



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 réglementations en vigueur.

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








The installation, operation 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

MAXON electro-mechanical valves are electrically actuated fuel shut-off valves. The valves are designed for a fast acting return to the at rest position upon removal of a control voltage signal. Motorized automatic and manual actuators are available depending on application needs. In addition, normally-closed and normally-open options are available. The normally-closed versions will shut off flow when de-energized and pass flow when energized. The normally-open versions will shut off flow when energized and pass flow when de-energized. Electro-mechanical valves are also offered in configurations that meet hazardous locations.

Nameplate and abbreviations

Consult the nameplate of 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
OPENING	Valve opening time (for automatic valves only). Units shown in seconds.
	Solenoid/clutch voltage and frequency
	Motor voltage and frequency
T _{AMB}	Ambient temperature range
T _F	Fluid temperature range
SHUT	Visual indication that valve is shut
OPEN	Visual indication that valve is open
SPDT (HS)	Single pole double throw hermetically-sealed switch(es)
SPDT	Single pole double throw switch(es)
SPDT (HC)	Single pole double throw high capacity switch(es) (used when DC motors are ordered)
DPDT	Double pole double throw switch(es)
GENERAL PURPOSE AREA	Designates components used in general purpose areas
DIVISION 2 AREA	Designates components used in Division 2 hazardous locations areas
	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

Valve model number description

Every MAXON gas electro-mechanical valve can be accurately identified by the model number shown on the valve nameplate. The example below shows a typical gas electro-mechanical valve model number, along with the available choices for each item represented in the model number.

Configured item number					Valve body						Actuator					
Valve size	Flow capacity	Valve type	Normal position	Area classification	Body connection	Body seals & bumper material	Body material	Internal trim package		Solenoid OR circuit board voltage	Motor voltage OR handle side plate	Motor timing (automatic valves only)	Switch options	Enclosure rating	Instruction language	
300	C	MA	1	1	-	A	A	1	1	-	B	B	2	0	A	0

Valve size

075 - 3/4" (DN20)
 100 - 1" (DN25)
 125 - 1-1/4" (DN32)
 150 - 1-1/2" (DN40)
 200 - 2" (DN50)
 250 - 2-1/2" (DN65)
 300 - 3" (DN80)
 400 - 4" (DN100)
 600 - 6" (DN150)

Flow capacity

S - Standard
 C - CP body construction
 H - High capacity

Valve reset type

MA - MAXON automatic (motorized) valve
 MM - MAXON manual valve

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
 4 - Valve body only (400 & 600 high capacity valves only)

Body connection

A - ANSI (NPT) threaded
 B - ANSI flanged (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)
 H - EN1092-1 PN16 flanged (ISO 7005-1 PN16)

Body seals & bumper material

A - Buna o-rings/Buna bumper
 B - Viton o-rings/Buna bumper
 C - Viton o-rings/Viton bumper [1]
 D - Ethylene Propylene o-rings/Ethylene Propylene bumper [1]
 E - Omniflex o-rings/Buna bumper
 F - Omniflex o-rings/Viton bumper [1]

Body material

1 - Cast iron
 2 - Carbon steel
 5 - Stainless steel
 6 - Low temp carbon steel

Internal trim package

1 - Trim package 1
 2 - Trim package 2
 4 - Trim package 2, oxy clean [1]

Solenoid OR circuit board voltage

A - 115VAC 50 Hz
 B - 115VAC 60 Hz
 C - 230VAC 50 Hz
 D - 230VAC 60 Hz
 E - 208VAC 50 Hz
 F - 24VDC
 G - 120VDC

Motor voltage

A - 115VAC 50 Hz
 B - 115VAC 60 Hz
 C - 230VAC 50 Hz
 D - 230VAC 60 Hz
 E - 24VDC

Motor timing

1 - 2.5 second
 2 - 6 second
 3 - 12 second
 * - N/A with manual valves

OR Handle side plate

A - Standard handle
 B - Tandem main
 C - Tandem blocking
 D - Tandem overhead
 E - Wheel and chain

