Valve model number description

Every MAXON Series 8000 Valve can be accurately identified by the model number shown on the valve nameplate. The example below shows a typical Series 8000 Valve model number, along with the available choices for each item represented in the model number. The first five choices determine the valve's configured item number. Valve body and actuator options are identified by the next eight characters in the model number.

Configured Item Number						Valve Body					Actuator				
Valve Size	Flow Capacity	Pressure Rating	Normal Position	Area Classification		Body Connection	Body Seals	Body Material	Internal Trim Package		Primary Voltage	Switch Option	Enclosure Rating	Instruction Language	Visual Indication
300	C	81	1	1	-	A	A	1	1	-	B	1	A	1	1

Valve Size
075 – 3/4" (DN 20)
100 – 1" (DN 25)
125 – 1-1/4" (DN 32)
150 – 1-1/2" (DN 40)
200 – 2" (DN 50)
250 – 2-1/2" (DN 65)
300 – 3" (DN 80)
400 – 4" (DN 100)
600 – 6" (DN 150)

Flow Capacity
S – Standard
C – CP Body Construction

Operating Pressure Rating
80 – Pneumatic Standard Pressure
81 – Pneumatic High Pressure

Normal Position
1 – Normally-Closed Shut-Off Valve
2 – Normally-Open Vent Valve

Area Classification
1 – General Purpose
2 – Non-incendive, Class I, II and III Division 2
3 – Intrinsically Safe, Class I, II and III Division 1 (and ATEX Zone 1/21 when ordered with the ATEX IS solenoid) [1]
4 – Valve Body Only

Body Connection
A – NPT
B – ANSI Flanged (ISO 7005 PN 20)
C – ISO 7-1 Threaded
D – DIN PN 16 Flanged
E – Socket Welded Nipple
F – Socket Welded Nipple w/Class 150 Flange (ISO 7005 PN 20)
G – Socket Welded Nipple w/Class 300 Flange (ISO 7005 PN 50)
H – EN1092-1 PN16 (ISO 7005-1 PN16)
* - Actuator Only

Body Seals
A – Buna-N
B – Viton
C – Ethylene Propylene [2]
F – Omniflex
X – Special
* - Actuator Only

Body Material
1 – Cast Iron
2 – Carbon Steel
5 – Stainless Steel
6 – Low Temp Carbon Steel
X – Special
* - Actuator Only

Internal Trim Package
1 – Trim Package 1
2 – Trim Package 2
3 – Trim Package 3 (NACE)
4 – Trim Package 2, oxy clean [2]
5 – Trim Package 3, oxy clean [2]
6 – Trim 2 fire safe
7 – Trim 3 fire safe
X – Special [2]
* - Actuator Only

Primary Voltage
A – 120VAC 50Hz
B – 120VAC 60Hz
D – 240VAC 50Hz
E – 240VAC 60Hz
G – 24VDC
H – 24VDC IS [1]
J – 24VDC IS-ATEX [1]
X – Special
Z – None (customer-supplied, external mount)
* - Valve Body Only

Switch Option
0 – None
1 – VOS1/VCS1 - V7
2 – VOS2/VCS2 - V7
3 – VOS1/VCS1 - IP67
4 – VOS2/VCS2 - IP67
X – Special
* - Valve Body Only

Enclosure Rating
A – NEMA 4, IP65
B – NEMA 4X, IP65
X – Special
* - Valve Body Only

Instruction Language
0 – English
1 – French
2 – Russian
3 – German
4 – Portuguese

Visual Indication
1 – Red closed/green open
2 – Green closed/red open
3 – Black closed/yellow open

[1] 50°C maximum ambient temperature limit
[2] -17°C minimum ambient temperature limit

Valve body assembly options & specifications

Series 8000 Normally-Closed Shut-Off Valves							
Nominal Pipe Size	Flow Capacity	Actuator Pressure Class	Body Connections Available	Body Material	Trim Package Options	Cv Rating	MOPD Rating (bar)
.75”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	19	13
1”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	20	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
1.25”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	45	13
1.5”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	53	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
2”	Std.	High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5	86	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
2.5”	Std.	High Press.	A, B, C, D	1, Cast Iron	1	127	10
	CP	Std.		1, Cast Iron	1, 2, 3, 4, 5	304	3.4
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5		12
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
3”	Std.	High Press.	A, C	1, Cast Iron	1	173	10
	CP	Std.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5	423	2.8
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5		9
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
4”	CP	Std.	B, D, H	1, Cast Iron	1, 2, 3, 4, 5	490	2.8
				2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.		1, Cast Iron	1, 2, 3, 4, 5		9
				2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
6”	Std.	Std.	B, D, H	1, Cast Iron	1, 2, 3, 4, 5	1172	4.1
				2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
		High Press.		1, Cast Iron	1, 2, 3, 4, 5		6.9
				2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			

Body Connections:
A - NPT
B - ANSI Flanged (ISO 7005 PN20)
C - ISO 7-1 Threaded
D - DIN PN16 Flanged
E - Socket Welded Nipple
F - Socket Welded Nipple w/ Class 150 Flange (ISO 7005 PN20)
G - Socket Welded Nipple w/Class 300 Flange (ISO 7005 PN50)
H - EN1092-1 PN16 (ISO 7005-1 PN16)

Body Material:
1 - Cast Iron
2 - Carbon Steel
5 - Stainless Steel
6 - Low Temp Carbon Steel

Trim Package Options and Typical Material:
1 - 400 Series Stainless Steel Seat, Hardened Ductile Iron Disc, PEEK Follower Ring
2 - 300 Series Stainless Steel Seat, 300 Series Stainless Steel Disc, PEEK Follower Ring
3 - 300 Series Stainless Steel Seat, 300 Series Stainless Steel Disc, 300 Series Stainless Steel Stem, PEEK Follower Ring (NACE compliant)
4 - Oxy Clean, Trim 2
5 - Oxy Clean, Trim 3
6 - Trim 2 fire safe
7 - Trim 3 fire safe

Body Seals:
All configurations allow for Buna-N and Viton elastomers as standard. Omniflex and Ethylene Propylene are available for special services. Consult MAXON for proper application.

Series 8000 Normally-Open Vent Valves							
Nominal Pipe Size	Flow Capacity	Actuator Pressure Class	Body Connections Available	Body Material	Trim Package Options	Cv Rating	MOPD Rating (bar)
.75”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	19	13
1”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	20	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
1.5”	Std.	High Press.	A, C	1, Cast Iron	1, 2, 3, 4, 5	53	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
2”	Std.	High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5	86	13
			A, C, E, F, G	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		17
				5, Stainless Steel			
2.5”	CP	Std.	A, B, C, D	1, Cast Iron	1, 2, 3, 4, 5	304	3.4
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5		12
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
3”	CP	Std.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5	423	2.8
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.	A, B, C, D, H	1, Cast Iron	1, 2, 3, 4, 5		9.3
			B, D, H	2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			
4”	CP	Std.	B, D, H	1, Cast Iron	1, 2, 3, 4, 5	490	2.8
				2, 6 Carbon Steel	2, 3, 4, 5		
				5, Stainless Steel			
		High Press.		1, Cast Iron	1, 2, 3, 4, 5		9.3
				2, 6 Carbon Steel	2, 3, 4, 5, 6, 7		
				5, Stainless Steel			

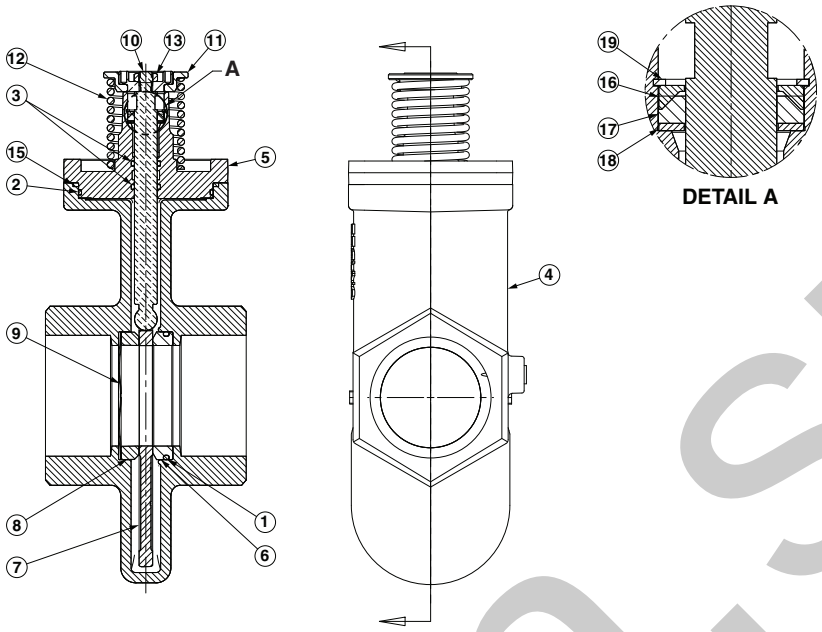
Body Connections:
A - NPT
B - ANSI Flanged (ISO 7005 PN20)
C - ISO 7-1 Threaded
D - DIN PN16 Flanged
E - Socket Welded Nipple
F - Socket Welded Nipple w/ Class 150 Flange (ISO 7005 PN20)
G - Socket Welded Nipple w/ Class 300 Flange (ISO 7005 PN50)
H - EN1092-1 PN16 (ISO 7005-1 PN16)

Body Material:
1 - Cast Iron
2 - Carbon Steel
5 - Stainless Steel
6 - Low Temp Carbon Steel

Trim Package Options and Typical Material:
1 - 400 Series Stainless Steel Seat, Hardened Ductile Iron Disc, PEEK Follower Ring
2 - 300 Series Stainless Steel Seat, 300 Series Stainless Steel Disc, PEEK Follower Ring
3 - 300 Series Stainless Steel Seat, 300 Series Stainless Steel Disc, 300 Series Stainless Steel Stem, PEEK Follower Ring (NACE compliant)
4 - Oxy Clean, Trim 2
5 - Oxy Clean, Trim 3
6 - Trim 2 fire safe
7 - Trim 3 fire safe

Body Seals:
All configurations allow for Buna-N and Viton elastomers as standard. Omniflex and Ethylene Propylene are available for special services. Consult MAXON for proper application.

Valve body assembly specifications



Body Seal Material		
Item No.	Description	Material
1	Seat O-Ring	Standard material options are Buna-N and Viton. Omniflex and Ethylene Propylene are available for special service. Consult MAXON for proper material selection.
2	Body O-Ring	
3	Stem O-Ring	

Body and Bonnet Materials					
Item No.	Description	Material Code			
		1	2	5	6
4	Body	Cast Iron ASTM A126, Class B	Cast Steel ASTM A216 Gr. WCB	Stainless Steel ASTM A351 Gr. CF8M	Low Temp Carbon Steel ASTM A352 Gr. LCB
5	Bonnet				

Trim Package Materials						
Item No.	Description	Internal Trim Package				
		1	2	3	6	7
6	Seat	Hardened 400 Series Stainless Steel	300 Series Stainless Steel			
7	Disc	Hardened Ductile Iron	300 Series Stainless Steel			
8	Follower Ring	PEEK			300 Series Stainless Steel	
9	Wavy Spring	300 Series Stainless Steel				
10	Stem	17-4 PH Stainless Steel		300 Series Stainless Steel	17-4 PH Stainless Steel	300 Series Stainless Steel
11	Spring Retainer	Blackened Carbon Steel				
12	Compression Spring	17-7 PH Stainless Steel				
13	Jam Nut	Zinc Plated Carbon Steel				
14	Spring Pin (when req'd.)	Carbon Steel				
15	Body Graphite Ring	---	---	---	Flexible Graphite	
16	Packing Washer	---	---	---	300 Series Stainless Steel	
17	Stem Graphite Ring	---	---	---	Flexible Graphite	
18	Flat Washer	---	---	---	300 Series Stainless Steel	
19	Retaining Ring	---	---	---	Zinc Plated Carbon Steel	

Valve body assembly - gas compatibility

Gas	Gas Code	Suggested Material Options			MOPD Rating	Agency Approvals and Certifications			
		Body Seal	Body & Bonnet	Trim Package [5]		FM	CSA [3]	CE [4]	
								GAD	MD
Air	AIR	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Ammonia	AMM	A, C, F	1, 2, 5, 6	1, 2, 3, 6 ,7	Std.	X	X	NA	X
Butane Gas	BUT	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Coke Oven Gas	COKE	B, F	5	Analysis Required	Std.	X	X	NA	X
Delco	DEL	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Digester [1]	DIG	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Endothermic AGA	ENDO	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Exothermic Gas	EXO	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Hydrogen Gas	HYD	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	[2]	X	X	NA	X
Manufactured [1]	MFGD	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Natural Gas	NAT	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Nitrogen	NIT	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Oxygen High	OXYH	B, C, F	2, 5, 6	4, 5	13 bar max	X	X	NA	X
Oxygen Low	OXYL	B, C, F	1, 2, 5, 6	4, 5	2 bar max	X	X	NA	X
Oxygen X	OXYX	B, C, F	2, 5, 6	4, 5	Std.	X	X	NA	X
Propane	PROP	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Refinery [1]	REF	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Sour Natural [1]	SOUR	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Town Gas [1]	TOWN	Analysis Required	5	Analysis Required	Std.	X	X	X	X
Land Fill Gas	LAND	Analysis Required	5	Analysis Required	Std.	X	X	NA	X

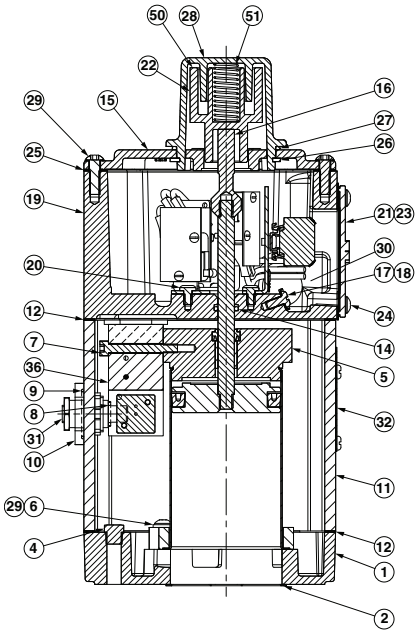
Notes:
[1] Other body and trim packages may be acceptable pending fuel analysis. For pricing inquiry, Viton body seals will be standard option. Contact MAXON for details.
[2] Valve maximum operating pressure (MOPD) to be reduced by 25% from standard ratings.
[3] ISO connections are not recognized by CSA standards.
[4] All 8000 Valves do meet the essential requirements of the Low Voltage (73/23/EC) and the EMC (89/336/EC) Directives. GAD refers to the Gas Appliances Directive (2009/142/EC): this Directive only covers the use of commercially available fuels (natural gas, butane, town gas and LPG). MD stands for Machinery Directive (2006/42/EC). All Series 8000 valves meet the essential requirements for fuel shut-off on Industrial Thermal Equipment as specified in EN746-2.
[5] Trim Package 1 is only allowed with body and bonnet 1.

