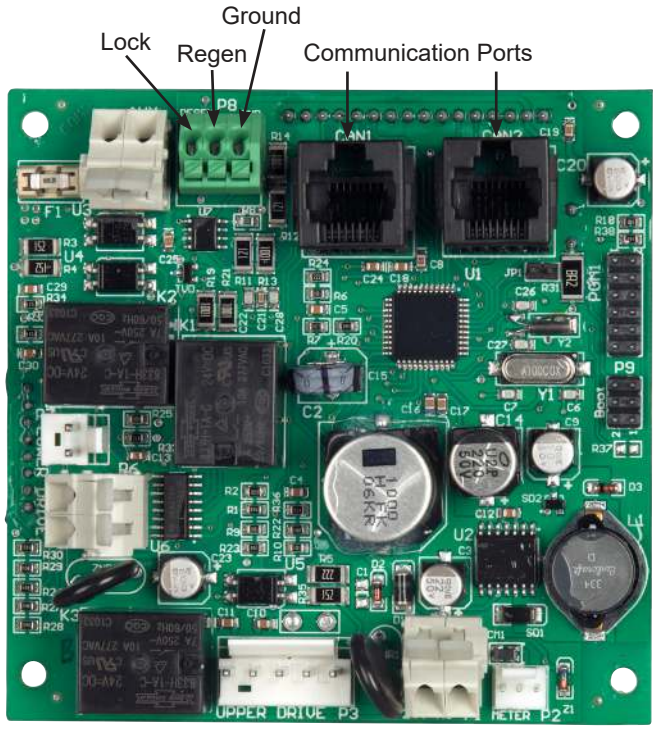


Figure 2 Current NXT Circuit Board

TIMER OPERATION

Set Time of Day

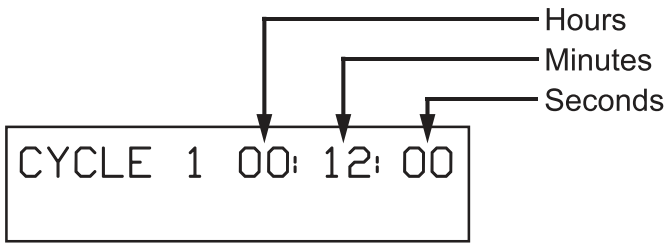
Hold the Up or Down button to change time. While in time change mode press Shift to adjust next digit over. On multiple tank systems change time on #1 control only. All other controls in system will mirror the time on control #1.

Manually Initiating a Regeneration

1. When timer is In Service or Stand By, press the Extra Cycle button on the main screen for five (5) seconds to force a manual regeneration if another unit is not in Regeneration.
2. The timer reaches Regeneration cycle Step #1.
3. Press the Extra Cycle button once to advance valve to the next Regeneration cycle.

Timer Operation During Regeneration

In the Regeneration cycle step display, the timer shows the current Regeneration cycle number the valve is in, or has reached, and the time remaining in that step. Once all regeneration steps are complete the timer returns to In Service and resumes normal operation.



Example: 12 minutes remaining in Cycle 1

Press the Extra Cycle button during a Regeneration Cycle to immediately advance the valve to the next cycle and resume normal timing.

Flow Meter Equipped Timer

During normal operation the Time of Day screen alternates with the Error screen (if errors are present).

As treated water is used, the Volume Remaining display counts down from the calculated system capacity to zero. When zero is reached a Regeneration cycle begins if no other units are in regeneration.

Timer Operation During Programming

The timer enters the Program Mode in Standby or Service Mode as long as it is not in regeneration. While in the Program Mode the timer continues to operate normally monitoring water usage. Timer programming is stored in memory permanently.

Timer Operation During A Power Failure

During a power failure all timer displays and programming are stored for use upon power re-application. The timer retains all values, without loss. The timer is fully inoperative and any calls for regeneration are delayed. The timer, upon power re-application, resumes normal operation from the point that it was interrupted.

NOTE: A flashing Time of Day display indicates a power outage. Hold the Up or Down button to reset time.

Remote Lockout

The timer does not allow the unit/system to go into Regeneration until the regeneration lockout input signal to the unit is cleared. This requires a contact closure to activate the lockout. The recommended gauge wire is 20 with a maximum length of 500 feet.

Regeneration Day Override Feature

If the Day Override option is turned on and the actual number of days since last regeneration exceeds the set regeneration day override value, the Regeneration cycle starts. If other units are in regeneration, it is added to a regeneration queue. This occurs regardless of the remaining volume available.

⚠ WARNING: This unit is not designed to drive/power external devices. Transformer must be grounded. Ground wire must be terminated to the back plate where grounding label is located.

Auxiliary Relay Output

The Auxiliary Relay Output on the circuit board can be programmed to be closed during a window of time within the regeneration sequence. The Aux Relay Output Start time sets the turn-on time referenced to the start of regeneration. The Aux Relay Output End time sets the turn-off time referenced to the start of regeneration. The Auxiliary Relay Output shares the same relay as the Chemical Pump Output. See wiring diagram for connection information.

Chemical Pump Output

When the Chemical Pump Output feature is enabled, the control will calculate volume of water used and close the relay when the set CPO Aux Relay Volume is reached. Once activated, the relay will stay closed for the amount of time set in CPO Aux Relay Time. The Chemical Pump Output only functions while in service, and the CPO volume is reset to zero each regeneration. The Chemical Pump Output shares the same relay as the Auxiliary Relay Output. See wiring diagram for connection information.

MASTER PROGRAMMING MODE FLOW CHART

CAUTION Before entering Master Programming, please contact your local professional water dealer.

When the Master Programming Mode is entered, parameters can be set to make the timer(s) function as needed.

NOTE: Depending on current option settings, some displays cannot be viewed or set.

Entering Master Programming Mode

1. Press and hold the Shift and Up buttons for 5 seconds.

   OR

2. Set the time of day display to 12:01 PM or 12:01HR. Press and hold Up or Down buttons to set the time. Then press the Up and Down buttons at the same time for 5 seconds.

Exiting Master Programming Mode

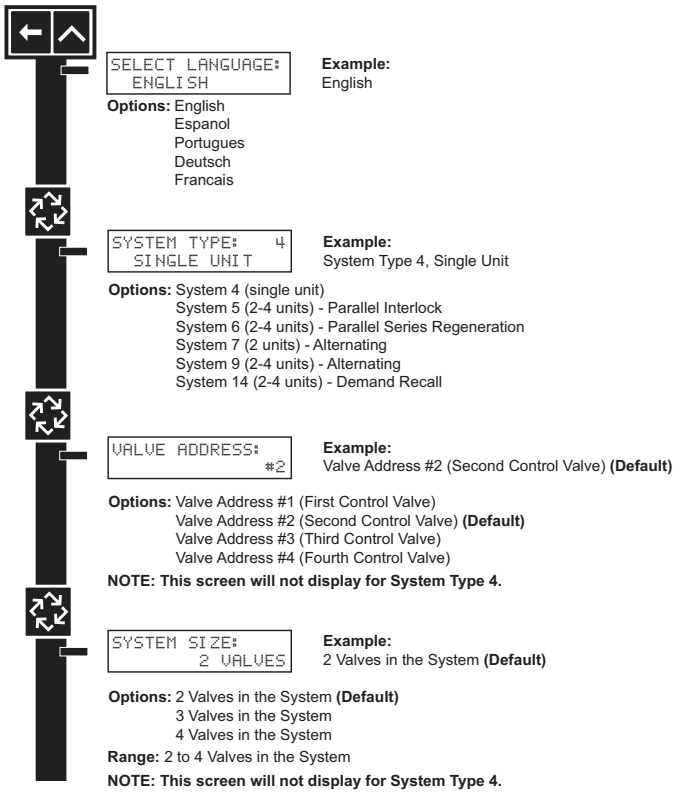
1. Press the Extra Cycle button once per display until all are viewed. Master Programming Mode is exited and the normal display screen appears.
2. To exit the Master Programming Mode without saving changes, press the Diagnostic button.

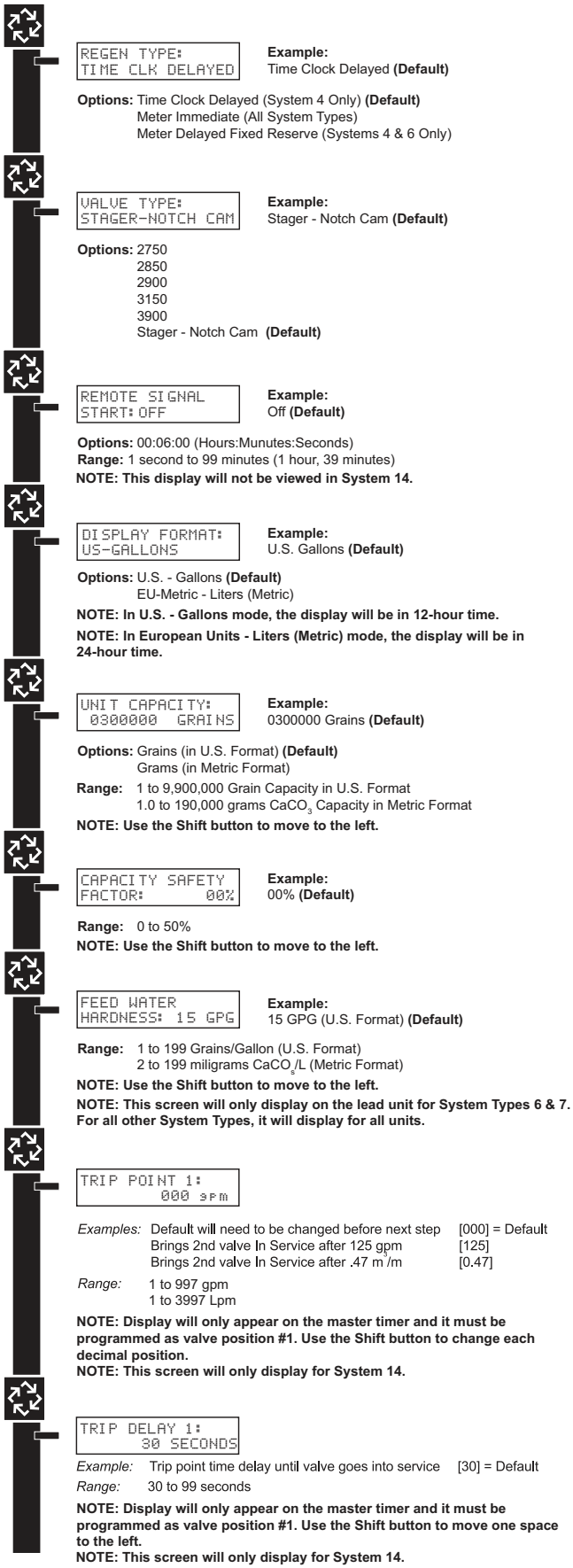
NOTE: If no keypad activity is made for 5 minutes while in the Master Programming Mode, or if there is a power failure, no changes will be saved, and the unit will go back to the main display screen.

Resets

Soft Reset: Press and hold the Up and Down buttons for 25 seconds until 12:00PM (or 12:00HR) appears. This resets all parameters except for the flow meter totalizer volume.

Master Reset: Hold the Extra Cycle button while powering up the unit. This resets all of the parameters in the unit. Check and verify the choices selected in Master Programming Mode.





MASTER PROGRAMMING MODE FLOW CHART *continued*

TRIP POINT 2:
GPM

Examples: Brings 3rd valve In Service after 250 gpm [250]
Brings 3rd valve In Service after .95 m^3/m [0.95]

Range: 2 to 998 gpm
1 to 3997 Lpm

NOTE: Display will only appear on the master timer and it must be programmed as valve position #1. System size must be 3 or 4 to appear. Use the Shift button to move one space to the left.
NOTE: This screen will only display for System 14.

TRIP DELAY 2:
30 SECONDS

Example: Trip point time delay until valve goes into Service [30] = Default

Range: 30 to 99 seconds

NOTE: Display will only appear on the master timer and it must be programmed as valve position #1. System size must be 3 or 4 to appear. Use the Shift button to move one space to the left.
NOTE: This screen will only display for System 14.

TRIP POINT 3:
GPM

Examples: Brings 4th Valve In Service after 350 gpm [350]
Brings 4th Valve In Service after 1.32 m^3/m [1.32]

Range: 3 to 999 gpm
1 to 3997 Lpm

NOTE: Display will only appear on the master timer and it must be programmed as valve position #1. System size must be 4 to appear. Use the Shift button to move one space to the left.
NOTE: This screen will only display for System 14.

TRIP DELAY 3:
30 SECONDS

Example: Trip point time delay until valve goes to Service [30] = Default

Range: 30 to 99 seconds

NOTE: Display will only appear on the master timer and it must be programmed as valve position #1. System size must be 4 to appear. Use the Shift button to move one space to the left.
NOTE: This screen will only display for System 14.

REGENERATION DAY
OVERRIDE: OFF

Example:
Off **(Default for Meter)**
On **(Default for Time Clock)**

REGENERATION DAY
OVERRIDE: 01 DAYS

Example:
1 Day

Options: Off **(Default for Meter)** or On **(Default for Time Clock)**

Range: 1 to 99 Days

REGENERATION
TIME: 02:00AM

Example:
2:00 A.M. **(Default)**

Options: A.M. (U.S. Format)
HR (Metric Format)

NOTE: Regeneration time will not appear unless Regeneration Day Override is on.

CYCLE 1 00:10:00

Example: Backwash
00:10:00 **(Default 48-00 Stager & 51-09 Stager)**
(Hours:Minutes:Seconds)

CYCLE 2 01:00:00

Example: Brine
01:00:00 **(Default 48-00 Stager & 51-09 Stager)**
(Hours:Minutes:Seconds)

Options: 01:00:00 for Conditioner for the 48-00 Stager & 51-09 Stager **(Default)**
00:00:00 for Filter for the 48-00 Stager

CYCLE 3 00:10:00

Example: Fast Rinse
00:10:00 **(Default 48-00 Stager & 51-09 Stager)**
(Hours:Minutes:Seconds)

CYCLE 4 OFF

Example:
Off **(Default 48-00 Stager)**

CYCLE 4 00:12:00

Example: Refill
00:12:00 **(Default 51-09 Stager)**
(Hours:Minutes:Seconds)

CYCLE 5 OFF

Example:
Off **(Default 51-09 Stager)**

NOTE: This screen will only display when cycle 4 is not OFF.

AUXILIARY RELAY:
DISABLED

Example:
Auxiliary Relay is Disabled

Options: Enabled
Disabled **(Default)**

AUX RELAY OUTPUT
START 1 00:00:00

Example:
Auxiliary Relay Output Start 1 at
0 hours, 0 minutes, & 0 seconds

Range: 00:00:00 to 18:00:00

NOTE: Only displayed if Auxiliary Relay is enabled in previous screen. Auxiliary Relay will only display if Chemical Pump is OFF for System Types 6 & 7.

AUX RELAY OUTPUT
END 1 00:00:00

Example:
Auxiliary Relay Output End 1 at
0 hours, 0 minutes, & 0 seconds

Range: 00:00:00 to 18:00:00

CHEMICAL PUMP:
DISABLED

Example:
Chemical Pump is Disabled

Options: Enabled
Disabled **(Default)**

NOTE: This screen will only display on the lead unit for System Types 6 & 7. For all other System Types, it will display for all units.

CPO AUX RELAY
VOLUME: 000 9

Example:
Energize Chemical Pump relay every 50 gals (50)
Energize Chemical Pump relay every 200 L (200)

Range: 1 to 999 gallons in U.S. Format
1 to 9999 L in Metric Format

CPO AUX RELAY
TIME: 00:00:00

Example:
Each time chemical pump relay is on, run for
30 seconds (00:00:30)

Range: 00:00:00 to 02:00:00

FLOW METER:
1.0 PADDLE

Example:
1.0 Paddle Flow Meter

Options: 1.0 Paddle
1.0 Turbine
1.5 Paddle
1.5 Turbine
2.0 Paddle
3.0 Paddle
Generic

NOTE: Default flow meter type is based on the valve type. This screen will only display on the lead unit for System Types 6 & 7. All other system types it will display for all units.

MAXIMUM FLOW
RATE: 0000 GPM

Example:
Maximum Flow Rate of 0 gpm

Range: 20 - 2000 gpm (U.S. Format)
20 - 2000 Lpm (Metric Format)

NOTE: Only displayed if "Generic" is chosen for the flow meter.

ADD 01 GALLONS
EVERY 001 PULSES

Example:
Add 1 Gallon for Each Pulse in U.S. Format

Options: Gallons (U.S. Format)
Liters (Metric Format)

Range: 1 - 99 Gallons (U.S. Format)
0.1 - 09.9 L (Metric Format)
Pulses: 1 - 99

NOTE: Only displayed if "Generic" is chosen for the flow meter.

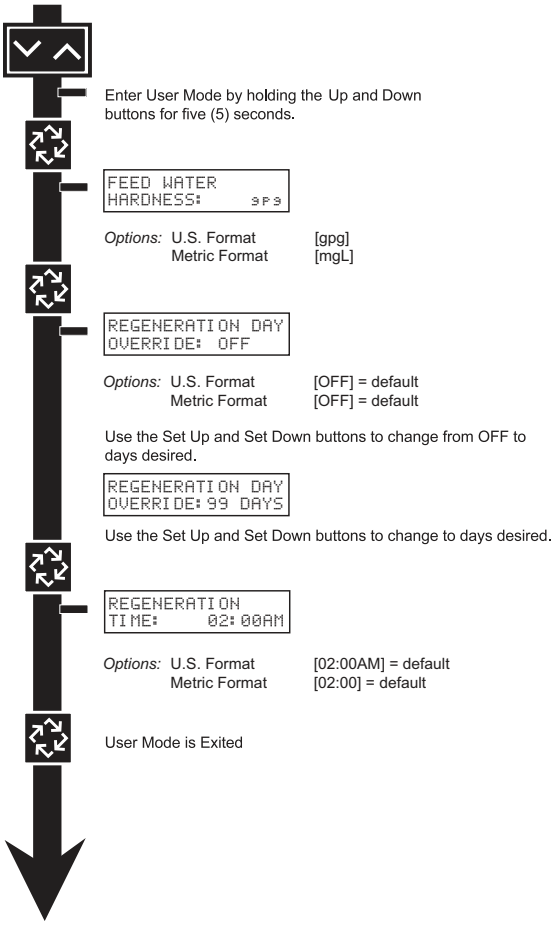
PROGRAMMING UNIT
PLEASE WAIT...

Example:
Master Programming Mode is Exiting

USER PROGRAMMING MODE FLOW CHART

Entering User Programming Mode

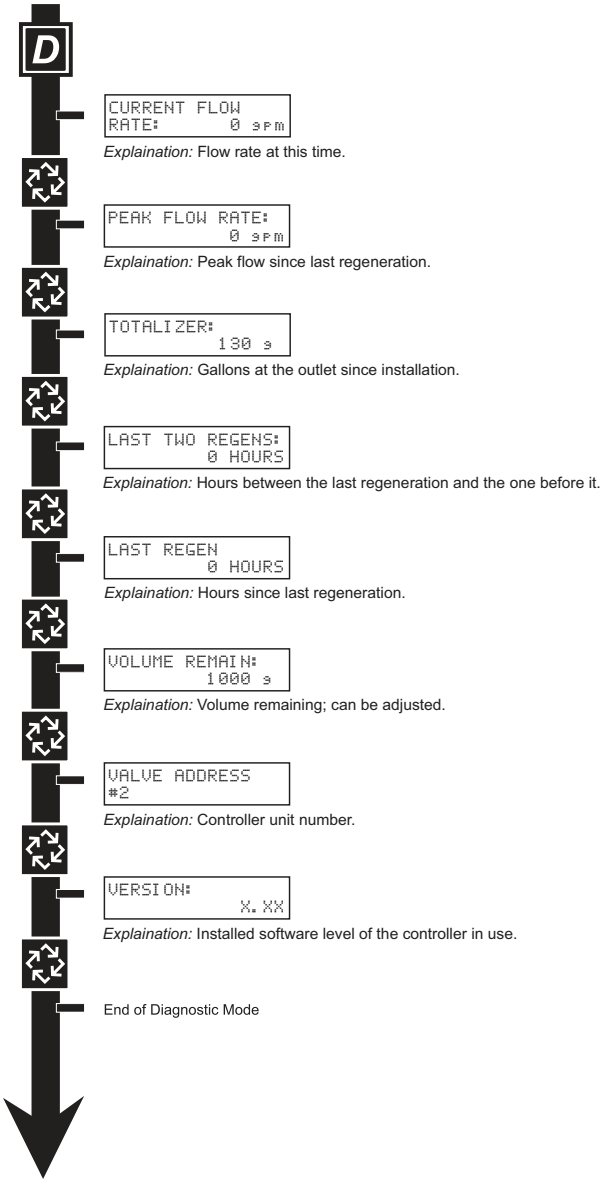
Hold the Up and Down buttons for 5 seconds.



DIAGNOSTIC PROGRAMMING MODE FLOW CHART

Entering Diagnostic Programming Mode

1. Push and release the "D" button.
2. Press the Extra Cycle button once per display until all displays are viewed and Normal Display is resumed.
3. Push and release the"D" button at anytime during diagnostic mode and the timer will exit the mode.
4. Depending on the current controller programming, certain displays may not be able to be viewed or set.



NXT Multi Language
Programming Parameters and Ranges

System Type	4 Time Clock	4 Metered Immediate	4 Metered Delayed	5 Interlock				6 Series				7 Alternating		9 Alternating				14 Demand Recall				Programming Parameter Ranges	
																						Gallons	Liters
Valve Address				1	2	3	4	1	2	3	4	1	2	1	2	3	4	1	2	3	4	1 thru 4	
Select Language	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	English, Espanol, Portugues, Deutsch, Francais	
System Size				x				x				x		x				x				1 thru 4	
Regen Type	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Time Clock, Metered Delayed, Metered Immediate	
Valve Type	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	2750, 2850, 2900, 3150, 3900, Stager	
Regenerant Flow	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Downflow, Upflow, Upflow Fill First	
Remote Signal Start	x	x	x	x	x	x	x	x				x		x	x	x	x					Off, 00:00:01 - 01:39:00	
Display Format	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	US - Gallons	EU - Metric-Liters
Unit Capacity		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	1 - 9900000 Grains	1 - 198000 gCaCO3
Capacity Safety Factor		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	0- 50%	
Feed Water Hardness		x	x	x	x	x	x	x				x	x	x	x	x	x	x	x	x	x	1 - 199 Grains/Gallons	1 - 1999 mgL
Trip Point 1																		x				0 - 997gpm	0 - 3997 Lpm
Trip Delay 1																		x				30 - 99 Seconds	30 - 99 Seconds
Trip Point 2																		x				Trip Point 1 + 1 - 998 gpm	Trip Point 1 + 1 - 3998 Lpm
Trip Delay 2																		x				30 - 99 Seconds	30 - 99 Seconds
Trip Point 3																		x				Trip Point 2 + 1 - 999 gpm	Trip Point 2 + 1 - 3999 Lpm
Trip Delay 3																		x				30 - 99 Seconds	30 - 99 Seconds
Regeneration Day Override	x	x	x	x	x	x	x	x				x		x	x	x	x	x	x	x	x	Off, 1 - 99	
Regeneration Time	x	o	o	o	o	o	o	o				o	o	o	o	o	o	o	o	o	o	12:00 a.m. - 11:59 p.m.	00:00 - 23:59 Hour
Cycle 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	00:00:00 - 04:00:00	
Cycle 2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Off, 00:00:00 - 04:00:00	
Cycle 3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Off, 00:00:00 - 04:00:00	
Cycle 4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Off, 00:00:00 - 04:00:00	
Cycle 5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Off, 00:00:00 - 04:00:00	
Auxiliary Relay	x	x	x	x	x	x	x	u	x	x	x	u	x	x	x	x	x	x	x	x	x	Enabled, Disabled	
Aux Relay Output Start	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	00:00:01 to Total Regeneration Time - 1	
Aux Relay Output End	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	Start Time + 1 to Total Regeneration Time	
Chemical Pump		x	x	x	x	x	x	u				u		x	x	x	x	x	x	x	x	Enabled, Disabled	
CPO Aux Relay Volume		c	c	c	c	c	c	c				c		c	c	c	c	c	c	c	c	1 - 999 gallons	0001 - 9999 Liters
CPO Aux Relay Time		c	c	c	c	c	c	c				c		c	c	c	c	c	c	c	c	00:00:01 - 02:00:00	00:00:01 - 02:00:00
Flow Meter		x	x	x	x	x	x	x				x		x	x	x	x	x	x	x	x	1" 1.5" Paddle or Turbine, 2" Paddle, 3" Paddle, Generic	
Generic		x	x	x	x	x	x	x				x		x	x	x	x	x	x	x	x		
Maximum Flow Rate		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a	a	20 - 2000 GPM	20 - 2000 LPM
Add _ _ _ Gallons or Liters		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a	a	1 - 255 Gallons	001 - 255 Liters
Every _ _ _ Pulses		a	a	a	a	a	a	a				a		a	a	a	a	a	a	a	a	1 - 255	1 - 255

Notes

o - Regeneration Time will only be viewed if Regeneration Day Override is used.

u - If Auxiliary Relay is Enabled then Chemical Pump Relay will not be viewed or if Chemical Pump Relay is Enabled then Auxiliary Relay will not be viewed.

c - All Relay Output parameters programming will be viewed if Enabled.

a - If Generic Flow Meter is chosen, then programming parameters will be viewed.

Stager Operation

Stagers are motor driven, rotary multi-port valves used to control a set of valves in a predefined sequence. They function by internally connecting inlet pressure to a defined set of control ports and allowing other control ports be vented through a drain. Control ports are used to open and close valves in a preset sequence. As the stager advances to various positions, different valves are open and closed in a system. The control port pressure and vent sequence is preset at the factory and cannot be field altered.

Stager Installation

1. Connect a constant pressure water or air source to the 1/8" NPT stager inlet. Control fluid pressure must be equal to or greater than system pressure. To ensure long trouble free operation, a 100 micron filter in the control pressure line is recommended.
2. Stager drain port should be left open or discharged to unrestricted or open drain. DO NOT plug or restrict drain port.
3. Connect the 1/8" NPT control ports to appropriate valves. Refer to tubing schematic provided in the Plumbing Diagrams section of this manual. Tubing inside diameter should be 1/8" or larger.

Inverted Type Stagers

Stagers that are ordered inverted would be used on systems with all normally closed valves. Inverted Stagers send pressure signals to open valves and vent signals to close valves.

Filter Operation Using 48-00 Stagers

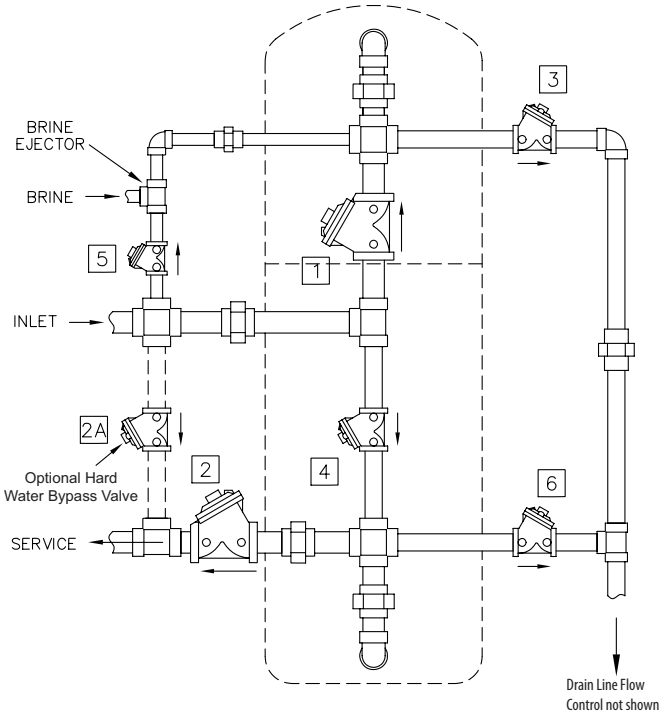
When using a 48-00 Stager to operate a filter:

1. Plug stager port #5 using a 1/8" pipe plug

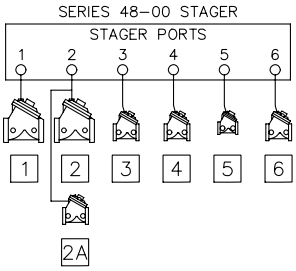
2. Program cycle 2 time to 0:00:00 or the desired settle time

PLUMBING DIAGRAMS

4 Position Softener (48-00 Stager)



4 POSITION SOFTENER

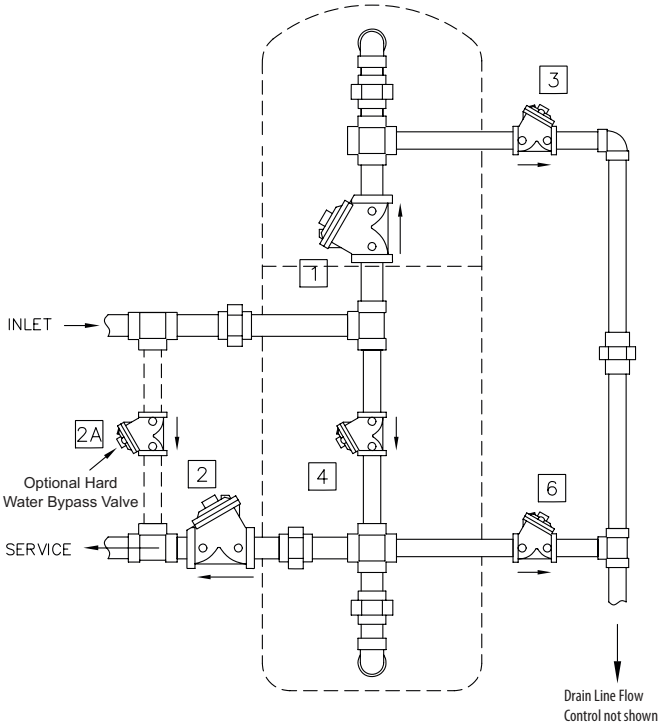


NOTCH	POS.	FUNCTION	PORTS VENTED[B]	VALVES OPEN[A]
A	4	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E	2	BRINE	5,6	5,6,2A
F	3	RINSE	1,6	1,6,2A

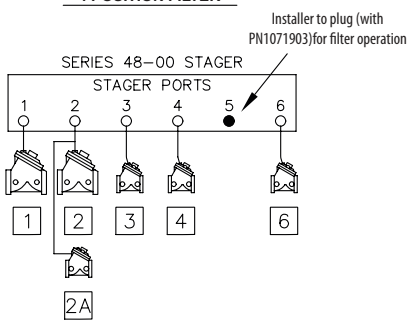
Note A: All valves normally open except optional valve 2A.
Note B: Inverted Stager types will have these ports pressurized. Inverted Stager to be used with all valves normally closed except optional valve 2A.