Switch options

Automatic valves

0 - VOS1/none
 1 - VOS1/VCS1
 2 - VOS2/VCS2
 3 - VOS2/VCS1
 4 - VOS1HC/VCS1HC

Manual valves

0 - None
 1 - VOS1/VCS1
 2 - VOS2/VCS2
 3 - VOS2/VCS1

Enclosure rating

A - NEMA 4
 B - NEMA 4X

Instruction language

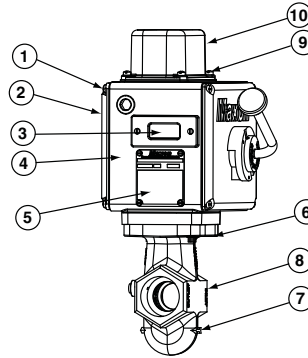
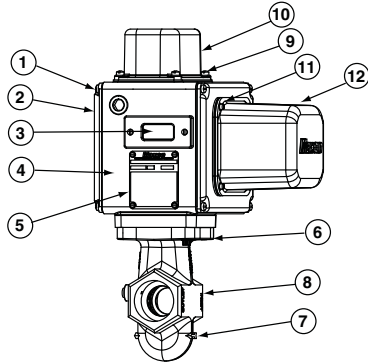
0 - English

[1] 0°F minimum ambient temperature limit

**Automatic (motorized) valve
Current model designation
(former model designation)**
SMA11 (5000), CMA11 (5000 CP),
SMA21 (STO-A), CMA21 (STO-A-CP)

**Manual valve
Current model designation
(former model designation)**
SMM11 (808), CMM11 (808 CP), SMM21 (STO-M)

- 1) Access cover screws
- 2) Access cover
- 3) Visual indication
- 4) Mainbase
- 5) Nameplate
- 6) Actuator bolts
- 7) Flow arrow
- 8) Valve body
- 9) Terminal block cover screws
- 10) Terminal block cover
- 11) Motor cover screws
- 12) Motor cover
- 13) Top cover plate screws
- 14) Top cover plate
- 15) Top housing
- 16) Top housing screws



**Automatic (motorized) valve - 4" & 6" high capacity
Current model designation (former model designation)**
HMA11 (7000)

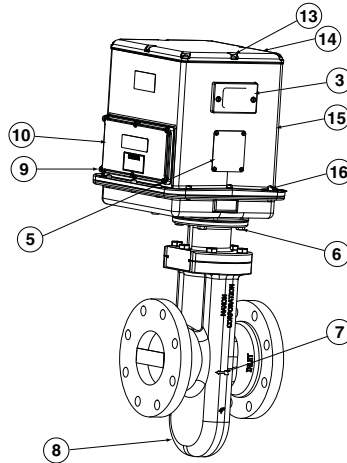


Table 1 - Torque specifications

Valve type	Item number	Description	Torque
Standard and CP valves	1	Access cover screws 1/4-20	96 in-lbs
	6	Actuator bolts 5/16-18 (3/4" - 1-1/2" sizes)	35 ft-lbs
	6	Actuator bolts 3/8-16 (2" - 6" sizes)	40 ft-lbs
	9	Terminal block cover screws 1/4-20	50 in-lbs
	11	Motor cover screws #10-24	30 in-lbs
High capacity valves	9	Terminal block cover screws #10-24	30 in-lbs
	13	Top cover plate screws 1/4-20	96 in-lbs
	16	Top housing screws 1/4-20	96 in-lbs

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 window indicator will be visible to your operating personnel. The open/shut window indicator should never face downward. The valve side plates should be located in a vertical plane for best performance. Valves are usually installed in horizontal piping; however, other orientations are acceptable, subject to the above limitations. The top assemblies of all MAXON valves are field rotatable to allow installations involving conflicts with these mounting restrictions.
4. 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.
 - 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.
 - Grounding is achieved with a grounding screw, which is located in the top assembly.
 - Customer connections are provided via terminal blocks located in the top assembly.
 - Main power wiring (120 VAC or 240 VAC) must be segregated from lower voltage 24 VDC signal wiring, when both are required.
5. Maintain integrity of the electro-mechanical actuator enclosures by using the appropriate electrical connectors for the (2) 3/4" NPT conduit threaded connections. The electrical enclosure is NEMA 4 rated with an option for NEMA 4X.
6. 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

Valve type	Item number	Description	Torque
Standard and CP valves	1	Access cover screws 1/4-20	96 in-lbs
	6	Actuator bolts 5/16-18 (3/4" - 1-1/2" sizes)	35 ft-lbs
	6	Actuator bolts 3/8-16 (2" - 6" sizes)	40 ft-lbs
	9	Terminal block cover screws 1/4-20	50 in-lbs
	11	Motor cover screws #10-24	30 in-lbs
High capacity valves	9	Terminal block cover screws #10-24	30 in-lbs
	13	Top cover plate screws 1/4-20	96 in-lbs
	16	Top housing screws 1/4-20	96 in-lbs

7. Verify proper installation and operation by electrically actuating the valve for 10-15 cycles prior to the first introduction of gas.