Body Seals:
A - Buna-N
B - Viton
C - Ethylene Propylene
F - Omniflex

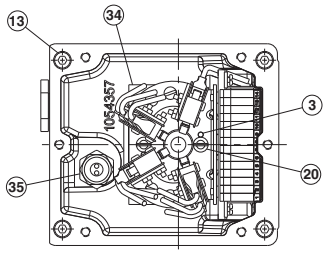
Body & Bonnet:
1 - Cast Iron
2 - Carbon Steel
5 - Stainless Steel
6 - Low Temp Carbon Steel

Trim Package:
1 - Trim Package 1
2 - Trim Package 2
3 - Trim Package 3 (NACE)
4 - Trim Package 2, Oxy Clean
5 - Trim Package 3, Oxy Clean
6 - Trim 2 fire safe
7 - Trim 3 fire safe

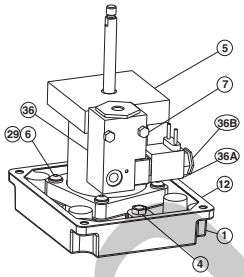
Valve actuator assembly specifications



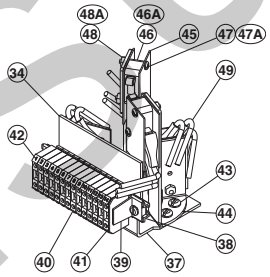
Typical Actuator Assembly



View Without Top Plate



Typical Cylinder Assembly Mounting



General Purpose Switch Assembly

Item Number	Description	Item No.	Description
1	Base Plate	29	M6-1.0 x 20 Cap Screw
2	Bonnet Gasket	30	3/4” Pipe Plug
3	Drive Pin	31	.125 Inlet Pipe Plug
4	Filter Vent	32	Info Plate
5	Cylinder Assembly	33	Actuator Bolts (not shown)
6	M6 Lock Washer	34	Switch Assembly
7	M5-0.8 x 40 Hex Screw	35	Liquid Tight Connector
8	O-Ring	36	Solenoid w/Quick Exhaust Assembly
9	O-Ring	36A	Solenoid Coil
10	Solenoid Adapter Inlet	36B	Solenoid Cap
11	Housing	37	Switch & Terminal Bracket
12	Housing Gasket	38	DIN Rail
13	M6-1.0 x 60 Soc HD Cap Screw	39	End Stop
14	O-Ring	40	Terminal Block
15	Top Plate	41	End Cover
16	Switch Indicator	42	Marker Strips
17	Washer	43	M4-0.7 x 6 Slotted Screw
18	M5-0.8 x 10 Ground Screw	44	Switch Bracket
19	Top Housing	45	Switch Insulator
20	M4-0.7 x 6 Slotted Screw	46	V7 Switch
21	Terminal Block Cover Gasket	46A	IP67 Switch
22	Info Label	47	#4-40 x .75 Slotted Screw
23	Terminal Block Cover	47A	#2-56 x .437 Slotted Screw
24	M5-0.8 x 12 Cap Screw	48	#4-40 Hex Nut
25	Top Housing Gasket	48A	#2-56 Hex Nut
26	External Retaining Ring	49	Wire
27	O-Ring	50	Visual Indicator
28	Indicator Cover	51	Spring

Electrical data

General

Series 8000 Valves are pneumatically operated and a solenoid valve controls the air supply. The solenoid valve is directly wired into the control system.
Position switch wiring diagrams (reproduced below) are part of each valve assembly, summarizing electrical data and wiring for a valve equipped with terminal block and a full complement of optional switches.
Good practice normally dictates that auxiliary switches in valves should be used for signal duty only, not to operate additional safety devices.
Valve position switches are offered in SPDT (Single Pole/Double Throw). Recommended packages include one open switch and one closed switch, (VOS1/VCS1) and additional auxiliary switches designated by VOS2/VCS2.
VCS (Valve Closed Switch) is actuated at the end of the closing stroke.
VOS (Valve Open Switch) is actuated at the end of the opening stroke.

Switch amperage ratings are shown on the schematic wiring diagrams below. DO NOT EXCEED rated amperage or total load shown. Diagrams show valve with a full complement of switches. The indicated internal wiring is present only when the appropriate auxiliary switches are specified.

Figure 1: Normally-Closed Shut-Off Valve

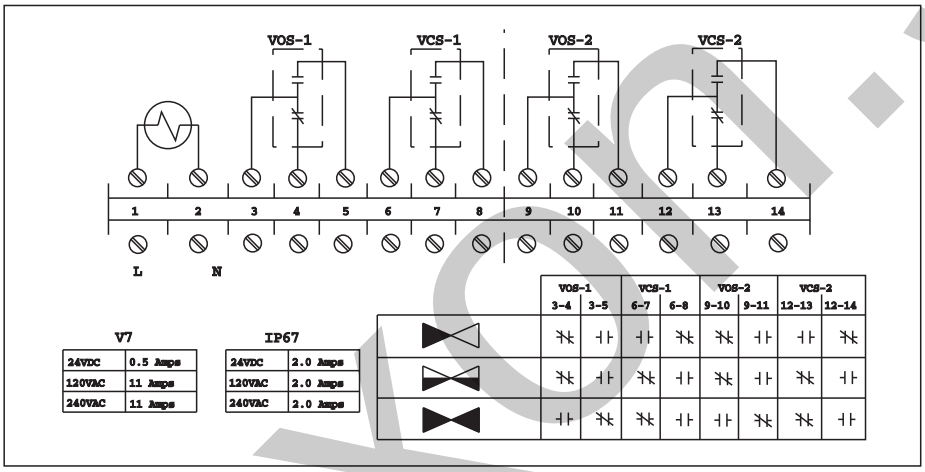
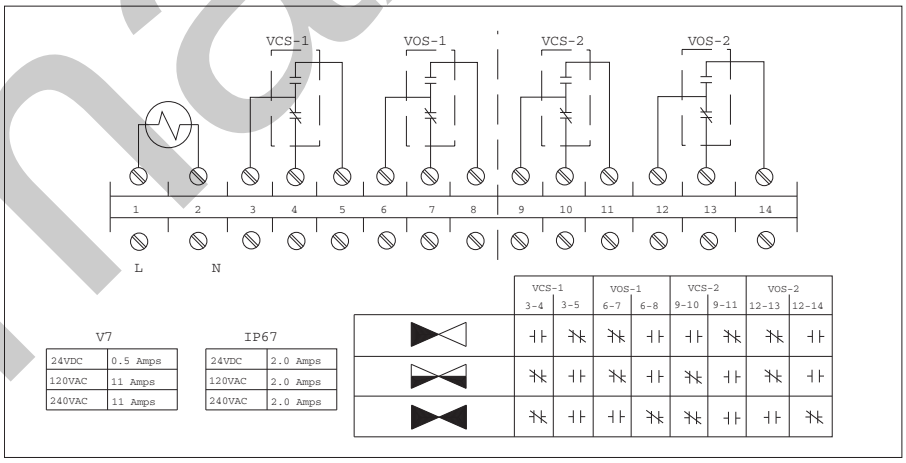


Figure 2: Normally-Open Vent Valve



General Purpose - Series 8011, 8111, 8021 & 8121

Solenoid valve power ratings				
Voltage	Amperage (A)		Power	
	In-Rush	Holding	In-Rush	Holding
24VDC	0.20	0.20	4.8 W	4.8 W
120VAC 50 Hz	0.09	0.07	11 VA	8.5 VA
120VAC 60 Hz	0.08	0.05	9.4 VA	6.9 VA
240VAC 50 Hz	0.05	0.04	11 VA	8.5 VA
240VAC 60 Hz	0.04	0.03	9.4 VA	6.9 VA

Standard switch amperage ratings as shown on the valve switch wiring diagram	
Voltage	Maximum Amperage (A)
24VDC	0.5
120VAC 50/60 Hz	11
240VAC 50/60 Hz	11

Non-incendive Valves - Series 8012, 8112, 8022 & 8122

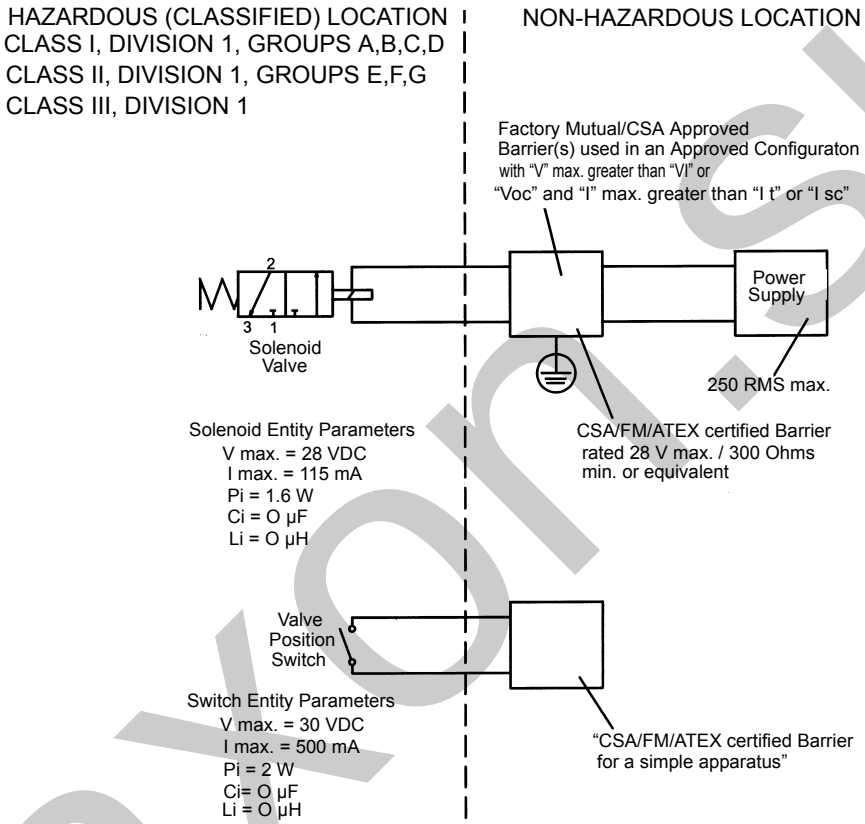
Solenoid valve power ratings				
Voltage	Amperage (A)		Power	
	In-Rush	Holding	In-Rush	Holding
24VDC	0.20	0.20	4.8 W	4.8 W
120VAC 50 Hz	0.09	0.07	11 VA	8.5 VA
120VAC 60 Hz	0.08	0.05	9.4 VA	6.9 VA
240VAC 50 Hz	0.05	0.04	11 VA	8.5 VA
240VAC 60 Hz	0.04	0.03	9.4 VA	6.9 VA
24VDC IS	0.09	0.09	2.1 W	2.1 W

IP67 switch amperage ratings as shown on the valve switch wiring diagram	
Voltage	Maximum Amperage (A)
24VDC	2.0
120VAC 50/60 Hz	2.0
240VAC 50/60 Hz	2.0

Intrinsically Safe Valves - Series 8013, 8023, 8113 & 8123

The Series 8000 Valve achieves Class I Div.1 hazardous location certification through the Intrinsically Safe (IS) protection method. Below is a representation of the Control Drawing. The MAXON standard offering does not include the barriers/isolators that are depicted below in the non-hazardous location; however, they can be provided as an additional accessory. Consult MAXON for details.

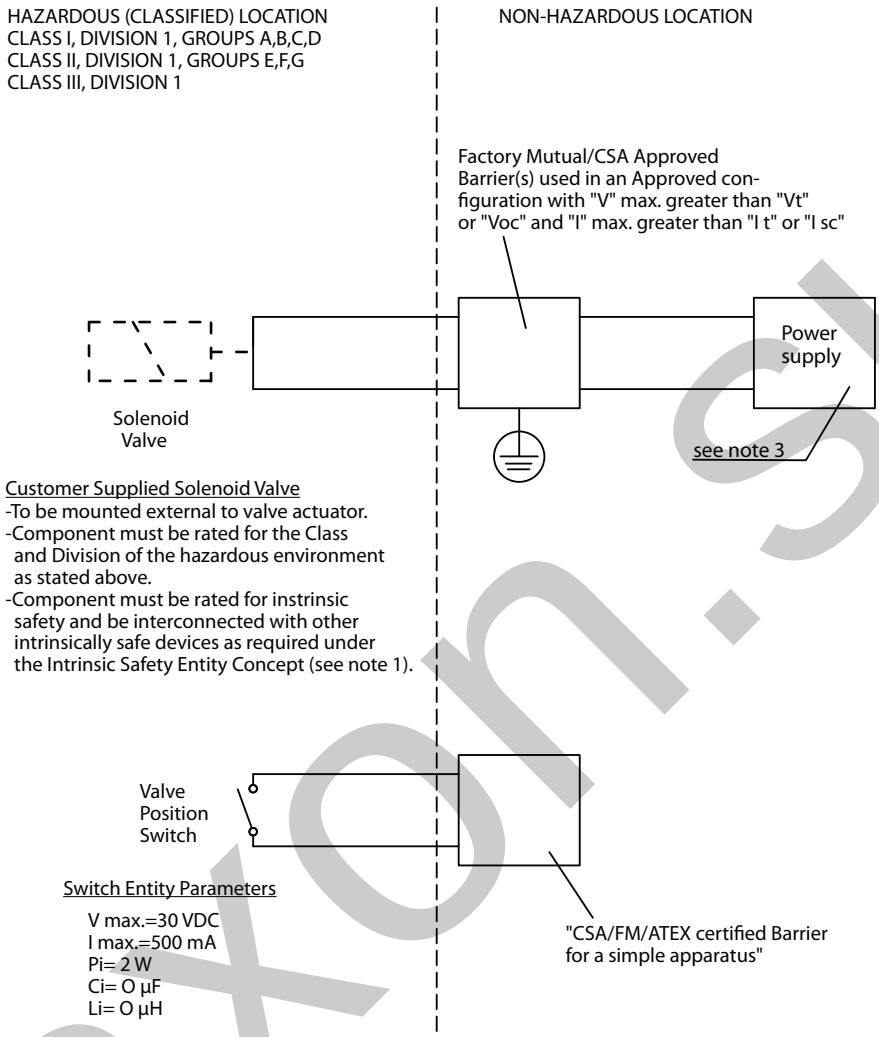
The intrinsic safety and operational criteria for most applications can be met with a 24 VDC supply and the barriers described in the Control Drawing. Specific installations with long cable runs, low power requirements, or other complications may require a barrier with different parameters.



NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically Safe devices with entity parameters not specifically examined in combination as a system when:
V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
6) Installation in the European Union should be in accordance to Directive 94/9/EC (ATEX 95).
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
9) No revision to drawing without prior authorization from FM Approval and CSA International.

Control drawing for customer-supplied, externally mounted solenoids



NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically Safe devices with entity parameters not specifically examined in combination as a system when: V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than the maximum permissible safe area voltage (Um) for the barrier.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
6) Installation in the European Union should be in accordance to Directive 94/9/EC (ATEX 95).
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
9) No revision to drawing without prior authorization from FM Approval and CSA International.

To select a different safety barrier, choose a design that limits voltage, current, and power under worst-case fault conditions to values less than the IS entity parameters, while still meeting the minimum operational requirements under worst-case non-fault conditions. The IS entity parameters and operational requirements are listed in the following tables.

The barrier will specify a maximum voltage peak V_{oc} [1], a maximum short-circuit current, I_{sc} [2] and maximum power output P_o [3]. These barrier ratings must be less than or equal to the IS entity parameters of the field device, i.e., $V_{oc} \leq V_{max}$, $I_{sc} \leq I_{max}$, and $P_o \leq P_i$.The barrier will also specify a maximum allowed capacitance Ca and inductance La, which must be greater than or equal to the sum of those of the load device and field wiring, i.e., $C_a \geq C_i + C_{cable}$ and $L_a \geq L_i + L_{cable}$.

The solenoid requires a minimum current (I_{min}) to operate properly. The nominal barrier input voltage ($V_{working}$, as specified by the barrier) must be adequate to provide I_{min} through the maximum barrier resistance, the maximum wiring resistance, the resistance of any fuses, and the maximum solenoid resistance (R_i).

NOTE: $V_{working}$ will always be less than V_{max} or V_{oc}. Never intentionally supply Voc to the barrier, as this could blow an internal fuse and ruin the barrier.

[1] The maximum voltage possible at the barrier input or output under a no-load condition.
[2] Found when the barrier input is at V_{oc} and a short-circuit appears on the barrier output.
[3] Found when the barrier input is at V_{oc} and a matched load appears on the barrier output. Note that this value is the transmitted power, and does not include the power dissipated by the barrier itself.

Barrier selection criteria for solenoid

IS entity parameters [4]	
Maximum voltage input (V_{max})	28 V [5]
Maximum current input (I_{max})	115 mA
Maximum power input (P_i)	1.6 W
Internal capacitance (C_i)	0 µF
Internal inductance (L_i)	0 µH
Operational Parameters	
Minimum operational current (Imin)	37 mA
Solenoid internal resistance (Ri)	275 ohms ± 8%

Barrier selection criteria for switch

IS entity parameters (simple apparatus)	
Maximum voltage input (V_{max})	30 V [6]
Maximum current input (I_{max})	500 mA [6]
Maximum power input (P_i)	1.3 W [7]
Internal capacitance (C_i)	0 µF
Internal inductance (L_i)	0 µH
Operational Parameters	
Minimum operational current (Imin)	Application specific
Switch internal on-resistance (Ri)	< 1 ohm

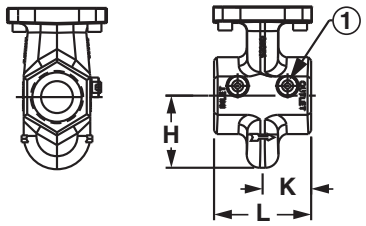
[4] Obtained from the manufacturer's published entity parameters.
[5] Never intentionally supply Vmax to the barrier, as this could blow an internal fuse and ruin the barrier.
[6] Obtained from the switch's safety ratings.
[7] Standard P_i for a simple apparatus.

Dimensions & weights

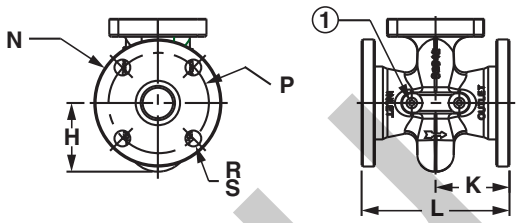
Series 8100 valve bodies: .75” (DN20) to 3” (DN80)

1) 2x 1/4” NPT test connection

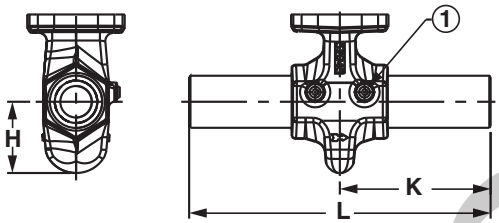
Body Connection A & C



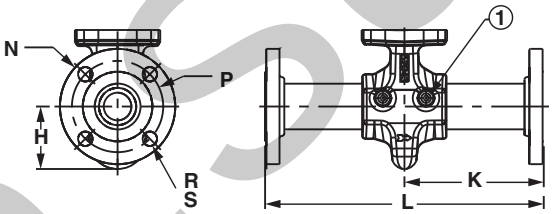
Body Connection B, D & H



Body Connection E



Body Connection F & G



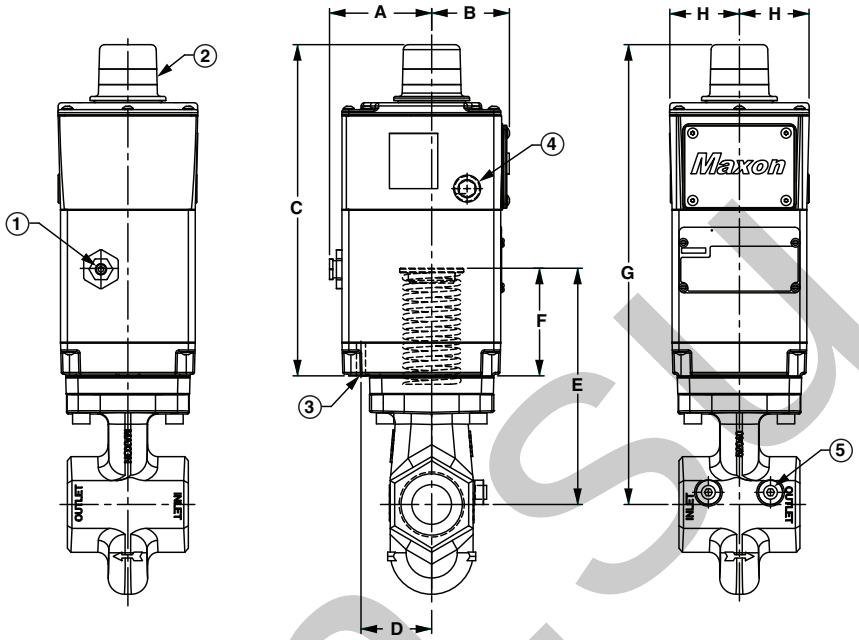
Valve Size	Flow Capacity	Body Connection	Body/ Bonnet Material	Approximate Dimensions (in mm)							Approximate Weight (in kg)		
				H	K	L	N Ø	P Ø	R Ø	S # of holes	Body Assembly	Actuator Assembly	Total Weight
.75”	S	A, C	Cast Iron	50	48	96	N/A				3	5	9
1”	S	A, C	Cast Iron				N/A				3		9
		A, C	Carbon Steel & Stainless Steel				N/A				4		9
		E			175	350	N/A				5		10
		F			185	368	109	78	15	4	6		12
		G					124	88	19		7		13
1.25”	S	A, C	Cast Iron	60			N/A				4		9
1.5”	S	A, C	Cast Iron	68	50	101	N/A				5		10
		A, C	Carbon Steel & Stainless Steel				N/A				5		10
		E			172	345	N/A				6		11
		F			182	365	127	99	15	4	9		15
		G					154	114	22		11		17
2”	S	A, C	Cast Iron	83	55	111	N/A				7		12
		B			88	177	152	121	19	4	11		17
		D, H					165	124	18		11		17
		A, C	Carbon Steel & Stainless Steel		55	111	N/A				8		13
		E			175	350	N/A				10		15
		F			185	368	152	121	19	4	15		20
		G					165	127	19	8	16		22
2.5”	S	A, C	Cast Iron	73	63	127	N/A				8		14
		B		78	96	190	177	139	19	4	13		19
		D					185	144	18		13		19
3”	S	A, C	Cast Iron	76	66	132	N/A				9		14

Flow Capacity:
S - Standard
C - CP Body Construction

Body Connection:
A - NPT
B - ANSI Flanged (ISO 7005 PN20)
C - ISO 7-1 Threaded
D - DIN PN16 Flanged
E - Socket Welded Nipple
F - Socket Welded Nipple w/ Class150 Flange (ISO 7005 PN20)
G - Socket Welded Nipple w/ Class 300 Flange (ISO 7005 PN50)
H - EN1092-1 PN16 (ISO 7005-1 PN16)

Series 8100 actuator: .75” (DN20) to 3” (DN80)

1) 1/8” NPT air inlet connection
2) Visual indication of valve position
3) Air exhaust - do not block
4) 2x 3/4” conduit connection
5) 2x 1/4” NPT test connection

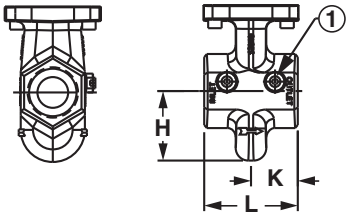


Valve Size	Approximate dimensions (in mm)							
	A	B	C	D	E	F	G	H
.75”	88	71	305	66	177	101	381	63
1”								
1.25”					203		406	
1.5”								
2”					228		432	
2.5”								
3”								

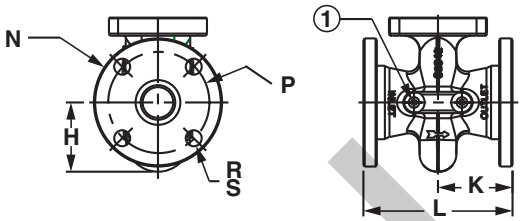
Series 8000 valve body: 2.5” CP (DN65), 3” CP (DN80), 4” CP (DN100)

1) 2x 1/4” NPT test connection

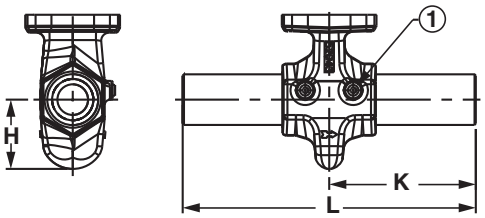
Body Connection A & C



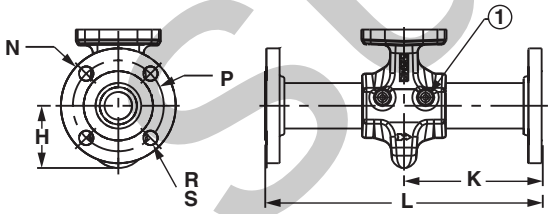
Body Connection B, D & H



Body Connection E



Body Connection F & G



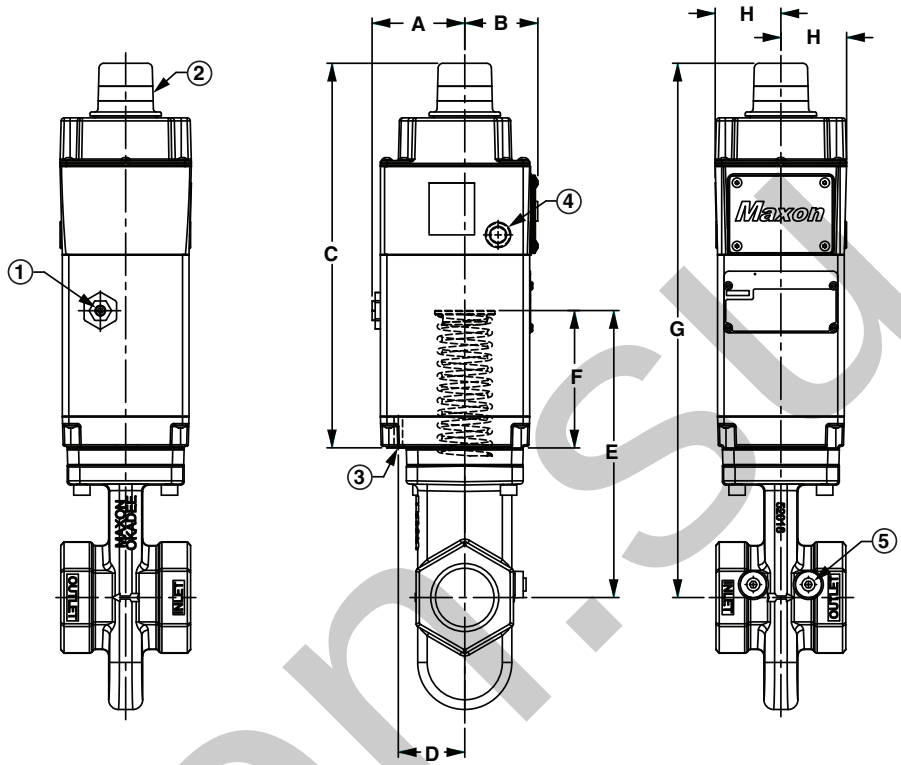
Valve Size	Flow Capacity	Body Connection	Body/Bonnet Material	Approximate Dimensions (in mm)							Approximate Weight (in kg)		
				H	K	L	N Ø	P Ø	R Ø	S # of holes	Body Assembly	Actuator Assembly	Total Weight
2.5”	C	A, C	Cast Iron	109	63	127	N/A				8	5	14
		B		114	96	190	177	139	19	4	14		19
		D					185	144	19		14		19
		H					185	144	19	8	14		19
		B	Carbon Steel & Stainless Steel				177	139	19	4	15		21
		D					185	144	18		15		21
		H					185	144	18	8	13		19
	C	G	CS & SS	112	155	312	190	150	22	8	18		23
3”	C	A, C	Cast Iron	129	71	139	N/A				10		16
		B		132	101	203	190	152	19	4	20		26
		D, H					200	160	19	8	20		26
		B	Carbon Steel & Stainless Steel				190	152	19	4	21		27
		D, H					200	160	18	8	21		27
	C	G	CS & SS	132	168	338	211	168	22	8	25		30
4”	C	B	Cast Iron	139	114	228	228	190	19	8	29		34
		D, H					220	180	19		29		34
		B	Carbon Steel & Stainless Steel				228	190	19		29		34
		D, H					220	180	18		29		34
	C	G	CS & SS	130	188	389	254	200	22	8	38		43