PLUMBING DIAGRAMS *continued*

4 Position Filter (48-00 Stager)



4 POSITION FILTER



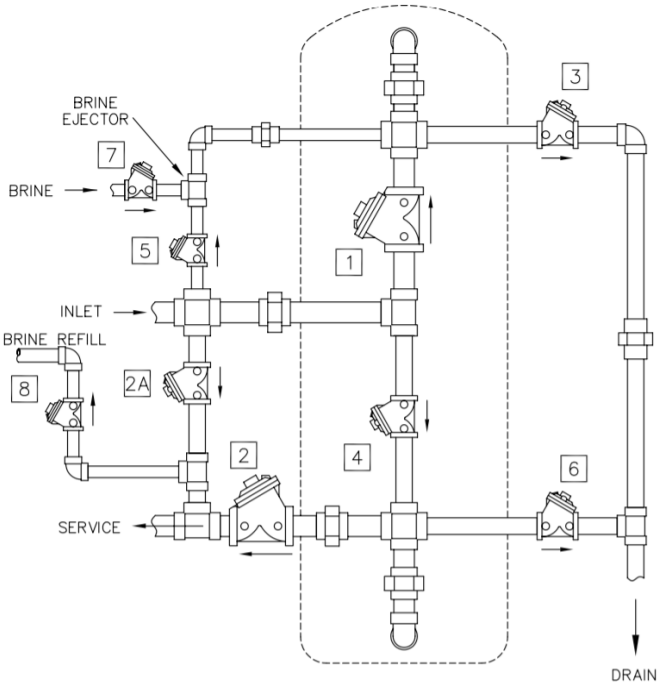
NOTCH	POS.	FUNCTION	PORTS VENTED [B]	VALVES OPEN [A]
A	4	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E	2	BRINE [C]	5,6	5,6,2A
F	3	RINSE	1,6	1,6,2A

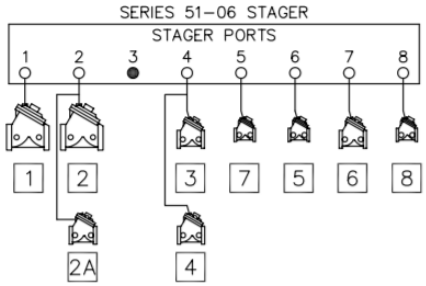
Note A: All valves normally open except optional valve 2A.

Note B: Inverted Stager types will have these ports pressurized. Inverted Stager to be used with all valves normally closed except optional valve 2A.

Note C: Program Cycle 2 time to 00:00:00 for filter operation.

5 Position Softener w/Timed Brine Refill (51-06 Stager)





NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2	1,2
B				
C	1	BACKWASH	4	3,4,2A
D				
E	2	BRINE	5,6,7	5,6,7,2A
F	3	SLOW RINSE	6,7	5,6,2A
G	4	FAST RINSE	1,7	1,6,2A
H	5	BRINE REFILL	1,2,8	1,2,8

NOTE:

1. ALL OTHER PORTS PRESSURIZED.

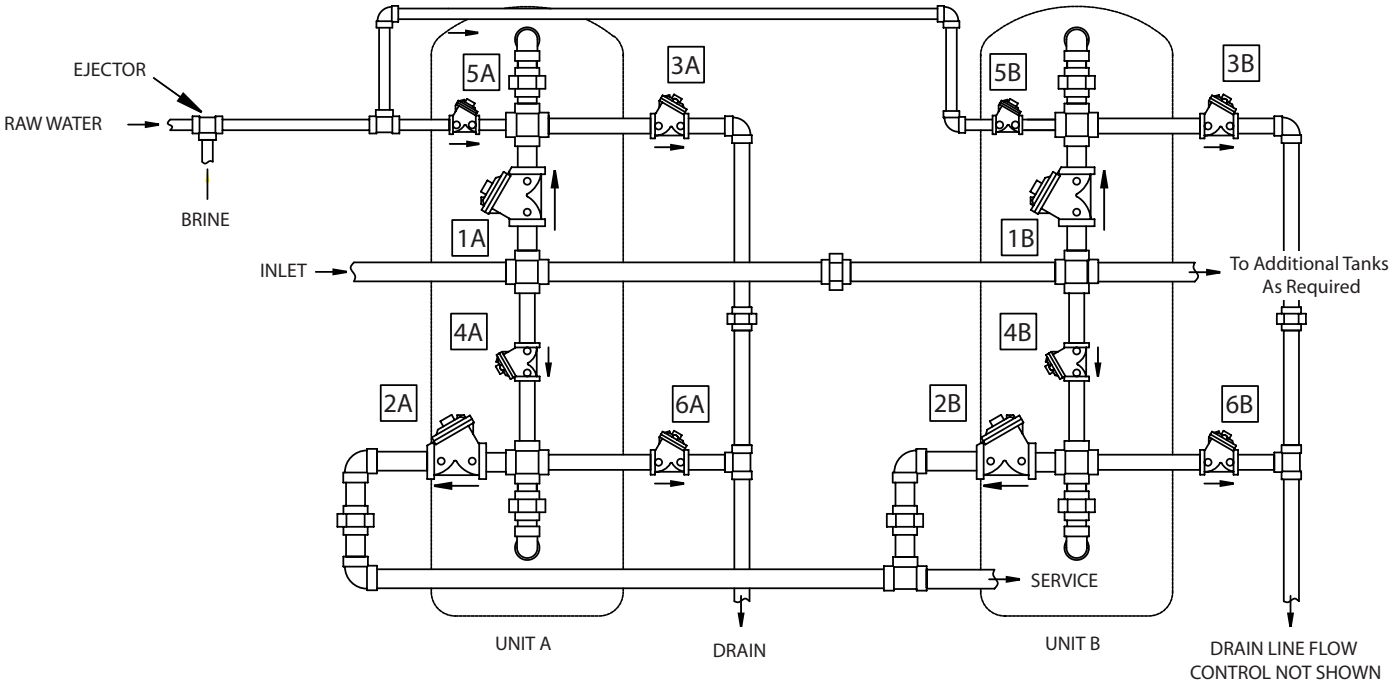
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.

3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.

4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

PLUMBING DIAGRAMS *continued*

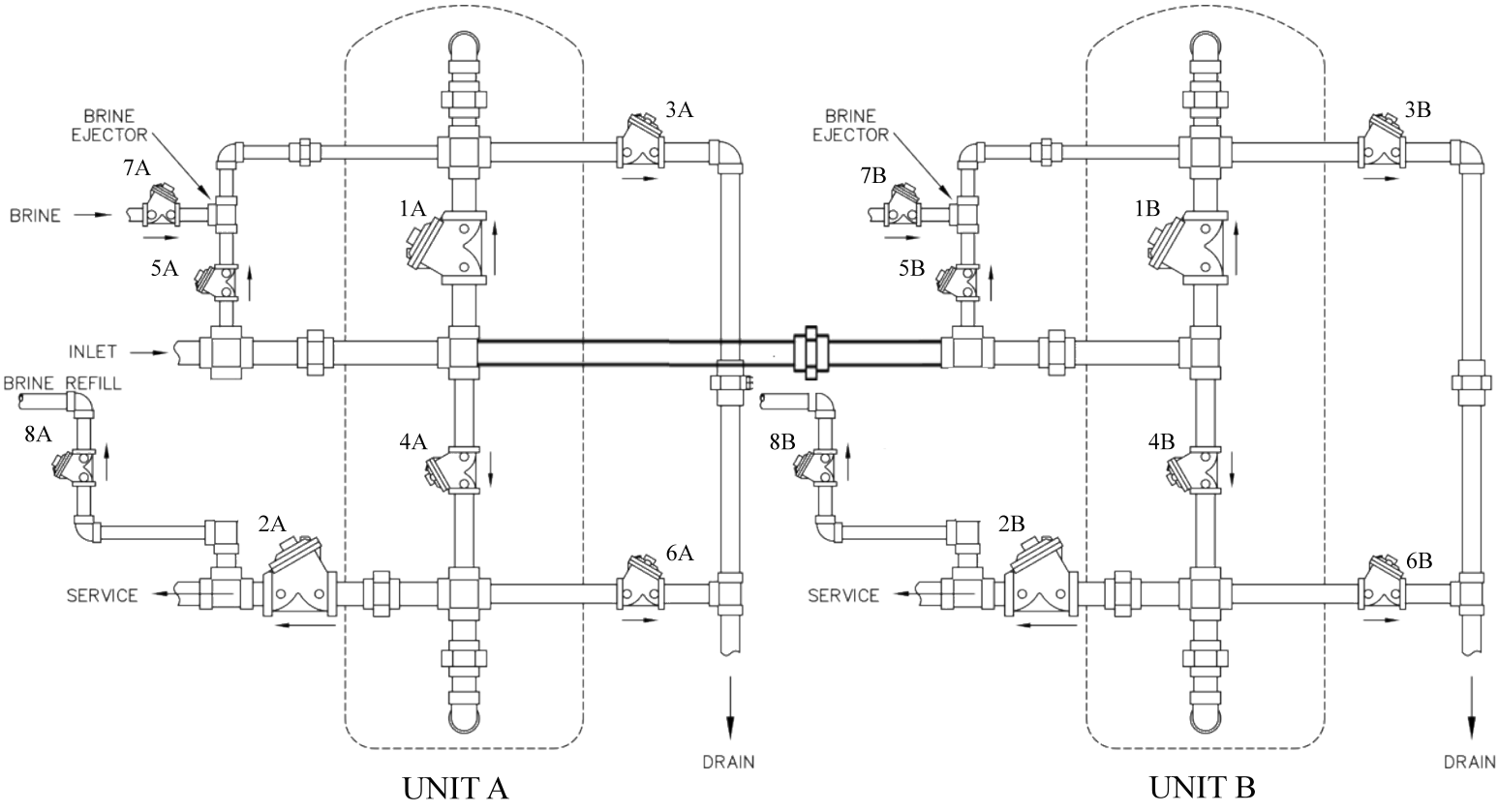
Multiple Tank 4 Position Softener (48-00 Stager)



NOTE: All valves normally open, pressure to close.

NOTE: Valve 2 for each tank is controlled by solenoid for system 7, 9, 14

Multiple Tank 5 Position Softener (51-06 Stager)

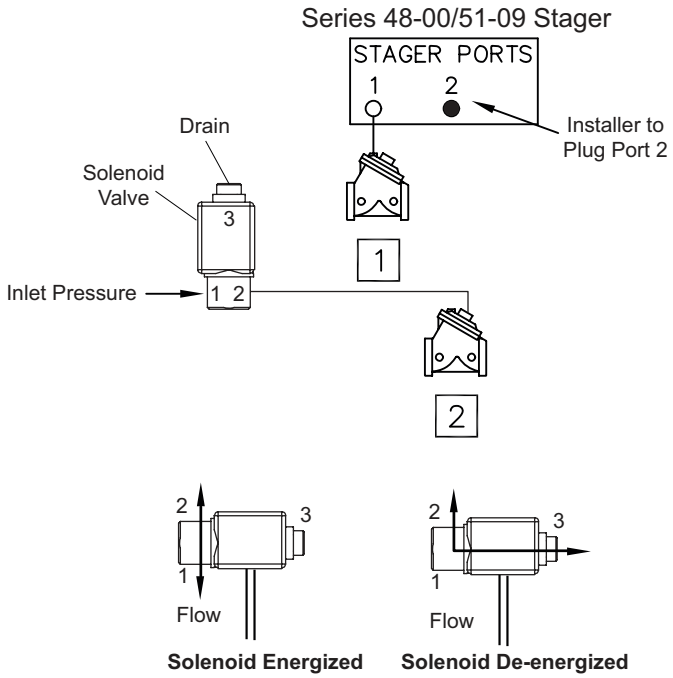


NOTE: All valves normally open, pressure to close.

NOTE: Valve 2 for each tank is controlled by solenoid for system 7, 9, 14

SOLENOID USE

Solenoids only required for Systems 7, 9 and 14



Energized To Close

The NXT Stager control can operate an optional 24 VAC solenoid to control when a tank is off line. This solenoid is electrically connected to the "lower drive" connection on the circuit board, and control pressure is run through the solenoid to the service outlet diaphragm valve.

The solenoid installed at the factory is a universal type. It is plumbed in an energize to close configuration when service outlet valve is normally open.

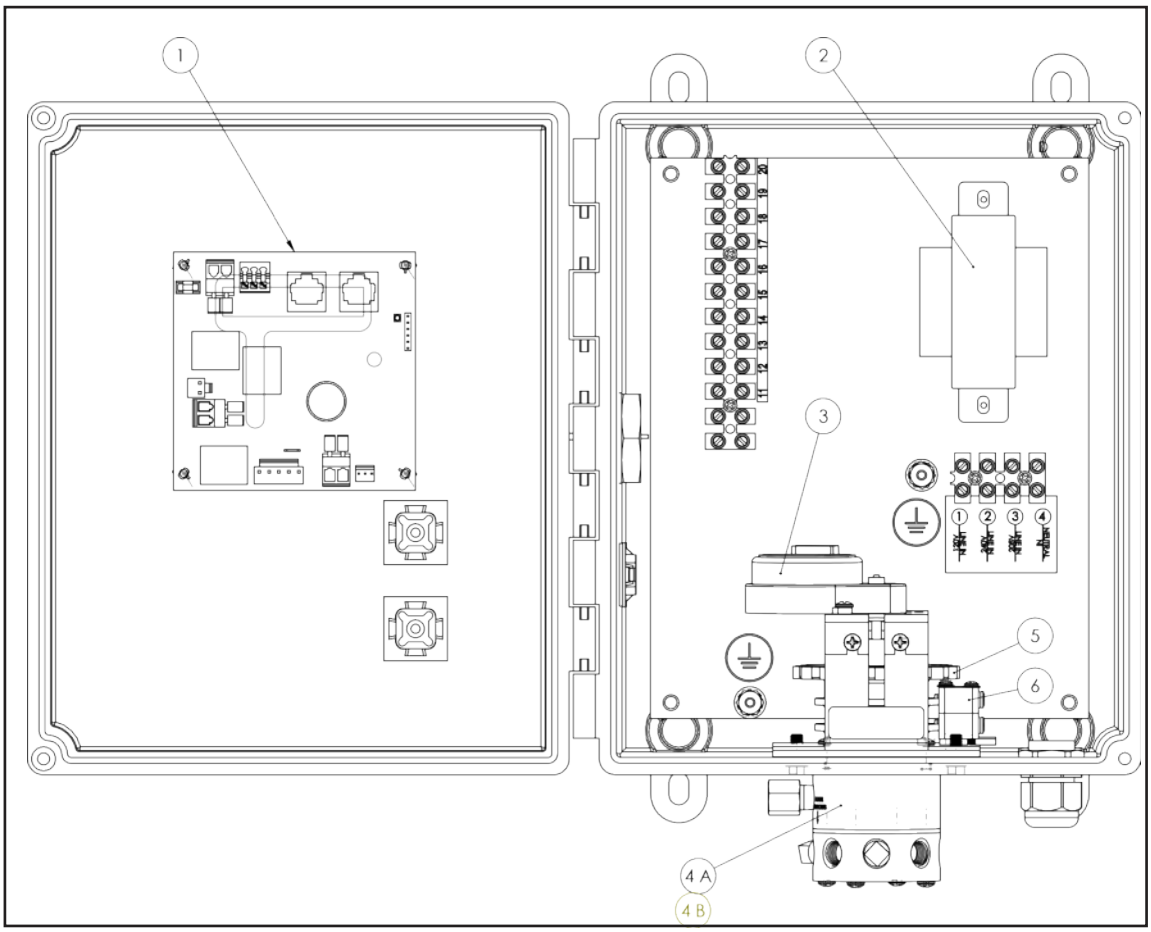
When a tank enters Regeneration or Standby the solenoid is energized. Pressure from solenoid port 1 passes to port 2. The diaphragm valve #2 will close.

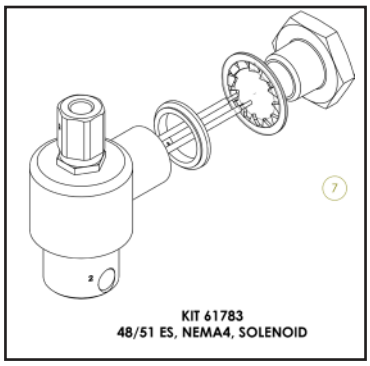
When a tank enters In Service the solenoid is de-energized. The inlet pressure to solenoid port 2 is stopped. The diaphragm valve is vented through solenoid port 2 to port 3 (drain). The valve #2 opens.

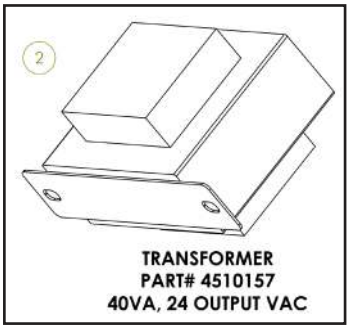
Inverted Stagers Only - Energize to Open

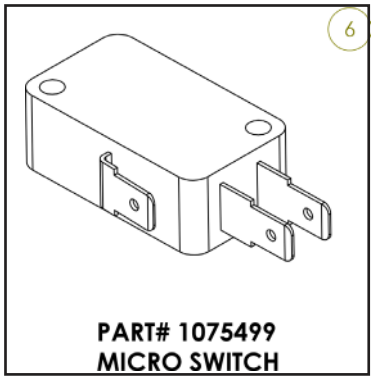
If the service outlet vavle is normally closed, connect constant pressure source to solenoid port 3. Connect solenoid port 2 to service outlet valve. Solenoid port 1 is drain.

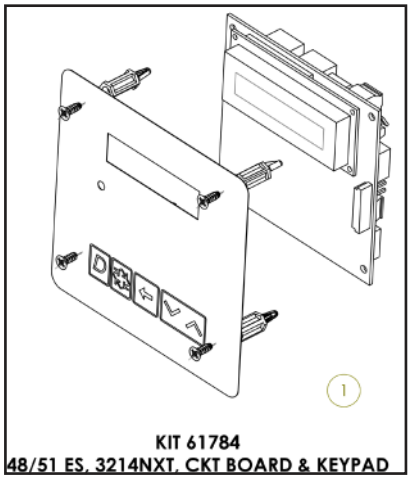
STAGER CONTROLLER, 51 & 48, NXT, NEMA 4
24V/50-60Hz ASSEMBLY

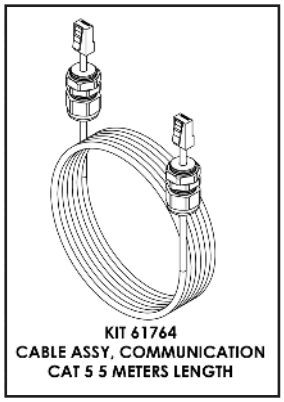


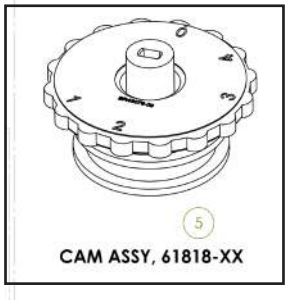


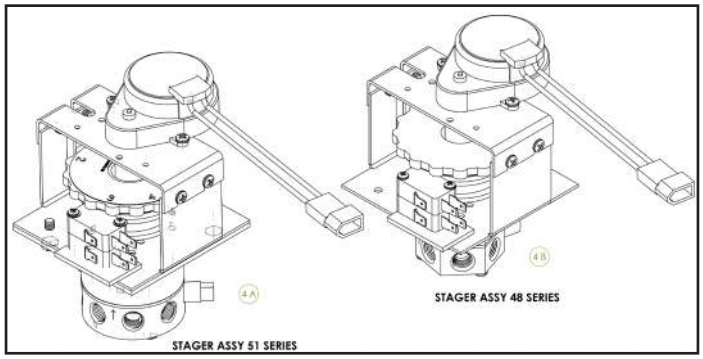








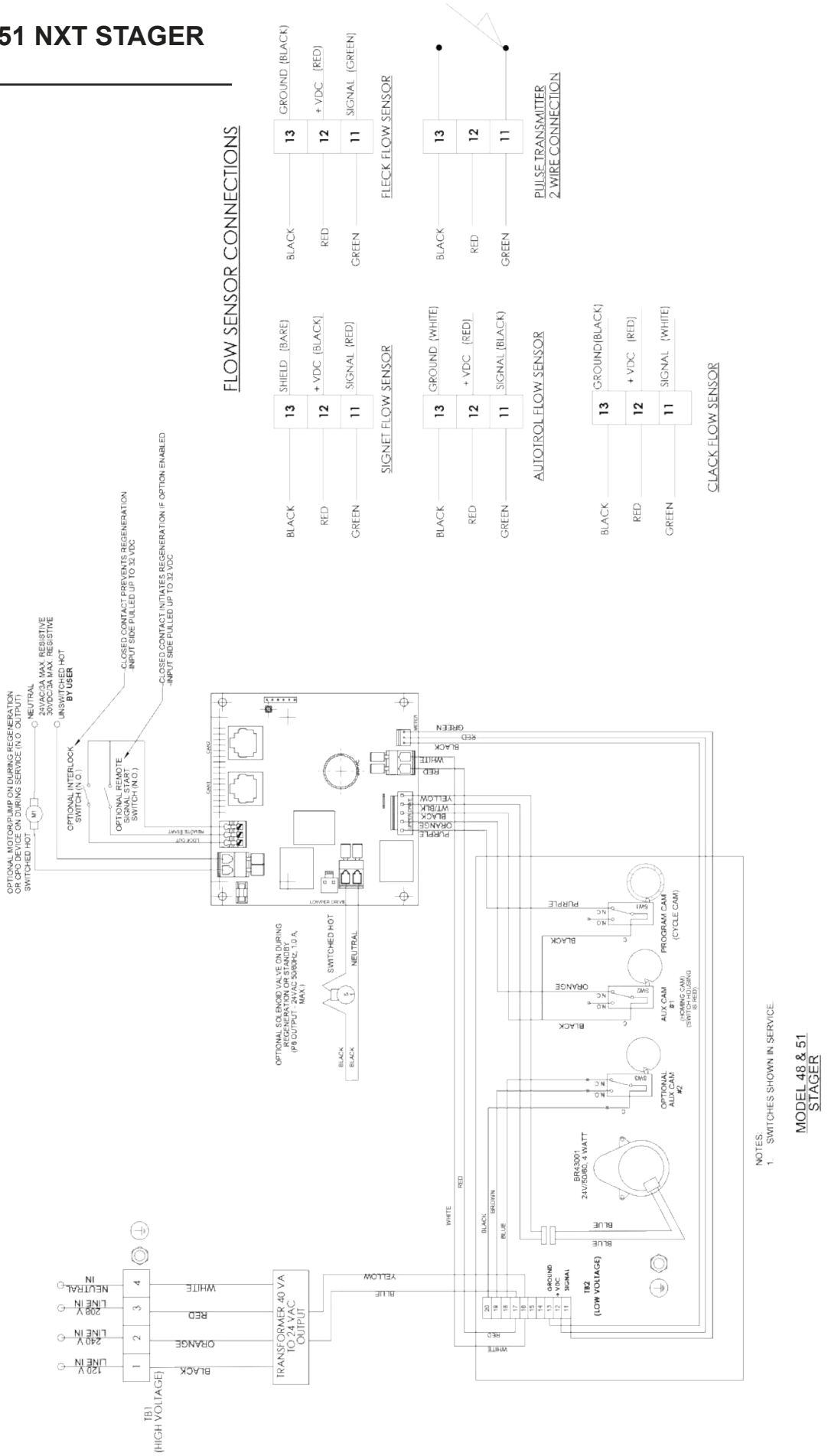




Service Parts Common To Both 48 & 51 NXT Stager Control

61783.....Kit, 48/51 ES NEMA4, Solenoid
61784.....Kit 48/51 ES, 3214 NXT, CKT Board & Keypad
61764.....Cable Assy, Communication, CAT 5, 5 Meters Long
1075499.....Switch, Micro
40941.....Wire Harness, Upper Drive
1075502.....Wire Harness, 2nd Aux Switch
43001.....Motor
4510157.....Transformer
See Service Assemblies Section for Stager and Cam Assemblies

WIRING DIAGRAM 48/51 NXT STAGER CONTROLLER



TROUBLESHOOTING

Detected Errors

If a communication error is detected, an Error Screen will alternate with the main (time of day) screen every few seconds.

- All units In Service remain in the In Service position.
- All units in Standby go to In Service.
- Any unit in Regeneration when the error occurs completes Regeneration and goes to In Service.
- No units are allowed to start a Regeneration Cycle while the error condition exists, unless they are manually forced into Regeneration.
- When an error is corrected and the error no longer displays (it may take several seconds for all of the units in a system to stop displaying the error message), the system returns to normal operation.

NOTE: During the error condition the control continues to monitor the flow meter and update the volume remaining. Once the error condition is corrected all units return to the operating status they were in prior to the error. Regeneration queue is rebuilt according to the normal system operation. Or, if more than one unit has been queued for regeneration, then the queue is rebuilt according to which one communicates first.

Message Displayed	Cause For Error	Correction
Flashing time	Power outage.	Program time by holding UP on Unit #1.
Detected Error = Matching Address	Two or more units programmed with the same valve address number.	Program each unit with unique valve address number in Master Programming.
Detected Error = Program Mismatch	Master program parameters do not match between two or more controls.	Confirm Master Programming for each unit.
Detected Error = No Message #1	No power to Control #1.	Power Control #1.
	Communication Cable to Valve Address #1 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #2	No power to Control #2.	Power Control #2.
	Communication Cable to Valve Address #2 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #3	No power to Control #3.	Power Control #3.
	Communication Cable to Valve Address #3 bad or missing.	Connect or replace Communication Cable.
Detected Error = No Message #4	No power to Control #4.	Power Control #4.
	Communication Cable to Valve Address #4 bad or missing.	Connect or replace Communication Cable.
Detected Error = E2 Reset Unit	This message appears after a software reset.	Reprogram control using Master Programming section.
Test Mode	Circuit Board was not programmed at factory.	Replace Circuit Board.
Black Squares on screen	Bad Circuit Board.	Replace Circuit Board.
INI on screen for more than 2 minutes	Circuit board not getting feedback from cycle switch.	Inspect Motor - should be rotating.
		Connect wire harness to cycle switch.
		Check Cycle Micro Switch.
CHG on screen for more than 2 minutes	Control programmed incorrectly as 2900 or 3900 valve type.	Reprogram unit as Stager Valve type.