Specifications

Valve body assemblies							
Valve size	Flow capacity	Body connections available [1]	Body material	Cv rating	Flow rate [2] $\left[\frac{cfh}{m^3 h} \right]$	MOPD $\left[\frac{psig}{bar} \right]$	Special service MOPD [3] $\left[\frac{psig}{bar} \right]$
3/4" (DN20)	S	A, C	Iron	19	1060 / 30	125 / 8.6	30 / 2.1
1" (DN25)	S	A, C	Iron	20	1115 / 31	125 / 8.6	30 / 2.1
		A, C, E, F	Steel				
			Stainless				
1-1/4" (DN32)	S	A, C	Iron	45	2510 / 71	100 / 6.9	30 / 2.1
1-1/2" (DN40)	S	A, C	Iron	53	2956 / 83	70 / 4.8	20 / 1.4
		A, C, E, F	Steel				
			Stainless				
2" (DN50)	S	A, B, C, D, H	Iron	86	4796 / 135	70 / 4.8	15 / 1.1
		A, C, E, F	Steel				
			Stainless				
2-1/2" (DN65)	S	A, B, C, D, H	Iron	127	7083 / 200	40 / 2.8	10 / 0.7
	CP	A, B, C, D, H	Iron				
		B, D, H	Steel Stainless				
3" (DN80)	S	A, C	Iron	173	9648 / 273	30 / 2.1	5 / 0.3
	CP	A, B, C, D, H	Iron				
		B, D, H	Steel Stainless				
4" (DN100)	CP	B, D, H	Iron	490	27328 / 773	40 / 2.8	10 / 0.7
			Steel				
			Stainless				
	HC		Iron	719	40100 / 1135	60 / 4.1	10 / 0.7
			Steel				
			Stainless				
6" (DN150)	S	B, D, H	Iron	869	48465 / 1372	30 / 2.1	5 / 0.3
			Steel				
			Stainless				
	HC		Iron	1172	65364 / 1850	50 / 3.4	10 / 0.7
			Steel				
			Stainless				

[1] Body connections:

- A - NPT
- B - ANSI 150 lb flange (ISO 7005 PN20)
- C - ISO threaded
- D - DIN PN16 flange
- E - Socket welded nipple
- F - Socket welded nipple w/ANSI 150 lb flange (ISO 7005 PN20)
- H - EN 1092-1 PN16 (ISO 7005-1 PN16)

[2] Flow for natural gas (s.g. 0.60) at differential pressure = 1" wc and standard temperature (68°F) and pressure (14.696 psi)

[3] Valve maximum operating pressure differential (MOPD) to be reduced for special service fuel applications

Valve body assembly - gas compatibility

Gas compatibility and valve approvals / certifications										
Gas	Gas code	Suggested material options			MOPD rating	Agency approvals and certifications				
		Body seals & bumper	Body & bonnet	Trim package		FM	CSA [3]	CE [4]		UL [3]
							GAD	MD		
Air	AIR	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X		X	X
Ammonia	AMM	A, D, E	1, 2, 5, 6	1, 2	Std.	X	X		X	
Butane gas	BUT	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X	X	X	X
Coke oven gas	COKE	C, F	1, 2, 5, 6	2	[5]	X	X		X	
Delco	DEL	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X		X	X
Digester [1]	DIG	Analysis required	5	2	[5]	X	X		X	
Endothermic AGA	ENDO	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X		X	X
Exothermic gas	EXO	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X		X	X
Hydrogen gas	HYD	A, B, C, E, F	1, 2, 5, 6	1, 2	[2]	X	X		X	
Manufactured [1]	MFGD	Analysis required	5	2	Std.	X	X		X	
Natural gas	NAT	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X	X	X	X
Nitrogen	NIT	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X		X	X
Oxygen high	OXYH	C, D, F	2, 5, 6	4	125 psig max	X	X		X	
Oxygen low	OXYL	C, D, F	1, 2, 5, 6	4	30 psig max	X	X		X	
Propane	PROP	A, B, C, E, F	1, 2, 5, 6	1, 2	Std.	X	X	X	X	X
Refinery [1]	REF	Analysis required	5	2	[5]	X	X		X	
Sour natural [1]	SOUR	Analysis required	5	2	[5]	X	X		X	
Town gas [1]	TOWN	Analysis required	5	2	Std.	X	X	X	X	
Land fill gas [1]	LAND	Analysis required	5	2	[5]	X	X		X	

[1] Other body and trim packages may be acceptable pending fuel analysis. For pricing inquiries, Viton or Omniflex o-rings should be used. Contact MAXON for details.