Flow Capacity:
S - Standard
C - CP Body Construction

Body Connection
A - NPT
B - ANSI Flanged (ISO 7005 PN20)
C - ISO 7-1 Threaded
D - DIN PN16 Flanged
E - Socket Welded Nipple
F - Socket Welded Nipple w/ Class 150 Flange (ISO 7005 PN20)
G - Socket Welded Nipple w/ Class 300 Flange (ISO 7005 PN50)
H - EN1092-1 PN16 (ISO 7005-1 PN16)

Series 8000 actuator: 2.5” CP (DN65), 3” CP (DN80), 4” CP (DN100)

1) 1/8” NPT air inlet connection
2) Visual indication of valve position
3) Air exhaust - do not block
4) 2x 3/4“ conduit connection
5) 2x 1/4” NPT test connection

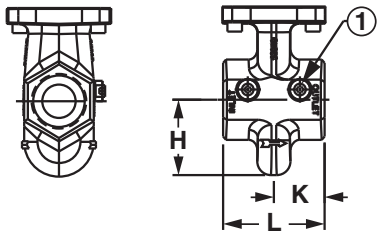


Valve Size	Flow Capacity	Approximate Dimensions (in mm)							
		A	B	C	D	E	F	G	H
2.5”	CP	88	71	376	66	281	134	523	63
3”	CP					299		541	
4”	CP								

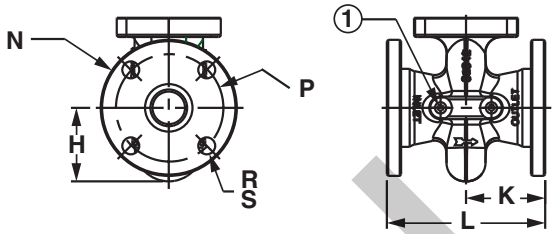
Series 8100 valve body: 2.5” CP, 3” CP, 4” CP

1) 2x 1/4” NPT test connection

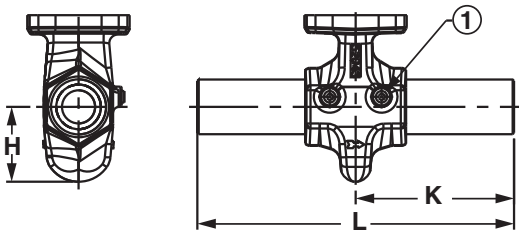
Body Connection A & C



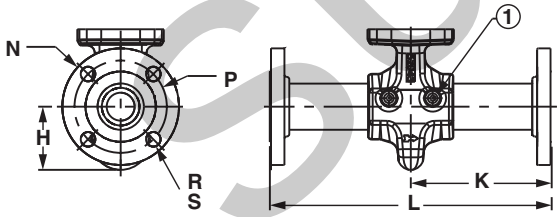
Body Connection B, D & H



Body Connection E



Body Connection F & G



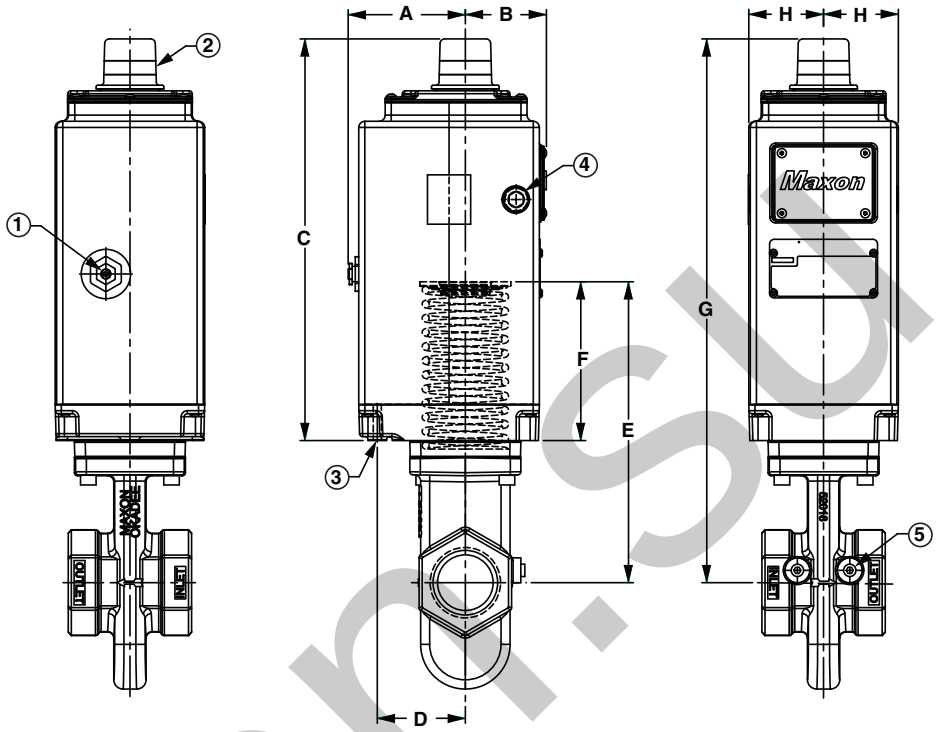
Valve Size	Flow Capacity	Body Connection	Body/Bonnet Material	Approximate Dimensions (in mm)							Approximate Weight (in kg)		
				H	K	L	N Ø	P Ø	R Ø	S # of holes	Body Assembly	Actuator Assembly	Total Weight
2.5”	C	A, C	Cast Iron	109	63	127	N/A				8	5	14
		B		114	96	190	177	139	19	4	14		19
		D					185	144	19		14		19
		H					185	144	19	8	14		19
		B	Carbon Steel & Stainless Steel				177	139	19	4	15		21
		D					185	144	18		15		21
		H					185	144	18	8	15		21
	C	G	CS & SS	112	155	312	190	150	22	8	18		23
3”	C	A, C	Cast Iron	129	71	139	N/A				12		18
		B		132	101	203	190	152	19	4	21		27
		D, H					200	160	19	8	21		27
		B	Carbon Steel & Stainless Steel				190	152	19	4	22		28
		D, H					200	160	18	8	22		28
	C	G	CS & SS	132	168	338	211	168	22	8	25		30
4”	C	B	Cast Iron	139	114	228	228	190	19	8	29		35
		D, H					220	180	19		29		35
		B	Carbon Steel & Stainless Steel				228	190	19		30		36
		D, H					220	180	18		30		36
	C	G	CS & SS	130	188	389	254	200	22	8	38		43

Flow Capacity:
S - Standard
C - CP Body Construction

Body Connection:
A - NPT
B - ANSI Flanged (ISO 7005 PN20)
C - ISO 7-1 Threaded
D - DIN PN16 Flanged
E - Socket Welded Nipples
F - Socket Welded Nipples w/ Class 150 Flange (ISO 7005 PN20)
G - Socket Welded Nipples w/ Class 300 Flange (ISO 7005 PN50)
H - EN1092-1 PN16 (ISO 7005-1 PN16)

Series 8100 actuator: 2.5” CP, 3” CP, 4” CP

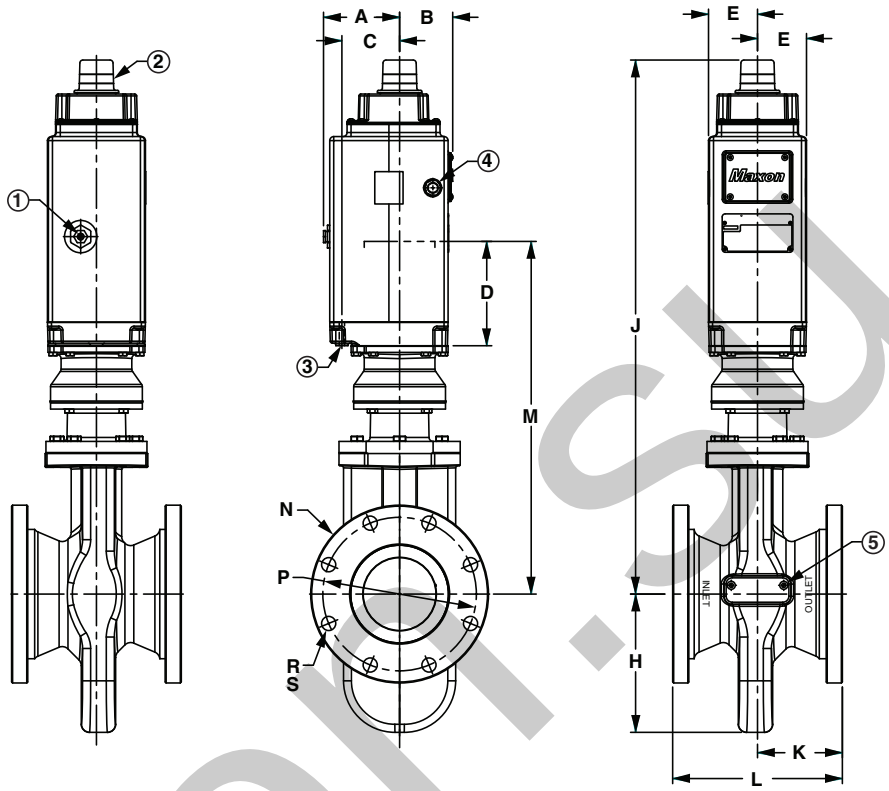
1) 1/8” NPT air inlet connection
2) Visual indication of valve position
3) Air exhaust - do not block
4) 2x 3/4” conduit connection
5) 2x 1/4” NPT test connection



Valve Size	Flow Capacity	Approximate Dimensions (in mm)							
		A	B	C	D	E	F	G	H
2.5”	CP	114	83	414	91	309	162	561	76
3”	CP					327		579	
4”	CP								

Series 8000 and 8100: 6”

1) 1/8” NPT air inlet connection
2) Visual indication of valve position
3) 1/8” NPT air exhaust - do not block
4) 2x 3/4” conduit connection
5) 2x 1/4” NPT test connection



Valve Size	Flow Capacity	Body Conn.	Body/Bonnet Material	Approximate Dimensions (in mm)														Approximate Weight (in kg)		
				A	B	C	D	E	H	J	K	L	M	N Ø	P Ø	R Ø	S #of holes	Body Assembly	Actuator Assembly	Total Weight
6”	S	B	Cast Iron	116	83	91	165	76	218	840	133	266	553	279	241	22	8	53	10	63
		D												284	241	21		53		63
		B	Carbon Steel & Stainless Steel											279	241	22		57		67
		D												284	241	21		57		67

Flow Capacity:
S - Standard

Body Connection:
B - ANSI 150 lbs (ISO7005 - PN20)
D - DIN PN16 Flanged

Accessories

Speed Control Set Kits

Manually adjustable valve restricts flow to the actuator inlet and so reduces opening speed of the normally closed shut-off valve or reduces the closing speed of normally open vent valves.

- Available in carbon steel and stainless steel construction
- 90° mating elbow provided for easy assembly
- Tamper-proof set screw prevents accidental misadjustment

Kit No. 1067124
Carbon Steel construction

Kit No. 1067125
Stainless Steel construction

Intrinsic Safety Interfaces

Approved units interposed between the hazardous and safe area circuits limit parameters such as voltage, current or power.

- Suitable for use in Class I, Div. 2 areas
- DIN rail mounted
- Complements intrinsically safe Series 8000 Valves

Engineering recommendations for barriers and isolator option				
Manufacturer	IS interface type	Model no.	Application	MAXON no.
MTL	Zener Diode [1]	MTL 7728+	Solenoid	1067656
		MTL 7787+	Switch [2]	1067655
	Isolator [3]	MTL 5025	Solenoid	1067660
		MTL 5018	Switch [4]	1067659

[1] Circuit must be isolated from earth in hazardous area
[2] Two barriers required for VOS1 / VCS1
[3] Circuit may be earthed at one point in hazardous area
[4] One barrier required for VOS1 / VCS1

Please read the operating and mounting instructions before using the equipment. Install the equipment in compliance with the prevailing regulations.

Bedrijfs- en montagehandleiding voor gebruik goed lezen! Apparaat moet volgens de geldende voorschriften worden geïnstalleerd.

Lire les instructions de montage et de service avant utilisation! L'appareil doit impérativement être installé selon les règlementations en vigueur.

Betriebs- und Montageanleitung vor Gebrauch lesen! Gerät muß nach den geltenden Vorschriften installiert werden.

The Installation, Operating and Maintenance Instructions contain important information that must be read and followed by anyone operating or servicing this product. Do not operate or service this equipment unless the instructions have been read. IMPROPER INSTALLATION OR USE OF THIS PRODUCT COULD RESULT IN BODILY INJURY OR DEATH.

Description

The Series 8000 Valve is a pneumatically operated fuel shut-off valve. These valves require compressed air for actuation. The 8000 Series valve will open or close by the addition of a control voltage signal. Removal of the signal will cause a fast acting return to the at rest position.Options are available in both normally closed and normally open versions.

