

## FLUID CONTROL DIVISION

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## G7 SERIES GENERAL PURPOSE SOLENOID VALVES (REV0319)



IOM 7222

2-Way Direct Lift and Internally Piloted  
Valve Types: 22xCxxxx7 and 23xCxxxx7



## INSTALLATION, OPERATING, & MAINTENANCE INSTRUCTIONS

This document is intended for use as a complementary resource to the User Safety Responsibility Statements located in product literature and posted to [www.parker.com/safety](http://www.parker.com/safety).

### WARNING



FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS ("Products") COULD CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

Possible consequences of failure or improper selection, or improper use of these Products include, but are not limited to:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work piece or component parts being thrown off at high speeds
- Failure of a device to function properly, for example, failure to clamp or unclamp an associated item or device
- Explosion
- Sudden moving or falling objects
- Release of toxic or otherwise injurious liquids or gases
- Electrical shorts or burn out of equipment

Before selecting or using any of these Products, it is important that you read and follow the subsequent instructions.

This document and other information from Parker Hannifin Corporation, its subsidiaries, and authorized distributors provide Product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the Product in the current Product literature and in any other materials provided from Parker or its subsidiaries or authorized distributors. Due to the variety of operating conditions and applications for these Products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety, and warning requirements of the application are met.

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### Description

These valves are 2-way internally-piloted models. They are available in normally closed configuration.

### Media Codes

Identified below are the codes utilized by Underwriters Laboratories (UL) and the Canadian Standards Association (CSA) for various common fluids. Codes for fluids approved by the agencies for use with each valve are printed on the outside of individual valve packaging. Consult catalog Technical section for additional information.

Code	Media
A	Air
AC	Acetylene
F	Common refrigerants, except ammonia
G	City gas
GA	Gasoline
HO	Petroleum-based hydraulic oils with viscosities from 125 to 400 SSU at 38°C
02	Nos. 1 and 2 fuel oils with viscosities not more than 40 SSU at 38°C
02-06	Nos. 2-6 oil
OX	Oxygen
S	Steam
W	Water

For media and ambient temperature limitations, reference valve nameplate, packaging, and/or catalog specifications.

### Parker Tracking System

This product is equipped with the innovative Parker Tracking System (PTS). Scan a product's PTS code, or enter its PTS ID into any of Parker's web-based PTS programs, including PTS Mobile, the free mobile app, for instant access to technical and commercial resources. Maximize uptime with Parker Tracking System.

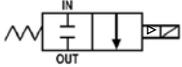
Visit [parker.com/pts](http://parker.com/pts) for more information.

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## Principles of Operation

### 2-Way Normally Closed: 22xCxxxx7 and 23xCxxxx7



#### De-Energized

Pressure is connected to "IN" and flow is blocked by the diaphragm assembly on the body orifice.

#### Energized

The plunger lifts, pressure differential and/or mechanical linkage shifts the diaphragm assembly, and flow is permitted through the valve from "IN" to "OUT".

## Installation

Carefully read all installation, operating, and maintenance procedures prior to installing or servicing valves. Do not use valves as safety shut-off valves during installation or maintenance.

### WARNING



Return system to atmospheric pressure before installation. Turn off electrical power before connecting valves to a power source.

Valves to be installed in Hazardous Locations, must be equipped with compatible Hazardous Location solenoid coils. Verify nameplate data and solenoid coil part number before installation.

Failure to comply could result in personal injury or death.

#### Mounting Position and Piping:

These valves are designed to be multi-poised and will perform properly when mounted in any position. For optimum longevity and performance, the valves should be mounted vertically upright to minimize wear and reduce the possibility of foreign matter accumulating inside the sleeve.

Valves may be mounted directly on piping or by use of a compatible mounting bracket.

Allow adequate clearance above valves for removal of the solenoid coil during maintenance.

If solenoid coil assembly orientation is inconvenient, uninstall nut, washer, and nameplate and set them aside. Lift coil firmly to disengage upper and lower coil seals. Take care not to lose upper coil seal. With seals disengaged, rotate coil assembly to desired position. Reinstall components per the subsequent "Coil Replacement" section steps 5-6. Take care not to damage or misplace loose parts.

### Caution

Do not use sleeve or enclosure as a lever when applying torque. Tightening torque for process connections should not exceed the following values for each port size:

- 3/8" NPT: 225 in/lbs.
- 1/2" NPT: 300 in/lbs.
- 3/4" NPT: 450 in/lbs.