[2] Valve maximum operating pressure differential (MOPD) to be reduced by 25% from standard ratings.

[3] ISO connections are not recognized by CSA or UL standards

[4] All electro-mechanical 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 (90/396/EC); this Directive only covers the use of commercially available fuels (natural gas, butane, town gas and LPG). MD stands for Machinery Directive (98/37/EC).

[5] Valve maximum operating pressure differential (MOPD) to be reduced from standard ratings for special service fuel applications.

Body seals & bumper:

A - Buna o-rings/Buna bumper
 B - Viton o-rings/Buna bumper
 C - Viton o-rings/Viton bumper
 D - Ethylene propylene o-rings/Ethylene propylene bumper
 E - Omniflex o-rings/Buna bumper
 F - Omniflex o-rings/Viton bumper

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
 4 - Trim package 2, oxy clean







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

- Actuators rated for NEMA 4 or optional NEMA 4X
- Ambient and fluid temperature range of -20°F to +140°F for standard and CP flow constructions
- Ambient and fluid temperature range of -20°F to +125°F for high capacity flow constructions
- All valves for oxygen service or using Ethylene Propylene body seals are limited to a minimum ambient and fluid temperature of 0°F

Product approvals

	General Purpose Valves SMA11, SMM11, CMA11, CMM11, SMA21, SMM21, CMA21		Non-incendive/Non-sparking Valves SMA12, SMM12, SMA22, CMA22, CMA12, CMM12, SMM22, CMM22	
	Standards	Markings	Standards	Markings
FM approvals	FM 7400		FM 7400 FM 3611 FM 3600 FM 3810	Class I, Div. 2, Groups ABCD Class II, Div. 2, Groups FG Class III, Div. 2 Temp Code T5 (AC) T3 (DC, sizes 3/4" - 1-1/2") T3C (DC, sizes 2"-6") 
UL approvals	UL 429	 Listed General Purpose 628A (Normally open valves)  Listed Safety Shut-off 628A (Normally closed valves)	Not applicable	Not applicable
CSA International	CSA 6.5	 C/I	CSA 6.5 CSA 22.2 No. 213	Class I, Div. 2, Groups ABCD Class II, Div. 2, Groups FG Class III, Div. 2 Temp Code T5 (AC) T3 (DC, sizes 3/4" - 1-1/2") T3C (DC, sizes 2"-6") 
European approvals [1]	EN 161 EN 13774	CL/KL: A, GR 2 EC PIN: C87BQ83	EN 161 EN 13774	CL/KL: A, GR 2 EC PIN: C87BQ83
IEC approvals	IEC 61508	None	IEC 61508	None

[1] Product certified to meet the following:
Gas Appliance Directive (90/396/EEC)
Low Voltage Directive (73/23/EEC)
EMC Directive (89/336/EEC)

Electrical data

Standard flow and CP body constructions

Solenoids					
3/4" - 1-1/2" standard flow		2" - 3" standard flow		2-1/2"CP - 4"CP & 6" standard flow	
Voltage	Power	Voltage	Power	Voltage	Power
115VAC, 50 Hz	23VA	115VAC, 50 Hz	23VA	115VAC, 50 Hz	40VA
115VAC, 60 Hz	23VA	115VAC, 60 Hz	23VA	115VAC, 60 Hz	40VA
230VAC, 50 Hz	23VA	230VAC, 50 Hz	23VA	230VAC, 50 Hz	40VA
230VAC, 60 Hz	23VA	230VAC, 60 Hz	23VA	230VAC, 60 Hz	40VA
208VAC, 50 Hz	23VA	208VAC, 50 Hz	23VA	208VAC, 50 Hz	40VA
24VDC	14W	24VDC	24W	24VDC	24W
120VDC	14W	120VDC	34W	120VDC	34W

Motor operators	
Voltage	Power
115VAC, 50 Hz	322VA
115VAC, 60 Hz	196VA
230VAC, 50 Hz	322VA
230VAC, 60 Hz	198VA
24VDC	60W

To determine valve OPENING VA: (or CLOSING VA for normally-open versions)

Automatic reset valves

- Total VA is the sum of the motor and solenoid VA ratings for the appropriate voltage/frequency in the tables above.
- If supply voltages are different, then the circuits must be segregated.