Series 8*1* Normally Closed will shut off flow when de-energized and pass flow when energized.

Series 8*2* Normally Open will shut off flow when energized and pass flow when de-energized.

The Series 8000 Valve has optional configurations that meet hazardous locations.

The Series 8000 Valve has fire safe trim configurations that meet API 6FA.

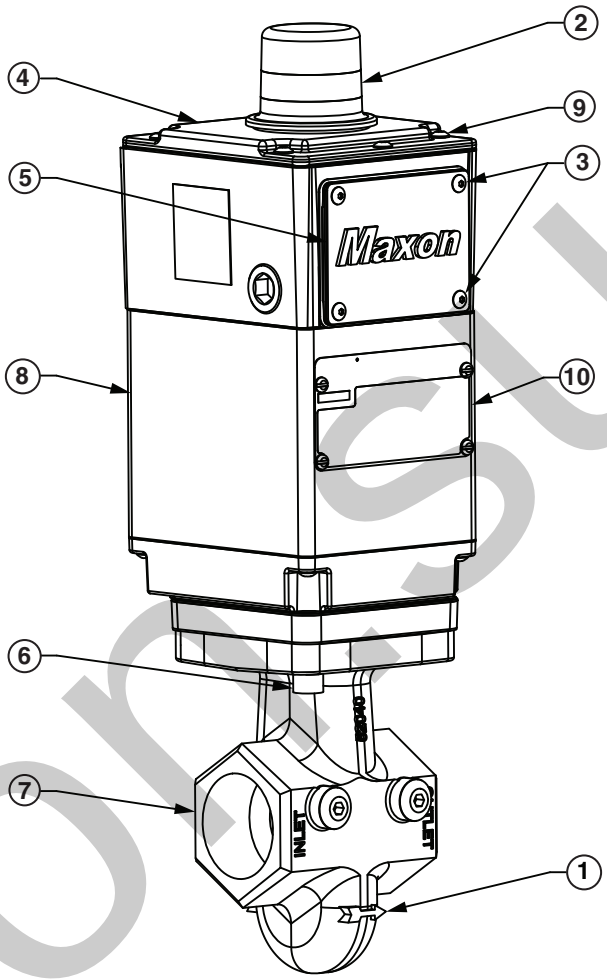
Nameplate and abbreviations

Consult the nameplate on your valve. This lists the maximum operating pressure, temperature limitations, voltage requirements and service conditions of your specific valve. Do not exceed nameplate ratings.

Abbreviation or Symbol	Description
M.O.P.	Maximum Operating Pressure
P_{ACT}	Required actuator pressure
T_{AMB}	Ambient temperature range
T_F	Fluid temperature range
	Visual indication determined by text, color and symbol; valve is shown in open position
	Visual indication determined by text, color and symbol; valve is shown in closed position
	Valve is shut
	Valve is partially open
	Valve is full open
VOS-1/2	Valve open switch(es)
VCS-1/2	Valve closed switch(es); proof of closure

Component identification

1) Flow arrow
2) Visual indication
3) Terminal block cover screws, M5 x 0.8
4) Switch access cover
5) Terminal block cover
6) Actuator bolts, M8 x 1.25 or M10 x 1.50
7) Valve body
8) Actuator
9) Switch access cover screws, M6 x 1.0
10) Nameplate



Installation

1. A gas filter or strainer of 40 mesh (0.6 mm maximum) or greater is recommended in the fuel gas piping to protect the downstream safety shut-off valves.
2. Properly support and pipe the valve in the direction of the flow arrow on the valve body. Valve seats are directional. Sealing will be maintained at full rated pressures in one direction only. Sealing will be provided in reverse flow only at reduced pressures.
3. Mount valve so that open/shut indicator will not face downward.
4. Series 8000 Valves require clean, dry compressed air or gas piped to the inlet of the actuator. Guidelines for various actuating gases:
   A. Compressed Air
      1. The vent, located on the underside of the base plate, should be protected from blockage.
      2. Although MAXON Series 8000 Valves do not require lubrication, they do contain Buna-N (-40°C) or silicone (-50°C) seals in the actuator sub-assembly. Compressed air supply must not contain any lubricant that is not compatible with Buna-N or silicone elastomers.
   B. Natural gas and other fuel gases can be used to actuate the Series 8000 Valve when the appropriate considerations are taken into account.
      1. Apply only the Intrinsically Safe Series 8000 Valve for the application. The general purpose and non-incendive options are not suitable for fuel gas activation.
      2. The activating fuel gas must be clean and free of moisture. The Series 8000 actuator contains Buna-N elastomers and brass components that will come in contact with the activating gas. The quality of the gas must not contain any constituents that are not compatible with Buna-N or brass.
      3. The exhaust gas must be vented to the atmosphere in a safe manner by piping from the filtered vent, located on the underside of the actuator's base. A 1/8" NPT female connection in the base plate allows for proper piping.
      4. The use of fuel gases for actuation is not permitted in EC areas due to ATEX Zone 2 restrictions.
      5. Actuators for fuel gas activation are only rated from -40°C to 60°C.
   C. For applications that are governed by the ATEX Directive (94/9/EC), use of fuel gas activation is not acceptable.
5. In some instances, it may be desired to utilize a slow opening feature for either application or code-related reasons. If a slow opening feature is required for normally closed shut-off valves, use MAXON's optional speed control set kit.
6. Wire the valve in accordance with all applicable local and national codes and standards. In U.S. and Canada, wiring must conform to the NEC ANSI/NFPA 70 and/or CSA C22.1, Part 1.
   A. Supply voltages must agree with valve's nameplate voltage within -15%/+10% for proper operation. For electrical wiring schematic, see instructions or sample affixed inside valve terminal block cover.
   B. Grounding is achieved with a grounding screw, which is located in the top assembly.
   C. Customer connections are provided via terminal block located in the top assembly.
   D. Main power wiring (120 VAC or 240 VAC) must be segregated from lower voltage 24 VDC signal wiring, when both are required.
   E. WARNING: For Division 2 installations using the intrinsically safe solenoid, the power source is not to exceed 28VDC with a minimum series resistance of 300 ohms.
7. Maintain integrity of the Series 8000 actuator enclosure by using the appropriate electrical connectors for the (2) 3/4" NPT conduit threaded connections.The Series 8000 electrical enclosure is NEMA 4 and IP65 rated with an option for NEMA 4X.
8. All access cover plate screws should be tightened using an alternate cross-corner tightening pattern to the values shown in Table 1.

Table 1 - Torque Specifications

Item Number	Description	Torque
3	Terminal Block Cover Screws, M5 x 0.8	5 N.m
9	Switch Access Cover Screws, M6 x 1.0	5.6 N.m
6	Actuator Bolts, M8 x 1.25	33 N.m
6	Actuator Bolts, M10 x 1.50	54 N.m

9. Verify proper installation and operation by electrically actuating the valve for 10-15 cycles prior to the first introduction of gas.
10. When customer-supplied, externally mounted solenoids are used, the component must be rated for the Class and Division of the hazardous area. MAXON 8112, 8122, 8012, 8022 valves will only carry FM approval to FM 3611, 3600 and 3810 standards. MAXON 8113, 8123, 8013, 8023 valves will only carry FM approval to 3610, 3600 and 3810 standards

Specifications

Valve Body Assemblies							
Valve Size	Flow Capacity	Actuator Pressure Class	Body Connections Available [1]	Body Material	Cv Rating	Flow Rate [2] $\left[\frac{cfh}{m^3/h}\right]$	MOP $\left[\frac{psig}{bar}\right]$
.75” (DN 20)	Std.	High Pressure	A, C	Iron	19	1060 / 30	200/13.8
1” (DN 25)	Std.	High Pressure	A, C	Iron	20	1115 / 31	200/13.8
			A, C, E, F, G	Steel			255/17.6
				Stainless			
1.25” (DN 32)	Std.	HIgh Pressure	A, C	Iron	45	2510 / 71	200/13.8
1.5” (DN 40)	Std.	High Pressure	A, C	Iron	53	2956 / 83	200/13.8
			A, C, E, F, G	Steel			255/17.6
				Stainless			
2” (DN 50)	Std.	High Pressure	A, B, C, D, H	Iron	86	4796 / 135	200/13.8
			A, C, E, F, G	Steel			255/17.6
				Stainless			
2.5” (DN 65)	Std.	High Pressure	A, B, C, D, H	Iron	127	7083 / 200	150/10.3
	CP	Std.	A, B, C, D, H	Iron	304	16955 / 480	50/3.4
			B, D, H	Steel			
				Stainless			
		High Pressure	A, B, C, D, H	Iron			175/12.1
			B, D, H	Steel			
				Stainless			
3” (DN 80)	Std.	High Pressure	A, C	Iron	173	9648 / 273	150/10.3
	CP	Std.	A, B, C, D, H	Iron	423	23591 / 668	40/2.7
			B, D, H	Steel			
				Stainless			
		High Pressure	A, B, C, D, H	Iron			135/9.3
			B, D, H	Steel			
				Stainless			
4” (DN 100)	CP	Std.	B, D, H	Iron	490	27328 / 773	40/2.7
				Steel			
				Stainless			
		High Pressure		Iron			135/9.3
				Steel			
				Stainless			
6” (DN 150)	Std.	Std.	B, D, H	Iron	1172	65364 / 1850	60/4.1
				Steel			
				Stainless			
		High Pressure		Iron			100/6.9
				Steel			
				Stainless			

Note 1: Body Connections
A - NPT
B - ANSI 150 lb Flange (ISO 7005 PN 20)
C - ISO Threaded
D - DIN PN16 Flange
E - Socket Welded Nipple
F - Socket Welded Nipple w/ANSI 150 lb flange (ISO 7005 PN20)
G - Socket Welded Nipple w/ANSI 300 lb flange (ISO 7005 PN 50)
H - EN 1092-1 PN16 (ISO 7005-1 PN16)

Note 2: Flow for Natural Gas (S.G. 0.60) at differential pressure = 2.5 mbar and standard temperature (15°C) and pressure (1.013 bar)

Operating characteristics

- Opening time varies per valve size, 3 seconds or less for largest size. For slower opening, a speed control set can be supplied by MAXON.
- Closing time is less than 1 second.
- Type of Gas

Gas Compatibility and Valve Approvals/Certifications

Gas	Gas Code	Suggested Material Options			MOPD Rating	Agency Approvals and Certifications			
		Body seals	Body & bonnet	Trim Package [5]		FM	CSA [3]	CE [4]	
								GAD	MD
Air	AIR	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Ammonia	AMM	A, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Butane Gas	BUT	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Coke Oven Gas	COKE	B, F	5	Analysis Required	Std.	X	X	NA	X
Delco	DEL	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Digester [1]	DIG	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Endothermic AGA	ENDO	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Exothermic Gas	EXO	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Hydrogen Gas	HYD	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	[2]	X	X	NA	X
Manufactured [1]	MFGD	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Natural Gas	NAT	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Nitrogen	NIT	A, B, C, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	NA	X
Oxygen High	OXYH	B, C, F	2, 5, 6	4, 5	13 bar max	X	X	NA	X
Oxygen Low	OXYL	B, C, F	1, 2, 5, 6	4, 5	2 bar max	X	X	NA	X
Oxygen X	OXYX	B, C, F	2, 5, 6	4, 5	Std.	X	X	NA	X
Propane	PROP	A, B, F	1, 2, 5, 6	1, 2, 3, 6, 7	Std.	X	X	X	X
Refinery [1]	REF	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Sour Natural [1]	SOUR	Analysis Required	5	Analysis Required	Std.	X	X	NA	X
Town Gas [1]	TOWN	Analysis Required	5	Analysis Required	Std.	X	X	X	X
Land Fill Gas	LAND	Analysis Required	5	Analysis Required	Std.	X	X	NA	X

Notes:
[1] Other body and trim packages may be acceptable pending fuel analysis. For pricing inquiry, Viton body seals will be standard option. Contact MAXON for details.
[2] Valve maximum operating pressure (MOPD) to be reduced by 25% from standard ratings.
[3] ISO connections are not recognized by CSA standards.
[4] All 8000 Valves do meet the essential requirements of the Low Voltage (73/23/EC) and the EMC (89/336/EC) Directives. GAD refers to the Gas Appliances Directive (2009/142/EC): this Directive only covers the use of commercially available fuels (natural gas, butane, town gas and LPG). MD stands for Machinery Directive (2006/42/EC). All Series 8000 valves meet the essential requirements for fuel shut off on Industrial Thermal Equipment as specified in EN746-2.
[5] Trim Package 1 is only allowed with body and bonnet 1.

Body Seals:
A - Buna-N
B - Viton
C - Ethylene Propylene
F - Omniflex

Body & Bonnet:
1 - Cast Iron
2 - Carbon Steel
5 - Stainless Steel
6 - Low Temp Carbon Steel

Trim Package:
1 - Trim Package 1
2 - Trim Package 2
3 - Trim Package 3 (NACE)
4 - Trim Package 2, Oxy Clean
5 - Trim Package 3, Oxy Clean
6 - Trim 2 fire safe
7 - Trim 3 fire safe

Auxiliary features

- Non-adjustable Proof of Closure Switch(es) with valve seal over travel interlock.
- Auxiliary switch for indication of full travel (open for normally closed valves, closed for normally open valves).

Operating environment

- Fluid temperature range of -40°C to 100°C, with options available for -50°C to 100°C.
- Actuators are rated for NEMA 4, IP65 or optional NEMA 4X, IP65.
- Ambient temperature range of -40°C to 60°C for the 8011, 8111, 8021 and 8121 General Purpose and 8012, 8112, 8022 and 8122 Non-Incendive series valves; option of -50°C to 60°C also available.
- Ambient temperature range of -40°C to 50°C for 8013, 8113, 8023 and 8123 Intrinsically Safe series valves; option of -50°C to 50°C also available.
- All valves for oxygen service or using Ethylene Propylene body seals are limited to a minimum ambient and fluid temperature of -17°C.

