

Installation & Maintenance Instructions



2-WAY AND 3-WAY LOWER POWER GENERAL PURPOSE OR
WATERTIGHT/EXPLOSIONPROOF SOLENOIDS

ASSEMBLY

Catalog Nos.
8003G300
8003G301
8003G302
8003G303

NOTICE: See separate valve installation and maintenance instructions for information on: Operation, Positioning, Mounting, Piping, Filter Requirements for Air or Inert Gas, Flow Controls, Cleaning, Preventive Maintenance, Cause of Improper Operation, Disassembly and Reassembly of Basic Valve.

DESCRIPTION

Catalog Numbers 8003G301 2-way construction and 8003G300 3-way construction are epoxy encapsulated pull-type solenoids. The green solenoid with lead wires and 1/2" NPT conduit connection is designed to meet Enclosure Type 1-General Purpose, Type 2-Dripproof, Types 3 and 3S-Raintight, and Types 4 and 4X-Watertight. The black solenoid on catalog numbers prefixed "EF" or "EV" is designed to meet Enclosure Types 3 and 3S-Raintight, Types 4 and 4X-Watertight, Types 6 and 6P-Submersible, Type 7 (A, B, C, & D) Explosionproof Class I, Division 1, Groups A, B, C, & D and Type 9 (E, F, & G)-Dust-Ignitionproof Class II, Division 1, Groups E, F, & G and Nonincendive for Class I, Division 2. Catalog number prefix "EV" denotes stainless steel construction.

Series 8003G30x are also available in:

- **Open-Frame Construction:** The solenoid may be supplied with 1/4" spade, screw, DIN terminals or a Multi-Pin connector.
 - **DIN Plug Connector Kit No. K236034:** Use this kit only for solenoids with DIN terminals. The DIN plug connector kit provides a two pole with grounding contact DIN Type 43650 construction
- **Junction Box:** This junction box construction meets Enclosure Types 2, 3, 3S, 4, and 4X. Only solenoids with 1/4" spade or screw terminals may have a junction box. The junction box provides a 1/2" conduit connection, grounding and spade or screw terminal connections within the junction box.

OPERATION

Series 8003G-When the solenoid is energized, the core is drawn into the cartridge assembly.

INSTALLATION

Check nameplate for correct catalog number, service, and wattage. Check front of solenoid for voltage and frequency.

FOR BLACK ENCLOSURE TYPES 7 AND 9 ONLY

▲ CAUTION: To prevent fire or explosion, do not install solenoid and/or valve where ignition temperature of hazardous atmosphere is less than the maximum surface temperature listed on the nameplate.

▲ ATTENTION: Pour éviter un incendie ou une explosion, ne pas installer l'électrovanne et / ou la vanne dans une atmosphère dangereuse dont la température d'inflammation est inférieure à la température de surface maximale indiquée sur la plaque signalétique.

NOTE: These solenoids have an internal non-resettable thermal fuse to limit solenoid temperature in the event that extraordinary conditions occur which could cause excessive temperatures. These conditions include high input voltage, a jammed core, excessive ambient temperature or a shorted solenoid, etc. This unique feature is a standard feature only in solenoids with black explosionproof/dust-ignitionproof enclosures (Types 7 & 9).

▲ CAUTION: To protect the solenoid valve or operator, install a strainer or filter, suitable for the service involved in the inlet side as close to the valve or operator as possible. Clean periodically depending on service conditions.

▲ ATTENTION: Afin de protéger l'électrovanne ou l'actionneur, installer une crépine ou un filtre adapté le

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plus proche possible en amont de l'électrovanne ou de l'actionneur. Nettoyer périodiquement le filtre en fonction des conditions d'utilisation.

Temperature Limitations

For maximum solenoid ambient temperatures, refer to chart. The temperature limitations listed only indicate maximum application temperatures for field wiring rated at 90°C. See valve installation and maintenance instructions for valve temperature limitations.