Manual reset valves

- Total VA consists of only the solenoid VA rating.

To determine valve HOLDING VA:

- Holding VA consists of the solenoid VA rating for the appropriate voltage/frequency.

4" and 6" high capacity valves

Printed circuit boards	
Voltage	Power
115VAC, 50 Hz	13VA
115VAC, 60 Hz	13VA
230VAC, 50 Hz	25VA
230VAC, 60 Hz	25VA
120VDC	14W

Motor operators	
Voltage	Power
115VAC, 50 Hz	667VA
115VAC, 60 Hz	391VA
230VAC, 50 Hz	667VA
230VAC, 60 Hz	391VA

To determine valve OPENING VA:

- Total VA is the sum of the motor and printed circuit board VA ratings for the appropriate voltage/frequency in the tables shown.
- If supply voltages are different, then the circuits must be segregated.

To determine valve HOLDING VA:

- Holding VA consists of the printed circuit board VA rating for the appropriate voltage/frequency.

Available voltages and electrical data - Non-incendive areas

All MAXON valves are electrically actuated from a power source through the flame safeguard and/or safety control circuits. Standard valve assemblies include an internal holding solenoid on standard flow and CP body constructions, or a printed circuit board on high capacity valves. The solenoid (or printed circuit board) is energized whenever the valve is powered. The motor operator on automatic reset valves is powered only during the opening stroke for normally-closed valves, or the closing stroke for normally-open versions.

Standard flow and CP body constructions

Solenoids					
3/4" - 1-1/2" standard flow		2" - 3" standard flow		2-1/2"CP - 4"CP & 6" standard flow	
Voltage	Power	Voltage	Power	Voltage	Power
115VAC, 50 Hz	23VA	115VAC, 50 Hz	23VA	115VAC, 50 Hz	34VA
115VAC, 60 Hz	16VA	115VAC, 60 Hz	16VA	115VAC, 60 Hz	26VA
230VAC, 50 Hz	23VA	230VAC, 50 Hz	23VA	230VAC, 50 Hz	34VA
230VAC, 60 Hz	16VA	230VAC, 60 Hz	16VA	230VAC, 60 Hz	26VA
24VDC	18W	24VDC	24W	24VDC	24W
120VDC	26W	120VDC	34W	120VDC	34W

Motor operators	
Voltage	Power
115VAC, 50 Hz	322VA
115VAC, 60 Hz	196VA
230VAC, 50 Hz	322VA
230VAC, 60 Hz	198VA

To determine valve OPENING VA: (or CLOSING VA for normally-open versions)

Automatic reset valves

- Total VA is the sum of the motor and solenoid VA ratings for the appropriate voltage/frequency in the tables above.
- If supply voltages are different, then the circuits must be segregated.

Manual reset valves

- Total VA consists of only the solenoid VA rating.

To determine valve HOLDING VA:

- Holding VA consists of the solenoid VA rating for the appropriate voltage/frequency.

Actuator assembly rotation



MAXON electro-mechanical 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.

1. Shut off all electrical power and close off upstream manual cock.
2. Remove terminal block cover plate and disconnect power lead wires. (Tag carefully for later re-assembly.)
3. Remove conduit and electrical leads.
4. Note physical position of any signal switch actuator wands on auxiliary signal switches.
5. Unscrew the two actuator bolts screwed up from the bottom to 1/4 inch. **DO NOT** completely remove. These bolts secure the valve body to the valve's top assembly housing.
6. Gently lift the top assembly (not more than 1/4" in height); just enough to break the seal between the valve body assembly and the rubber gasket adhering to the bottom of the top housing.