SERVICE ASSEMBLIES

48-00 ES Stager Assembly

61808-01 .....Stager Assy, 48-00, NXT 24VAC, HMG No 2nd Aux Switch
61808-02 .....Stager Assy, 48-00, NXT 24VAC, SA, 2nd Aux Notched in Service
61808-03 .....Stager Assy, 48-00, NXT 24VAC, SC, 2nd Aux Notched In Backwash
61808-10 .....Stager Assy, 48-00, Inverted, NXT 24VAC, HMG No 2nd Aux Switch
61808-20 .....Stager Assy, 48-00, Inverted, NXT 24VAC, SA, 2nd Aux Notched in Service
61808-30 .....Stager Assy, 48-00, Inverted, NXT 24VAC, SC, 2nd Aux Notched In Backwash
1074817.....Kit, Internal Parts, 48-00 Stager
61817-01 .....Cam Assy, 48-00 NXT, HMG, no 2nd Aux Cam
61817-02 .....Cam Assy, 48-00 NXT, SA, 2nd Aux Notched in Service
61817-03 .....Cam Assy, 48-00 NXT, SC, 2nd Aux Notched in Backwash

51-06 ES Stager Assembly

61967-01 .....Stager Assy, 51-06, NXT 24VAC, HMG, No 2nd Aux Switch
61967-02 .....Stager Assy, 51-06, NXT 24VAC, SA, 2nd Aux Notched in Service
61967-03 .....Stager Assy, 51-06, NXT 24VAC, SC, 2nd Aux Notched in Backwash
61967-04 .....Stager Assy, 51-06, NXT 24VAC, SH, 2nd Aux Notched in Refill
1074888.....Kit, Internal Parts, 51-06 Stager
61968-01 .....Cam Assy, 51-06 NXT, HMG, No 2nd Aux Switch
61968-02 .....Cam Assy, 51-06 NXT, SA, 2nd Aux Notched in Service
61968-03 .....Cam Assy, 51-06 NXT, SD, 2nd Aux Notched in Backwash

SPECIFICATIONS

NXT GENERIC METER GUIDELINES

Open collector output

Pulse rate generated must not exceed 100 pulses per second (100 Hz), or 6,000 pulses per minute

Support for meter outputs in the range of 1-255 gallons (25.5 m^3) for every 1-255 pulses
Example: 35 gallons/100 pulses
(= 3.5 gallons/10 pulses, = 0.35 gallons/1 pulse)

Meter must operate at 5 VDC

NXT

SYSTEM #	SYSTEM DESCRIPTION	STAGERS	TYPE
4	Single Unit	1	Time Clock: No Meter Immediate: One Meter Delayed: One Meter Remote: No Meter
5	Interlocked	2, 3, 4	Immediate: All Meters Remote: No Meter
6	Series	2, 3, 4	Immediate: One Meter Delayed: One Meter Remote: No Meter
7	Alternating	2	Immediate: One Meter Remote: No Meter
9	Alternating	2, 3, 4	Immediate: All Meters Remote: No Meter
14	Demand Flow	2, 3, 4	Immediate: All Meters

ELECTRICAL RATING

24V AC Transformers

115V AC +/- 20% input	230V AC +/- 20% input
24V AC output w/40V A	24V AC output w/108V A

HUMIDITY

95% RH, non-condensing

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AQUAMATIC® EASY NEST KIT

SIMPLIFYING VALVE NESTS

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

FEATURES/BENEFITS

No-hassle selection documentation for specifying, engineering and building the valve nest system

Easy nest kits include diaphragm valves, control, pilot tubing, tubing fittings for the valve, injector (for softener system), and suggested application drawings for assembly of the unit

Filter and softener configurations available

Service flow rates: 80-1300 gpm (18-295 m^3/h)* per tank

Backwash flow rates: 35-392 gpm (8-89 m^3/h) for a softener system* 35-1200 gpm (8-272 m^3/h) for a filter system*

All components can be serviced while the valve is in-line

Unique Y-pattern design with large seat opening and high lift disc permits higher flow rates at lower pressure loss than other comparable valves

Larger diaphragm area compared to seat area permits drip-tight closing without any springs

Pre-formed, stress-relieved diaphragm minimizes fatigue, maximizes valve responsiveness and diaphragm lifetime

Diaphragm acts as an actuator, eliminating the need for electric or pneumatic actuators

OPTIONS

Available in either composite or metal valve configurations

Electronic 962 stager control

TYPICAL APPLICATIONS

Tank Sizes Coverage
36"-120" for softeners and filters

* Flow rates shown are valve only, not the completed system

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AQUAMATIC®
EASY NEST KITS

AQUAMATIC® EASY NEST KITS

OPERATING SPECIFICATIONS

Valve Body	Cast Iron or Glass-filled Noryl
Diaphragm	Buna N/Polyamide
Injector	PVC
Control Enclosures (Electronic)	NEMA 4X Fiberglass
Operating Pressure	20 to 120 psi (1.38 to 8.27 bar)
Operating Temperature	35° to 120°F (2° to 38°C)
Operating Voltages	115V, 50/60 Hz; 220V, 50/60 Hz

PERFORMANCE RANGE (SINGLE TANK SYSTEMS)

Service Flow Rates	80 to 1300 gpm (18 to 295 m^3/h) per tank
Backwash Flow Rates (Softeners)	35 to 392 gpm (8 to 89 m^3/h)
Backwash Flow Rates (Filters)	35 to 1200 gpm (18 to 272 m^3/h)
System Sizes	36" to 120"diameter tanks

CONFIGURATIONS

System Configurations

Single Tank Softeners	4 Position
Multi-Tank Softeners	2, 3, and 4 Tank, Parallel; 2 Tank Alternating Softeners
Single Tank Filters	3 Position
Multi-Tank Filters	2, 3, and 4 Tank, Sequential

Control Configurations

Electronic	Demand and Time Clock (Battery Back-up)
Programmable Regeneration Range tion	0-255 Minutes Regenera- (Each Cycle)
Stager Valves	6, 8 and 16 Ports

Piping Configurations

Valves Cast Iron	3/4"- 3" Female Thread, NPT, BSP, JIS; 3"- 6" Flanged
Noryl (Plastic)	1" - 3" Union, Female Solvent Weld; 2"- 3" Female Solvent Weld or Flange
Injectors	1/2"- 2" Female NPT Thread, Solvent Weld
Stager Tubing	1/4" Poly Tubing

AVAILABLE STANDARD SOFTENER CONFIGURATIONS

MODEL #	PART #	TANK DIAMETER IN. (CM)	RESIN AMOUNT FT^3 (LITERS)	PIPE SIZE	SERVICE FLOW RATE @ PRESSURE DROP		BACKWASH FLOW RATE @ PRESSURE DROP	
					GPM @ PSI	M^3/HR @ BARS	GPM @ PSI	M^3/HR @ BARS
CAST IRON VALVESW								
S425-36	1078826	36 (92)	20 (565)	2"	100 @ 6.4	22.7 @ .4	36 @ 2.3	8.1 @ 0.2
S425-42	1078783	42 (106)	30 (850)	2"	150 @ 14.3	34 @ 1.0	48 @ 4.4	10.9 @ 0.3
S426-48	1078784	48 (120)	40 (1130)	2"	180 @ 14.0	40.9 @ 1.0	63 @ 7.5	14.3 @ 0.5
S426-54	1078785	54 (135)	50 (1415)	2.5"	220 @ 13.7	50 @ .0.9	80 @ 12.2	18 @ 0.8
S427-60	1078786	60 (150)	60 (1700)	3"	300 @ 10.0	68 @ 0.7	98 @ 6.3	22.2 @ 0.4
S427-63	1078828	63 (160)	70 (1980)	3"	325 @ 11.6	73.8 @ 0.8	108 @ 7.5	24.5 @ 0.5
S428-72	1078787	72 (180)	85 (2400)	4"	425 @ 4.8	96.6 @ 0.3	140 @ 8.5	31.8 @ 0.6
S428-78	1078788	78 (200)	100 (2830)	4"	500 @ 6.6	113.6 @ 0.5	165 @ 11.8	37.5 @ 0.8
S428-84	1078789	84 (215)	125 (3540)	4"	625 @ 10.0	142 @ 0.7	192 @ 10.5	43.6 @ 0.7
S428-90	1078790	90 (230)	140 (3965)	4"	700 @ 13.0	159 @ 0.9	220 @ 13.8	50 @ 1.0
S429-96	1078791	96 (245)	165 (4670)	6"	825 @ 4.0	187.5 @ 0.3	255 @ 7.6	58 @ 0.5
S429-102	1078792	102 (260)	185 (5240)	6"	925 @ 4.2	210 @ 0.3	285 @ 9.2	64.7 @ 0.6
S429-108	1078793	108 (275)	210 (5945)	6"	1100 @ 6.0	250 @ 0.4	320 @ 11.5	72.7 @ 0.8
S429-114	1078794	114 (290)	235 (6655)	6"	1200 @ 7.0	272 @ 0.5	355 @ 3.5	80.6 @ 0.2
S429-120	1078795	120 (305)	260 (7360)	6"	1300 @ 8.3	295 @ 0.6	390 @ 5.0	88.6 @ 0.3
COMPOSITE VALVES SERIES K52								
S524-36	1078796	36 (92)	20 (565)	1.5"	80 @ 9.0	18.1 @ 0.6	35 @ 11	7.9 @ 0.8
S526-42	1078797	42 (106)	30 (850)	2.5"	150 @ 4.5	34 @ 0.3	48 @ 4.0	10.9 @ 0.3
S526-48	1078798	48 (120)	40 (1130)	2.5"	180 @ 7.0	41 @ 0.5	63 @ 5.6	14.3 @ 0.4
S526-54	1078799	54 (135)	50 (1415)	2.5"	220 @ 10	50 @ 0.7	80 @ 10	18 @ 0.7
COMPOSITE VALVES SERIES K53								
S534-36	1078800	36 (92)	20 (565)	1.5"	100 @ 8.7	22.7 @ .60	35 @ 7.5	7.9 @ 0.5
S535-42	1078801	42 (106)	30 (850)	2"	150 @ 6.4	34 @ .44	48 @ 2.0	10.9 @ 0.1
S535-48	1078802	48 (120)	40 (1130)	2"	180 @ 9.2	41 @ .63	63 @ 4.0	14.3 @ 0.3
S537-54	1078803	54 (135)	50 (1415)	3"	220 @ 2.4	50 @ .16	80 @ 7.0	18 @ 0.5
S537-60	1078829	60 (150)	60 (1700)	3"	300 @ 4.5	68.1 @ .31	98 @ 8.4	22.2 @ 0.6
S537-63	1078804	63 (160)	65 (1840)	3"	325 @ 5.3	73.8 @ .36	110 @ 4.0	25 @ 0.3
S537-72	1078805	72 (182)	90 (2550)	3"	425 @ 9.0	96.6 @ .62	140 @ 7.0	31.8 @ 0.5

AVAILABLE STANDARD FILTER CONFIGURATIONS

MODEL #	PART #	TANK DIAMETER IN. (CM)	PIPE SIZE	SERVICE AND BACKWASH FLOW RATE @ PRESSURE DROP					
				5 GPM/FT^2		10 GPM/FT^2		15 GPM/FT^2	
				GPM @ PSI	M^3/HR @ BARS	GPM @ PSI	M^3/HR @ BARS	GPM @ PSI	M^3/HR @ BARS
CAST IRON VALVES									
F425-42	1078806	42 (106)	2"	48 @ 1.5	10.9 @ 0.1	96 @ 5.8	21.8 @ 0.4	145 @ 13.2	33 @ 0.9
F426-48	1078807	48 (120)	2"	62 @ 1.7	14 @ 0.1	125 @ 6.7	28 @ 0.5	190 @ 15	43.2 @ 1.0
F426-54	1078808	54 (135)	2.5"	80 @ 2.8	18.1 @ 0.2	160 @ 7.2	36.2 @ 0.5	240 @ 16	54.5 @ 1.1
F427-60	1078809	60 (150)	3"	97 @ 1.1	22.0 @ 0.1	195 @ 4.3	44 @ 0.3	295 @ 9.5	67 @ 0.6
F428-72	1078810	72 (180)	4"	140 @ 0.5	31.8 @ 0.03	280 @ 2.5	63.6 @ 0.2	425 @ 5.5	96.6 @ 0.4
F428-78	1078811	78 (200)	4"	165 @ 0.7	36.3 @ 0.05	330 @ 3.2	75 @ 0.2	500 @ 7.5	113 @ 0.5
F428-84	1078812	84 (215)	4"	190 @ 1.0	43 @ 0.07	380 @ 4.4	87.5 @ 0.3	580 @ 10.0	132 @ 0.7
F428-96	1078813	96 (245)	4"	250 @ 1.6	56.8 @ 0.1	500 @ 7.4	113.6 @ 0.5	750 @ 16.0	170 @ 1.1
F429-108	1078814	108 (275)	6"	315 @ 0.5	71 @ 0.03	635 @ 2.0	143.6 @ 0.1	960 @ 4.5	218 @ 0.3
F429-120	1078815	120 (305)	6"	390 @ 0.8	88.6 @ 0.06	780 @ 3.0	177 @ 0.2	1180 @ 7.4	268 @ 0.5
COMPOSITE VALVES SERIES K52									
F524-36	1078816	36 (90)	2"	35 @ 1.7	8.0 @ 0.1	70 @ 6.8	16 @ 0.5	105 @ 15	23.8 @ 1.0
F526-42	1078817	42 (105)	2.5"	48 @ 0.46	11 @ 0.03	96 @ 2.0	22 @ 0.1	145 @ 4.2	33 @ 0.3
F526-48	1078818	48 (120)	3"	62.5 @ 0.8	14.2 @ 0.06	125 @ 3.2	28.4 @ 0.2	190 @ 7.3	43.2 @ 0.5
F526-54	1078819	54 (135)	3"	80 @ 1.3	18.1 @ 0.1	160 @ 5.2	36.2 @ 0.4	240 @ 11.5	54.5 @ 0.8
COMPOSITE VALVES SERIES K53									
F534-36	1078820	36 (90)	1.5"	35 @ 1.2	8 @ .08	70 @ 4.3	16 @ 0.3	105 @ 9.6	23.8 @ 0.7
F535-42	1078821	42 (105)	2"	48 @ 0.6	11 @ 0.04	96 @ 2.7	22 @ 0.2	145 @ 6.0	33 @ 0.4
F535-48	1078822	48 (120)	2"	62.5 @ 1.1	14.2 @ 0.08	125 @ 4.5	28.4 @ 0.3	190 @ 10.5	43.2 @ 0.7
F537-54	1078823	54 (135)	3"	80 @ 0.4	18.1 @ 0.03	160 @ 1.6	36.2 @ 0.1	240 @ 3.5	54.5 @ 0.2
F537-60	1078829	60 (150)	3"	98 @ 0.6	22.2 @ 0.04	195 @ 2.2	44.3 @ 0.2	295 @ 5.4	67 @ 0.4
F537-63	1078824	63 (160)	3"	107 @ 0.7	24 @ 0.05	215 @ 2.7	48 @ 0.2	325 @ 7.0	73.8 @ 0.5
SF37-72	1078825	72 (180)	3"	140 @ 1.2	31.8 @ 0.08	280 @ 5.0	63.6 @ 0.3	425 @ 11.4	96.6 @ 0.8

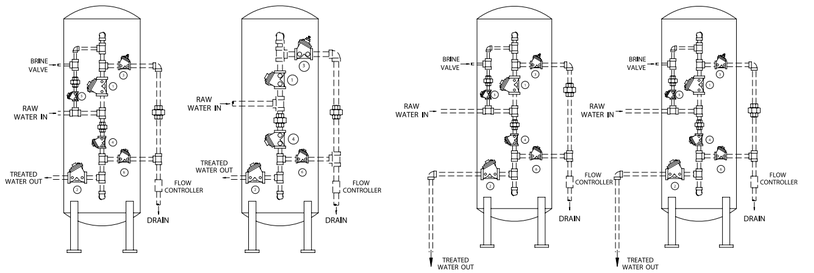
NOTE: Data supplied herein is provided as a guide only. Actual results may vary depending upon actual water conditions and system layout. Flow rates shown are valves only, not completed systems.

ELECTRONIC CONTROLLERS

PART NUMBER	DESCRIPTION
1078837	Single tank, 4 position softener
1078838	Single tank, 3 position filter
1078839	2 tank sequential filter
1078840	3 tank sequential filter
1078841	4 tank sequential filter
1078842	2 tank alternating softener
1078843	2 tank alternating softener w/rinse

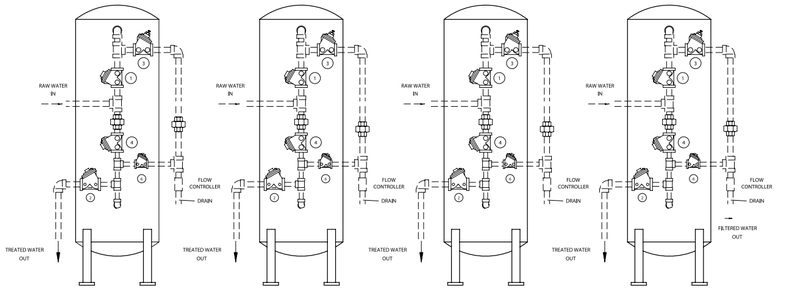
STANDARD SYSTEM LAYOUTS

TWO TANK ALTERNATING SOFTENERS



SOFTENER FILTER UNIT A UNIT B

FOUR TANK ALTERNATING SOFTENERS



UNIT A UNIT B UNIT C UNIT D

All systems are designed for guideline purposes only. Final authorship of engineering design and application is the responsibility of the assembling OEM. Pentair cannot be responsible for the performance and integrity of the installed system.

AQUAMATIC EASY NEST KITS

AQUAMATIC® EASY NEST
KITS INSTALLATION SUGGESTIONS

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GENERAL RECOMMENDATIONS

Hydraulics

- Vacuum breakers should be installed to prevent siphoning.
- Flexible connectors should follow FRP tank manufacturer's recommendations.

Electrical

- Supply of electricity should be compatible with the voltage required by the controller.
- Comply with local electrical codes and ensure an uninterrupted supply of power is available.

Plumbing

- Proper piping practices should be used on media tanks.
- Comply with local plumbing codes and follow common practices while plumbing the components.
- Plumber tape should be used on threads for cast iron Easy Nest Kits.
- Do not use plumber tape on plastic Easy Nest Kits.

Floor Drain

- Units should be located close to a clean working drain.
- The drains capacity should be checked for accepting backwash and Fast Rinse flows.
- An air gap should be installed on the drain to prevent backflow contamination.
- The systems drain line should be less than a 15 foot pipe length equivalent.
- Elevation of the drain line should be less than five feet above the injector.

Floor

- The floor should be able to support the installation weight of the system and be fairly level.

Isolating/Bypass Valving

- A manual bypass around the system for easy servicing and emergencies is recommended.

Matching Flanges

- Companion flanges are not included for large valves.

Upper and Lower Distributors/False Bottom

- Follow component manufacturers recommendations.

CALIFORNIA PROPOSITION 65 WARNING

⚠ WARNING: This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

Media Tanks

- Steel and FRP tanks can be used if proper piping practices are followed.

New System Check Out and Troubleshooting Guide

This is a guide for starting a system after all of the initial installation is completed:

- Plumbing is complete including raw water supply (inlet), Service (outlet), drain (including Drain Line Flow Control), and regenerate draw line. The brine tank and brine valve are installed, however no salt has been added at this time. A sufficient amount of water should be added to the brine tank so the water level is above the salt grid (if installed).
- The media tanks are loaded and the tanks are filled with water.
- Control Pressure to stager is connected to a constant source that is equal or larger than line pressure. Drain port of stager is open to atmosphere. For trouble-free operation, the use of a 5-micron filter, in the control pressure line is recommended.
- All necessary diaphragm valve/stager tubing has been connected.
- The control has power available but is not powered up at this time.

System Check Out

1. Manually advance stager to the Backwash Position by rotating the cam counterclockwise.
2. Open feed water supply valve fully (tanks have already been filled with water prior to this step). Water should flow to drain at Backwash flow rate, which is determined by a Drain Line Flow Control installed in the drain line. Water to Service should stop after several seconds. If water continues to Service refer to Section 1 of the Troubleshooting guide.
3. Backwash system until water to drain runs clear. Observe that no media is being washed to drain. If media is being washed to drain, turn feed water supply off immediately and refer to Section 2 of the Troubleshooting guide.
4. Manually advance stager to Draw/Slow Rinse position. Flow of water to drain should decrease substantially. Water level in the brine tank should begin to go down. After verifying draw rate, please move to next step.
   - If flow to drain does not decrease, refer to Section 3 of the Troubleshooting guide.
   - If level in brine tank does not go down, refer to Section 4 of the Troubleshooting guide.
5. Manually advance stager to Fast Rinse. Flow to drain should increase to the level it was during Backwash. If the flow does not increase, refer to Section 5 of the Troubleshooting guide.
6. Manually advance stager to Service position.
7. Apply power to controller.
8. If Electronic controller (with 962 timer) is used, follow instructions as outlined in 962 programming manual.
9. System Check Out is complete and may be placed into service.
10. Open Service outlet valve.

TROUBLESHOOTING GUIDE

Section	Symptom	Probable Cause	Correction
1	Water to service, no water to drain or water to both service and drain.	Tubing from stager to diaphragm valves may be incorrect. Refer to nest diagram, valves 3 and 4 tubing should not have pressure to them, all others should have pressure.	Refer to Manual to identify and correct tubing mistake.
2	Media washing to drain.	No drain line flow control is installed or drain line flow control is not sized correctly for media and/or water temperature.	Check for drain line flow control in drain line. Refer to media specification sheet for proper backwash rate.
3	Flow to drain does not decrease in draw cycle.	Tubing from stager to diaphragm valves may be incorrect. Refer to nest diagram, tubing going to valves 5 and 6 should not have pressure to them, all others should have pressure.	Refer to manual to identify and correct tubing mistake.
4	Level in brine tank does not go down.	Tubing from stager to diaphragm valves may be incorrect. Refer to nest diagram, tubing on valves 5 and 6 should not have pressure to them, all others should have pressure. Brine valve may be preventing draw.	Refer to manual to identify and correct tubing mistake. If tubing is correct, examine brine valve instruction sheet for troubleshooting information regarding the brine valve.
5	Flow to drain does not increase to the level it was during Backwash.	Tubing from stager to diaphragm valves may be incorrect. Refer to nest diagram, tubing on valves 1 and 6 should not have pressure to them, all others should have pressure.	Refer to manual to identify and correct tubing mistake.

EXISTING EASY NEST SYSTEM TROUBLESHOOTING GUIDE

Preliminary Checklist

Check to make sure:

- Vent ports on the diaphragm valves are not plugged or obstructed.
- Stager drain port is open to atmosphere.
- Controller has uninterrupted power source.
- Control pressure is equal to or greater than the system pressure and is a constant source.
- Systems using Easy Nest Kits consist of Normally Open type Diaphragm Valves controlled by pressure/vent signals from the stager control ports. Check for stager signal (pressured/vented) on valves by disconnecting tubing from the stager port connected to the valve. If upper diaphragm chamber (valve cap) is pressurized, valve should be closed and if vented, it should be open.

Problem	Possible Cause	Solution
Failure to draw brine.	Rinse outlet, valve No. 6, not opening.	Check for control signal on valve No. 6. If pressured, check stagers operation. If vented, disassemble and repair valve.
	Back pressure on injector.	Drain line flow controller restricted or too small.
	Low water pressure.	Inlet pressure must be at least 30 psi.
	Service inlet, valve No. 1, not closing.	Check for control signal on valve No. 1. If pressured, check stagers operation. If vented, disassemble and repair valve.
	Backwash inlet, valve No. 4, not closing.	Check for control signal on valve No. 4. If pressured, check stagers operation. If vented, disassemble and repair valve.
Mineral discharge to service.	Bottom distributor in media tank damaged or broken	Check and replace distributor.
Mineral discharge to drain.	Backwash flow control missing	Check drain line of flow controller.
	Backwash flow control oversized	Check for proper sizing of flow controller.
	Change in water pressure (If fixed orifice type, backwash flow controller is used)	If system has pressure fluctuation, install properly sized flow control in the drain line.
Change in water temperature.	Water temperature.	If water temperature is changed, adjust backwash flow rate per specification supplied by media manufacturer.
Low service flow rate and/or high pressure loss.	Service inlet and outlet, valve No. 1 and 2, not opening.	Disconnect tubing from stager ports 1 and 2. If pressured, stager is malfunctioning, repair stager. If stager port 1 and 2 are vented, check valve No. 1 and 2, repair valves.
Poor quality water to service.	Backwash inlet, valve No. 4, not closing.	Disconnect tubing from stager port No. 4. If pressured, stager is malfunctioning. If vented, check valve No. 5 and repair.
	Unit not regenerating.	Check controller operation and regeneration frequency setting.
	No brine draw.	Check brine valve operation.
	Lack of brine/salt in brine tank.	Check salt level. Fill brine tank, if necessary.
Unit will not regenerate automatically.	No electric power to timer.	Check electrical power supply for interruption.
	No flow indications (E9XX controller only).	Check flow meter.
	Control not programmed correctly.	Program control, see control manual.
Leak to drain.	Backwash outlet and/or rinse outlet valve not closing.	Disconnect tubing from stager ports 3 and 6. If vented, stager malfunctioning. If pressured, check valve and repair.
	Insufficient or lack of control pressure to stager.	Check control pressure to the stager, must be equal to or greater than line pressure to valves.
Salt in service line.	Not enough rinse time.	Check slow rinse and fast rinse time, adjust if necessary.
	Brine draw rate too slow.	Back pressure on injector.
	Back pressure on injector.	Check backwash flow controller or obstruction and remove obstruction.
	Salt dosage too high.	Check and adjust salt dosage.

EXISTING EASY NEST SYSTEM
TROUBLESHOOTING GUIDE *CONTINUED*

Problem	Possible Cause	Solution
Brine tank overflow.	Brine valve malfunctioning.	Repair or replace brine valve.
Valve operation erratic or slow.	Insufficient control pressure to stager.	Check control pressure to the stager, must be equal to or greater than line pressure.
	Stager drain port restricted or plugged.	Check stager drain for restriction and/or obstruction.
Improper or no backwash flow.	Backwash flow controller plugged or obstructed.	Check backwash flow controller for obstruction and remove obstruction.
	Backwash valves 3 and 4 not opening.	Check stager port connected to valves 3 and 4. It should be vented. If pressured, check stager operation. If vented, check and repair diaphragm valve.
Improper or no fast rinse flow.	Backwash flow controller plugged or obstructed.	Check backwash flow controller for obstruction and remove obstruction.
	Rinse outlet, valve No. 6, not opening.	Check stager port connected to valve 6. It should be vented. If pressured, check stager operation. If vented, check and repair diaphragm valve.
Poor water quality.	Service flow rate too high.	Check and adjust flow rate, if necessary.
	Media bed channeling or scaled.	Backwash media to reclassify media bed and check media condition.

COMPONENT TROUBLESHOOTING

Introduction

The Easy Nest Kit consists of three main components, Diaphragm Valves, Injector (for softeners) and Stager Controller. Troubleshooting guide for all three components is outlined below.

Diaphragm Valves

Problem	Possible Cause	Solution
Valve not closing.	Insufficient control pressure from stager port.	Check stager ports & tubing for obstruction.
	Valve disc damaged.	Disassemble valve and replace disc.
	Vent port plugged or obstructed.	Remove plug from vent port and check vent port for any obstruction, clear obstruction.
Valve operation slow or sluggish.	Tubing from stager is obstructed.	Remove obstruction.
	Vent port obstructed.	Remove obstruction.
Water leak through vent port when valve is closed. Water leak through vent port when valve is open.	Damaged diaphragm.	Replace diaphragm.
	Leak through the dynamic o-ring.	Disassemble valve and replace o-ring.
Water hammer when valve closes.	Excessive control pressure.	Reduce control pressure, must be equal to system pressure.
Valve does not open.	Stager drain port plugged or restricted.	Check and remove restriction from the stager drain port.

Stager

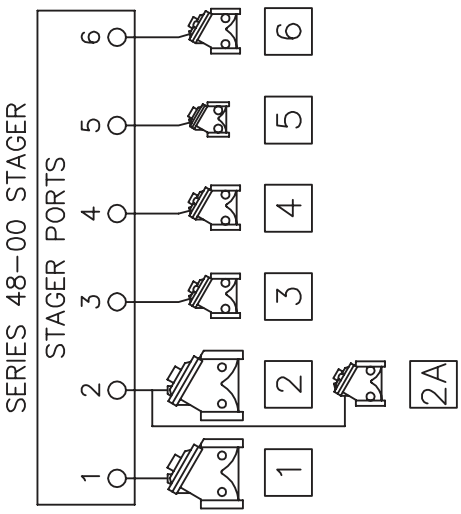
Problem	Possible Cause	Solution
Continuous leak to drain.	Foreign material between stem plate and gasket.	Clean & remove the foreign material.
	Stem plate and/or gasket worn or damaged.	Replace damaged parts.
Stager out of position, or not stopping at correct position. Stager not advancing.	Misaligned or damaged switch.	Align switch replace switch if damaged.
	Damaged motor.	Replace motor.
Stager ports not venting.	Restriction in tubing.	Check and remove restriction.
	Stager drain port plugged or restricted.	Check stager drain port and remove restriction.
No pressure at control ports. Low control pressure at the control ports.	Restricted or plugged control line to the stager. Control pressure must be equal to line pressure of the system.	Remove restriction.

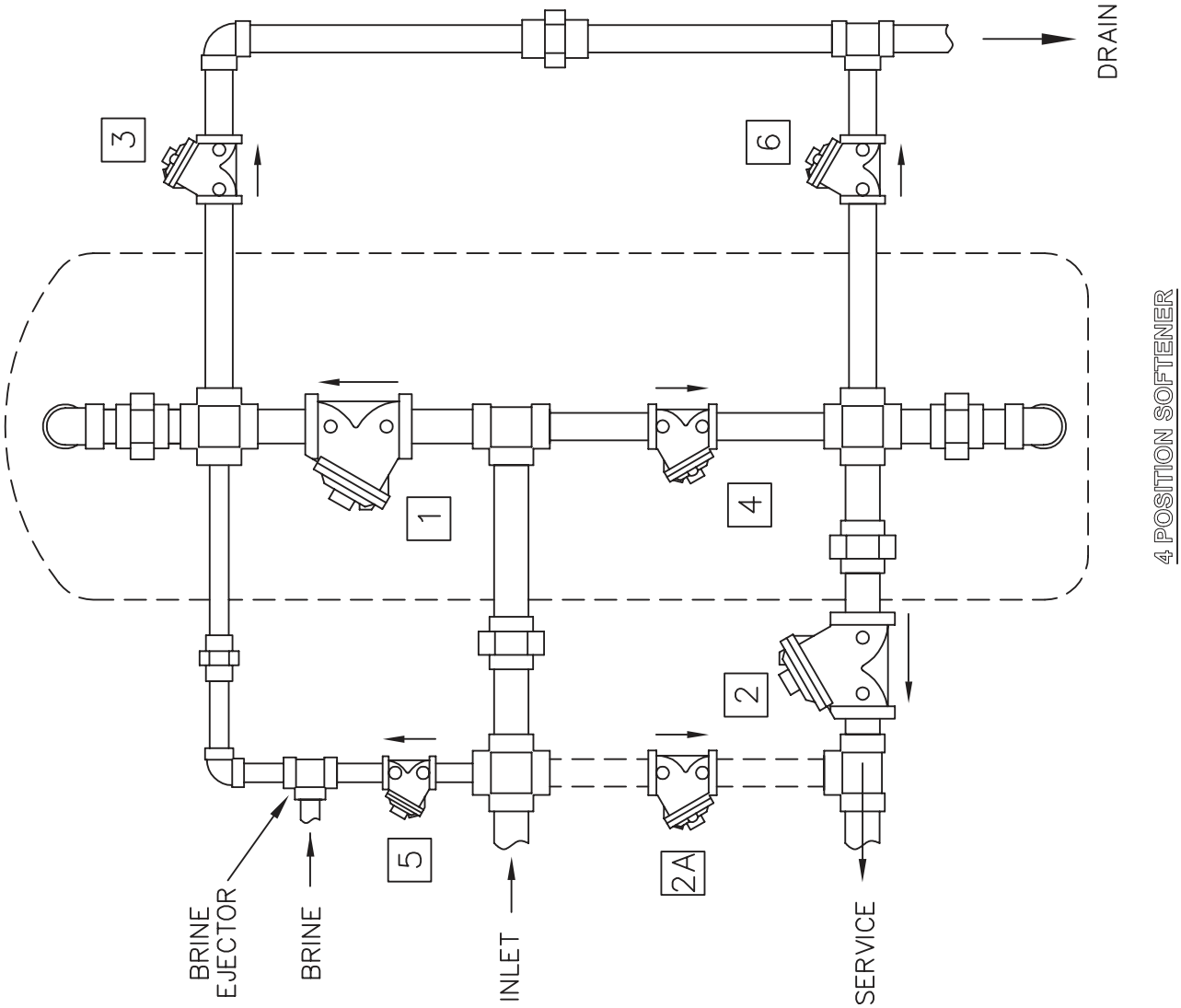
Controller

Refer to the controller manual.