Temperature Limitations For Catalog Numbers 8003G300 and 8003G301 Solenoids			
Watt Rating	Class of Insulation	Maximum Ambient/Fluid Temperature	
		°F	°C
1.4	F	140	60
1.7	F	140	60
1.8	H*	176	80
2.0	H*	176	80

- *If prefix HT or MH in solenoid catalog number
- Approved minimum fluid and ambient temperature is -76°F (-60°C) for the operator. Actual temperature can be limited depending on valve limits.

Positioning

This solenoid is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the cartridge assembly area.

Piping (General Instructions)

On some valve constructions, there is pilot exhaust (from the top of the solenoid) when the valve shifts. The pilot exhaust may be connected to the main exhaust if the air or inert gas cannot be exhausted directly to the atmosphere.

▲ CAUTION: Debris entering 1/8" NPT connection at top of cartridge assembly may cause valve malfunction. Use exhaust protector provided when venting to atmosphere or connect to an exhaust system. The exhaust protector provides a degree of protection against falling dirt, rain, sleet, snow and dust. External formation of ice on the exhaust protector may cause valve malfunction. For this case, an alternate means of venting is required.

▲ ATTENTION: Des impuretés peuvent pénétrer dans la partie haute de la cartouche via le raccord 1/8" NPT et entraîner un dysfonctionnement de la vanne. Utiliser le protecteur d'échappement fourni lorsque vous purgez directement dans l'atmosphère ou connecter le sur un réseau d'évacuation. Le protecteur d'échappement fournit une protection contre la pénétration d'impureté, pluie, neige fondue, neige et poussière. Une formation externe de glace sur le protecteur d'échappement peut entraîner un dysfonctionnement de la vanne. Dans ce cas, un autre moyen de purge est requis.

Connect piping to valve according to markings on valve body. Refer to flow diagrams provided in OPERATION section of basic valve installation and maintenance instructions.

▲ CAUTION: To avoid damage or accidental disengagement of cartridge assembly from valve body, hold cartridge assembly securely by wrenching flats when installing or removing piping at 1/8" NPT connection on top of the solenoid.

▲ ATTENTION: Afin d'éviter des dommages ou une extraction accidentelle de la cartouche du corps de la vanne, maintenir fermement la cartouche par les plats de serrage lors de l'installation ou de la dépose de la tuyauterie au niveau du raccord 1/8" NPT dans la partie haute de la bobine.

Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

▲ CAUTION: These solenoid valves are intended for use on clean dry air or inert gas, filtered to 40 micrometres or better. The dew point of the media should be at least 10°C (18°F) below the minimum temperature to which any portion of the clean air/inert gas system could be exposed to prevent freezing. If lubricated air is used, the lubricants must be compatible with Nitrile elastomers. Diester oils may cause operational problems. Instrument air in compliance with ANSI/ISA Standard 7.0.01-1996 exceeds the above requirements and is, therefore, an acceptable media for these valves.

▲ ATTENTION : Ces électrovannes doivent être utilisées avec de l'air sec, du gaz inerte ou gaz naturel propre, filtré jusqu'à 40 micromètres ou plus. Le point de rosée du fluide doit être d'au moins 10°C inférieur à la température minimale à laquelle toute partie du système d'air/gaz inerte propre pourrait être exposée, afin d'éviter le gel. En cas d'utilisation d'air lubrifié, les lubrifiants doivent être compatibles avec le FKM et/ou élastomères nitrile. Les huiles diester peuvent engendrer des problèmes de fonctionnement. L'air d'instrumentation conforme à la norme ANSI/ISA 7.0.01-1996 dépasse les exigences ci-dessus et constitue, par conséquent, un média acceptable pour ces vannes.