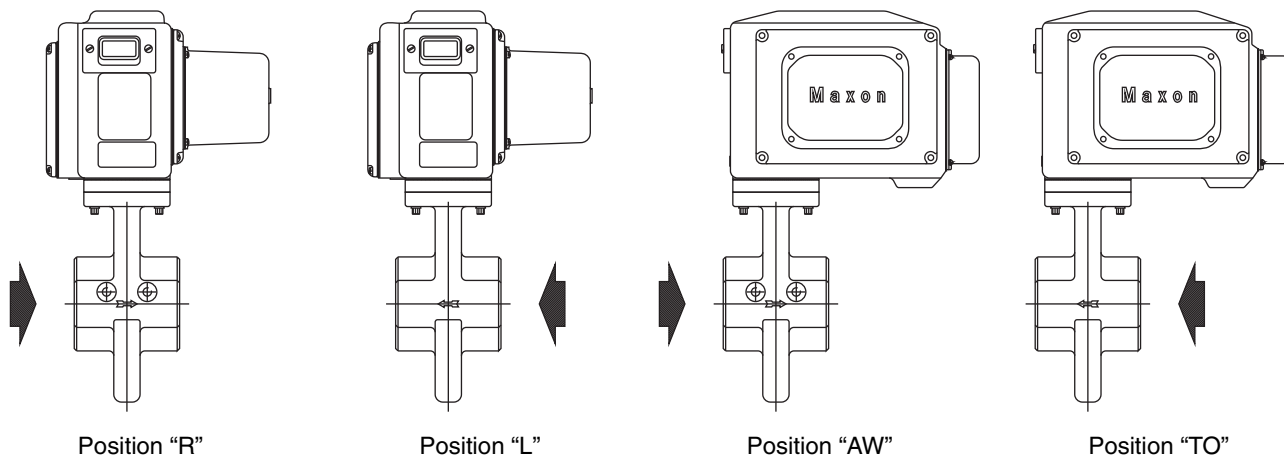
WARNING: Lifting too far may dislodge some small parts inside the top housing, requiring complex re-assembly and retesting by trained factory personnel.

7. Remove the two actuator bolts screwed up from the bottom (were partially unscrewed in step 5).
8. Carefully rotate top assembly to the desired position in a plane parallel to the top of the valve body casting. Rotate the top housing about 30° beyond this position, and then rotate it back. Reposition the top housing back down onto the valve body casting. This should align the open/shut indicator with its window and provide proper alignment of the internal mechanism.
9. Realign holes in valve body casting with the corresponding tapped holes in the bottom of the top assembly housing. Be sure the gasket is still in place between the body and top housing.
10. Reinsert the actuator bolts up from the bottom through the body and carefully engage threads of the top assembly. Tighten securely.
11. Reconnect conduit and electrical leads, then check that signal switch wands are properly positioned and that the open/shut indicator moves freely. Failure to correct any such misalignment can result in extensive damage to the internal mechanism of your valve.
12. 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.
13. Replace and secure terminal block cover plate and place valve in service.

Table 1 - Torque specifications

Valve type	Item number	Description	Torque
Standard and CP valves	1	Access cover screws 1/4-20	96 in-lbs
	6	Actuator bolts 5/16-18 (3/4" - 1-1/2" sizes)	35 ft-lbs
	6	Actuator bolts 3/8-16 (2" - 6" sizes)	40 ft-lbs
	9	Terminal block cover screws 1/4-20	50 in-lbs
	11	Motor cover screws #10-24	30 in-lbs
High capacity valves	9	Terminal block cover screws #10-24	30 in-lbs
	13	Top cover plate screws 1/4-20	96 in-lbs
	16	Top housing screws 1/4-20	96 in-lbs

Alternate top assembly positions



Four top assembly positions are available for most MAXON valves. When looking at the open/shut window indicator of an electro-mechanical valve assembly, the motor (for motorized versions) or the operating handle (for manual versions) will be on the right side of the top assembly. The valve body is on the bottom. From this view, the unidirectional valve body and the arrow on the valve body casting points in direction of the fluid flow: to the right (position "R"), to the left (position "L"), towards you (position "TO") or away from you (position "AW").

Field installation of valve position switch

General

- Shut off fuel supply upstream of valve, then de-energize valve electrically.
- Remove terminal block and access cover to provide access, being careful not to damage gaskets.
- Compare with illustrations below to identify your valve type.

Replacement switches

- Note wand position and mounting hole location carefully, then remove 2 screws and lift existing switch.
- 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.