4 POSITION SOFTENER (48-00 STAGER)

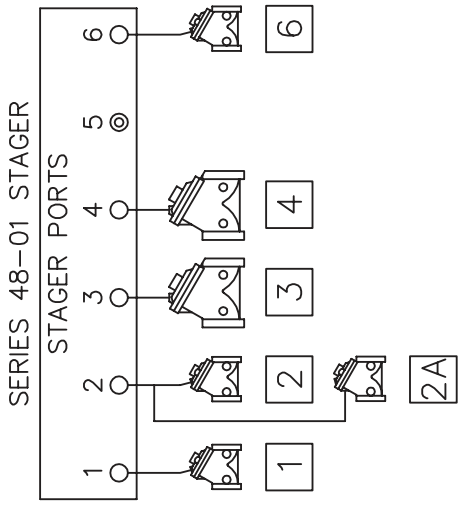
NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	4	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E	2	BRINE	5,6	5,6,2A
F	3	RINSE	1,6	1,6,2A

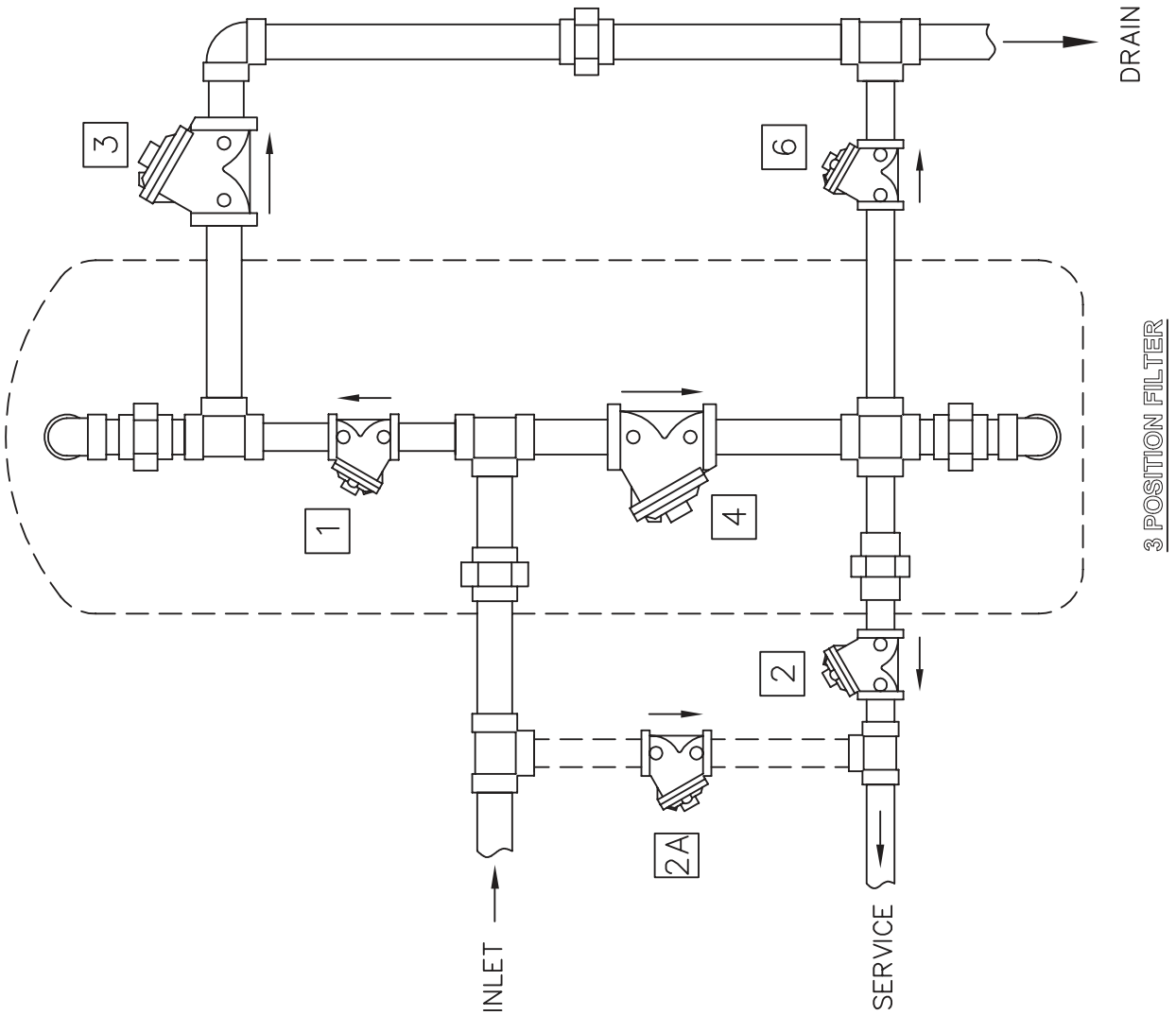




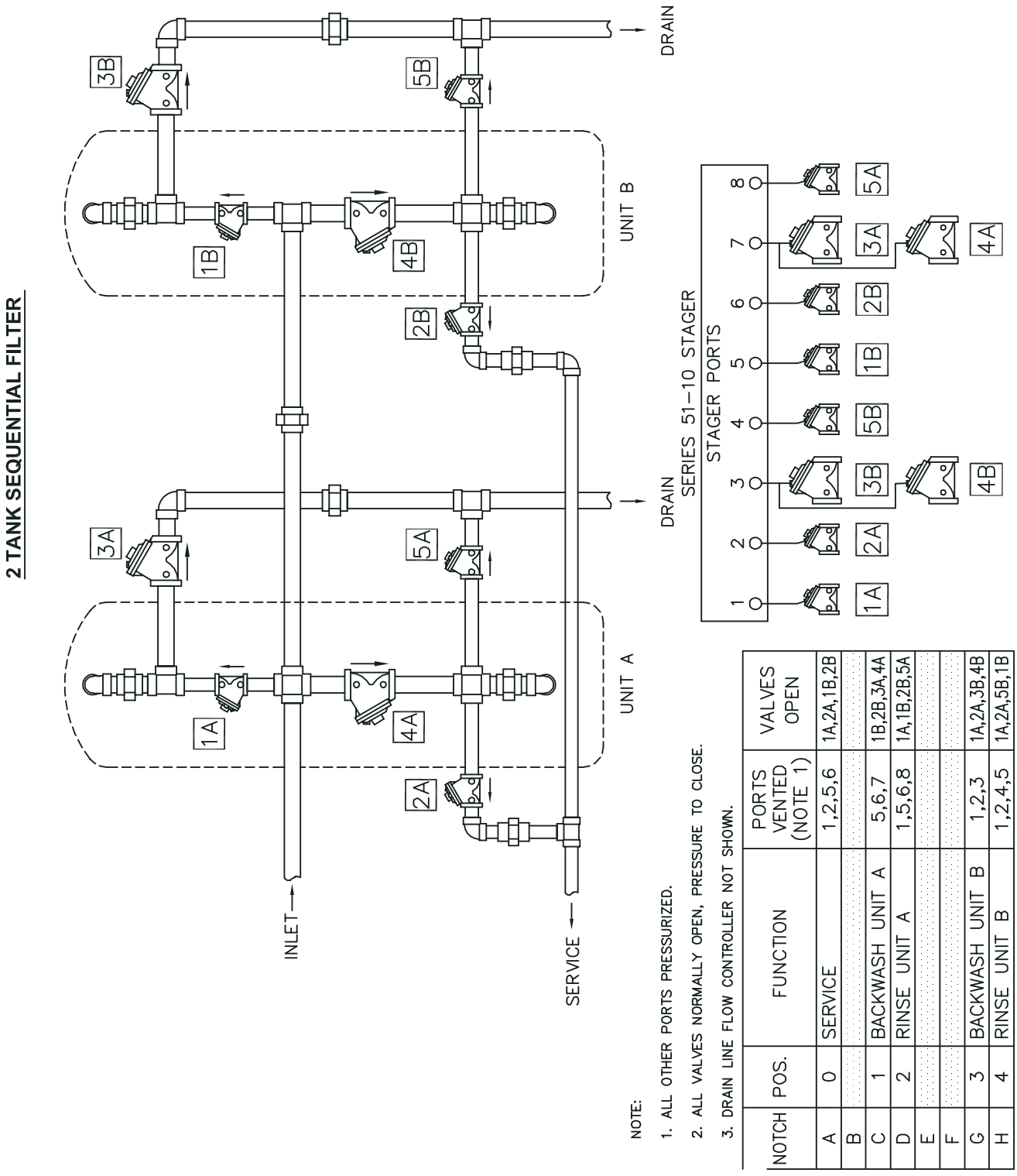
3 POSITION FILTER (48-01 STAGER)

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	3	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E				
F	2	RINSE	1,6	1,6,2A





2 TANK SEQUENTIAL FILTER (51-10 STAGER)

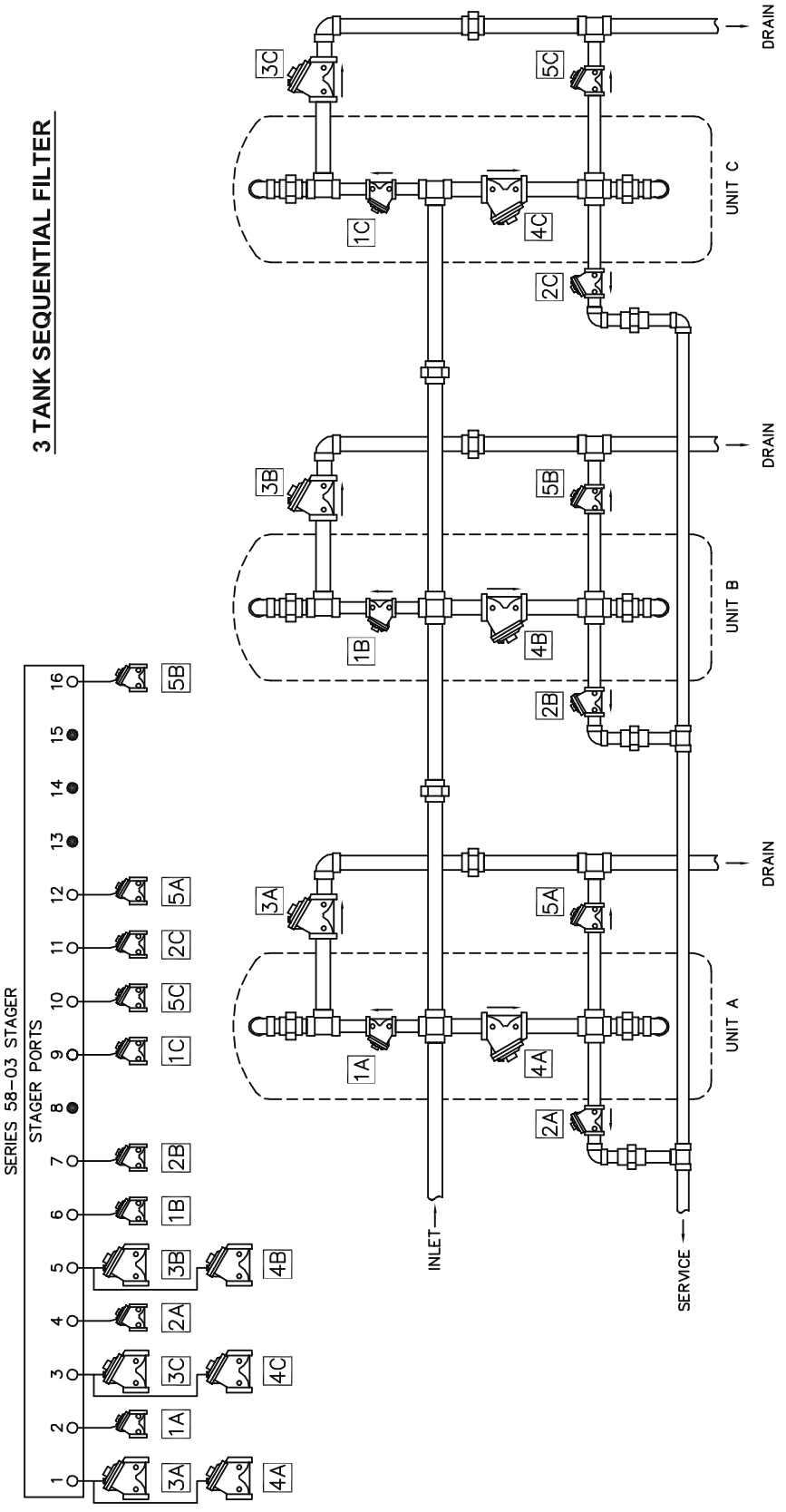


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2,5,6	1A,2A,1B,2B
B	.....	.....	.....	.....
C	1	BACKWASH UNIT A	5,6,7	1B,2B,3A,4A
D	2	RINSE UNIT A	1,5,6,8	1A,1B,2B,5A
E	.....	.....	.....	.....
F	.....	.....	.....	.....
G	3	BACKWASH UNIT B	1,2,3	1A,2A,3B,4B
H	4	RINSE UNIT B	1,2,4,5	1A,2A,5B,1B

3 TANK SEQUENTIAL FILTER (58-03)

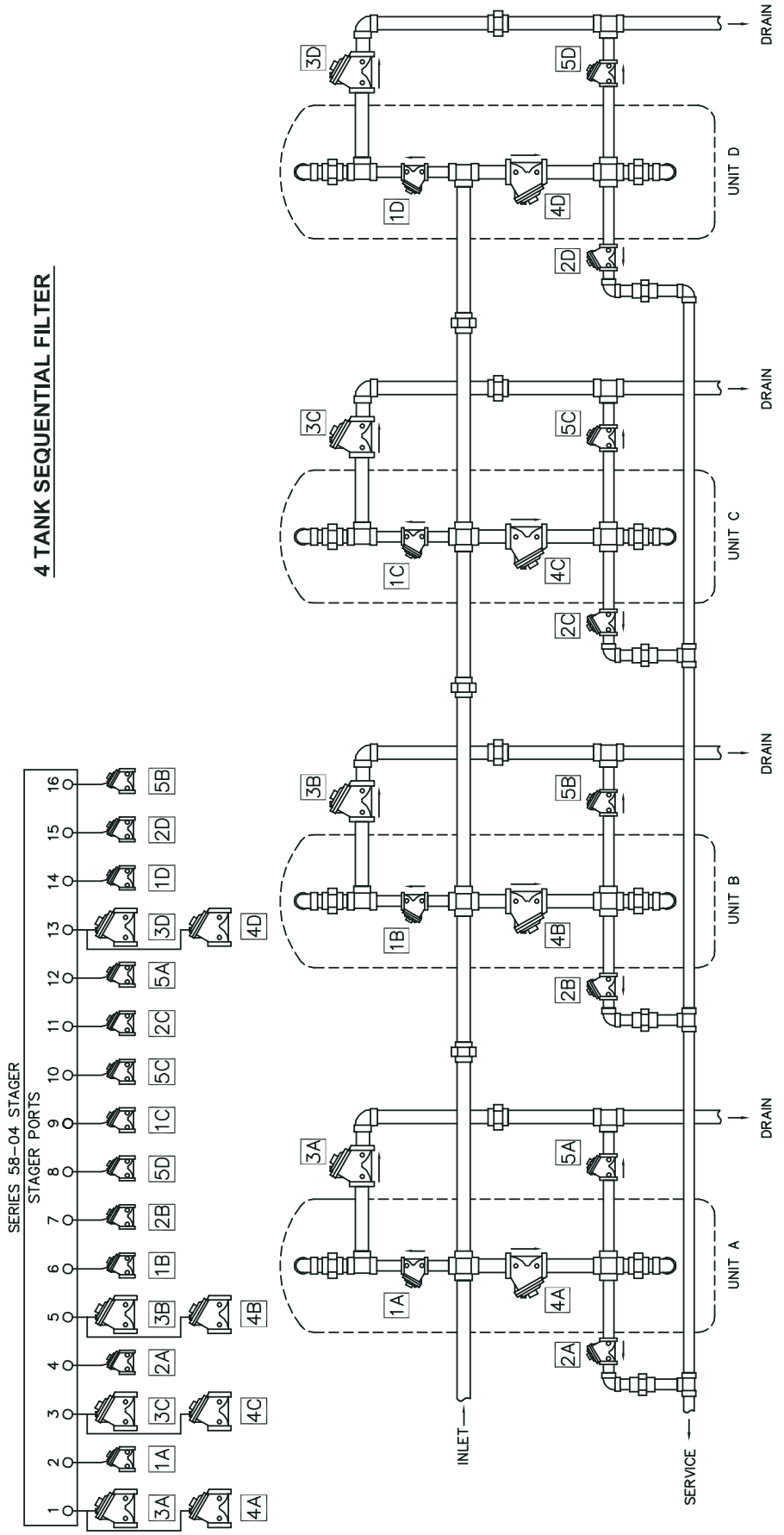


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

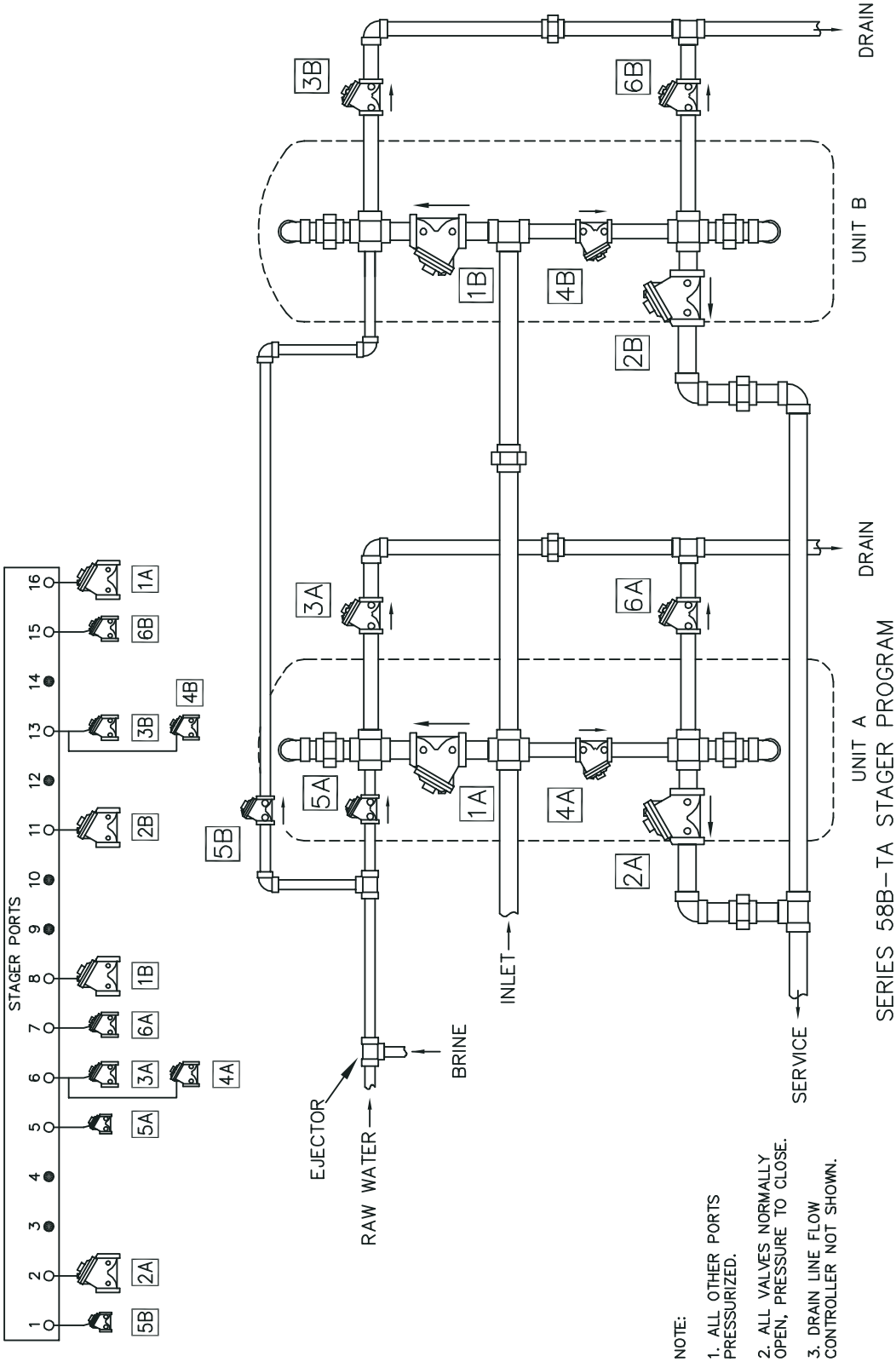
NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	2,4,6,7,9,11	1A,2A,1B,2B,1C,2C	J				
B					K				
C	1	BACKWASH UNIT A	1,6,7,9,11	3A,4A,1B,2B,1C,2C	L	5	BACKWASH UNIT C	2,3,4,6,7	1A,2A,1B,2B,3C,4C
D	2	RINSE UNIT A	2,6,7,9,11,12	1A,5A,1B,2B,1C,2C	M	6	RINSE UNIT C	2,4,6,7,9,10	1A,2A,1B,2B,1C,5C
E					N				
F					P				
G	3	BACKWASH UNIT B	2,4,5,9,11	1A,2A,3B,4B,1C,2C	Q				
H	4	RINSE UNIT B	2,4,6,9,11,16	1A,2A,1B,5B,1C,2C	R				

4 TANK SEQUENTIAL FILTER (58-04 STAGER)



NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	2,4,6,7,9,11	1A,2A,1B,2B,1C,2C,1D,2D	J				
B					K				
C	1	BACKWASH UNIT A	1,6,7,9,11	3A,4A,1B,2B,1C,2C,1D,2D	L	5	BACKWASH UNIT C	2,3,4,6,7	1A,3C,4C,2A,1B,2B,1D,2D
D	2	RINSE UNIT A	2,6,7,9,11,12	1A,1B,2B,1C,2C,5A,1D,2D	M	6	RINSE UNIT C	2,4,6,7,9,10	1A,2A,1B,2B,1C,5C,1D,2D
E					N				
F					P				
G	3	BACKWASH UNIT B	2,4,5,9,11	1A,2A,3B,4B,1C,2C,1D,2D	Q	7	BACKWASH UNIT D	2,4,6,7,9,11,13	1A,2A,1B,2B,1C,2C,(3D,4D)
H	4	RINSE UNIT B	2,4,6,9,11,16	1A,2A,1B,1C,2C,1D,2D,5B	R	8	RINSE UNIT D	2,4,6,7,8,9,11,14	1A,2A,1B,2B,5D,1C,2C,1D

TWO TANK ALTERNATING SOFTENER (58-TA STAGER)



NOTCH	POS.	FUNCTION		PORTS VENTED (NOTE 1)	VALVES OPEN
		UNIT A	UNIT B		
A	0	SERVICE	STANDBY	1,2,8,16	5B,2A,1B,1A
B					
C					
D	1	BACKWASH	SERVICE	6,8,11	3A,4A,2B,1B
E	2	BRINE/SLOW RINSE	SERVICE	5,7,8,11	5A,6A,2B,1B
F					
G					
H	3	FAST RINSE	SERVICE	7,8,11,16	6A,1B,2B,1A

NOTCH	POS.	FUNCTION		PORTS VENTED (NOTE 1)	VALVES OPEN
		UNIT A	UNIT B		
J	4	STANDBY	SERVICE	8,11,16	1B,2B,1A
K					
L					
M					
N					
P	6	SERVICE	BACKWASH	2,13,16	2A,3B,4B,1A
Q	7	SERVICE	BRINE/SLOW RINSE	1,2,15,16	5B,2A,6B,1A
R	8	SERVICE	FAST RINSE	2,8,15,16	2A,1B,6B,1A

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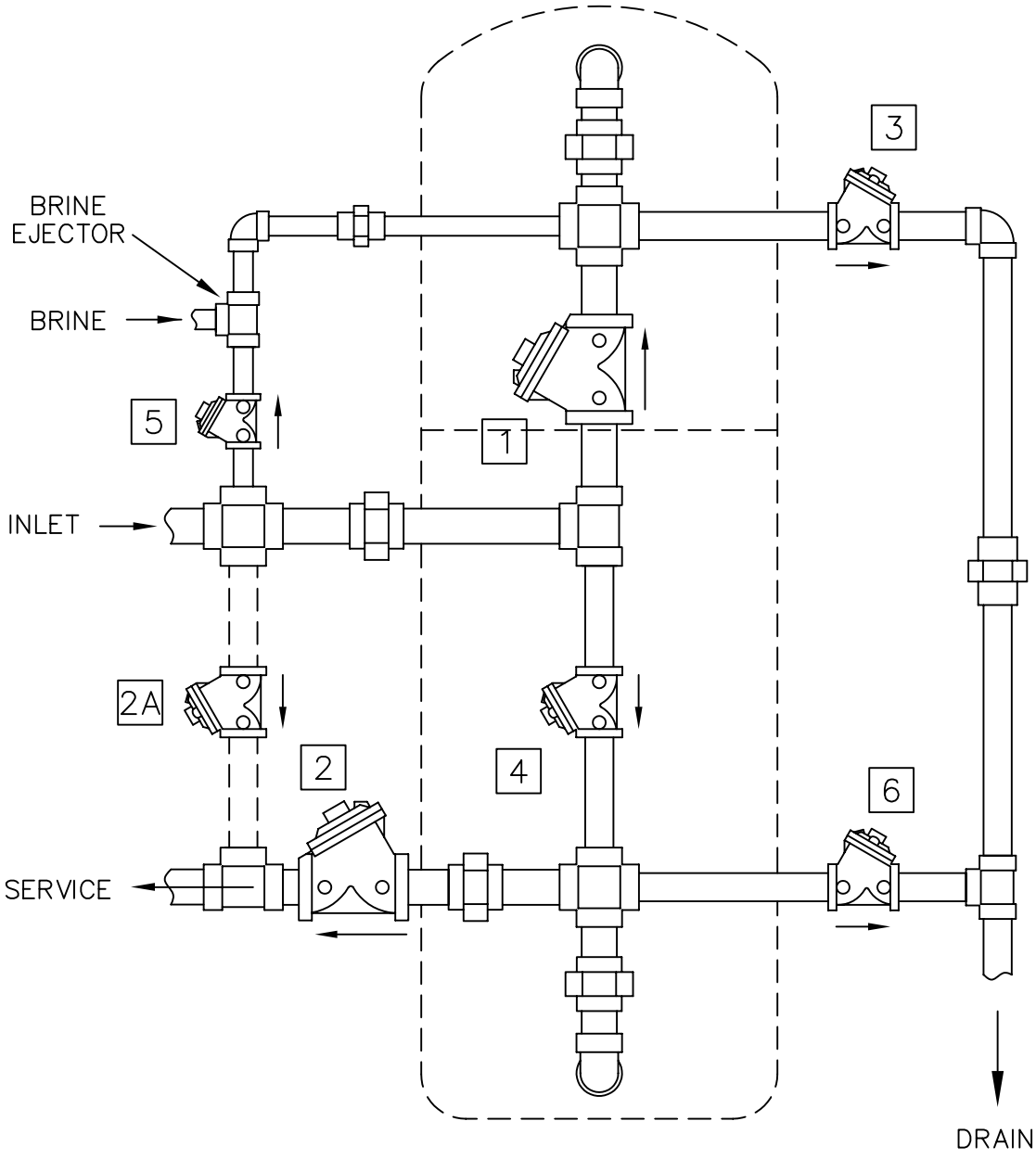
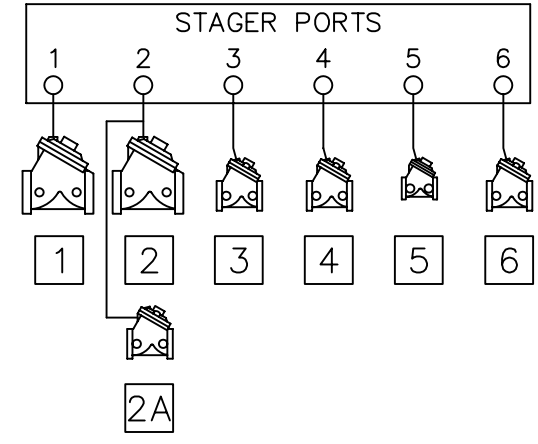
4 POSITION SOFTENER (48-00 STAGER)



4 POSITION SOFTENER

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	4	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E	2	BRINE	5,6	5,6,2A
F	3	RINSE	1,6	1,6,2A

SERIES 48–00 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.

2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.

3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.