Product approvals

Agency Approvals and Certifications

	General Purpose Valves 8111, 8121, 8011, 8021 Series		Non-Incendive/Non-Sparking Valves 8112, 8122, 8012, 8022 Series [3]		Intrinsically Safe Valves 8113, 8123, 8013, 8023 Series [4]	
	Standards	**Markings**	**Standards**	**Markings**	**Standards**	**Markings**
FM Approvals	FM 7400	FM APPROVED FM 7400	FM 7400 FM 3611 FM 3600 FM 3810	Class I, Div 2, Groups ABCD, T4 Class II, Div 2, Groups FG, T4 Class III, Div 2, T4 Ex nA nC IIC T4 Ta = 60C Gc IP65 FM APPROVED FM 3600 FM 3611 FM 3810 FMG11.0030X Ex nA nC IIC T4 Ta=60°C Gc IP65 Ex tC IIIC T135° Dc	FM 7400 FM 3610 FM 3600 FM 3810	Class I, Div 1, Groups ABCD, T5 Class II, Div 1, Groups EFG, T5 Class III, Div 1, T5 Ex ia IIC T5 Ta = -50C to +50C IP 65 FM APPROVED FM 3600 FM 3610 FM 3810 FMG11.0030X Ex ia IIC T5 Ta=-50°C to +50°C IP65 Ex tb IIIC T100°C Ta=-50°C to +50°C
FM Approvals- IECEx Certification	Not Applicable	None	IEC 60079-0 IEC 60079-15	Ex nA nC IIC T4 Ta=60°C Gc IP65 Ex tC IIIC T135°C Dc FMG 11.0030X FM APPROVED FM 3600 FM 3611 FM 3810 FMG11.0030X Ex nA nC IIC T4 Ta=60°C Gc IP65 Ex tC IIIC T135° Dc	IEC 60079-0 IEC 60079-11	Ex ia IIC T5 Ta= -50°C to +50°C IP65 Ex tb IIIC T100°C Ta= -50°C to +50°C FMG 11.0030X FM APPROVED FM 3600 FM 3610 FM 3810 FMG11.0030X Ex ia IIC T5 Ta=-50°C to +50°C IP65 Ex tb IIIC T100°C Ta=-50°C to +50°C
CSA International	CSA 6.5	C/I	CSA 6.5 CSA 22.2 No. 213 CSA 22.2 1010.1 CSA E60079-0 CSA E60079-15	Class I, Div 2, Groups ABCD, T4 Class II, Div 2, Groups FG, T4 Class III, Div 2, T4 Ex nA IIC T4 Ta = 60C (with standard solenoid) (Zone 2 approval) Ex nA IIC T5 Ta = 50C (with IS solenoid) (Zone 2 approval) C/I 03.1433937	CSA 6.5 CSA 22.2 No. 157 CSA 22.2 1010.1 CSA E60079-0 CSA E60079-11	Class I, Div 1, Groups ABCD, T5 Class II, Div 1, Groups EFG, T5 Class III, Div 1, T5 Ex ia IIC T5 Ta = 60C (Zone 0 Approval) C/I 03.1433937X Ex ia
European Approvals [1]	EN 161 EN 13774	CL/KL: A, GR 2 EC PIN: C86CM45	EN 161 EN 13774	CL/KL: A, GR 2 EC PIN: C86CM45	EN 161 EN 13774	CL/KL: A, GR 2 EC PIN: C86CM45
European Approvals [2] (Hazardous Locations)	Not Applicable	None	Not Applicable	None	EN 60079-0 EN 60079-11 EN 60529 EN 61241-11 EN 13463-1 EN 13463-5	II 2 G c Ex ia IIC T5 Ta=-50C to +50C IP65 II 2 D c Ex iaD 21 IP65 T100ºC Ta=-50C to +50ºC FM07ATEX0036
IEC Approvals	IEC 61010-1 IEC 61508	None	IEC 61010-1 IEC 61508	None	IEC 61010-1 IEC 61508	None
NCC/Inmetro	Not Applicable	None	ABNT NBR IEC 60079-0 IEC 60079-15 IEC 60079-31	Ex nAC IIC T4 Gc (-40 °C ≤ Ta ≤ +60 °C) Ex tc IIIC T135°C Dc IP65 Segurança INMETRO OCP 0034	ABNT NBR IEC 60079-0 ABNT NBR IEC 60079-11 IEC 60079-31	Ex ia IIC T5 Ga (-50 °C ≤ Ta ≤ +50 °C) Ex tc IIIC T135°C Dc IP65 Segurança INMETRO OCP 0034
KTL	Not Applicable	None	Announcement No. 2010-36 of Ministry of Employment and Labor	Ex nA nC IIC T5/T4 Ex tc IIIC T135°C IP65 (-40°C ≤ Ta ≤ +60°) 12-KB4BO-0058X-Ex	Announcement No. 2010-36 of Ministry of Employment and Labor	Ex ia IIC T5 (-50°C ≤ Ta ≤ +50°C) 12-KB4BO-0059X-Ex
AGA Certifications	AS 4629	None	AS 4629	None	AS 4629	None

[1] Product certified to meet the following: Gas Appliance Directive (2009/142/EC); Low Voltage Directive (73/23/EEC); EMC Directive (89/336/EEC)
[2] Product certified to meet the following: ATEX Directive (94/9/EC)
[3] When used with a customer-supplied, externally mounted solenoid, MAXON 8112, 8122, 8012, 8022 valves will only carry FM Approval to FM 3611, 3600 and 3810 standards.
[4] When used with a customer-supplied, externally mounted solenoid, MAXON 8113, 8123, 8013, 8023 valves will only carry FM Approval to FM 3610, 3600 and 3810 standards.

Valve cycle requirements

This is based on the standards that MAXON valves are approved to and the corresponding minimum number of cycles to be completed without failure as shown in the chart below.

	CSA (CSA 6.5)	FM (FM 7400)	European (EN161)
Automatic - Normally Closed Series 8011, 8111, 8012, 8112, 8013, 8113	100,000	20,000	<= 1” 200,000 <= 3” 100,000 <= 6” 50,000
Vent Valves Series 8021, 8121, 8022, 8122, 8023, 8123	No special requirements	No special requirements	No special requirements

Electrical data

Normally-Closed Shut-Off Valves

General Purpose Normally-Closed Valves

Series 8011 & Series 8111
Switches: V7
Solenoid Valve: Standard
24 VDC, 4.8W
120VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
240VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
See catalog page 10-30.3-11 or inside valve cover for wiring schematic.

Non-incendive Normally-Closed Valves

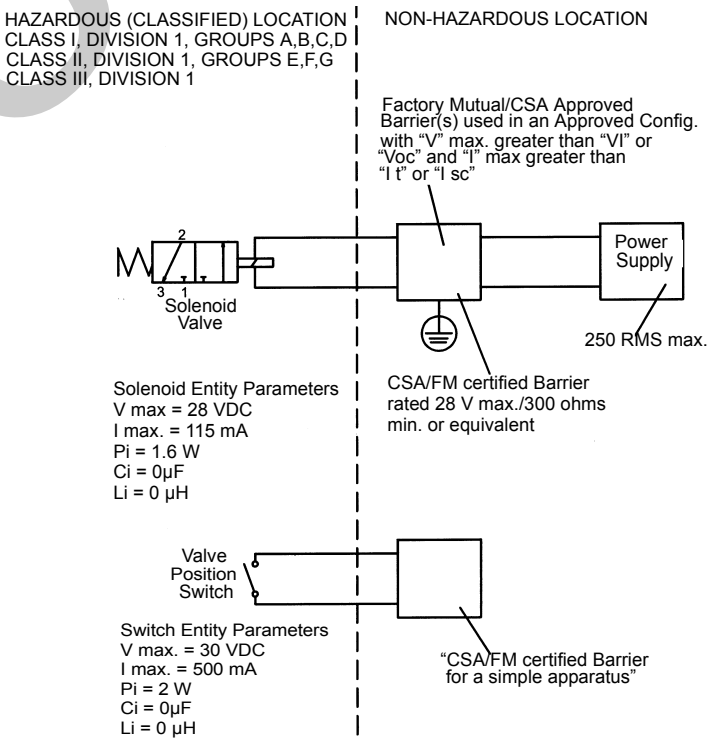
Series 8012 & Series 8112
Switches: IP67
Solenoid Valve: Standard
24 VDC, 4.8W
120VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
240VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
24VDC IS, .09A, 2.1W

Intrinsically Safe Normally-Closed Valves

Series 8013 & Series 8113
Switches: V7 with optional IP67
Solenoid Valve: Intrinsically Safe

NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically safe devices with entity parameters not specifically examined in combination as a system when: V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
6) Installation in the European Union should be in accordance to Directive 94/9/EC (ATEX 95).
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
9) No revision to drawing without prior authorization from FM Approval and CSA International.



Intrinsically Safe Normally-Closed Valves

Series 8013 & Series 8113

Switches: V7 with optional IP67

Solenoid Valve: Customer-supplied, externally mounted

NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically safe devices with entity parameters not specifically examined in combination as a system when: V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than the maximum permissible safe area voltage (Um) for the barrier.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
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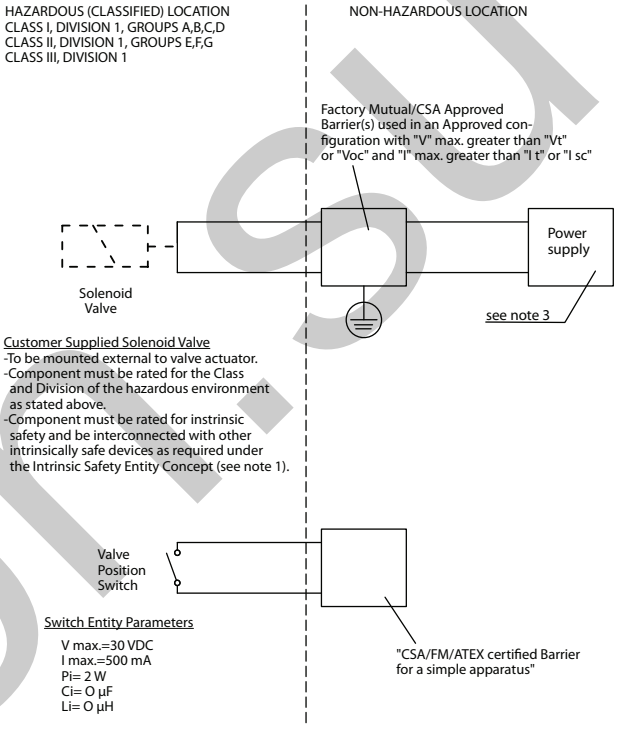
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
9) No revision to drawing without prior authorization from FM Approval and CSA International.



Normally-Open Vent Valves

General Purpose Normally-Open Vent Valves

Series 8021 & Series 8121
Switches: V7
Solenoid Valve: Standard
24 VDC, 4.8W
120VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
240VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
See catalog page 10-30.3-11 or inside valve cover for wiring schematic.

Non-incendive Normally-Open Vent Valves

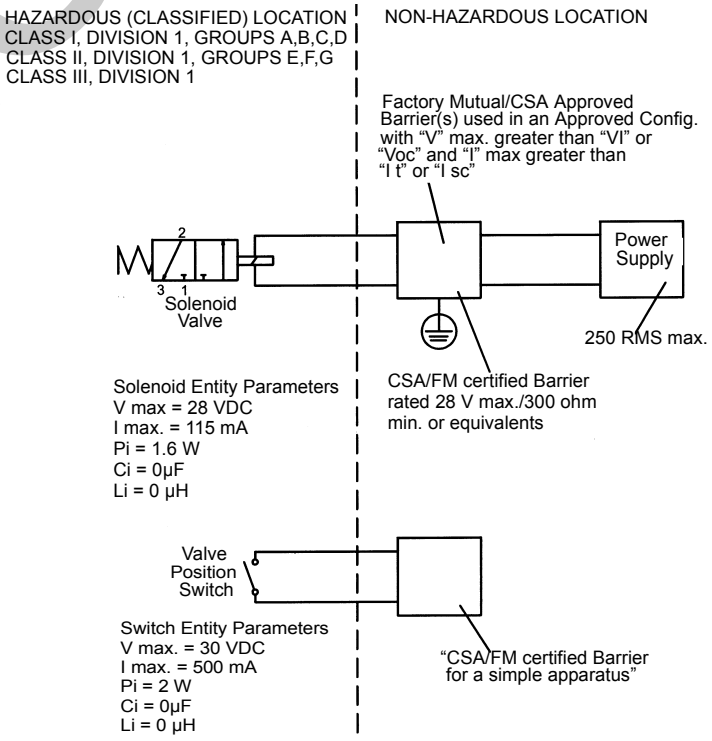
Series 8022 & Series 8122
Switches: IP67
Solenoid Valve: Standard
24 VDC, 4.8W
120VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
240VAC, 50/60 Hz, 11/9.4 VA Peak, 8.5/6.9 VA Holding
24VDC IS, .09A, 2.1W

Intrinsically Safe Normally-Open Vent Valves

Series 8023 & Series 8123
Switches: V7 with optional IP67
Solenoid Valve: Intrinsically Safe

NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically safe devices with entity parameters not specifically examined in combination as a system when: V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
6) Installation in the European Union should be in accordance to Directive 94/9/EC (ATEX 95).
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
9) No revision to drawing without prior authorization from FM Approval and CSA International.