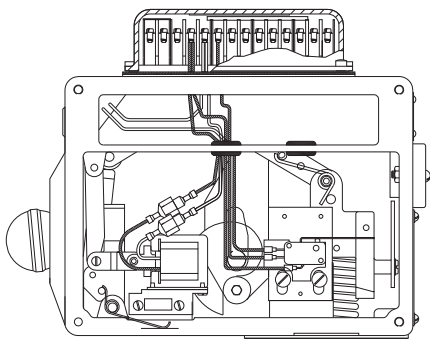
Add switches

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

- Check illustrations below. If your valve uses a switch mounting bracket as in Fig. 1 & 2, mount switches to bracket using the mounting holes appropriate for valve type and size. For high capacity valves, mount switches on the support stand.
- Position bracket so VCS wand just touches top of actuator, then move downward slightly, depressing wand until switch clicks, then tighten mounting screws to hold this position.
- Pin bracket by drilling 1/8" diameter holes 1/4" deep into bracket mounting pad through drive pin holes, then tap drive pin in until flush (not required for high capacity valves).
- Route wires to wiring compartment as shown, then complete wiring connections and clean out metal drilling chips from previous procedure.
- Cycle valve, checking switch actuation points carefully. (VCS actuates at top of stem stroke, VOS at bottom.) Simultaneously the valve body must be tested for switch continuity and seat leakage. Bend VOS switch wands slightly if necessary to insure valve is opening fully.
- Replace covers, then return valve to service.

Fig. 1

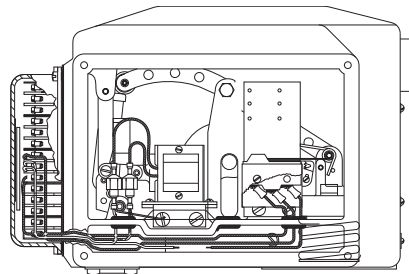
Manual reset actuator
3/4" - 3" standard flow



Reference mounting bracket A

Fig. 2

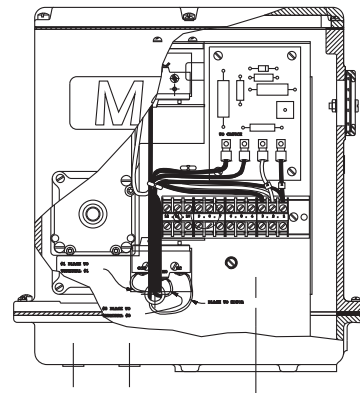
Automatic reset actuator
2-1/2" CP - 4" CP and 6" standard flow



Reference mounting bracket B

Fig. 3

Automatic reset actuator
4" & 6" high capacity



Switches mount on support stand

Wand position (for normally-closed valves)

VOS switch wand should be actuated from above

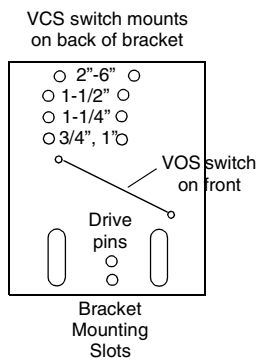


VCS switch wand should be actuated from below



Mounting brackets

Mounting bracket A



Mounting bracket B

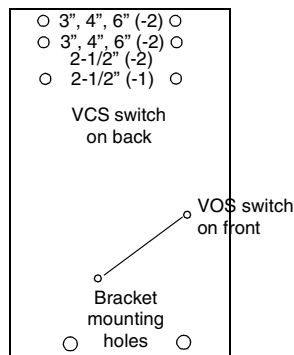


Table 1 - Torque specifications

Valve type	Item number	Description	Torque
Standard and CP valves	1	Access cover screws 1/4-20	96 in-lbs
	9	Terminal block cover screws 1/4-20	50 in-lbs
High capacity valves	16	Top housing screws 1/4-20	96 in-lbs

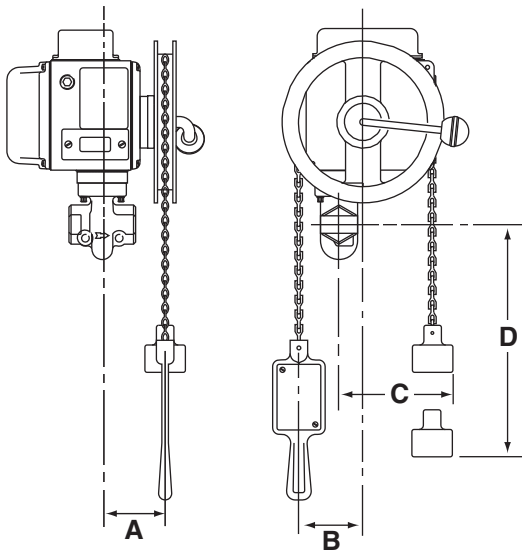
Overhead wheel & chain assembly

Overhead wheel and chain assembly allows operation of a manual reset valve in an otherwise inaccessible overhead location. A wheel is mounted onto the handle of the valve. The attached chain is weighted on one end and has a paddle handgrip on the other.