4. BRINE VALVE AND DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	CHANGED PIPING TO VALVE 2A TO BE DOTTED	NONE	MSM	15APR03	
A	INITIAL RELEASE	NONE	JWB	31JUL01	MSM

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4 POSITION SOFTENER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078271

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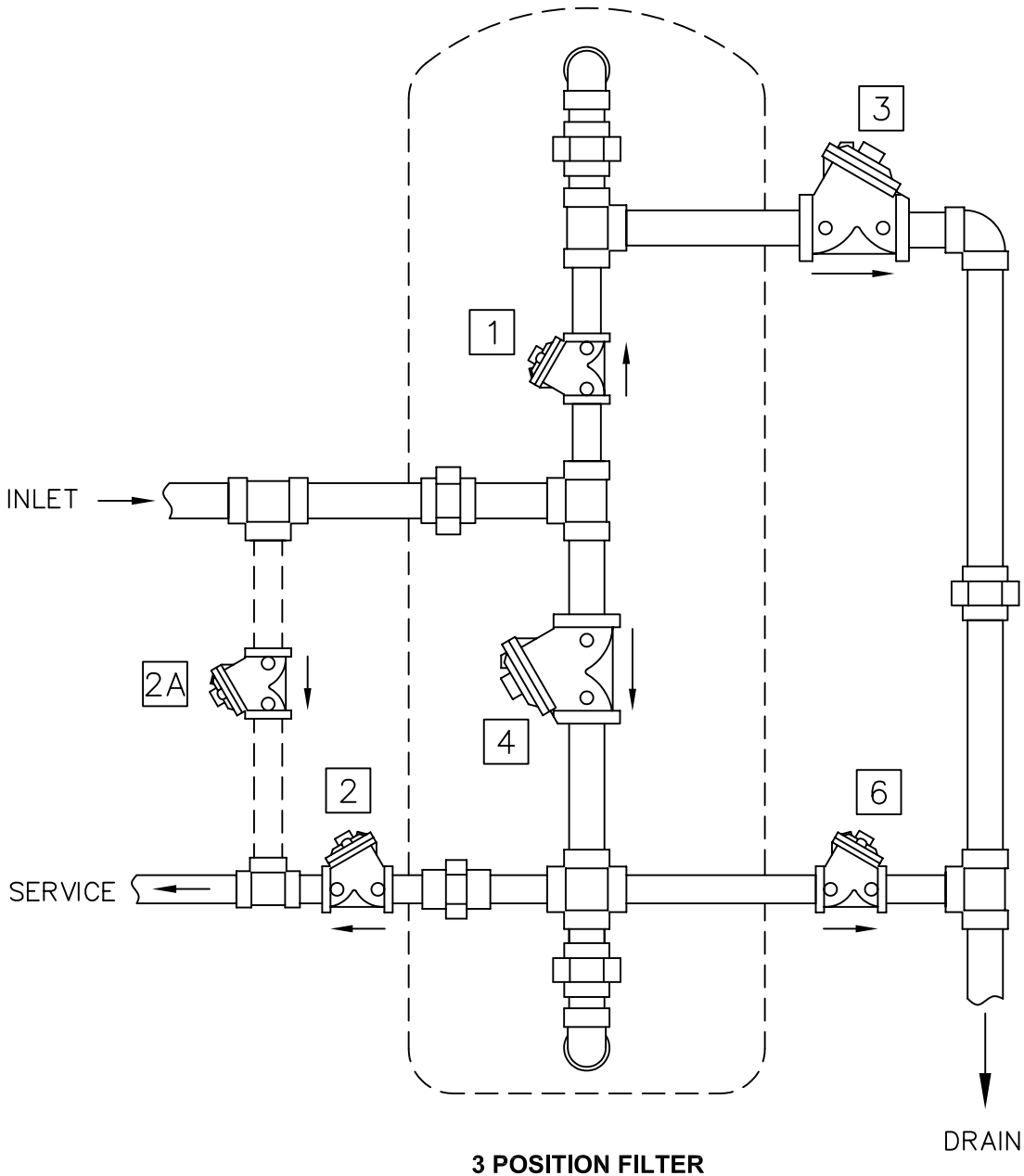
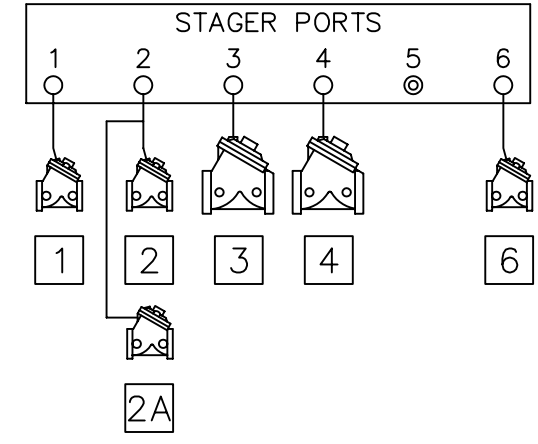
3 POSITION FILTER (48-01 STAGER)



3 POSITION FILTER

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	3	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E				
F	2	RINSE	1,6	1,6,2A

SERIES 48-01 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	CHANGED PIPING TO VALVE 2A TO BE DOTTED	NONE	MSM	15APR03	
A	INITIAL RELEASE	NONE	JWB	31JUL01	MSM

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3 POSITION FILTER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078272

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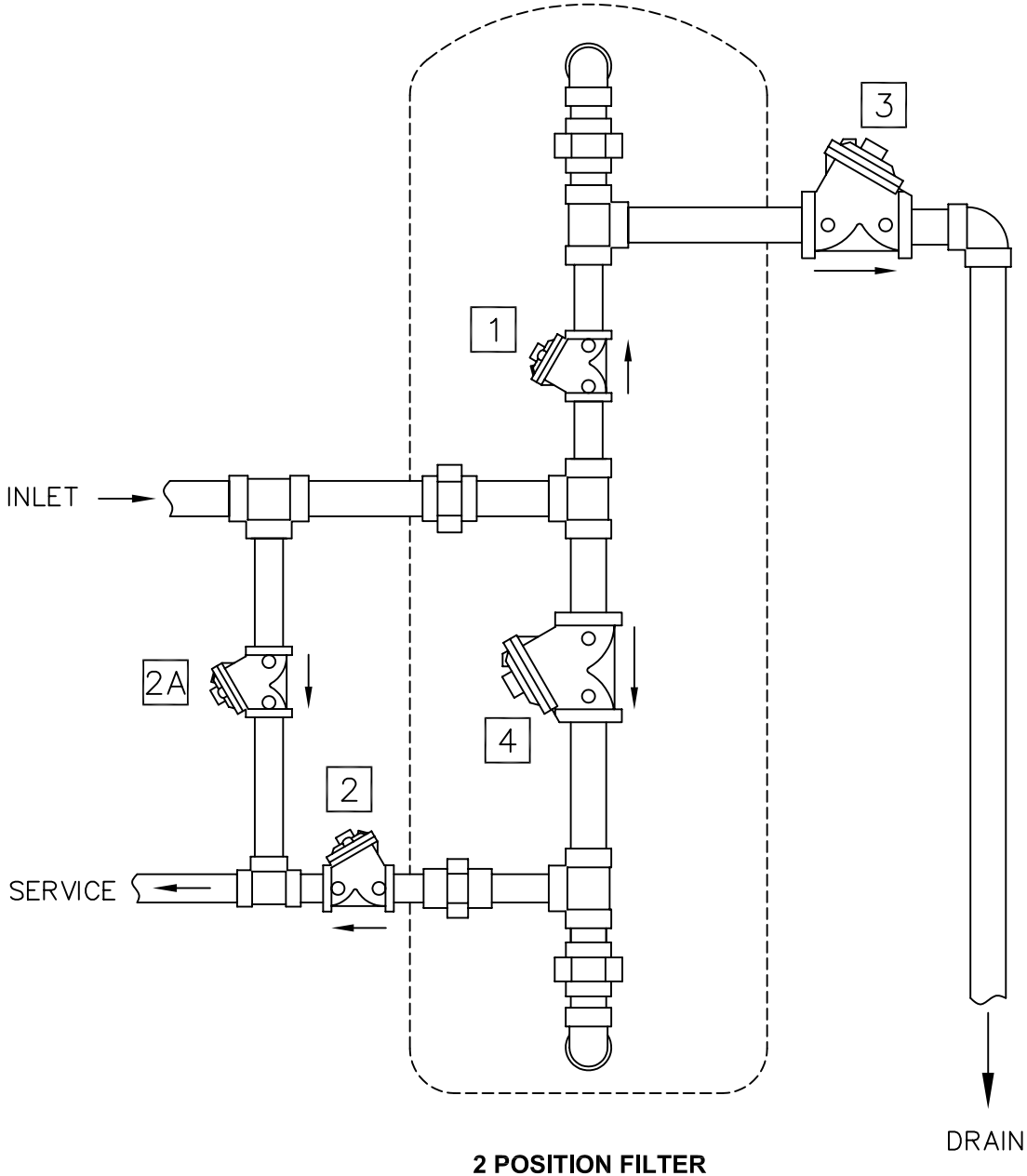
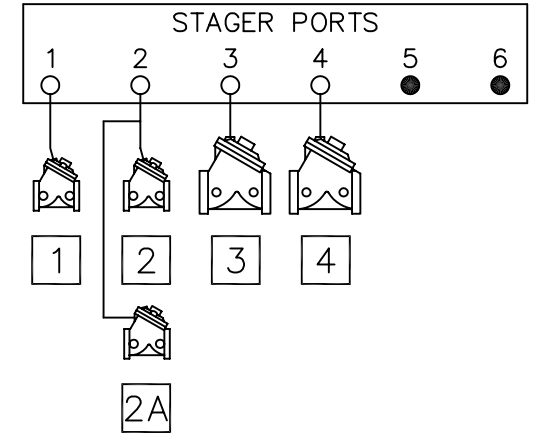
2 POSITION FILTER (48-04 STAGER)



2 POSITION FILTER

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	2	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D				
E				
F				

SERIES 48–04 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.

2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.

3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.

4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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2 POSITION FILTER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078273

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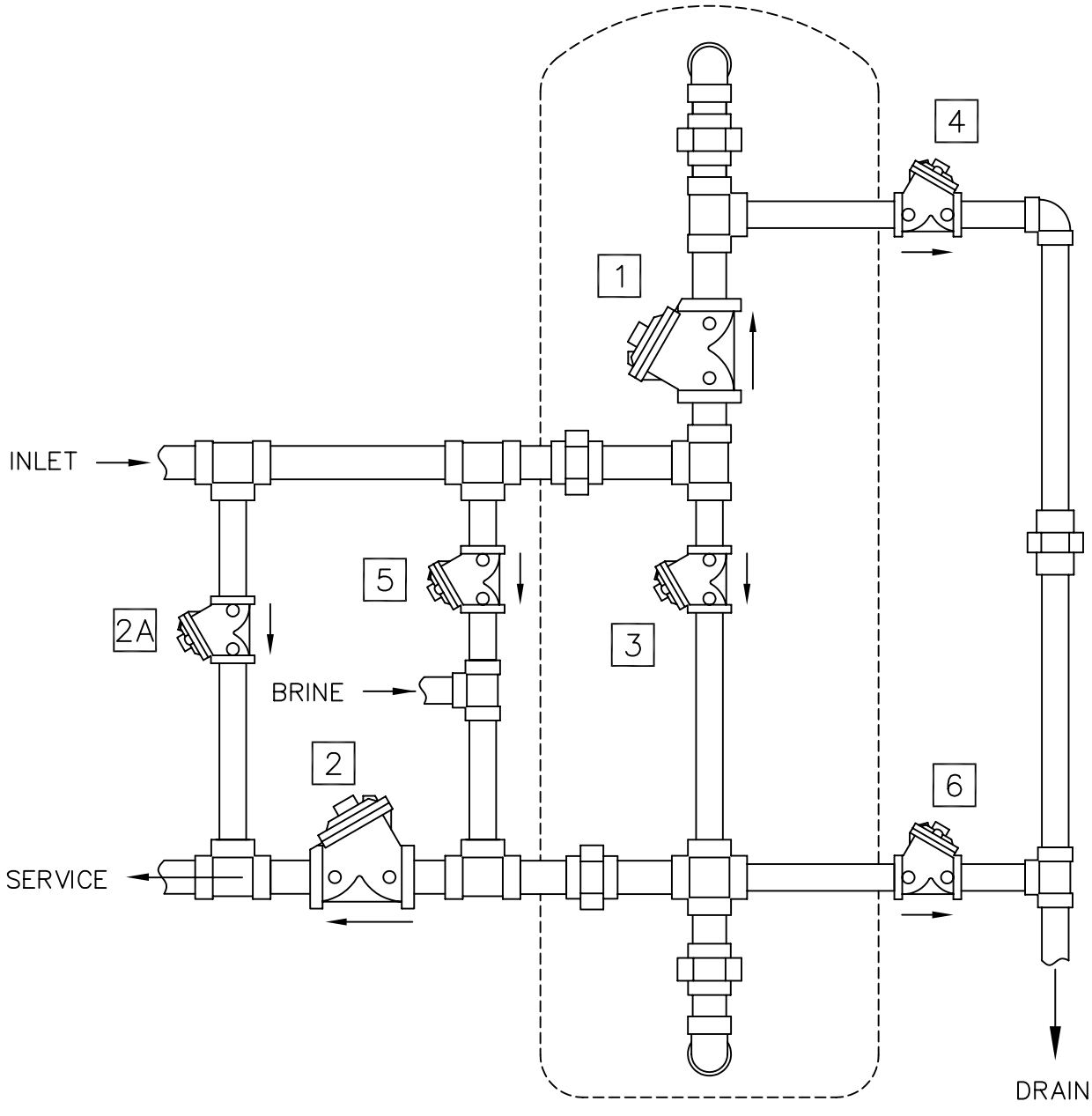
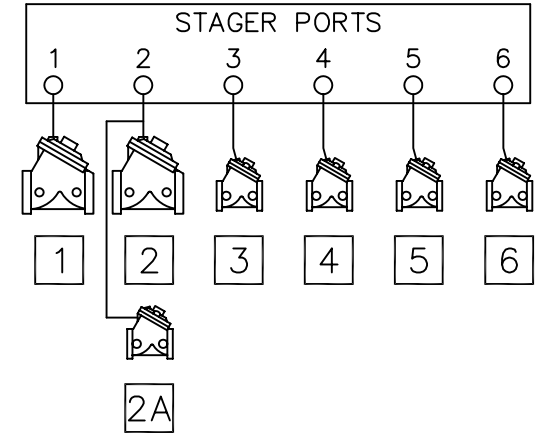
4 POS. SOFTENER COUNTER CURRENT REGEN. (48-12 STAGER)



4 POSITION SOFTENER COUNTER CURRENT REGENERATION

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	4	SERVICE	1,2	1,2
B				
C	1	BACKWASH	3,4	3,4,2A
D	2	BRINE	4,5	4,5,2A
E				
F	3	RINSE	1,6	1,6,2A

SERIES 48–12 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. BRINE VALVE AND DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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4 POSITION SOFTENER COUNTER CURRENT REGENERATION

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078274

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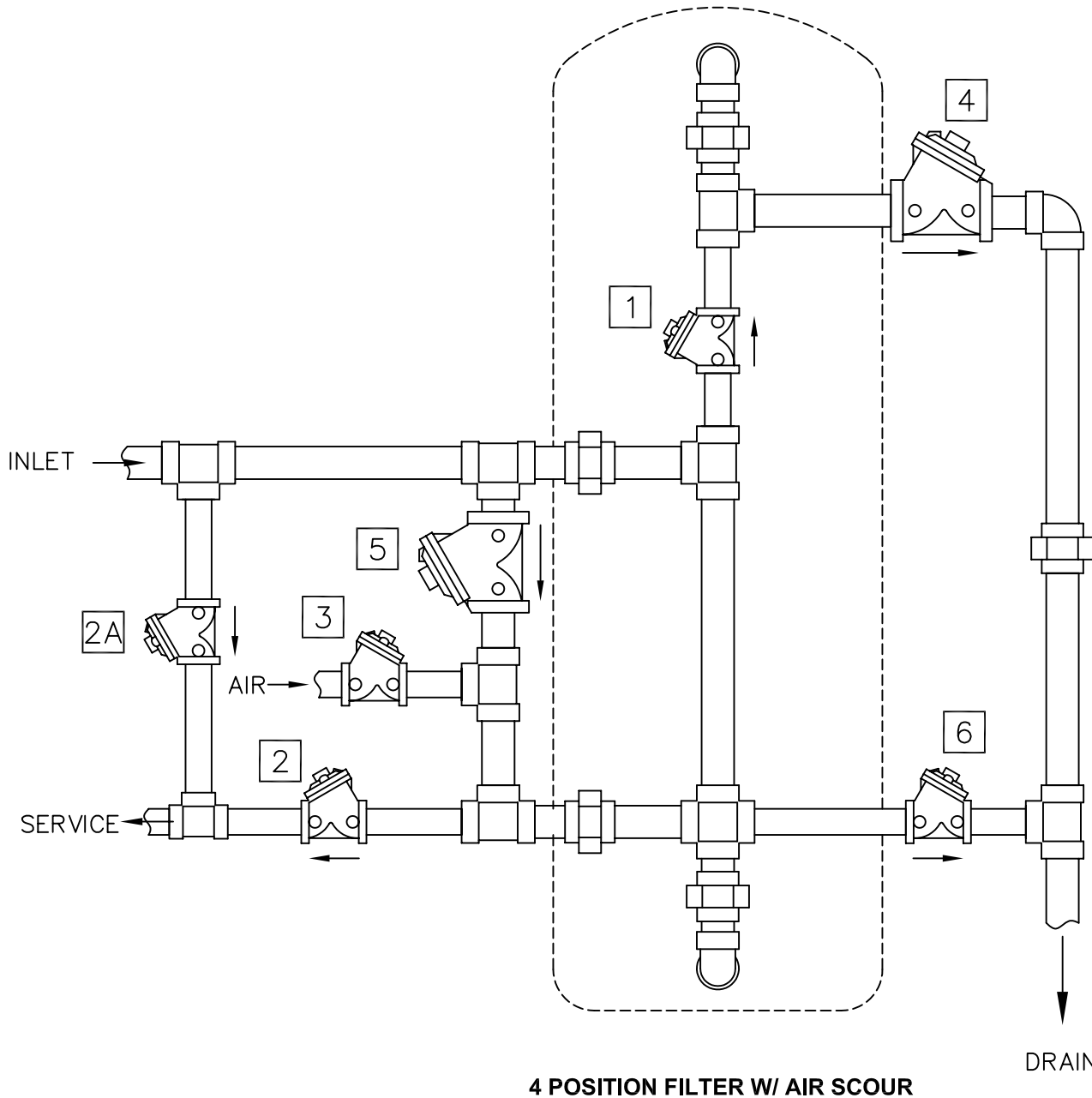
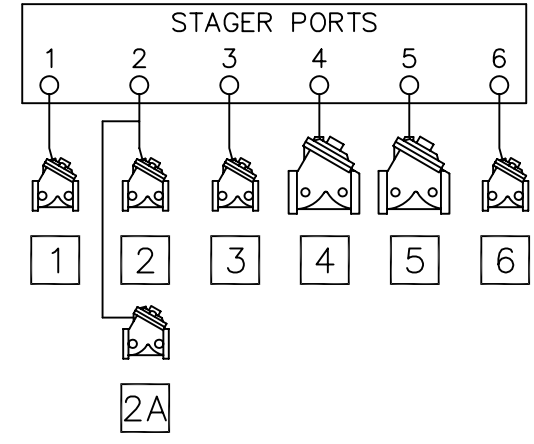
4 POSITION FILTER W/ AIR SCOUR (48-12 STAGER)



4 POSITION FILTER W/ AIR SCOUR

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	4	SERVICE	1,2	1,2
B				
C	1	AIR SCOUR	3,4	3,4,2A
D	2	BACKWASH	4,5	4,5,2A
E				
F	3	RINSE	1,6	1,6,2A

SERIES 48–12 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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4 POSITION FILTER W/ AIR SCOUR

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078275

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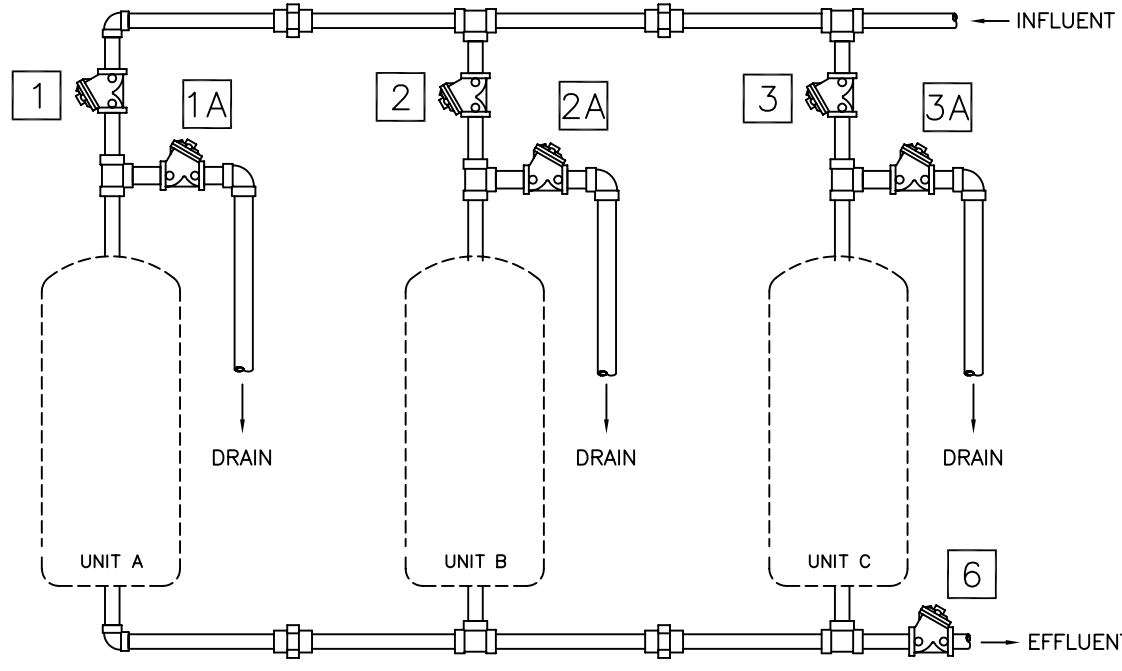
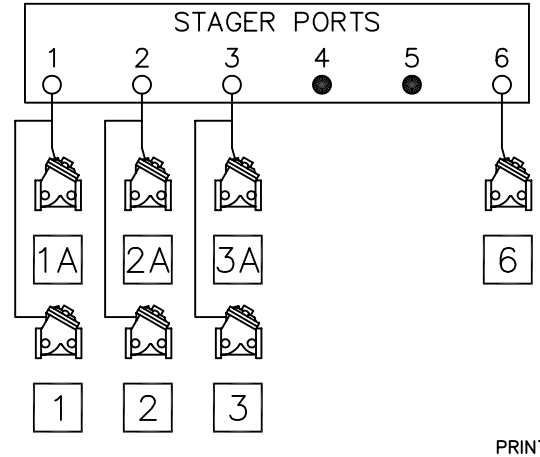
3 TANK SEQUENTIAL FILTER (48-83 STAGER)

3 TANK SEQUENTIAL FILTER BACKWASH ONLY



SERIES 48–83 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. VALVES 1A,2A,3A,6 ARE NORMALLY OPEN PRESSURE TO CLOSE.
3. VALVES 1,2,3 ARE NORMALLY CLOSED, PRESSURE TO OPEN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	2	BACKWASH UNIT B	2	1,2A,3
B	3	BACKWASH UNIT C	3	1,2,3A
C				
D				
E	4	SERVICE	6	1,2,3,6
F	1	BACKWASH UNIT A	1	1A,2,3

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REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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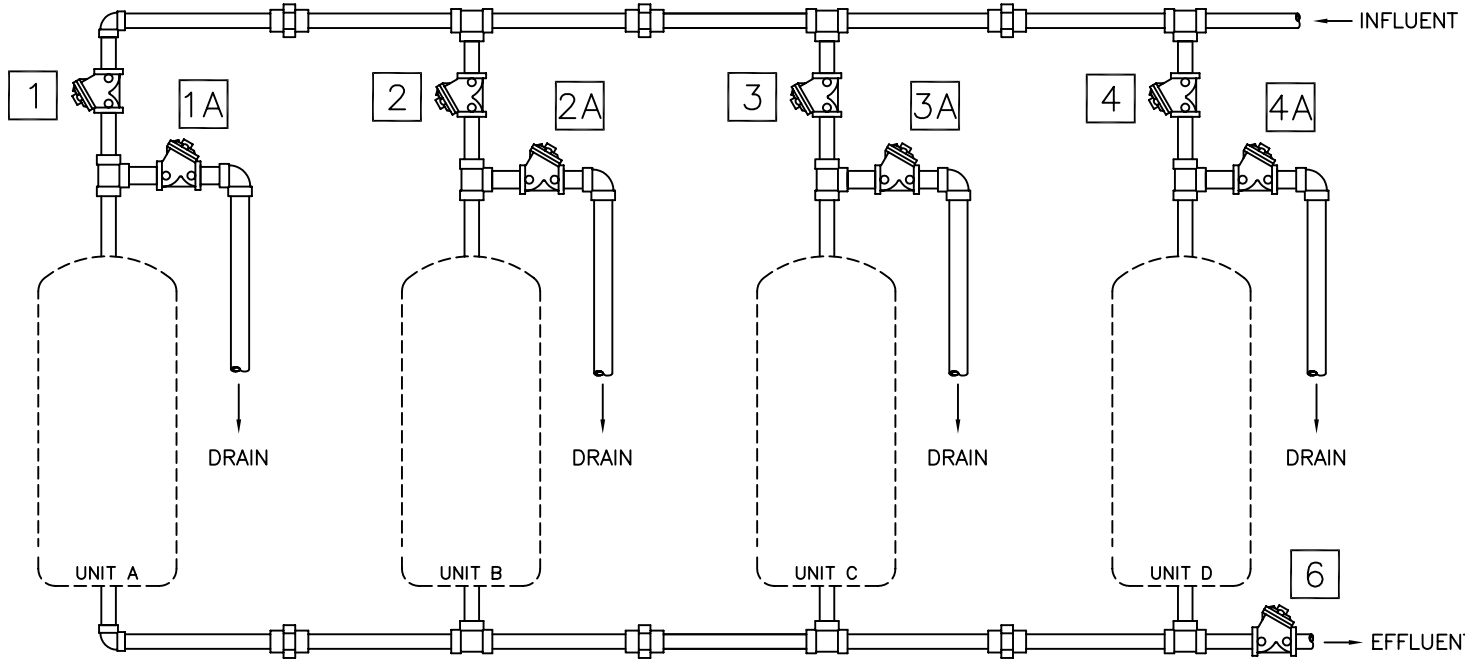
3 TANK SEQUENTIAL FILTER BACKWASH ONLY

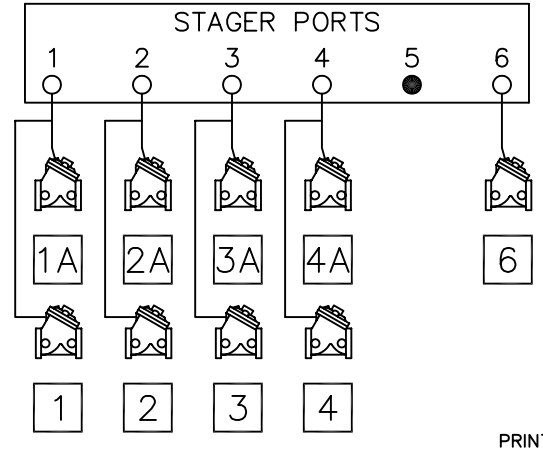
SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078276

4 TANK SEQUENTIAL FILTER (48-84 STAGER)

4 TANK SEQUENTIAL FILTER BACKWASH ONLY



SERIES 48–84 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.

2. VALVES 1A,2A,3A,4A,6 ARE NORMALLY OPEN PRESSURE TO CLOSE.

3. VALVES 1,2,3,4 ARE NORMALLY CLOSED, PRESSURE TO OPEN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	2	BACKWASH UNIT B	2	1,2A,3,4
B	3	BACKWASH UNIT C	3	1,2,3A,4
C	4	BACKWASH UNIT D	4	1,2,3,4A
D				
E	5	SERVICE	6	1,2,3,4,6
F	1	BACKWASH UNIT A	1	1A,2,3,4

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REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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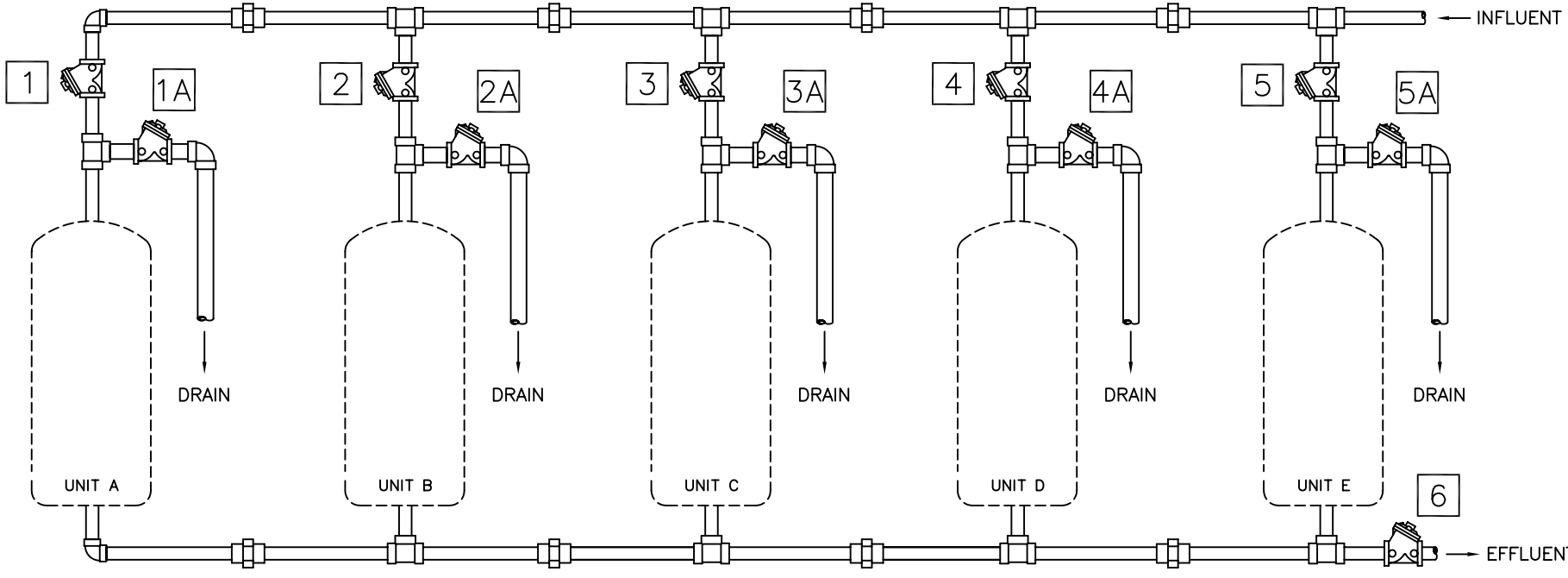
4 TANK SEQUENTIAL FILTER BACKWASH ONLY

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078277

5 TANK SEQUENTIAL FILTER (48-85 STAGER)

5 TANK SEQUENTIAL FILTER BACKWASH ONLY

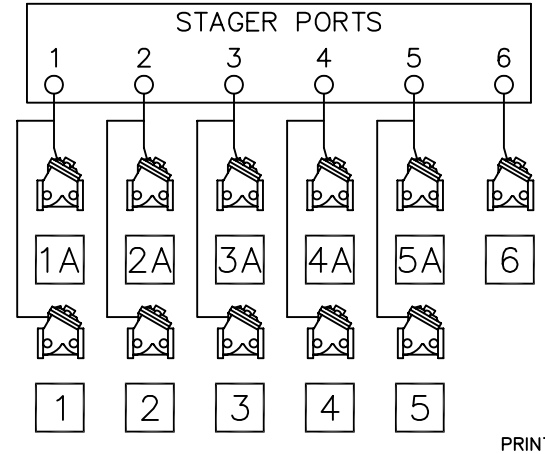


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. VALVES 1A,2A,3A,4A,5A,6 ARE NORMALLY OPEN PRESSURE TO CLOSE.
3. VALVES 1,2,3,4,5 ARE NORMALLY CLOSED, PRESSURE TO OPEN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	2	BACKWASH UNIT B	2	1,2A,3,4,5
B	3	BACKWASH UNIT C	3	1,2,3A,4,5
C	4	BACKWASH UNIT D	4	1,2,3,4A,5
D	5	BACKWASH UNIT E	5	1,2,3,4,5A
E	6	SERVICE	6	1,2,3,4,5,6
F	1	BACKWASH UNIT A	1	1A,2,3,4,5