Intrinsically Safe Normally-Open Vent Valves

Series 8023 & Series 8123

Switches: V7 with optional IP67

Solenoid Valve: Customer-supplied, externally mounted

NOTES:

1) The Intrinsic Safety Entity concept allows the interconnection of two FM approved (CSA Certified when installed in Canada) Intrinsically safe devices with entity parameters not specifically examined in combination as a system when:
   V_{oc} or U_o or $V_t \leq V_{max}$, I_{sc} or I_o or $I_t \leq I_{max}$, C_a or $C_o \geq C_i + C_{cable}$, L_a or $L_o \geq L_i + L_{cable}$, and for FM only: $P_o \leq P_i$.
2) Dust-tight conduit seal must be used when installed in Class II and Class III environments.
3) Control equipment connected to the Associated Apparatus must not use or generate more than the maximum permissible safe area voltage (Um) for the barrier.
4) Installation in the U.S. should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electric Code® (ANSI/NFPA 70) Sections 504 and 505.
5) Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
6) Installation in the European Union should be in accordance to Directive 94/9/EC (ATEX 95).
7) The configuration of associated Apparatus must be FM Approved (CSA Certified when in Canada) under Entity Concept.
8) Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
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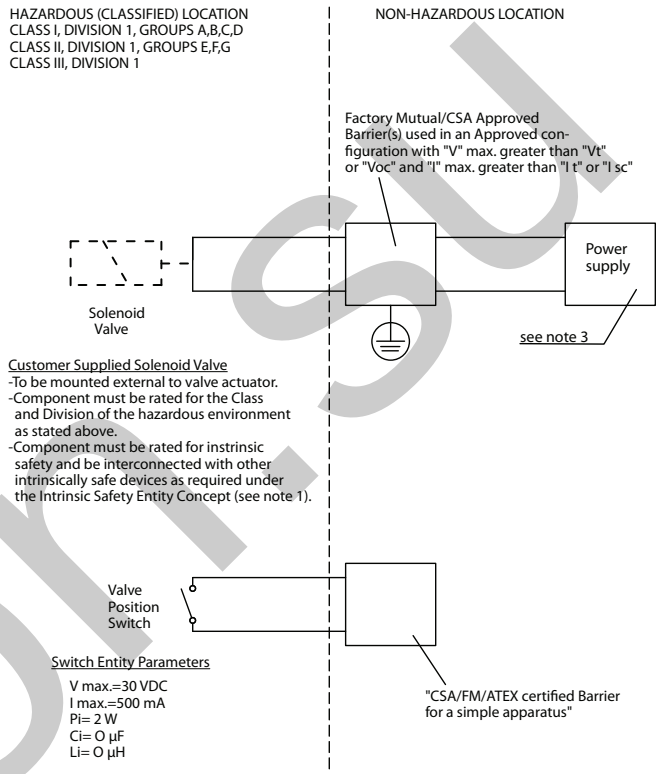
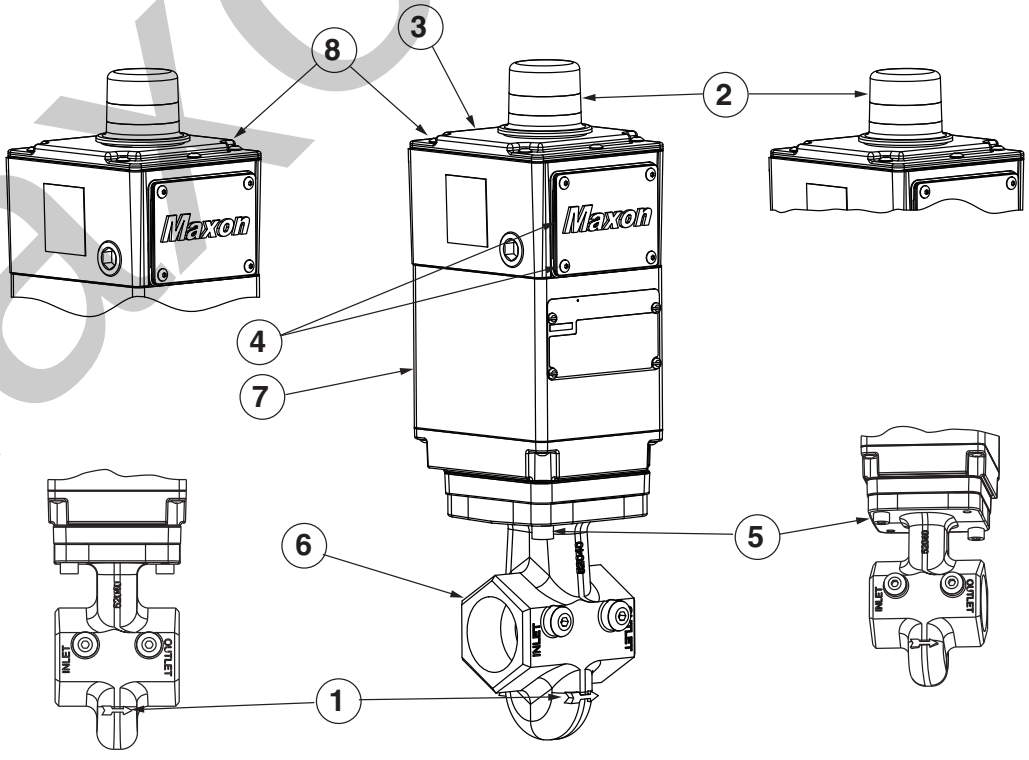


Actuator assembly rotation/replacement

MAXON Series 8000 Valves should be ordered in a configuration compatible with planned piping. If valve orientation is not correct, the actuator assembly can be rotated in 90° increments around the valve body centerline axis using the procedure below. This procedure should also be followed for field replacement of the actuator.

- **Shut off all electrical power** and close off upstream manual cock.
- **Remove terminal block access cover plate [4]** and disconnect power lead wires. **Caution:** Label all wires prior to disconnection when servicing valve. Wiring errors can cause improper and dangerous operation.
- **Remove conduit and** electrical leads.
- Remove all pneumatic lines.
- **Unscrew the actuator/body bolts [5]** screwed up from the bottom. These bolts secure the valve actuator **[7]** to the valve body **[6]**.
- **Gently lift the actuator [7] off valve body assembly** enough to break the seal between body assembly and the rubber gasket adhering to the bottom of the actuator base plate.
- **Carefully rotate/replace actuator assembly** to the desired position. Reposition the actuator back down onto the valve body casting.
- **Realign holes** in valve body casting with the corresponding tapped holes in the bottom of the actuator base plate. Be sure the gasket is still in place between the body and actuator base plate.
- **Reinsert the body bolts** up from the bottom through the body and carefully engage threads of the actuator assembly. Tighten securely referring to Table 1 on page 10-30.3-27 for appropriate torque specifications.
- **Reconnect conduit, electrical leads, and all pneumatic lines,** then check that signal switch wands are properly positioned. **Failure to correct any such misalignment can result in extensive damage to the internal mechanism of your valve.**
- **Energize valve and cycle several times** from closed to full open position. Also electrically trip the valve in a partially opened position to prove valve operates properly.
- **Replace and secure cover plates**.
- **Verify proper operation** after servicing.

1) Flow arrow on valve body
2) Open/shut indicator (see Note 1 below)
3) Switch access cover
4) Terminal block cover and screws
5) Actuator/body bolts
6) Valve body
7) Actuator assembly
8) Switch access cover screws



Note 1: Open/Shut indication is 360°. If required, the observation window may be cleaned with a damp cloth.

Field installation of valve position switch

Instructions below are written for normally-closed shut-off valves. For normally-open vent valves, reverse switch nomenclature. (VOS becomes VCS and vice versa.)

General: Shut off fuel supply upstream of valve, then de-energize valve electrically.
Remove top cover and terminal block cover to provide access, being careful not to damage gasket.
See pages 10-30.3-38 and 39 for instructions on adding or replacing switches.

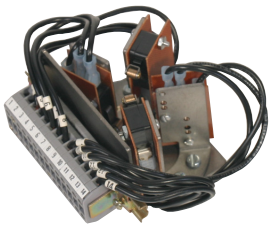
Substitution of components may affect suitability for Hazardous Locations.

Field Replacement Items

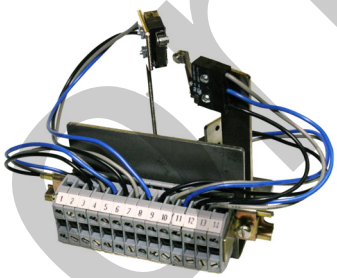
- Position Switches
- Actuators
- Solenoids

Contact MAXON with valve serial numbers to locate appropriate switch kit assembly.

Figure 1: Typical switch sub-assemblies



V7 Assembly for General Purpose and Intrinsically Safe valves



IP67 Switch Assembly for Non-Incendive and optional Intrinsically Safe valves

Replacement Switches:

- Carefully remove field wiring from the terminal block. Insure field wires are clearly marked to correct terminal.
- Unwire the solenoid valve lead wires from terminals labeled #1 and #2.
- Remove screws that secure the switch sub-assembly to the actuator housing. The switch sub-assembly should be easily removable from actuator assembly (see Figure 1: Typical Switch Sub-Assemblies).
- Note wand position and mounting hole location. Carefully remove the 2 screws and lift existing switch. Reference Figures 2 through 7 (page 10-30.3-38) to ensure correct switch location.
- Install replacement switch in same mounting holes on bracket and verify correct wand position.
- Replace existing wiring one connection at a time, following original route and placement.
- Reassemble switch sub-assembly in actuator housing. Dowel pins are provided to insure proper placement of switch sub-assembly.
- Wire the solenoid valve leads to terminals labeled #1 and #2.
- Cycle valve, checking switch actuation points carefully. VCS switch actuates at top of stem stroke and VOS at bottom for normally-closed shut-off valves; vice-versa for normally-open vent valves.
- Replace covers, and then return valve to service.

Add Switches:

- Carefully remove field wiring from the terminal block. Insure field wires are clearly marked to correct terminal.
- Unwire the solenoid valve lead wires from terminals labeled #1 and #2.
- Remove screws that secure the switch sub-assembly to the actuator housing. The switch sub-assembly should be easily removable from actuator assembly (see Figure 1: Typical Switch Sub-Assemblies).
- Reference Figures 2 through 7 to ensure correct switch location. Valve size is depicted in the model number by the first 4 digits. For example, a 3" CP valve should have Model No. 300C.
- Install switch and insulators, when provided, to correct hole. Insure proper alignment. VCS switch should have activation wand pointed upward and VOS activation wand should be pointed downward.
- Wire new switches to terminals provided.
- Reassemble switch sub-assembly in actuator housing. Dowel pins are provided to insure proper placement of switch sub-assembly.
- Wire the solenoid valve leads to terminals labeled #1 and #2.
- Cycle valve, checking switch actuation points carefully. VCS switch actuates at top of stem stroke and VOS at bottom for normally-closed shut-off valves; vice-versa for normally-open vent valves.
- Replace covers, and then return valve to service.

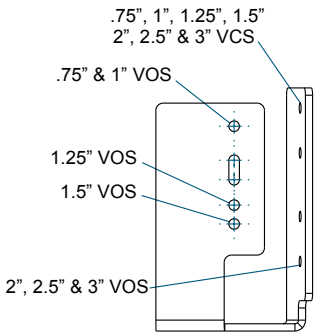


Figure 2:
IP67 Switch Bracket

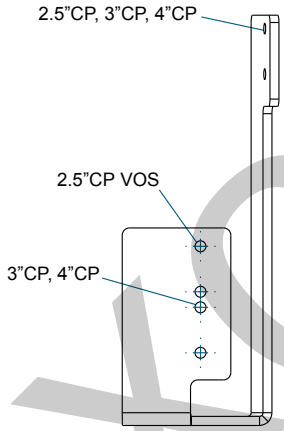


Figure 3:
IP67 Switch Bracket

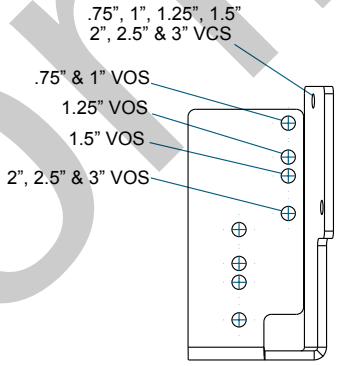


Figure 4:
General Purpose
Switch Bracket

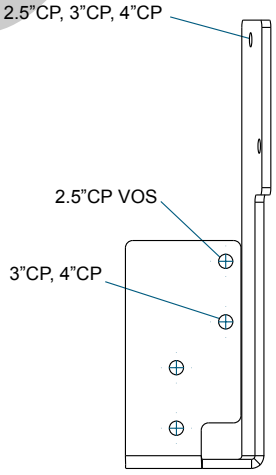


Figure 5:
General Purpose
Switch Assembly

Figure 6:
6" Valve IP67
Switch Bracket

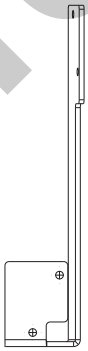


Figure 7:
6" Valve General
Purpose Switch Bracket

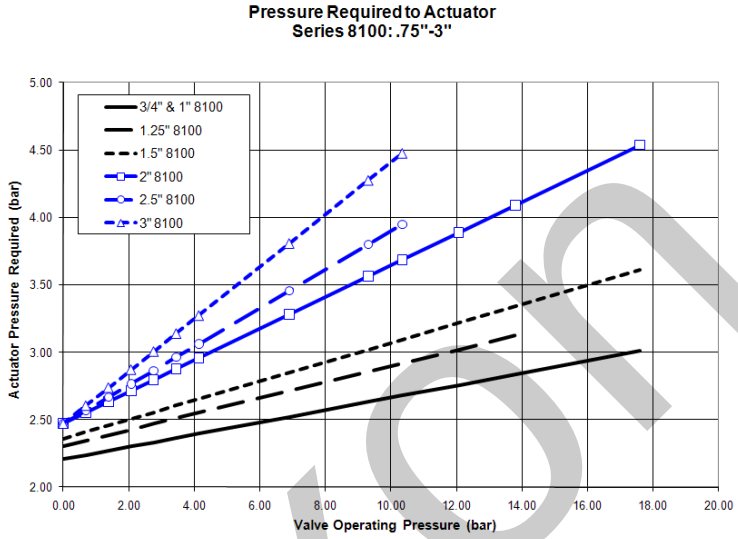
Operating instructions

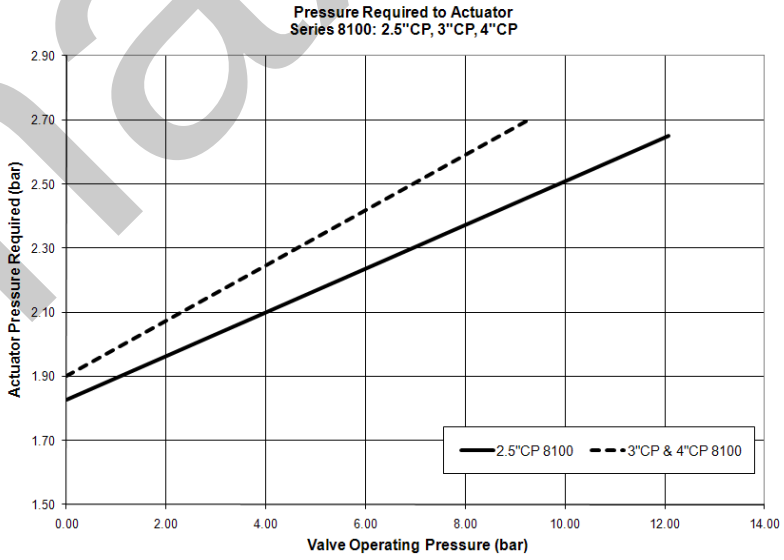
Refer to appropriate catalog bulletin and specification page for operating sequence applying to your specific valve. Never operate valve until all essential allied equipment is operative and any necessary purges completed. Failure of valve to operate normally indicates that it is not powered or supply air pressure is not adequate. Check this first!
Main system shut-off should always be accomplished with an upstream leak-tight manual fuel cock.