Wiring

Wiring must comply with local codes and the National Electrical Code. All solenoids supplied with lead wires are provided with a grounding wire which is green or green with yellow stripes and a 1/2" conduit connection. To facilitate wiring, the solenoid may be rotated 360° depending upon basic valve construction. For explosionproof solenoid version, the conduit lead wires are factory sealed for use in hazardous locations. The wiring method for Nonincendive Class I, Division 2 locations shall be in accordance with Section 501-4(b) of the National Electrical Code. The field circuit may be incendive. Wiring methods suitable for ordinary locations may not be used for wiring in incendive circuits.

▲ CAUTION: Excessive conduit strain on solenoid housing may damage solenoid or cause valve malfunction. Be sure conduit and additional junction boxes within the conduit run to the solenoid housing are properly aligned and supported.

▲ ATTENTION: Une contrainte de tube excessive sur le boîtier de solénoïde peut provoquer l'endommagement du solénoïde ou un dysfonctionnement de la vanne. Assurez-vous que le tube et les boîtes de jonction supplémentaires utilisés pour raccorder le boîtier du solénoïde sont alignés et soutenus correctement.

Additional Wiring Instructions For Junction Box (optional feature)

The junction box is used with spade or screw terminal solenoids only and is provided with a grounding screw and a 1/2" conduit connection. Connect #12-18 AWG stranded copper wire to the screw terminals. Within the junction box use field wire that is rated 90°C or greater for connections. After electrical hookup, replace cover gasket, cover and screws. Tighten screws evenly in a crisscross manner.

MAINTENANCE

▲ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize solenoid valve and vent fluid to a safe area before servicing.

▲ AVERTISSEMENT: Pour éviter tous danger de mort, de blessure grave ou de dommage matériel, avant d'intervenir sur la vanne, couper le courant, purger la vanne dans une zone sécurisée.

Cleaning

All solenoid operators and valves should be cleaned periodically. The time between cleaning will vary depending on medium and service conditions. In general, if the voltage to the solenoid is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case faulty valve operation will occur and the valve may fail to shift. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep medium flowing through the valve as free from dirt and foreign material as possible.
- Periodic exercise of the valve should be considered if ambient or fluid conditions are such that corrosion, elastomer degradation, fluid contamination build up, or other conditions that could impede solenoid valve shifting are possible. The actual frequency of exercise necessary will depend on specific operating conditions. A successful operating history is the best indication of a proper interval between exercise cycles.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete rebuild kit.

Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. Check for loose or blown fuses, open-circuited or grounded solenoid, broken lead wires or splice connections.
- **Burned-Out Solenoid:** Check for open-circuited solenoid. Replace if necessary. Check supply voltage; it must be the same as specified on nameplate/retainer and marked on the solenoid.
- **Low Voltage:** Check voltage across the solenoid leads. Voltage must be at least 85% of rated voltage.

Solenoid Replacement / Disassembly & Reassembly

1. Disconnect conduit, coil leads, and grounding wire.
2. Remove piping from 1/8" NPT connection on top of solenoid for 3-way construction.

▲ CAUTION: To avoid damage or accidental disengagement of cartridge assembly from valve body, hold cartridge assembly securely by wrenching flats when installing or removing piping at top of solenoid.

▲ ATTENTION: Afin d'éviter des dommages ou une extraction accidentelle de la cartouche du corps de la vanne, maintenir fermement la cartouche par les plats de serrage lors de l'installation ou de la dépose de la tuyauterie au niveau du raccord 1/8" NPT dans la partie haute de la bobine.

3. Push down on solenoid. Then using a suitable screwdriver, insert blade between solenoid and nameplate/retainer. Pry up slightly and push to remove nameplate/retainer.
4. Slip solenoid and spring washer off cartridge assembly.
5. Unscrew cartridge assembly from valve body and remove orifice gasket and cartridge gasket.
6. Refer to basic valve installation and maintenance instructions for further disassembly.
7. When reassembling, torque cartridge assembly to 175 ± 25 in-lbs [19,8 ± 2,8 Nm].

ORDERING INFORMATION FOR ASCO SOLENOIDS

When Ordering Solenoids for ASCO Solenoid Valves, order the number stamped on the solenoid. Also specify voltage and frequency.