SERIES 48–85 STAGER



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REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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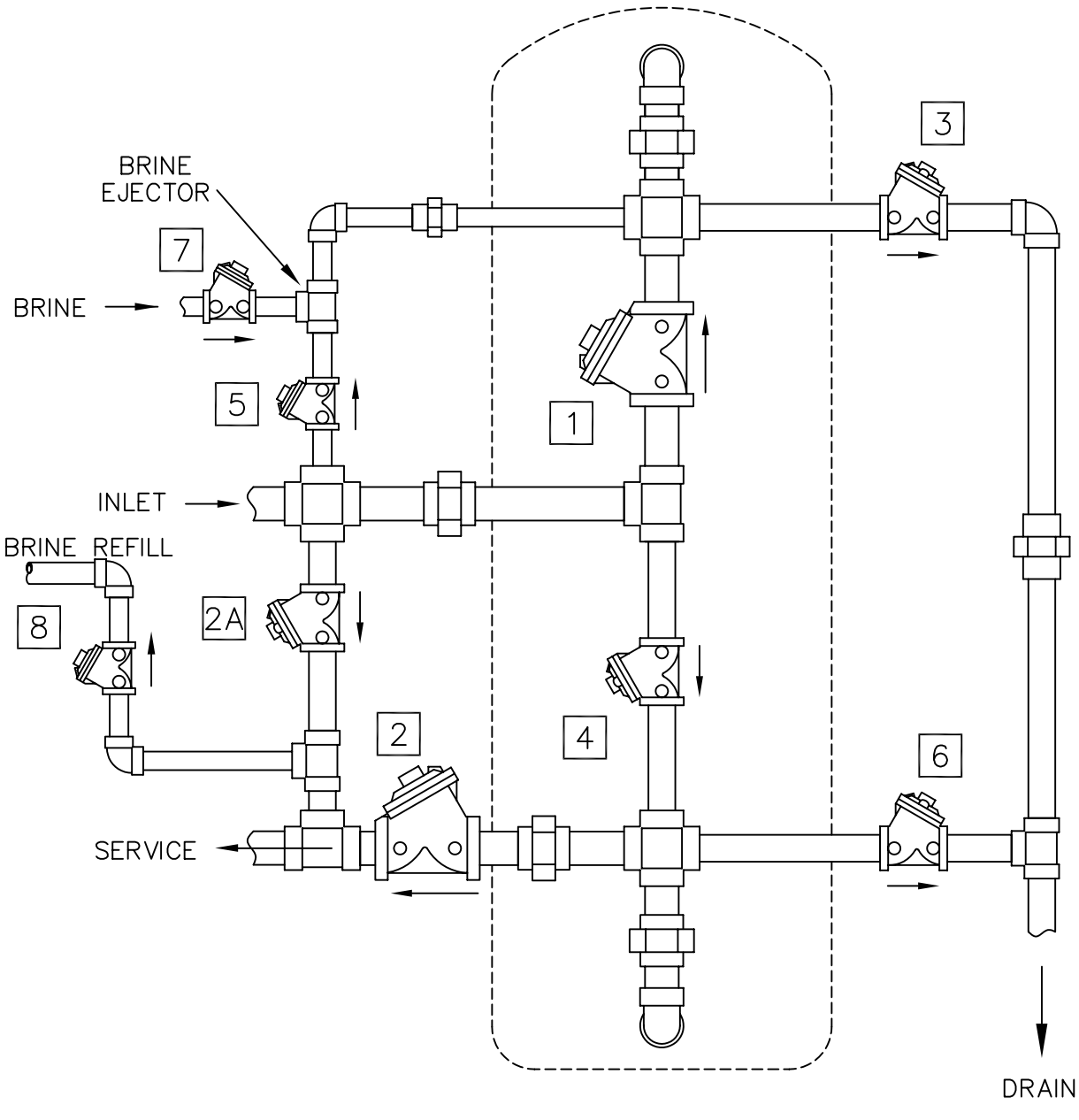
5 TANK SEQUENTIAL FILTER BACKWASH ONLY

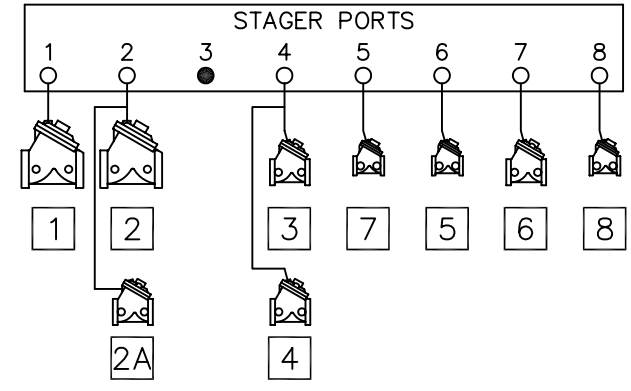
SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078278

6 POS. SOFTENER W/ TIMED BRINE & REFILL (51-06 STAGER)



NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2	1,2
B				
C	1	BACKWASH	4	3,4,2A
D				
E	2	BRINE	5,6,7	5,6,7,2A
F	3	SLOW RINSE	6,7	5,6,2A
G	4	FAST RINSE	1,7	1,6,2A
H	5	BRINE REFILL	1,2,8	1,2,8

SERIES 51-06 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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6 POSITION SOFTENER W/ TIMED BRINE & REFILL

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078279

6 POSITION SOFTENER W/ TIMED BRINE & REFILL

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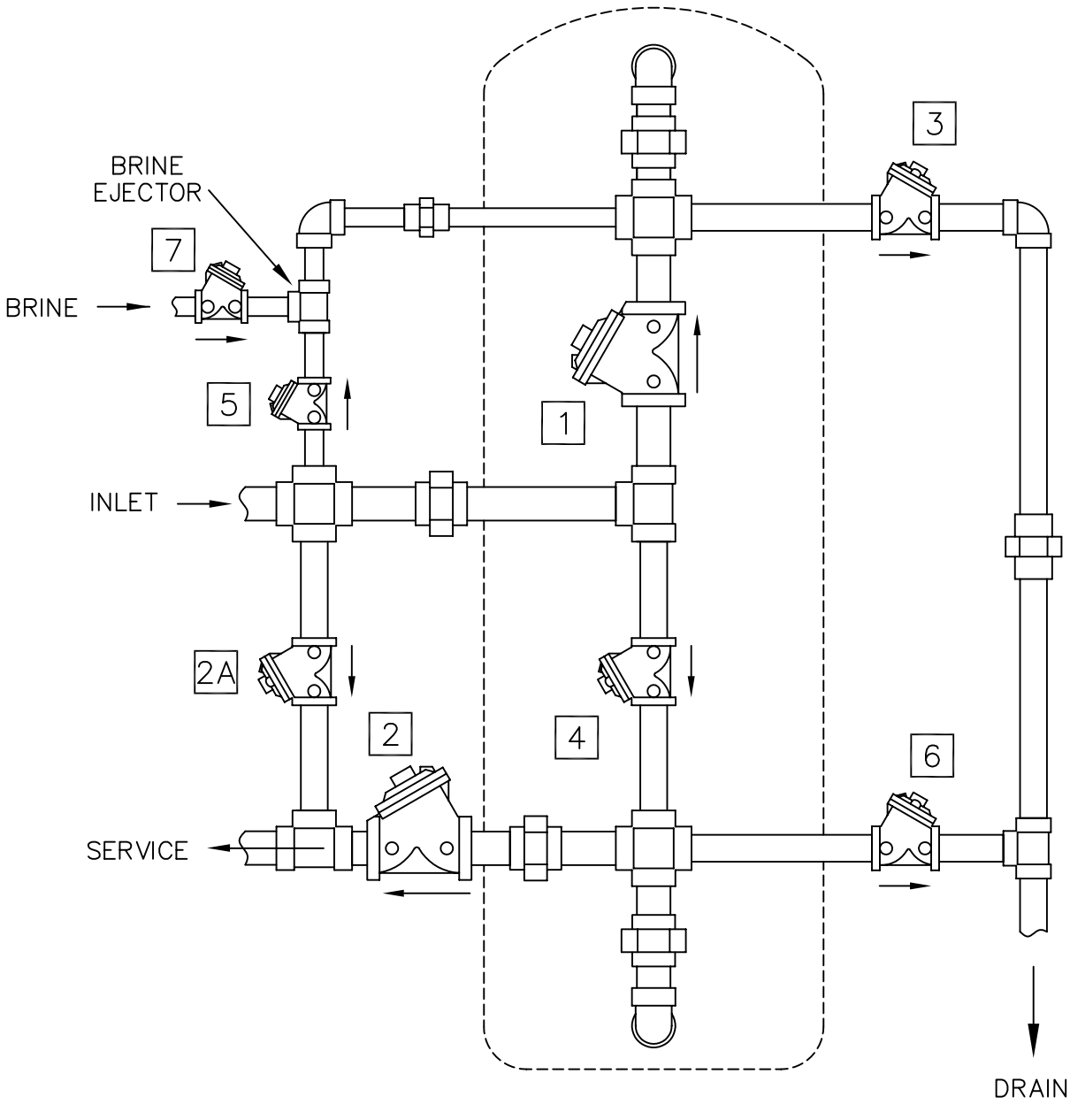
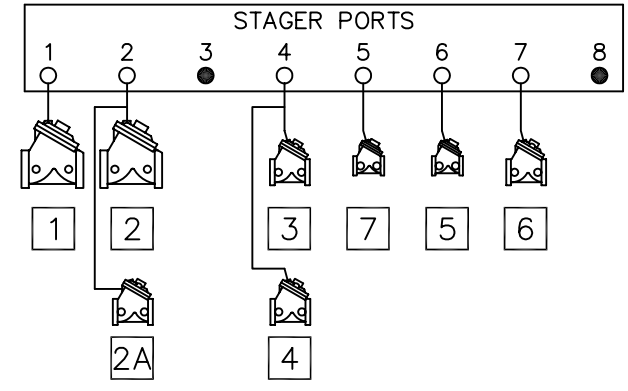
5 POS. SOFTENER W/ TIMED BRINE DRAW (51-07 STAGER)



5 POSITION SOFTENER W/ TIMED BRINE DRAW

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2	1,2
B				
C	1	BACKWASH	4	3,4,2A
D				
E	2	BRINE	5,6,7	5,6,7,2A
F	3	SLOW RINSE	6,7	5,6,2A
G	4	FAST RINSE	1,7	1,6,2A
H				

SERIES 51-07 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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5 POSITION SOFTENER W/ TIMED BRINE DRAW

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078280

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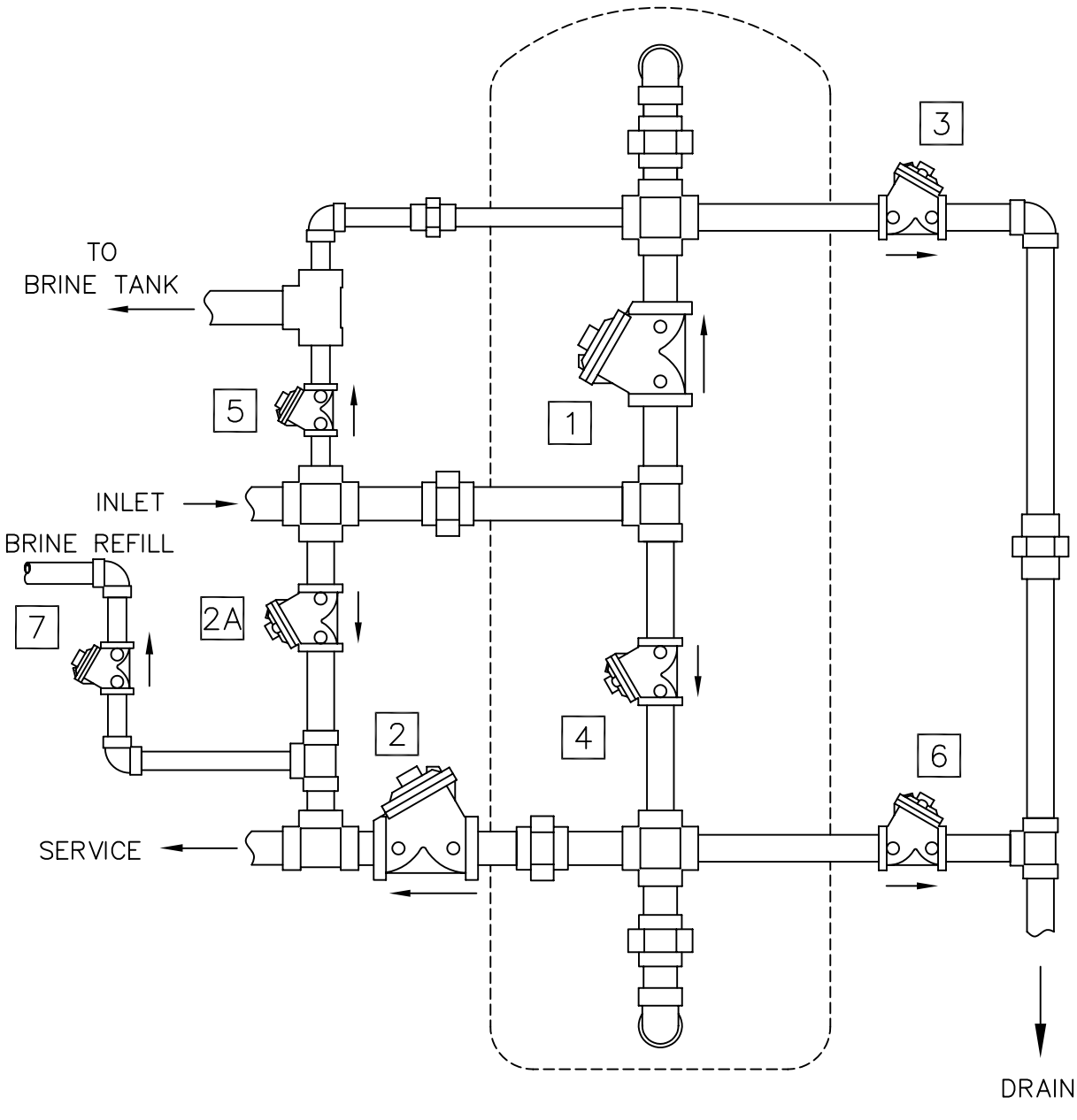
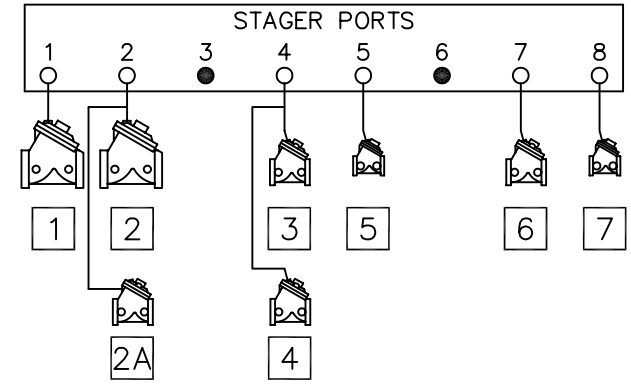
5 POS. SOFTENER W/ TIMED BRINE REFILL (51-09 STAGER)



NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2	1,2
B				
C				
D	1	BACKWASH	4	3,4,2A
E	2	BRINE/SLOW RINSE	5,7	5,6,2A
F				
G	3	FAST RINSE	1,7	1,6,2A
H	4	BRINE REFILL	1,2,8	1,2,7

SERIES 51-09 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.

2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.

3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.

4. BRINE VALVE AND DRAIN LINE FLOW CONTROLLER NOT SHOWN.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	CORRECTED STAGER	NONE	MSM	17JAN03	

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5 POSITION SOFTENER W/ TIMED BRINE REFILL

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	06JAN03	1078281

5 POSITION SOFTENER W/ TIMED BRINE REFILL

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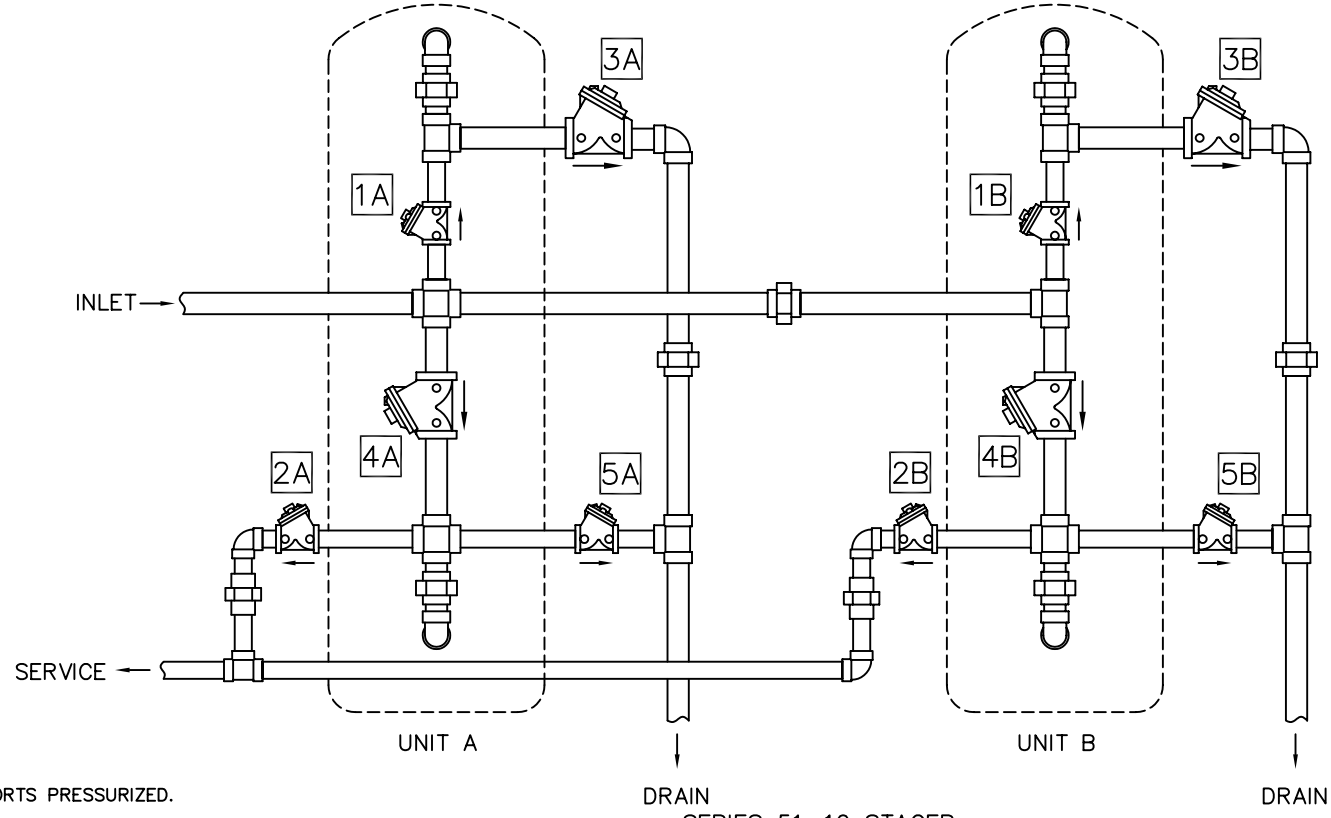
2 TANK SEQUENTIAL FILTER

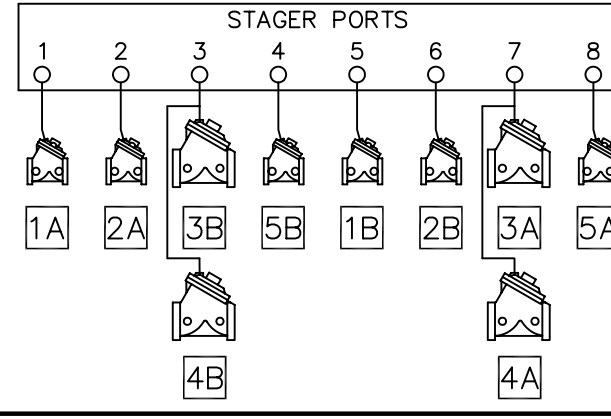


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2,5,6	1A,2A,1B,2B
B				
C	1	BACKWASH UNIT A	5,6,7	1B,2B,3A,4A
D	2	RINSE UNIT A	1,5,6,8	1A,1B,2B,5A
E				
F				
G	3	BACKWASH UNIT B	1,2,3	1A,2A,3B,4B
H	4	RINSE UNIT B	1,2,4,5	1A,2A,5B,1B

SERIES 51-10 STAGER



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REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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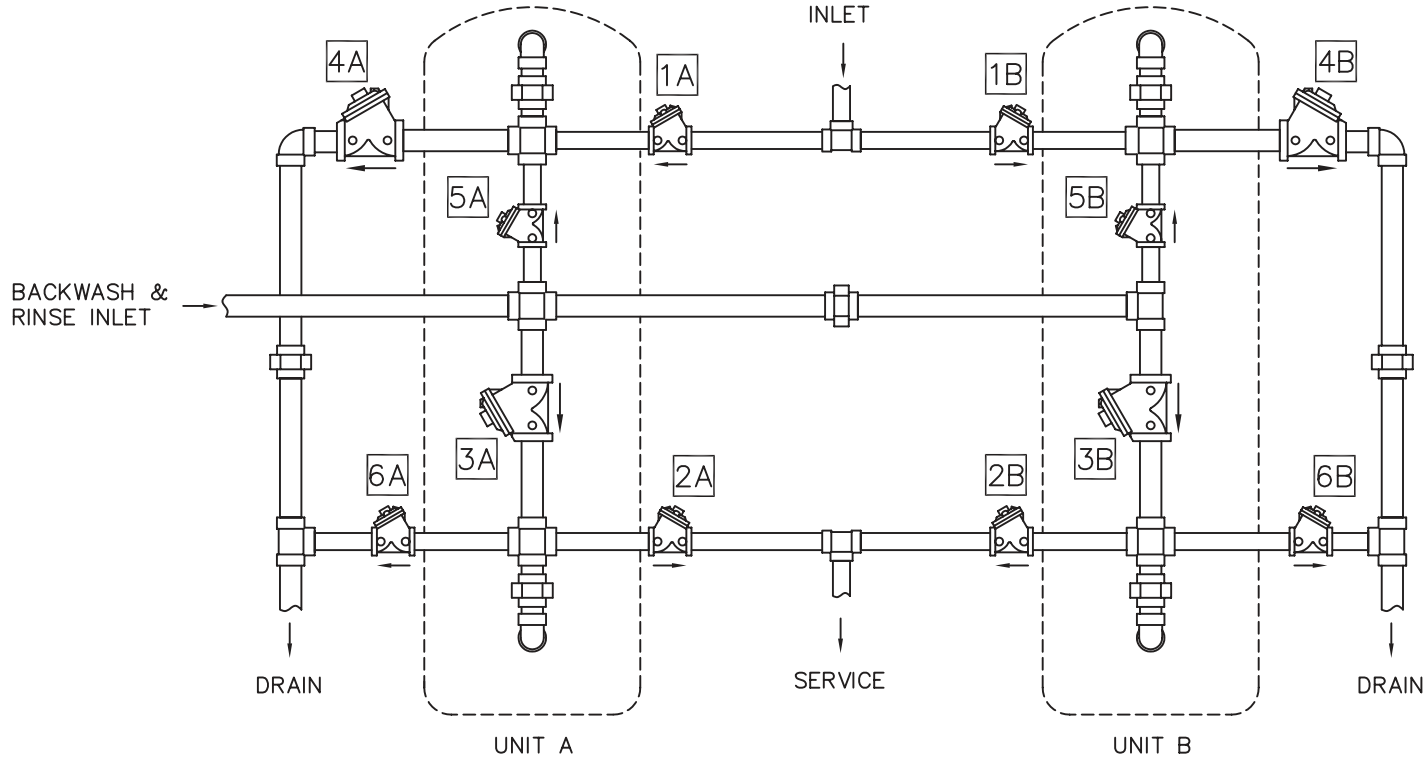
2 TANK SEQUENTIAL FILTER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078282

2 TANK SEQUENTIAL FILTER (51-10 STAGER)

2 TANK SEQUENTIAL FILTER
SEPARATE SOURCE FOR BACKWASH & RINSE SUPPLY

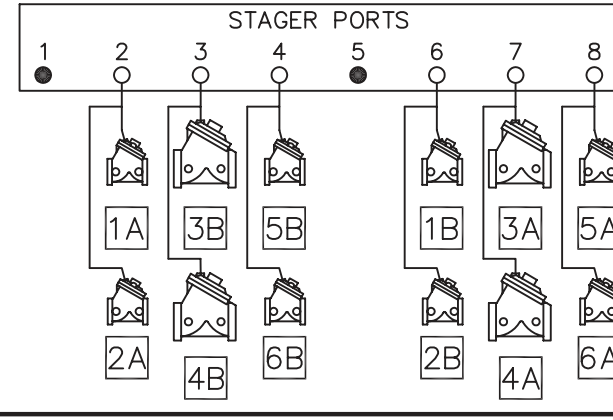


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	2,6	1A,2A,1B,2B
B				
C	1	BACKWASH UNIT A	6,7	1B,2B,3A,4A
D	2	RINSE UNIT A	6,8	1B,2B,5A,6A
E				
F				
G	3	BACKWASH UNIT B	2,3	1A,2A,3B,4B
H	4	RINSE UNIT B	2,4	1A,2A,5B,6B

SERIES 51-10 STAGER



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REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	VALVE 5B WAS CALLED 1B	NONE	MSM	23NOV04	

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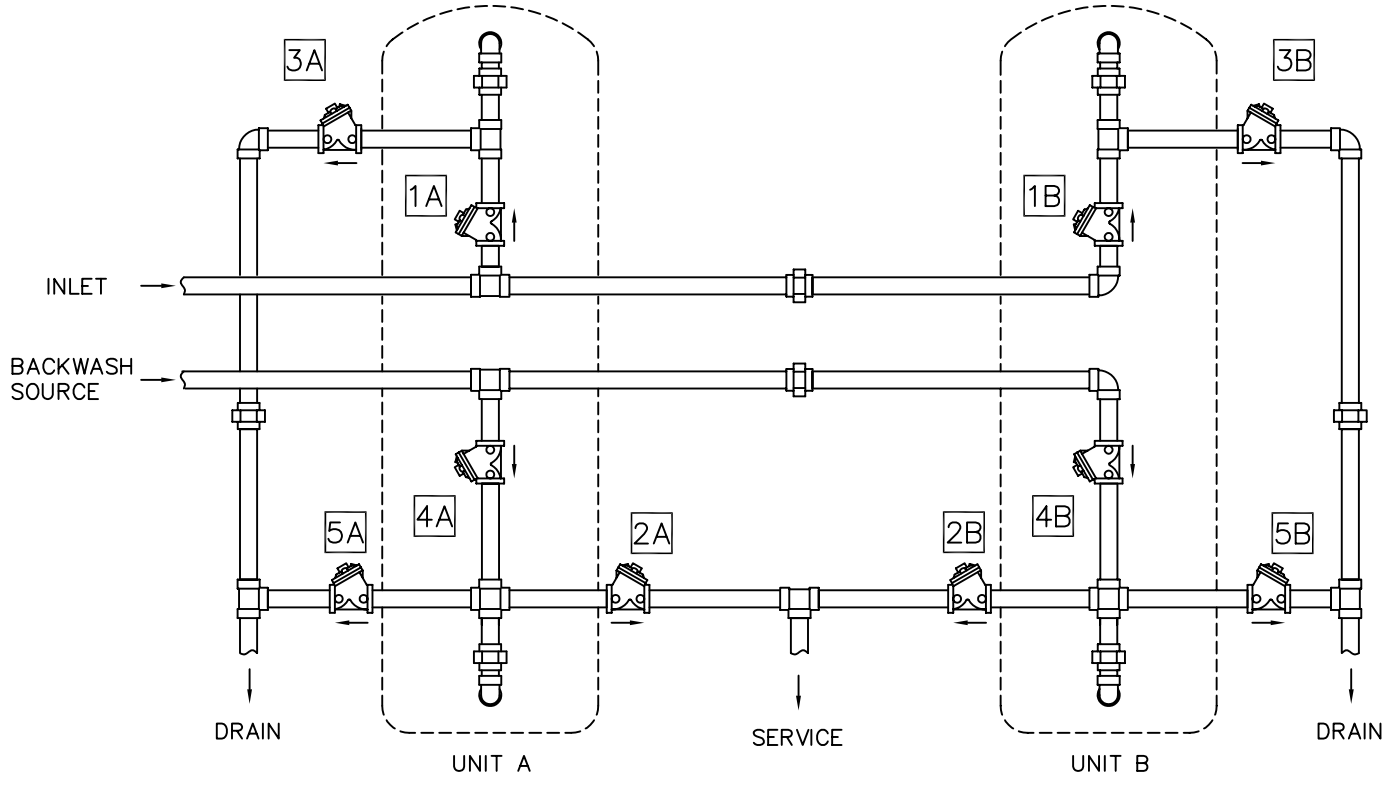
2 TANK SEQUENTIAL FILTER WITH SEPARATE SOURCE FOR BACKWASH & RINSE

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078283

2 TANK SEQUENTIAL FILTER W/ SEPARATE SOURCE FOR BACKWASH & RINSE (51-10 STAGER)

2 TANK SEQUENTIAL FILTER
SEPERATE BACKWASH SOURCE

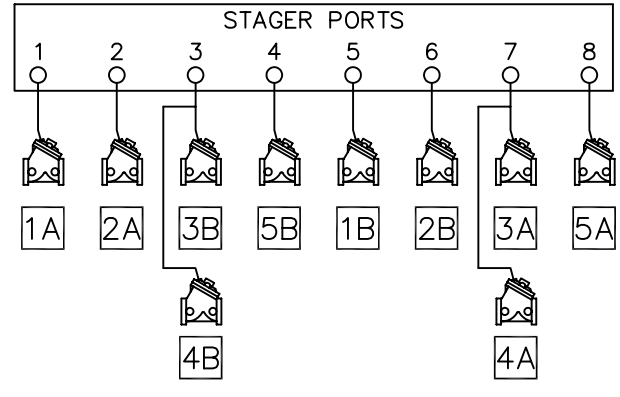


NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2,5,6	1A,2A,1B,2B
B				
C	1	BACKWASH UNIT A	5,6,7	1B,2B,3A,4A
D	2	RINSE UNIT A	1,5,6,8	1A,1B,2B,5A
E				
F				
G	3	BACKWASH UNIT B	1,2,3	1A,2A,3B,4B
H	4	RINSE UNIT B	1,2,4,5	1A,2A,5B,1B