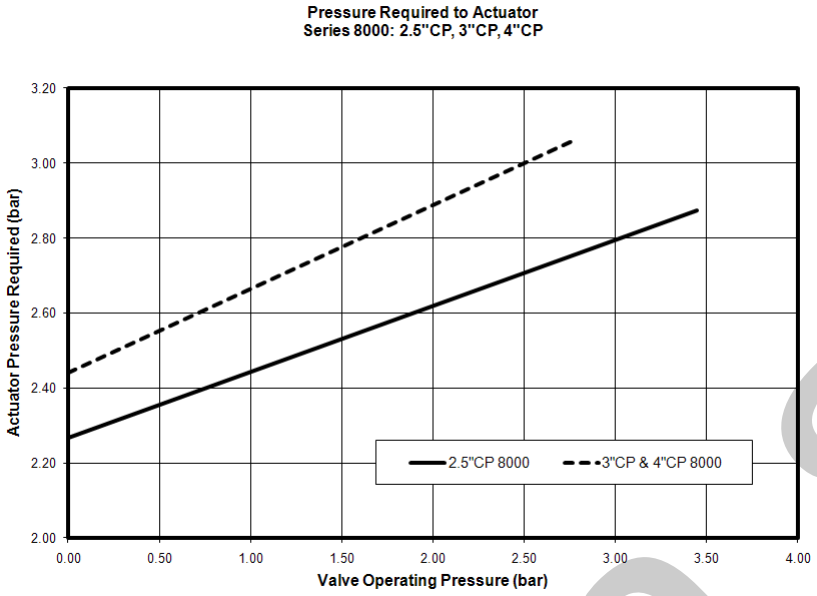
- Normally-closed shut-off valves begin opening cycle immediately upon being powered.
- Normally-open vent valves begin to close immediately upon being powered.

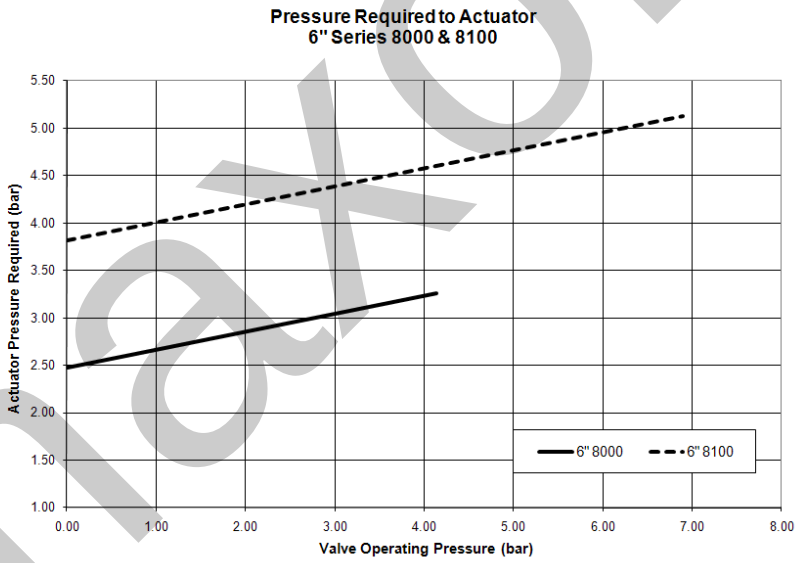
Alternate operator pressures

Series 8000 Valves may be operated within a range of motive pressures. Consult charts below for application fluid pressure and corresponding required actuator pressure.









Maintenance instructions

MAXON Series 8000 Valves are endurance tested far in excess of the most stringent requirements of the various approval agencies. They are designed for long life even if frequently cycled, and to be as maintenance-free and trouble-free as possible.

A valve operational test should be performed on an annual basis. If abnormal opening or closing is observed, the valve should be removed from service and your MAXON representative should be contacted. (See Valve Technical Data page 10-35.1.)

Valve leak test should be performed on an annual basis to assure continued safe and reliable operation. Every MAXON valve is operationally tested and meets the requirements of FCI 70-2 Class VI Seat Leakage when in good operable condition. Zero leakage may not be obtained in the field after it has been in service. For specific recommendations on leak test procedures, see MAXON Valve Technical Data page 10-35.2. Any valve that exceeds the allowable leakage, as set forth by your local codes or insurance requirements, should be removed from service and your MAXON representative should be contacted.

Actuator assembly components require no field lubrication and should **never** be oiled.

Auxiliary switches, solenoids or complete actuator may be replaced in the field.

Do not attempt field repair of valve body or actuator. Any alterations void all warranties and can create potentially hazardous situations.

If foreign material or corrosive substances are present in the fuel line, it will be necessary to inspect the valve to make certain it is operating properly. If abnormal opening or closing is observed, the valve should be removed from service. Contact your MAXON representative for instructions.

Operator should be aware of and observe characteristic opening/closing action of the valve. Should operation ever become sluggish, remove valve from service and contact MAXON for recommendations.

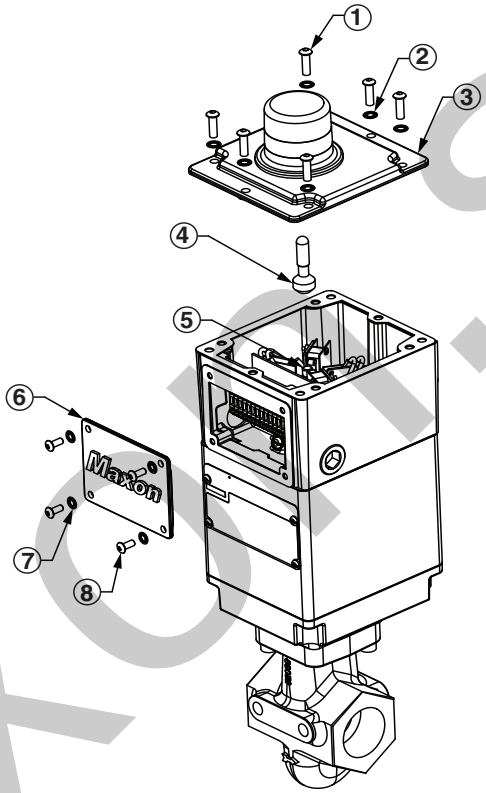
Address inquiries to MAXON. Local worldwide offices may be located at www.maxoncorp.com or by phoning 011-765-284-3304.

Include valve serial number and nameplate information.

Solenoid replacement procedure

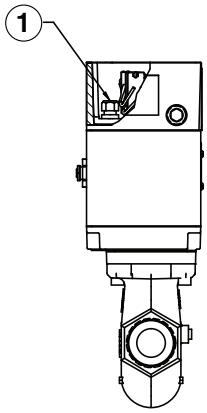
- All power sources, both pneumatic and electric, must be de-energized and follow all proper safety procedures prior to servicing valve.
- Use a 4 mm allen wrench to remove the top plate. A 3 mm allen wrench is used to remove the terminal block cover.
- Use a 5/16” open end wrench to hold the cylinder shaft, then use a pair of pliers to unthread the switch indicator from the cylinder shaft. When using pliers, grab the indicator from the top.

1) Top plate screw M6-1.0 x 20 socket head cap screw
2) M6 Lock washer
3) Top plate
4) Switch indicator
5) Cylinder shaft
6) Terminal block cover
7) M5 Lock washer
8) Terminal block cover screw M5-0.8 x 12 socket head cap screw



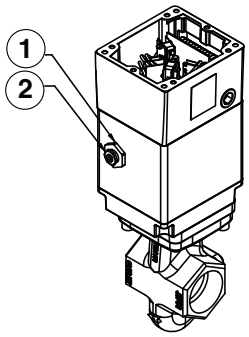
- Loosen the liquid tight connector nut where the solenoid wires come into the top housing. Remove #1 and #2 wire from the terminal block.

1) Liquid tight connector



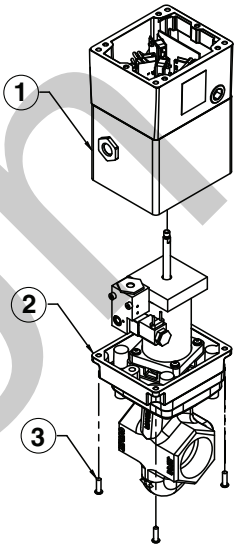
- Use a 3/4” wrench to remove the solenoid inlet fitting. An adjustable wrench is used to loosen the housing collar. Slightly loosen the housing collar but do not remove, due to the nut and o-ring located inside the housing becoming dislocated.

1) Housing collar
2) Solenoid inlet fitting



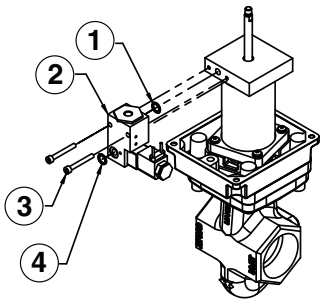
- Use a 4 mm allen wrench and remove the 4 screws that hold the housing to the base plate. Pull the housing straight up and remove. Old solenoid wires will pass through liquid tight connector.

1) Housing
2) Base plate
3) Housing screws M6-1.0 x 20 cap screws



- Use a 4 mm allen wrench and remove the 2 screws that hold the solenoid on. Replace the solenoid ensuring that there are 2 o-rings, one on the solenoid inlet and one on the solenoid outlet. The solenoid must be level when tightening screws.

1) Solenoid o-ring
2) Solenoid
3) M5-0.8 x 40 socket head cap screw
4) Solenoid o-ring



- Run the new solenoid wires back up through the liquid tight connector in the housing and align the cylinder shaft with the hole in the housing. Carefully slide housing back into position. Replace the 4 housing screws and leave loose.
- Verify the o-ring is still on the solenoid inlet by looking through the housing collar. Reinstall solenoid inlet fitting tight. Leave the housing collar loose.
- Reinstall solenoid wire #1 and #2 back to the terminal block and tighten down the liquid tight connector nut.
- A locking sealant must be used on the cylinder shaft threads and then reinstall the switch indicator. Make sure to remove any locking sealant that runs down the cylinder shaft. Re-energize pneumatic and electric power and cycle the valve several times to ensure it operates smoothly. Tighten down the 4 housing screws that hold the housing to the base plate using a cross pattern. Then tighten the housing collar on the solenoid inlet fitting. The o-ring under the housing collar must not be pinched while tightening the housing collar.
- Cycle valve several more times to see if it still operates smoothly. If not, loosen the 4 screws that hold the housing to the base plate and cycle again. Retighten the 4 housing screws. Put the top plate and terminal block covers back on valve.

IEC 61508 Instruction Requirements

Primary Safety Function

a. Series 8*1*, Normally Closed will pass flow when energized and shut off flow within the stated leakage specification when de-energized.
b. Series 8*2*, Normally Open will pass flow when de-energized and shut off flow within the stated leakage specification when energized.
c. The valves are designed for low demand applications.
d. The valve must be within specified operating conditions, as found in the instruction manual.

Proof test

The objective of proof testing is to detect failures within the Series 8000 Valve that prevent the valve from performing its safety function.

The frequency of proof testing, or the proof test interval, is to be determined in reliability calculations for the safety instrumented functions for which the Series 8000 Valve is applied. The proof tests must be performed more frequently or as frequently as specified in the calculation in order to maintain the required safety integrity of the safety instrumented function.

Maintenance instructions include a Valve Leak Test. These instructions must be followed during the proof test. This Valve Leak Test will detect approximately 99% of possible DU (Dangerous Undetected) failures resulting in a Proof Test Coverage of 99% for the valve. For specific recommendations on leak test procedures, see MAXON Valve Technical Document 10-35.2-1.

The person(s) performing the proof test of the Series 8000 Valve should be trained in SIS (Safety Instrumented Systems) operations, including bypass procedures, valve maintenance and Company Management of Change procedures.

Reliability Data and Lifetime Limit

A detailed Failure Mode, Effects, and Diagnostics Analysis (FMEDA) report is available from MAXON. This report details all failure rates and failure modes, common cause factors for applications with redundant devices and the expected lifetime of the Series 8000 Valve.

a. The Series 8000 Valve is intended for low demand mode applications up to SIL 3 for use in a simplex (1oo1) configuration, depending on the PFD_{AVG} calculation of the entire Safety Instrumented Function.
b. The development process of the Series 8000 Valve is certified up to SIL 3, allowing redundant use of the valve up to this Safety Integrity Level, depending on the PFD_{AVG} calculation of the entire Safety Instrumented Function.
c. When using the Series 8000 Valve in a redundant configuration, a common cause factor should be included in reliability calculations. For details, see the FMEDA report.
d. The reliability data listed in the FMEDA report is only valid for the useful lifetime of the Series 8000 Valve. The failure rates of the Series 8000 Valve may increase sometime after this period. Reliability calculations based on the data listed in the FMEDA report for mission times beyond the lifetime may yield results that are too optimistic, i.e. the calculated Safety Integrity Level will not be achieved.

Product Safety Officer

Any failures that are detected and that compromise functional safety should be reported to the Product Safety Officer within MAXON. Please contact MAXON Customer Service.

FITTING CERTIFICATE

We:
Maxon Corporation

Address:
201 E. 18th Street
Muncie, IN 47302
USA

Declare that all fittings produced at the above address within the following product group:
Maxon Series 8000 Air Actuated Valves

Conform to all applicable provisions of the European Gas Appliance Directive.

Certification: Product Identification Number C86CM45 applies
EC Surveillance: BSI (Notified Body Number 0086)

This certificate issued by: Maxon Corporation
Name: Lora Davis
Title/Position: Product Engineering Manager
Date of issue: April 15, 2011