Torque Chart

Part Name	Torque Value in Inch-Pounds	Torque Value in Newton-Meters
cartridge assembly	175 ± 25	19,8 ± 2,8
terminal block screw	10 ± 2	1,1 ± 0,2
socket head screw	15-20	1,7-2,3

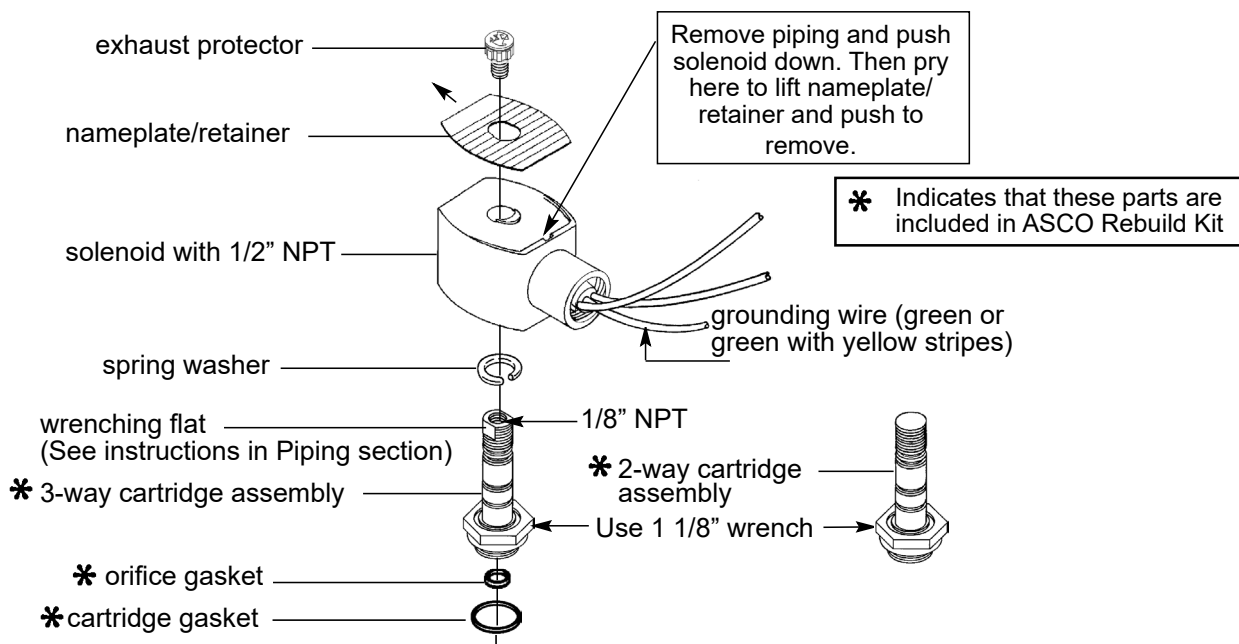


Figure 1. Assembly 8003GV300 low power solenoid.