SERIES 51-10 STAGER



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REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	ON PIPING DRAWING, VALVE 1A WAS SHOWN AS VALVE 5A	NONE	MSM	04JUN03	
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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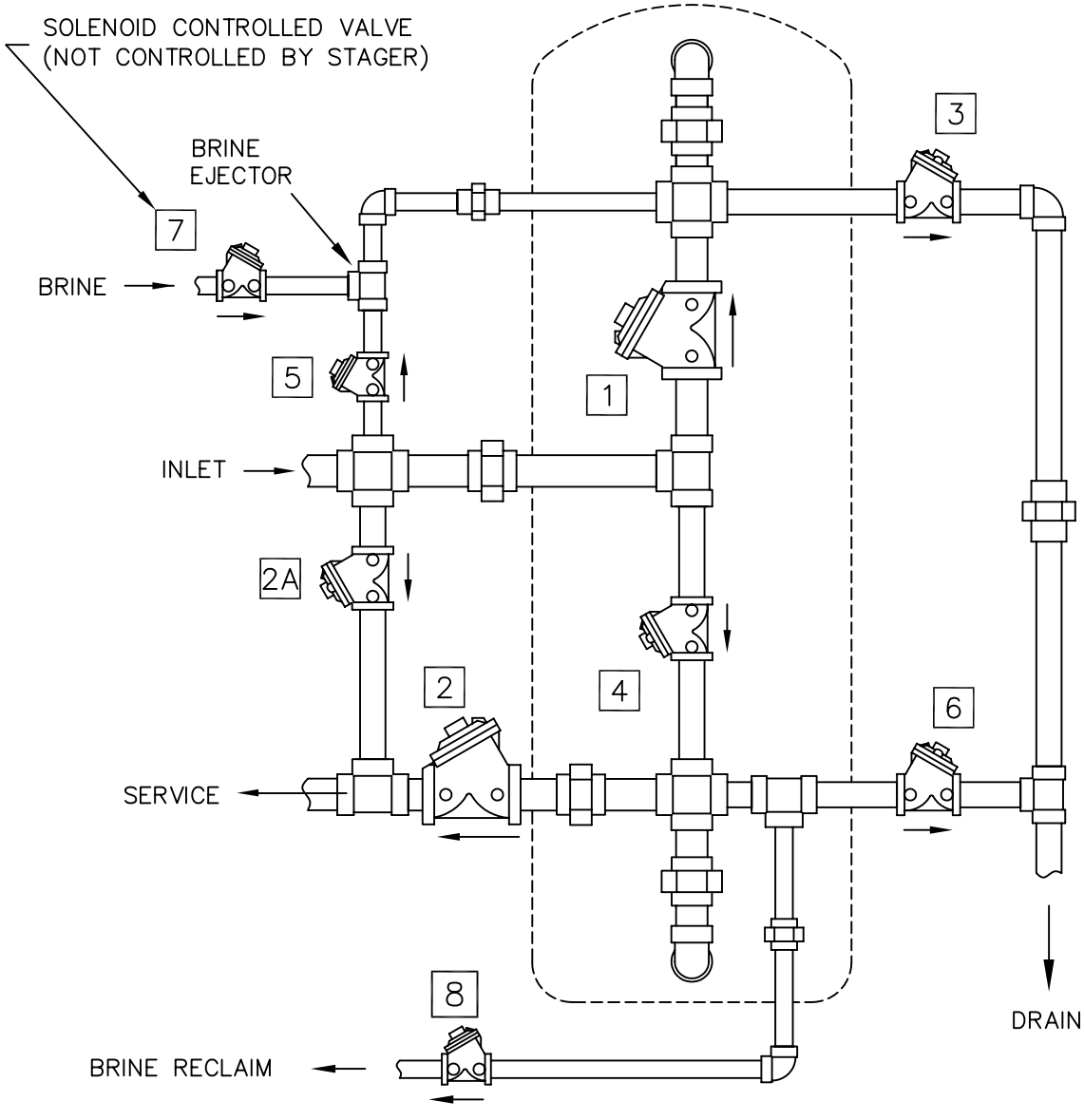
2 TANK SEQUENTIAL FILTER W/ SEPARATE BACKWASH SOURCE

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078284

2 TANK SEQ. FILTER W/SEP. BACKWASH SOURCE (51-10 STAGER)

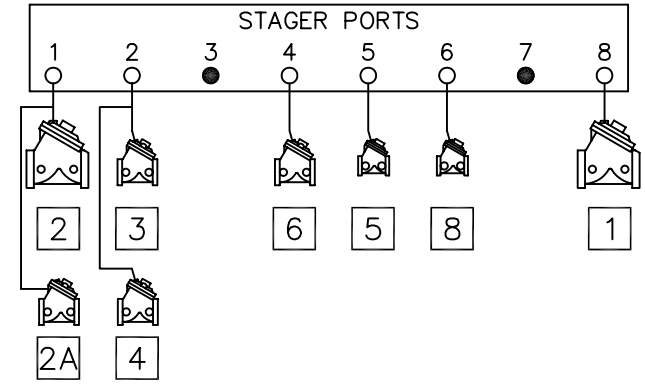
SOFTENER W/ BRINE RECLAIM (51-12 STAGER)



SOFTENER W/ BRINE RECLAIM

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,8	1,2
B	1	BACKWASH	2	3,4,2A
C				
D	2	BRINE	4,5	5,6,2A,(7)
E	3	DISPLACE	4,5	5,6,2A
F	4	RECLAIM BRINE	5,6	5,8,2A
G	5	FAST RINSE	4,8	1,6,2A
H				

SERIES 51-12 STAGER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES (EXCEPT NO. 2A) NORMALLY OPEN, PRESSURE TO CLOSE. VALVE 2A NORMALLY CLOSED.
3. VALVE 2A REQUIRED FOR RAW WATER BYPASS DURING REGENERATION.
4. DRAIN LINE FLOW CONTROLLER NOT SHOWN.
5. VALVE NO. 7 SOLENOID CONTROLLED (NOT CONTROLLED BY STAGER).

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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SOFTENER W/ BRINE RECLAIM

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078285

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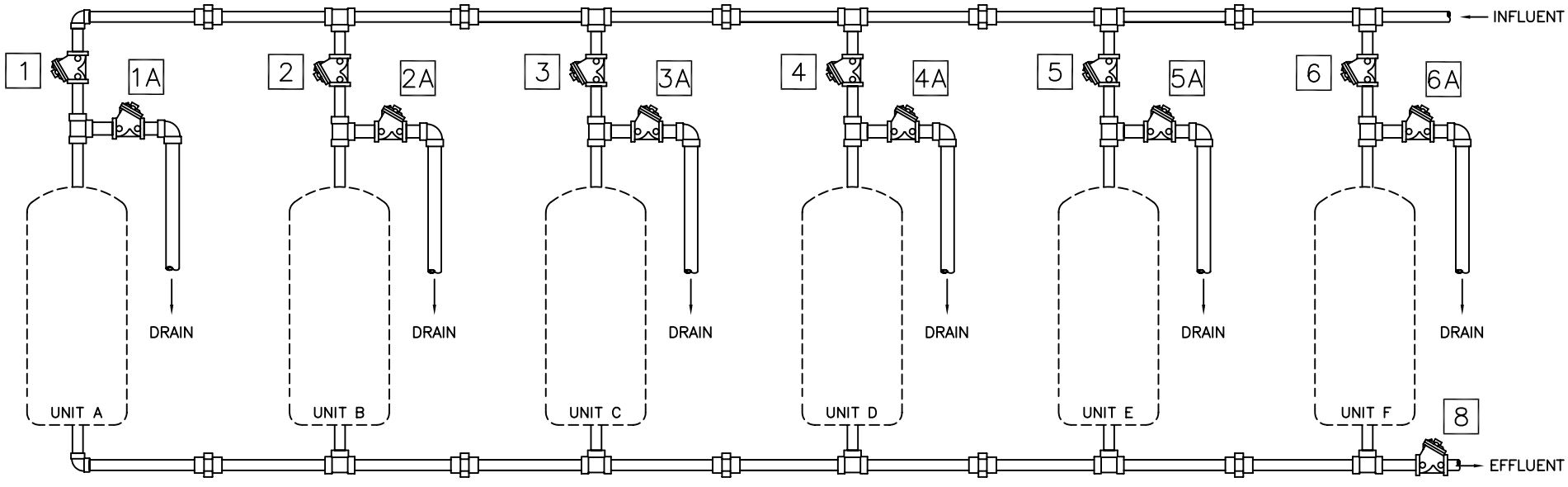
6 TANK SEQUENTIAL FILTER (51-86 STAGER)

6 TANK SEQUENTIAL FILTER BACKWASH ONLY



NOTE:

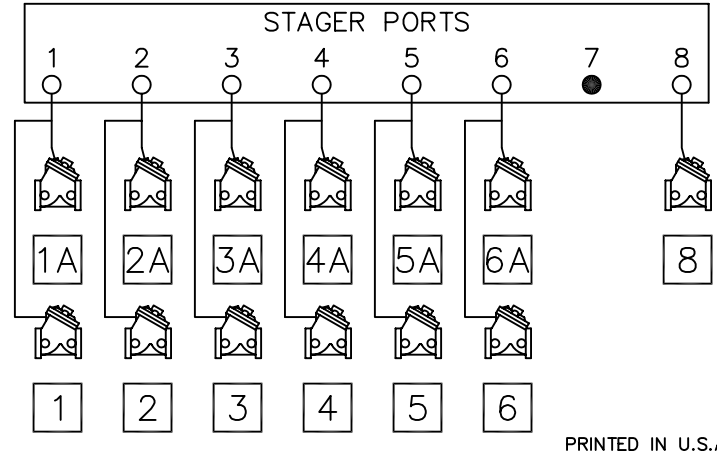
1. ALL OTHER PORTS PRESSURIZED.

2. VALVES 1A,2A,3A,4A,5A,6A,8 ARE NORMALLY OPEN PRESSURE TO CLOSE.

3. VALVES 1,2,3,4,5,6 ARE NORMALLY CLOSED, PRESSURE TO OPEN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	8	SERVICE	8	1,2,3,4,5,6,8
B	1	BACKWASH UNIT A	1	1A,2,3,4,5,6
C	2	BACKWASH UNIT B	2	1,2A,3,4,5,6
D	3	BACKWASH UNIT C	3	1,2,3A,4,5,6
E	4	BACKWASH UNIT D	4	1,2,3,4A,5,6
F	5	BACKWASH UNIT E	5	1,2,3,4,5A,6
G	6	BACKWASH UNIT F	6	1,2,3,4,5,6A
H				

SERIES 51–86 STAGER



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REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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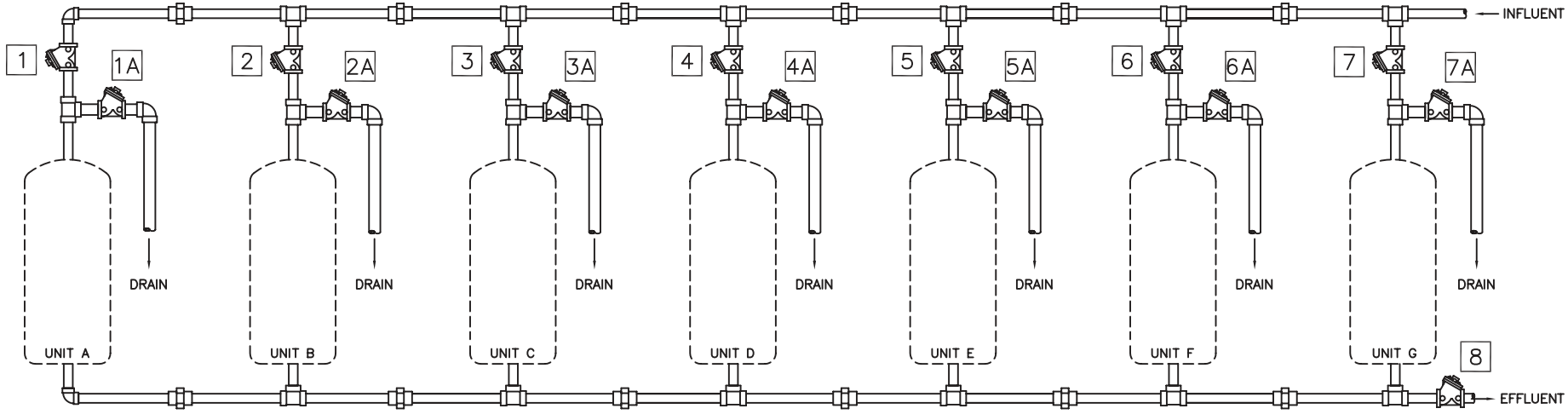
6 TANK SEQUENTIAL FILTER BACKWASH ONLY

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078286

7 TANK SEQUENTIAL FILTER BACKWASH ONLY



NOTE:

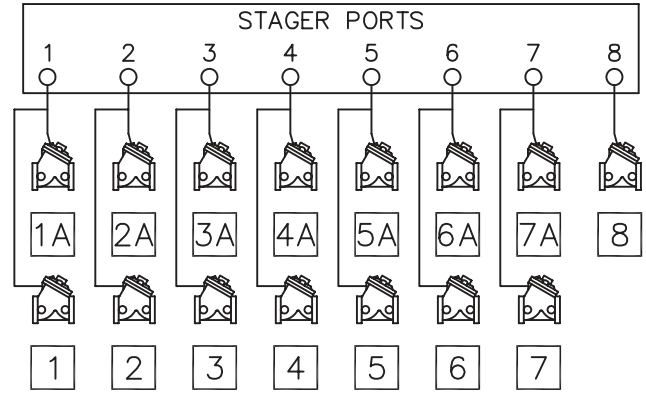
1. ALL OTHER PORTS PRESSURIZED.

2. VALVES 1A,2A,3A,4A,5A,6A,7A,8 ARE NORMALLY OPEN PRESSURE TO CLOSE.

3. VALVES 1,2,3,4,5,6,7 ARE NORMALLY CLOSED, PRESSURE TO OPEN.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	8	SERVICE	8	1,2,3,4,5,6,7,8
B	1	BACKWASH UNIT A	1	1A,2,3,4,5,6,7
C	2	BACKWASH UNIT B	2	1,2A,3,4,5,6,7
D	3	BACKWASH UNIT C	3	1,2,3A,4,5,6,7
E	4	BACKWASH UNIT D	4	1,2,3,4A,5,6,7
F	5	BACKWASH UNIT E	5	1,2,3,4,5A,6,7
G	6	BACKWASH UNIT F	6	1,2,3,4,5,6A,7
H	7	BACKWASH UNIT G	7	1,2,3,4,5,6,7A

SERIES 51-87 STAGER



PRINTED IN U.S.A.

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	MOVED SVC POS. TO NOTCH "A"	NONE	MSM	07SEP04	
A	INITIAL RELEASE	NONE	JWB	31JUL01	VKP

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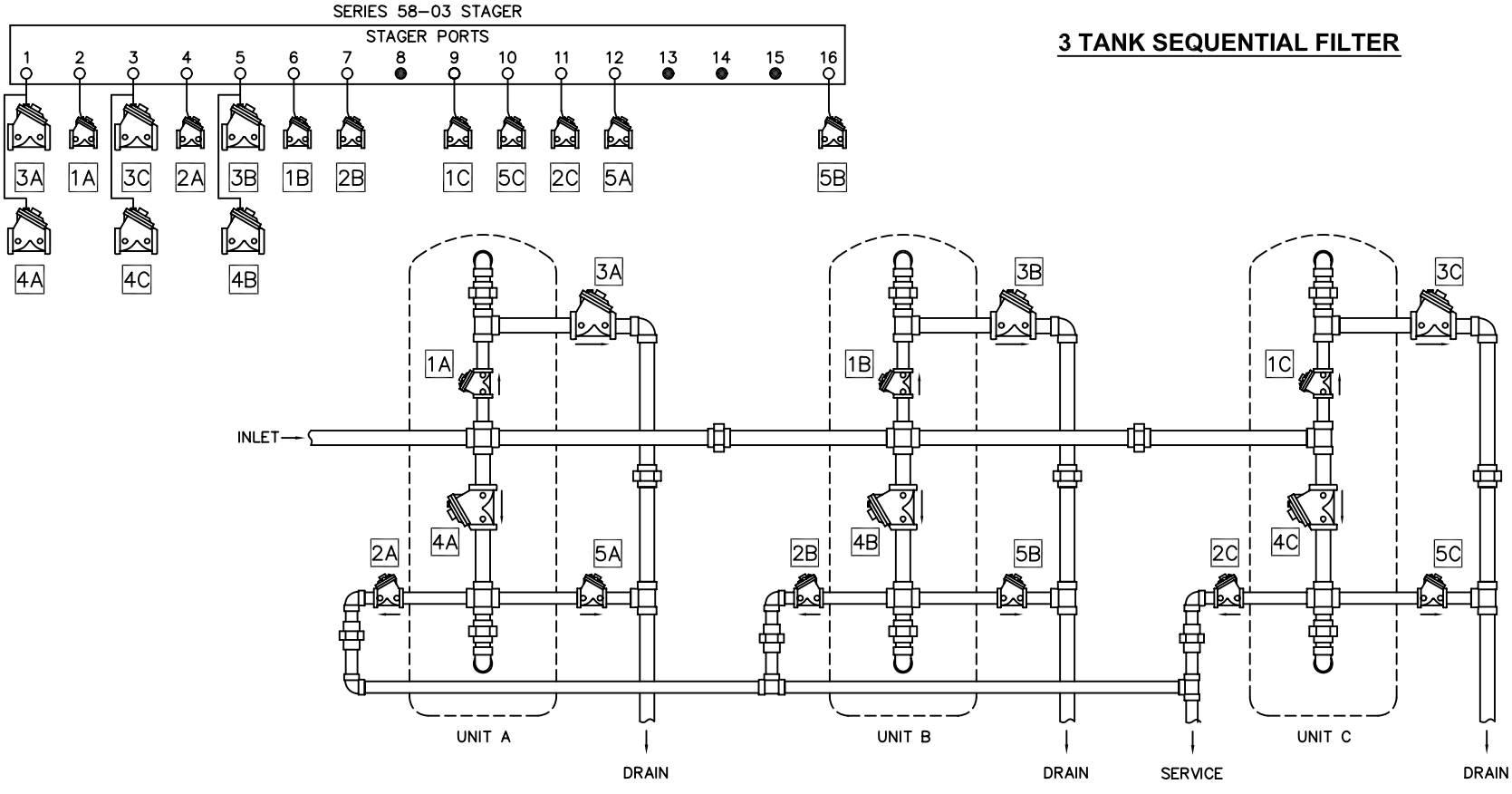
7 TANK SEQUENTIAL FILTER BACKWASH ONLY

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078287

7 TANK SEQUENTIAL FILTER (51-87 STAGER)

3 TANK SEQUENTIAL FILTER (58-03)

3 TANK SEQUENTIAL FILTER



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

PRINTED IN U.S.A.

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	2,4,6,7,9,11	1A,2A,1B,2B,1C,2C	J				
B					K				
C	1	BACKWASH UNIT A	1,6,7,9,11	3A,4A,1B,2B,1C,2C	L	5	BACKWASH UNIT C	2,3,4,6,7	1A,2A,1B,2B,3C,4C
D	2	RINSE UNIT A	2,6,7,9,11,12	1A,5A,1B,2B,1C,2C	M	6	RINSE UNIT C	2,4,6,7,9,10	1A,2A,1B,2B,1C,5C
E					N				
F					P				
G	3	BACKWASH UNIT B	2,4,5,9,11	1A,2A,3B,4B,1C,2C	Q				
H	4	RINSE UNIT B	2,4,6,9,11,16	1A,2A,1B,5B,1C,2C	R				

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	MOVED SVC OUTLET	NONE	MSM	17JAN03	

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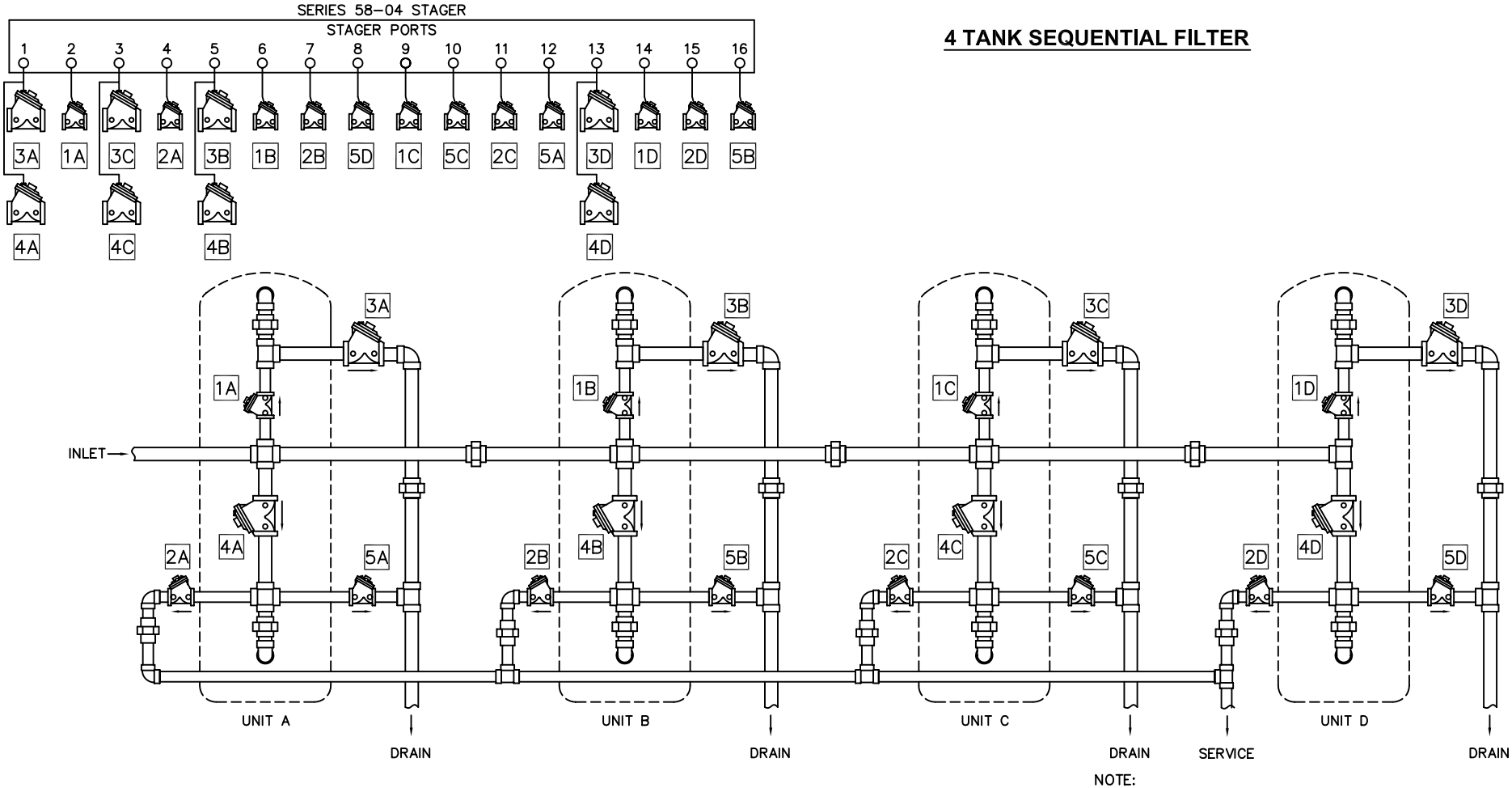
3 TANK SEQUENTIAL FILTER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078288

4 TANK SEQUENTIAL FILTER (58-04 STAGER)

4 TANK SEQUENTIAL FILTER



NOTE:
1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

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NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	2,4,6,7,9,11	1A,2A,1B,2B,1C,2C,1D,2D	J				
B					K				
C	1	BACKWASH UNIT A	1,6,7,9,11	3A,4A,1B,2B,1C,2C,1D,2D	L	5	BACKWASH UNIT C	2,3,4,6,7	1A,3C,4C,2A,1B,2B,1D,2D
D	2	RINSE UNIT A	2,6,7,9,11,12	1A,1B,2B,1C,2C,5A,1D,2D	M	6	RINSE UNIT C	2,4,6,7,9,10	1A,2A,1B,2B,1C,5C,1D,2D
E					N				
F					P				
G	3	BACKWASH UNIT B	2,4,5,9,11	1A,2A,3B,4B,1C,2C,1D,2D	Q	7	BACKWASH UNIT D	2,4,6,7,9,11,13	1A,2A,1B,2B,1C,2C,(3D,4D)
H	4	RINSE UNIT B	2,4,6,9,11,16	1A,2A,1B,1C,2C,1D,2D,5B	R	8	RINSE UNIT D	2,4,6,7,8,9,11,14	1A,2A,1B,2B,5D,1C,2C,1D

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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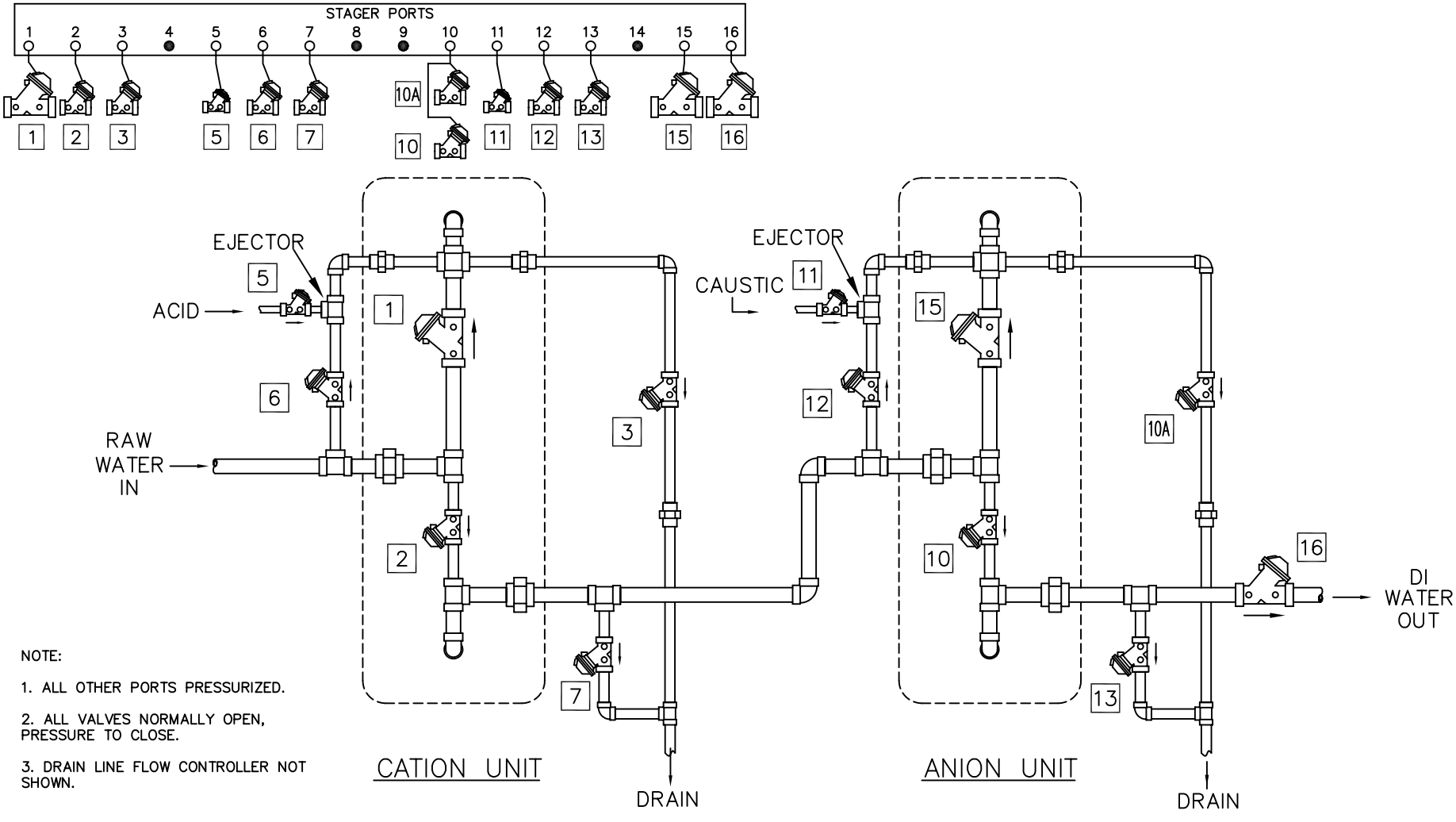
4 TANK SEQUENTIAL FILTER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078289

TWO BED DE-IONIZER SYSTEM (58-00 STAGER)



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

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SERIES 58B–00 STAGER PROGRAM

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,15,16	1,15,16	J	4	FAST RINSE	1,7	1,7
B					K	5	ANION BACKWASH	1,10	1,10,10A
C					L				
D	1	CATION BACKWASH	2,3	2,3	M				
E					N	6	CAUSTIC INJECT	1,11,12,13	1,11,12,13
F					P	7	SLOW RINSE	1,12,13	1,12,13
G	2	ACID INJECT	5,6,7	5,6,7	Q	8	FAST RINSE	1,13,15	1,13,15
H	3	SLOW RINSE	6,7	6,7	R				