Once the valve is electrically energized, pulling down on the paddle will open normally-closed versions or close normally-open versions.

MAXON valve's free-handle design permits valve to trip to its rest position on any power interruption.

Wheel and chain assembly includes a length of chain to position the paddle handgrip slightly below pipe centerline. A standard length of 7 feet of chain is included with CP and larger valve sizes and 5 feet is included with all other valves. Extra chain (in one foot increments) may be specified to fit your specific location.



Dimensions (in inches)			
A	B	C	D
5.25 maximum	4.06	7.25	12.19 maximum

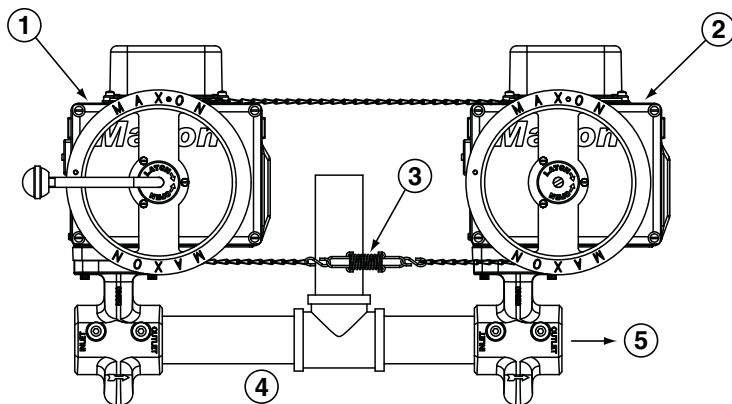
Tandem arrangements

(for simultaneous opening of main and blocking valves)

Installation instructions for tandem arrangements

1. Review and comply with all general valve installation instructions provided separately. (See sketch below.)
2. Mount both valves in fuel line with center to center spacing as originally specified, and blocking valve (without handle) downstream of main valve (with handle).
3. Check valve alignment to be certain that operating wheels lie in the same plane.
4. Remove tape from the wheel of the main valve and unwind the attached chain. Do not remove the screw holding chain to wheel; it has been factory positioned to assure correct alignment. Do not remove tension spring attached to one end of chain or the wooden block insert which preloads the spring.
5. Take free end of chain and loop it around the wheels of both main and blocking valve as shown in sketch below. Depending on the specific valve series and arrangement, tension spring may be located either above or below the wheel centerline.
6. Draw free end of chain and tension spring together so that as much slack as possible is eliminated, then insert the open eye of the spring "S" hook through the link in the chain that will most nearly maintain this position.
7. Crimp the "S" hook shut around the chain link, then cut and discard excess chain.
8. Remove spring preload wood block insert from the tension spring, and verify that the chain is drawn tight.
9. Rotate the operating handle of the main valve fully to latching position for your particular valve, then hold handle firmly in this position while performing the next few steps.
10. Rotate blocking valve wheel fully counter-clockwise until it strikes a stop (it will slide within the loop of chain).
11. Still holding main valve wheel in place, move blocking valve wheel approximately 1/4 to 1/2 inch back in the clockwise direction. Insert the #10-24 X 1/2" screw (furnished) through the chain link that lines up with the tapped hole on bottom of blocking valve wheel, then fasten securely.
12. Verify that the valves are wired in parallel as shown in wiring schematic on page 10-30.1-13.

- 1) Tandem main valve
- 2) Tandem blocking valve
- 3) Tension spring
- 4) Piping by others
- 5) Flow direction



To add wheel & chain assembly to existing tandem valves

1. Verify that both valves are in the same top assembly position (TO or AW). Rotate if necessary. (See top assembly rotation instructions on page 10-30.1-37.)
2. Bend handle of main valve outward about 25°.
3. Cut off handle of blocking valve at outer wheel face.
4. Remove hardware holding main valve wheel in place and mount new wheel and spacer to the existing wheel with new hardware provided.
5. Cut chain loop to the desired length and secure to both wheels.

Maintenance instructions

MAXON electro-mechanical 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 MAXON Technical Document 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 Technical Document 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, motors, clutches or circuit boards 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.