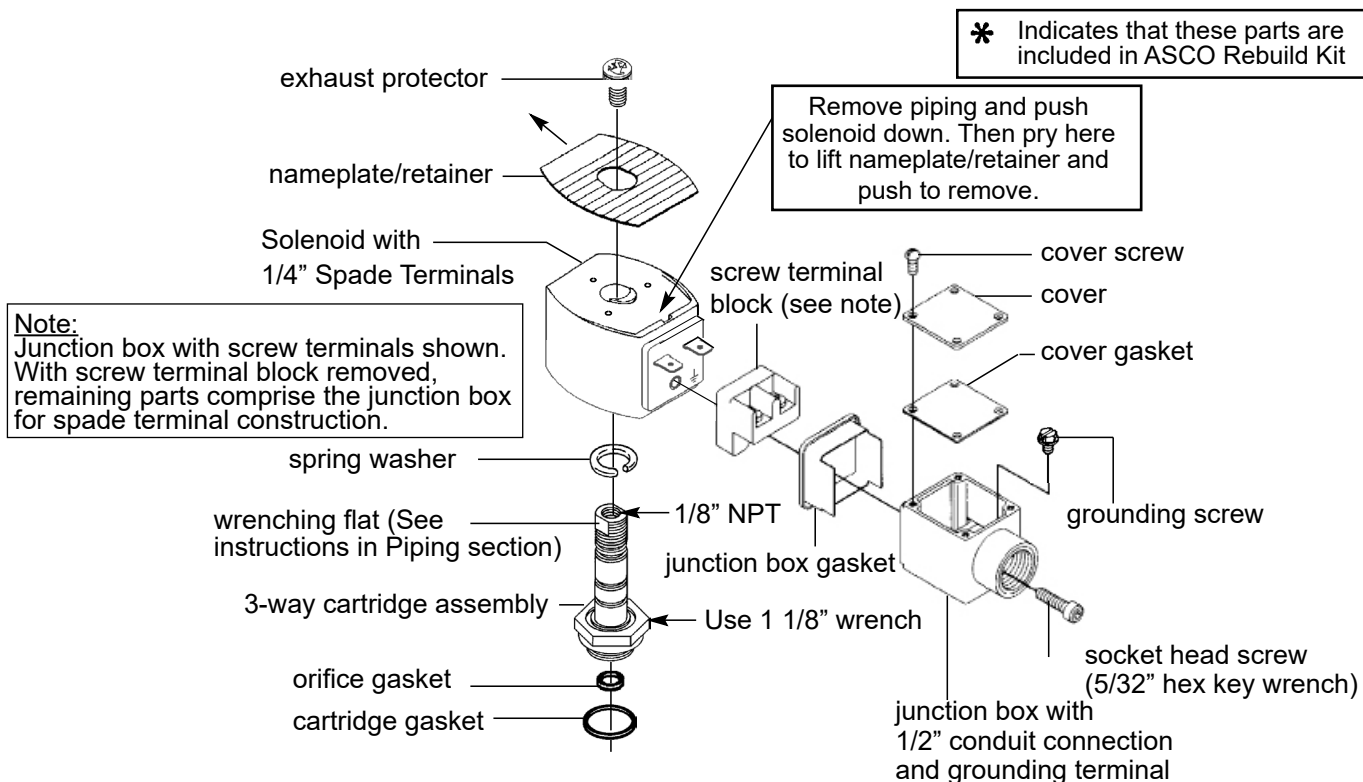
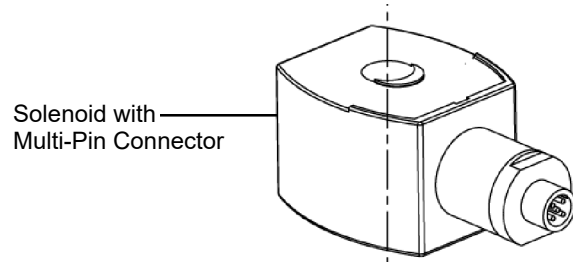
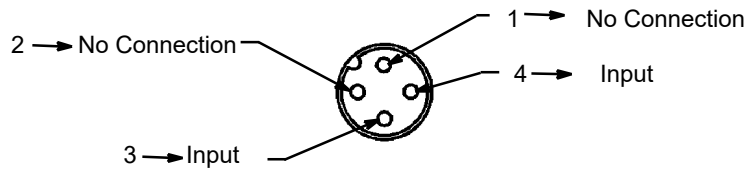


Figure 2. Junction box solenoid with 1/4" spade terminals or screw terminals.



DC: For mating connector, use 4-pin M12 x 1 threaded female connector.



Electrical Connection Size:

DC: Single keyway M12 x 1 (*Not polarity sensitive*)

AC: Dual keyway 1/2-20UNF Thread

**Figure 3.
4-Pin Anodized Aluminum Electrical Termination
(VT/VB)**