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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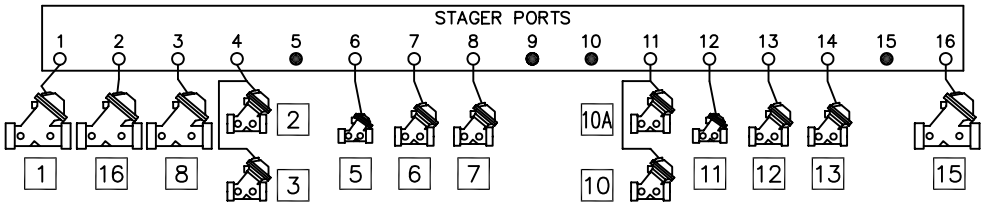
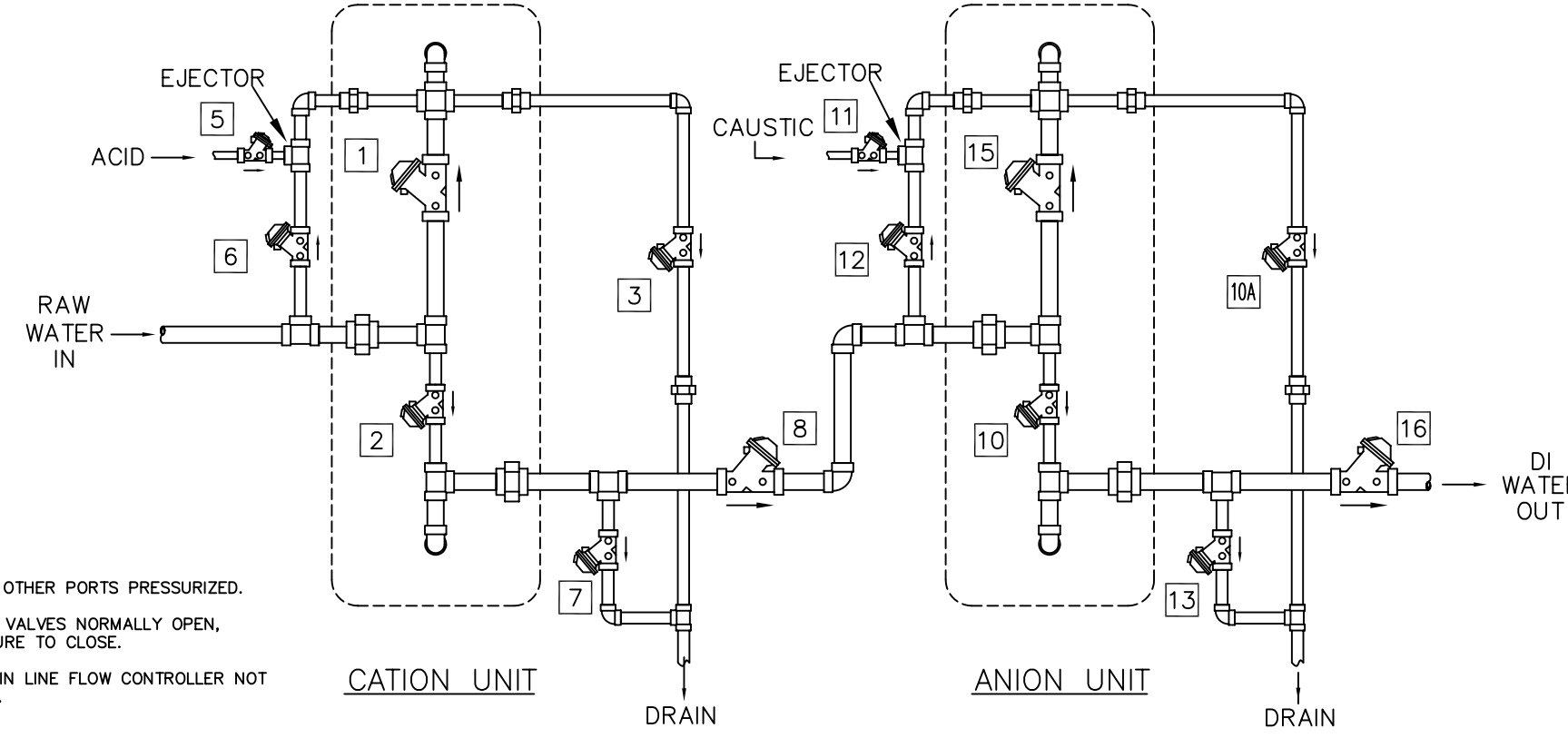
TWO BED DE-IONIZER SYSTEM

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078290

TWO BED DE-IONIZER W/ DE-GASIFIER (58-02 STAGER)





NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

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SERIES 58–02 STAGER PROGRAM

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	1,2,3,16	1,8,15,16	J	4	FAST RINSE	1,8	1,7
B					K	5	ANION BACKWASH	1,3,11	1,8,10,10A
C					L				
D	1	CATION BACKWASH	4	2,3	M				
E					N	6	CAUSTIC INJECT	1,3,12,13,14	1,8,11,12,13
F					P	7	SLOW RINSE	1,3,13,14	1,8,12,13
G	2	ACID INJECT	6,7,8	5,6,7	Q	8	FAST RINSE	1,3,14,16	1,8,13,15
H	3	SLOW RINSE	7,8	6,7	R				

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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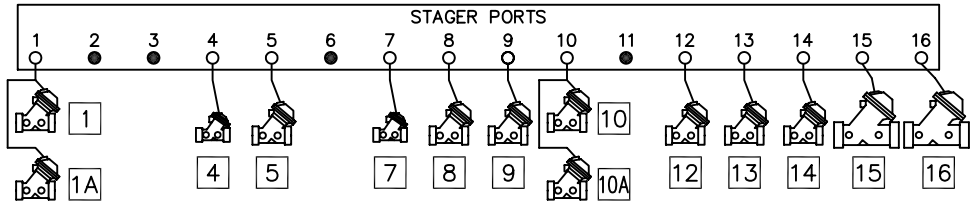
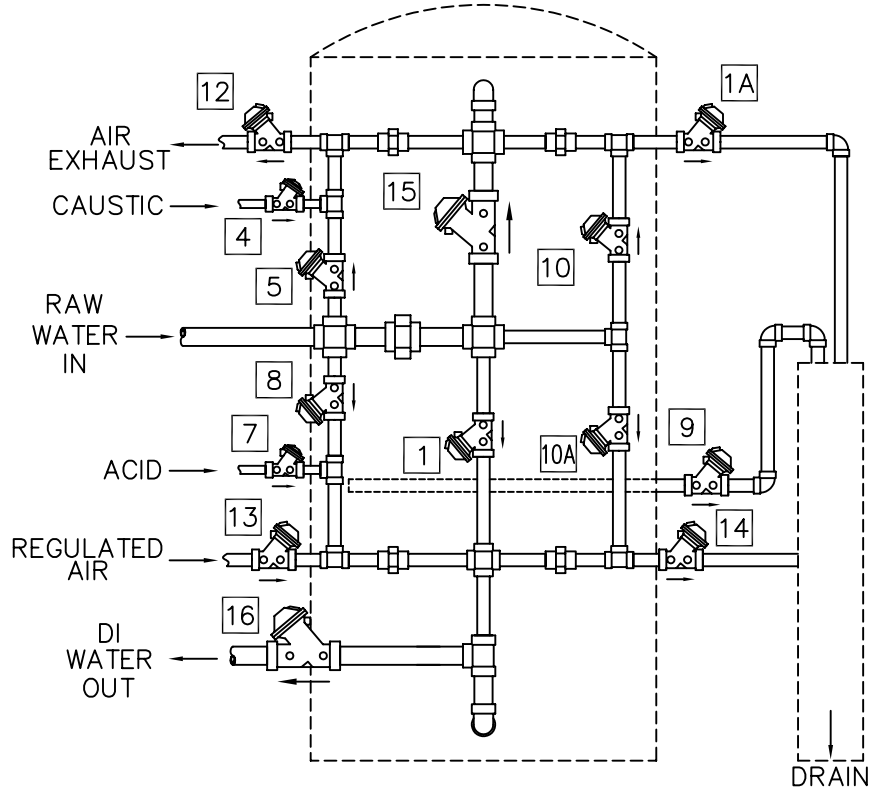
TWO BED DE-IONIZER W/ DE-GASIFIER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078291

MIXED BED DE-IONIZER (58-10 STAGER)





NOTE:

1. ALL OTHER PORTS PRESSURIZED.

2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.

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SERIES 58B–10 STAGER PROGRAM

NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	15,16	15,16	J	5	ACID INJECT	7,8,9	7,8,9
B					K	6	SLOW RINSE	8,9	8,9
C	1	BACKWASH	1	1,1A	L	7	RINSE	9,10	9,10,10A
D	2	SETTLE	NONE	NONE	M				
E					N	8	DRAIN DOWN	9,12	9,12
F	3	CAUSTIC INJECT	4,5,9	4,5,9	P	9	AIR INJECT	12,13	12,13
G	4	SLOW RINSE	5,9	5,9	Q				
H					R	10	FINAL RINSE	14,15	14,15

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	MSM	31JUL01	

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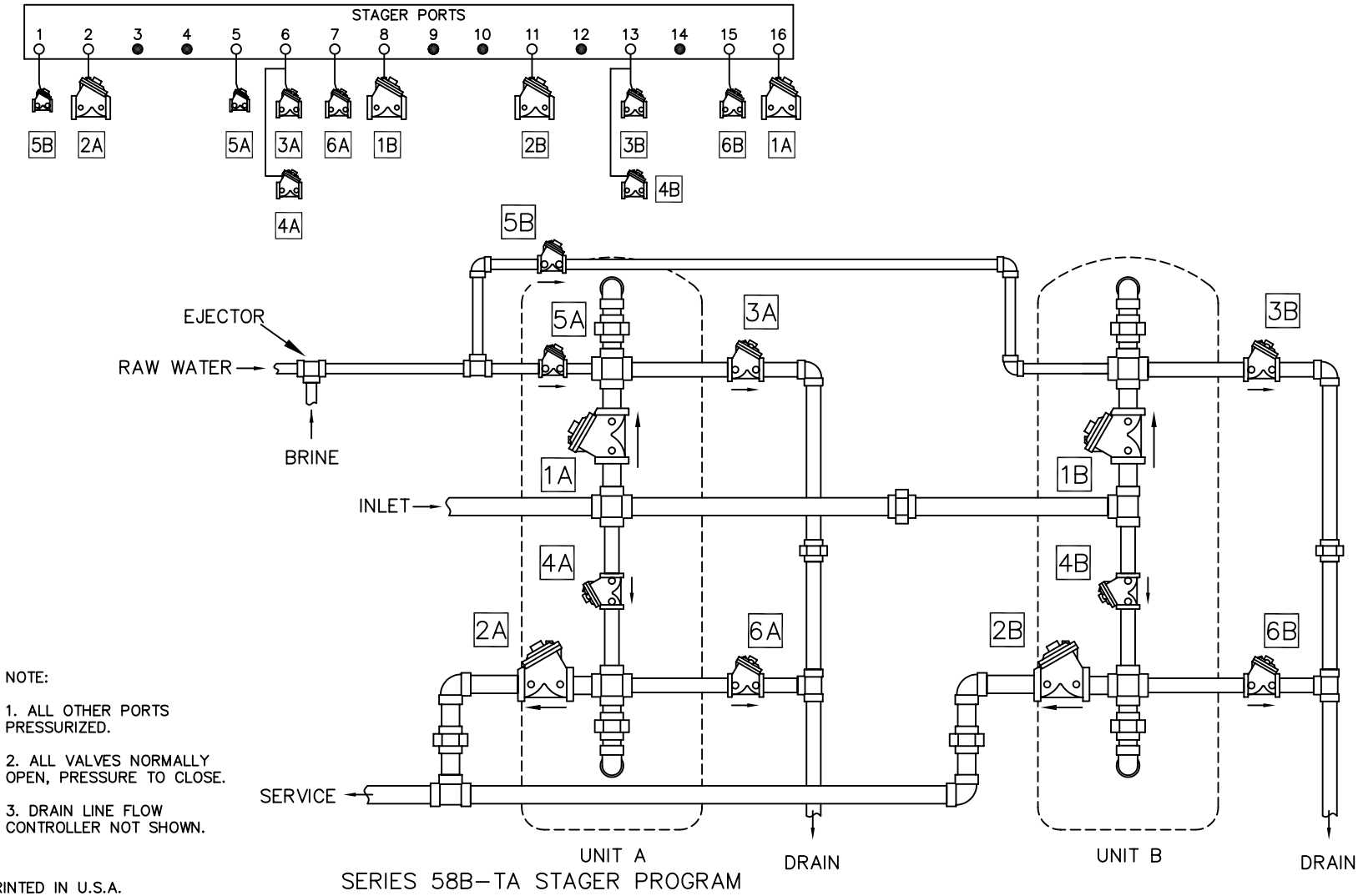
MIXED BED DE-IONIZER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078292

TWO TANK ALTERNATING SOFTENER (58-TA STAGER)



NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

SERIES 58B-TA STAGER PROGRAM

PRINTED IN U.S.A.

NOTCH	POS.	FUNCTION UNIT A	FUNCTION UNIT B	PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION UNIT A	FUNCTION UNIT B	PORTS VENTED (NOTE 1)	VALVES OPEN
A	0	SERVICE	STANDBY	1,2,8,16	5B,2A,1B,1A	J	4	STANDBY	SERVICE	8,11,16	1B,2B,1A
B						K					
C						L					
D	1	BACKWASH	SERVICE	6,8,11	3A,4A,2B,1B	M					
E	2	BRINE/SLOW RINSE	SERVICE	5,7,8,11	5A,6A,2B,1B	N					
F						P	5	SERVICE	BACKWASH	2,13,16	2A,3B,4B,1A
G						Q	6	SERVICE	BRINE/SLOW RINSE	1,2,15,16	5B,2A,6B,1A
H	3	FAST RINSE	SERVICE	7,8,11,16	6A,1B,2B,1A	R	7	SERVICE	FAST RINSE	2,8,15,16	2A,1B,6B,1A

REV	DESCRIPTION	ECO	DWN	DATE	APVD
B	CORRECTED ERROR IN STAGER POS. NOS.	NONE	MSM	21MAR03	

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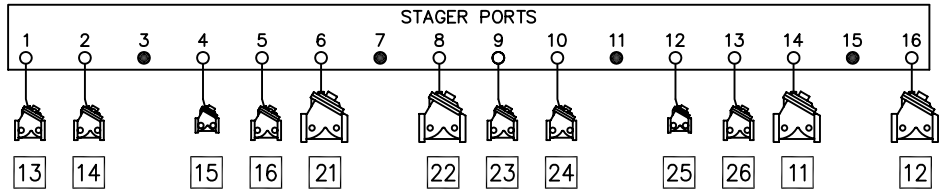
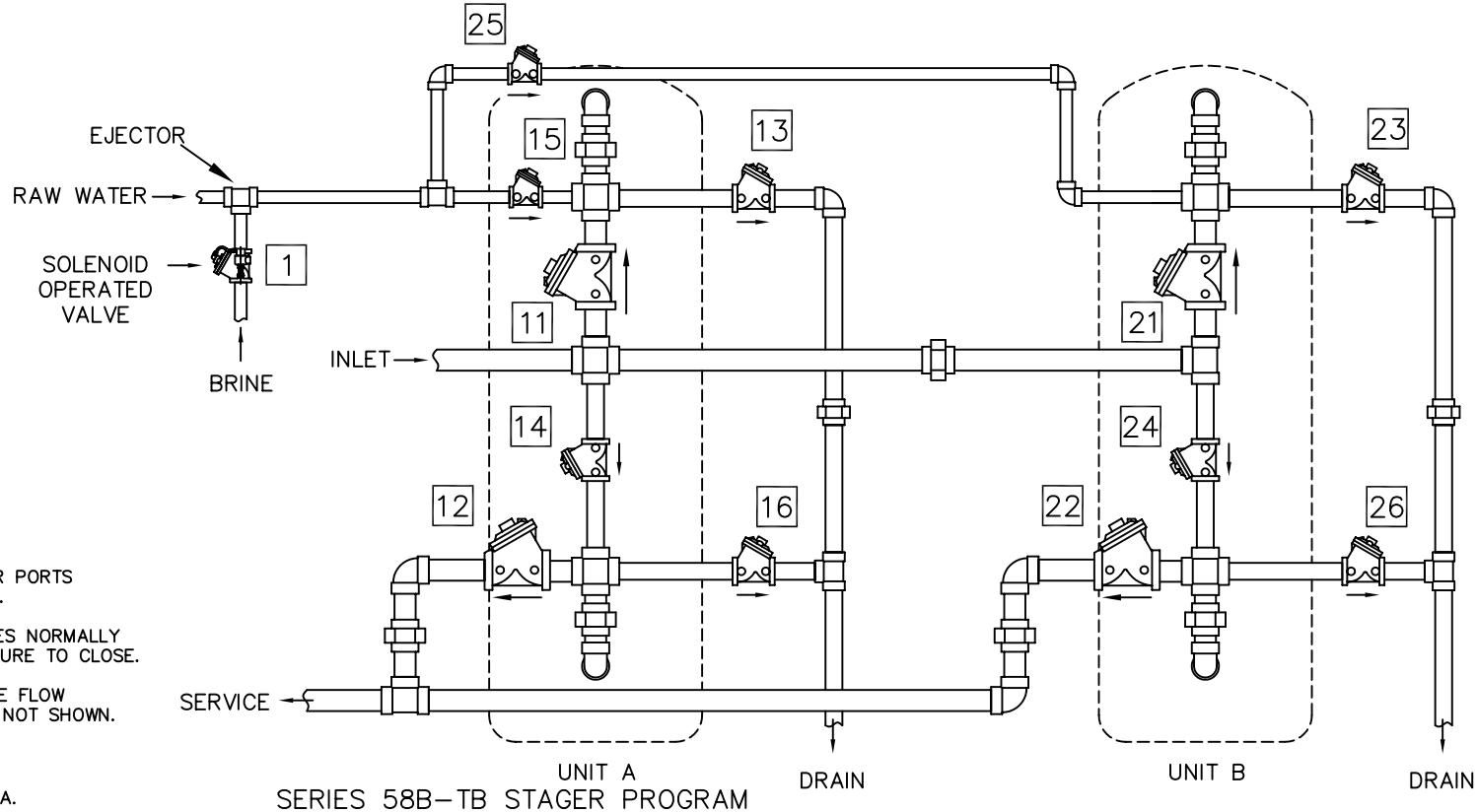
TWO UNIT ALTERNATING SOFTENER

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078293

TWO TANK ALTERNATING SOFTENER W/ TIMED BRINE (58-TB STAGER)





NOTE:

1. ALL OTHER PORTS PRESSURIZED.
2. ALL VALVES NORMALLY OPEN, PRESSURE TO CLOSE.
3. DRAIN LINE FLOW CONTROLLER NOT SHOWN.

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SERIES 58B–TB STAGER PROGRAM

NOTCH	POS.	FUNCTION		PORTS VENTED (NOTE 1)	VALVES OPEN	NOTCH	POS.	FUNCTION		PORTS VENTED (NOTE 1)	VALVES OPEN
		UNIT A	UNIT B					UNIT A	UNIT B		
A	0*	SERVICE	STANDBY	6,14,16	21,11,12	J	5*	STANDBY	SERVICE	6,8,14	21,22,11
B						K					
C						L					
D	1	BACKWASH	SERVICE	1,2,6,8	13,14,21,22	M	6	SERVICE	BACKWASH	9,10,14,16	23,24,11,12
E						N					
F	2**	BRINE DRAW	SERVICE	4,5,6,8	15,16,21,22	P	7**	SERVICE	BRINE DRAW	12,13,14,16	25,26,11,12
G	3	SLOW RINSE	SERVICE	4,5,6,8	15,16,21,22	Q	8	SERVICE	SLOW RINSE	12,13,14,16	25,26,11,12
H	4	FAST RINSE	SERVICE	5,6,8,14	16,21,22,11	R	9	SERVICE	FAST RINSE	6,13,14,16	21,26,11,12

* – NOTCH LOCATION FOR 1ST AUX. CAM/SWITCH

** – NOTCH LOCATION FOR 2ND AUX. CAM/SWITCH

REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	INITIAL RELEASE	NONE	JWB	31JUL01	

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TWO UNIT ALTERNATING SOFTENER W/ TIMED BRINE

SCALE	DRAWN	DATE	DWG. NO.
N/A	JWB	31JUL01	1078294

AQUAMATIC®
FLUID EJECTORS

COMMERCIAL CONTROL VALVE ACCESSORIES

MADE IN THE USA
OF FOREIGN & DOMESTIC PARTS

OPERATING SPECIFICATIONS

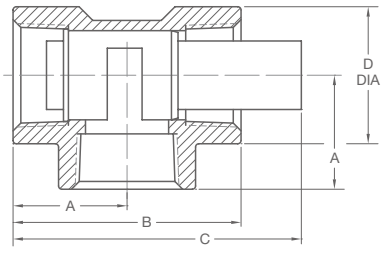
Min Operating Pressure	20 psi (1.37)
Max Operating Pressure	125 psi (8.6 bars)
Operating Temperature	up to 140°F (60°)
Body Material	PVC

For optimum performance, ejectors should be installed with a section of straight pipe extending from the discharge side.

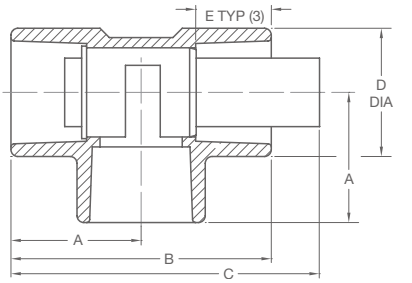
DIMENSIONS (NOMINAL & APPROXIMATE)

MODEL #	SIZE		DIAMETER				
	NPT	SOCKET	A	B	C	D	E
540	1/2"	-	1.37" (35 mm)	2.75" (70 mm)	-	1.31" (33 mm)	-
540S	-	1/2"	1.37" (35 mm)	2.75" (70 mm)	-	1.31" (33 mm)	0.88" (22 mm)
541	3/4"	-	1.72" (44 mm)	3.44" (88 mm)	-	1.5" (40 mm)	-
541S	-	3/4"	1.72" (44 mm)	3.44" (88 mm)	-	1.56" (40 mm)	1" (25 mm)
542	1"	-	1.72" (44 mm)	3.44" (88 mm)	-	1.81" (46 mm)	-
542S	-	1"	1.88" (48 mm)	3.75" (96 mm)	-	1.81" (46 mm)	1.13" (20 mm)
544	1-1/2"	-	2.09" (53 mm)	4.19" (106 mm)	5.25" (143 mm)	2.38" (60 mm)	-
544S	-	1-1/2"	2.38" (60 mm)	4.75" (120 mm)	5.63" (143 mm)	2.38" (60 mm)	1.38" (35 mm)
546	2"	-	2.78" (71 mm)	5.56" (168 mm)	6.63" (168 mm)	3" (76 mm)	-
546S	-	2"	2.78" (71 mm)	5.56" (168 mm)	6.63" (168 mm)	3.06" (78 mm)	1.5" (38 mm)

NPT



Socket Weld



PERFORMANCE

INLET PRESSURE PSI (BAR)	NOZZLE FLOW RATES - GAL/MIN (L/MIN)													
	540 (1/2")						541 (3/4")				542 (1")			
	540-1 BLACK	540-2 BROWN	540-3 RED	540-4 WHITE	540-5 BLUE	DRAW FACTOR	541-1 RED	541-2 WHITE	541-3 BLUE	DRAW FACTOR	542-1 RED	542-2 WHITE	542-3 BLUE	DRAW FACTOR
20 (1.37)	0.13 (0.52)	0.18 (0.73)	0.31 (1.22)	0.62 (2.44)	0.90 (3.50)	0.80	1.07 (4.30)	1.80 (7.20)	2.90 (11.2)	1.15	4.40 (17.3)	5.80 (22.0)	8.20 (31.7)	1.04
30 (2.06)	0.16 (0.60)	0.23 (0.84)	0.38 (1.42)	0.76 (2.82)	1.10 (4.00)	0.78	1.30 (4.90)	2.10 (8.30)	3.50 (13.0)	1.20	5.40 (20.0)	7.10 (25.0)	10.0 (36.0)	0.94
40 (2.75)	0.19 (0.74)	0.26 (1.00)	0.44 (1.74)	0.88 (3.50)	1.20 (4.90)	0.82	1.50 (6.00)	2.50 (10.2)	4.00 (16.0)	1.26	6.20 (24.5)	8.20 (31.0)	11.7 (45.0)	0.95
50 (3.44)	0.21 (0.86)	0.29 (1.20)	0.49 (2.02)	0.98 (4.00)	1.40 (5.70)	0.83	1.70 (7.00)	2.80 (11.8)	4.50 (18.4)	1.25	7.00 (28.4)	9.20 (36.0)	13.0 (52.0)	0.85
60 (4.13)	0.23 (0.91)	0.32 (1.27)	.54 (2.14)	1.10 (4.20)	1.50 (6.08)	0.85	1.80 (7.40)	3.10 (12.5)	4.90 (19.5)	1.15	7.60 (30.0)	10.0 (38.0)	14.4 (55.0)	0.82
70 (4.82)	0.25 (0.96)	0.35 1.34)	0.58 (2.25)	1.20 (4.40)	1.65 (6.40)	0.88	2.00 (7.80)	3.30 (13.1)	5.30 (20.5)	1.08	8.20 (31.6)	10.8 (40.0)	15.5 (58.0)	0.80
80 (5.51)	0.27 (1.05)	0.37 (1.47)	0.62 (2.47)	1.30 (4.90)	1.80 (7.00)	0.85	2.15 (8.50)	3.60 (14.4)	5.70 (22.5)	1.00	8.70 (34.8)	11.6 (44.0)	16.6 (63.0)	0.78
100 (6.9)	0.30 (1.13)	0.42 (1.60)	0.70 (2.66)	1.40 (5.20)	2.00 (7.50)	0.83	2.40 (9.20)	4.00 (15.5)	6.40 (24.3)	0.95	9.80 (37.5)	13.0 (47.5)	18.5 (68.5)	0.75
120 (8.27)	0.33 (1.21)	0.46 (1.70)	0.76 (2.84)	1.50 (5.60)	2.20 (8.10)	0.80	2.60 (9.80)	4.30 (16.6)	7.00 (26.0)	0.90	10.7 (40.0)	14.2 (50.7)	20.0 (73.0)	0.70
Nozzle Dia. E	0.038	0.042	0.052	0.070	0.086	-	0.098	0.125	0.157	-	0.188	0.219	0.250	-
Throat Dia. F	0.076	0.086	0.104	0.140	0.172	-	0.196	0.250	0.312	-	0.375	0.438	0.500	-

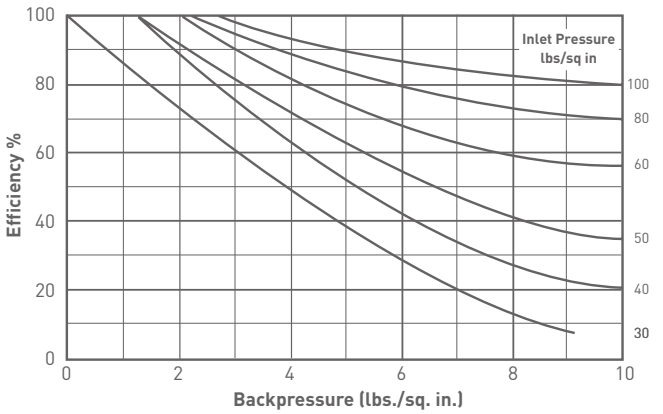
INLET PRESSURE PSI (BAR)	NOZZLE FLOW RATES - GAL/MIN (L/MIN)											
	544 (1-1/2")						546 (2")					
	544-1 RED	544-2 WHITE	544-3 BLUE	544-4 YELLOW	544-5 ORANGE	DRAW FACTOR	546-1 RED	546-2 WHITE	546-3 BLUE	546-4 YELLOW	546-5 ORANGE	DRAW FACTOR
20 (1.37)	8.70 (34.2)	13.4 (52.5)	17.0 (66.0)	21.0 (83.0)	24.5 (97.6)	1.08	29.5 (116)	35.7 (140)	28.4 (152)	45.0 (178)	52.0 (207)	1.08
30 (2.06)	10.6 (39.5)	16.4 (60.0)	20.7 (76.0)	25.7 (96.0)	30.0 (112)	1.12	36.0 (134)	43.7 (162)	47.0 (176)	55.0 (205)	64.0 (240)	1.12
40 (2.75)	12.3 (48.4)	19.0 (21.2)	24.0 (93.4)	29.7 (117)	34.7 (138)	1.16	41.7 (164)	50.0 (198)	54.0 (216)	64.0 (252)	74.0 (294)	1.16
50 (3.44)	13.8 (58.0)	21.2 (86.0)	26.8 (108)	33.2 (136)	38.8 (160)	1.15	46.6 (190)	56.5 (230)	61.0 (250)	71.4 (292)	83.0 (340)	1.15
60 (4.13)	15.0 (16.3)	23.0 (91.0)	29.5 (114)	36.3 (144)	42.5 (170)	0.95	51.0 (200)	62.0 (244)	66.5 (265)	78.0 (310)	91.0 (360)	0.95
70 (4.82)	16.3 (62.0)	25.0 (96.0)	31.8 (120)	39.3 (152)	46.0 (178)	0.90	55.0 (212)	67.0 (256)	71.0 (278)	84.5 (325)	98.0 (380)	0.90
80 (5.51)	17.4 (68.0)	27.0 (105)	34.0 (132)	42.0 (166)	49.0 (195)	0.80	59.0 (232)	71.0 (280)	77.0 (306)	90.0 (357)	106 (416)	0.80
100 (6.9)	19.5 (74.0)	30.0 (113)	38.0 (142)	47.0 (180)	55.0 (210)	0.80	66.0 (250)	80.0 (300)	86.0 (330)	100 (385)	118 (445)	0.80
120 (8.27)	21.3 (78.0)	32.8 (120)	41.5 (152)	51.5 (190)	60.0 (225)	0.75	72.0 (268)	87.0 (325)	94.0 (350)	110 (410)	130 (480)	0.75
Nozzle Dia. E	0.281	0.312	0.359	0.406	0.438	-	0.469	0.500	.0547	0.578	0.625	-
Throat Dia. F	0.562	0.625	0.719	0.812	0.875	-	0.938	1.000	1.094	1.156	1.250	-

Data based on: 1. Water media specific gravity 1.0; 2. Suction lift 3 ft. (1 meter); 3. Discharge head 0 ft. or meters; 4. Media temperature 60°F (15°C)

PERFORMANCE

Fig. 1: Efficiency vs. Backpressure

At different inlet pressure. Suction lift 3 feet (1 m).



SPECIFIC GRAVITY

FLUID	SPECIFIC GRAVITY
Saturated Brine (NaCl)	1.2
Hydrocholoric Acid (30%)	1.14
Sodium Hydroxide (50%)	1.52
Sulphuric Acid (20%)	1.13
Sodium Hydroxide (25%)	1.16

DRAW RATE

TO CALCULATE DRAWRATE

A = Nozzle flowrate
B = Specific gravity
C = Draw factor
D = Efficiency factor

$$\text{Drawrate} = \frac{(A)\ (C)\ (D)}{B}$$

HOW TO ORDER

1. Select series number based on required pipe size.
2. Add "S" suffix to series number if socket weld ends desired.
3. Add nozzle size suffix as determined by supply pressure and required flow (see example).

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