Remove protective closures from the ports. Connect line pressure to "IN" port. Use of pipe thread tape or compound is permissible, but should be applied sparingly to external threads only. Loctite primer #764 and pipe sealant #567 are recommended when using stainless steel fittings with stainless steel valve bodies. Do not allow foreign particles, pipe thread tape, or compound to enter valve.

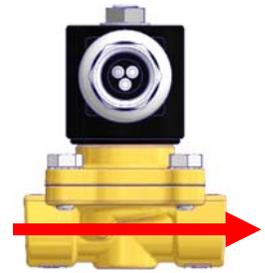
#### Pressure and Temperature Limits:

Application pressure and temperature parameters must conform to valve nameplate ratings. Prior to installation, reference valve labelling and packaging, and refer to the catalog to ensure application pressure and temperature requirements are met. Consult factory for applications requiring higher media or ambient temperatures.

#### De-Energized



#### Energized



Standard valves are supplied with solenoid coils designed for continuous duty service (100% duty cycle).

Normal free space must be provided for proper ventilation. When a solenoid coil is energized continuously for extended periods of time, the solenoid coil assembly will become hot. The coil is designed to operate permanently under these conditions. Any excessive heating will be indicated by smoking and/or odor of burning coil insulation.

#### Electrical Connection and Voltage Limits:

Electrical supply must conform to nameplate rating. Connect coil leads or terminals to the electrical circuit using standard electrical practices in compliance with local authorities and the National Electrical Code. The conduit solenoid coil and one-piece leaded solenoid coil contain a green "grounding" wire that must be secured to a proper ground location. Ensure applied voltage is within Parker-specified tolerances.

### WARNING



Do not remove the grounding wire. Doing so could negate a proper ground path and leave the valve assembly unprotected or "electrically hot". Failure to comply could result in personal injury or death.

Prior to installation, reference valve labelling and packaging, and refer to catalog to ensure application electrical requirements are met.

#### Media and Filtration:

To ensure valve protection, install a suitable strainer or filter as close as possible to the valve inlet. Dirt or foreign material in the media may cause excessive leakage, wear, or in exceptional cases, malfunction.

Prior to installation, reference valve labelling and packaging, and refer to the catalog to ensure application media requirements are met.

#### Lubrication:

Lubrication is not required although air line lubrication will substantially increase valve life. Gaskets may be lubricated with Dow Corning® DC200 oil or equivalent light machine oil.

Ethylene propylene rubber (EPDM) valve materials must not be exposed to petroleum-based lubricants or other hydrocarbons.

## General Maintenance

Depending on service conditions, valve media, filtration, lubrication, periodic cleaning, and/or worn component replacement may be required.

While in service, valves should be operated at least once per month to ensure proper operation.

Periodic inspection of internal valve parts for damage or excessive wear is recommended.

Thoroughly clean all parts if dirtied. If pressure vessel parts are worn or damaged, install a complete repair kit. If a replacement solenoid coil is required, install a complete coil kit.

**Repair Kits and Coil Kits:**

Scan a valve's unique PTS code, or enter its PTS ID into any of Parker's web-based PTS programs, including the free smart phone app, to order a repair kit and/or coil kit.

Alternatively, refer to valve nameplate for the proper kit ordering numbers. Repair kits service the valve pressure vessel and replace relevant valve assembly seals. Coil kits replace the solenoid coil and, where relevant, its seals.

**Cleaning:**

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the media and service conditions.

In general, if voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage indicates that cleaning is required. In extreme cases, faulty valve operation will occur, and the valve may fail to open or close. Clean any strainers/ filters when cleaning valves. Do not expose plastic or elastomeric materials to any type of commercial cleaning fluid. Parts should be cleaned with a mild soap and water solution.

**Coil Replacement****WARNING**

Prior to servicing valve, depressurize valve, turn off electrical power supply, and disconnect solenoid coil from its power supply.

Verify nameplate data and coil part number before installing replacement coil. Install only Hazardous Location replacement coils to valves equipped with Hazardous Location coils.

Do not energize coils which are not properly installed to a compatible pressure vessel.

Failure to comply could result in personal injury or death.

**Caution**

If possible, remove valve from process connections. If process connection is made to sleeve port, disconnect piping prior to disassembly. Component parts must be replaced in the proper order and orientation. Take care not to damage seal(s) and/ or orifice(s). Valve contains loose parts. Take care not to misplace or damage them.

1. Remove nut with 9/16" external hex tool.
2. Remove washer and nameplate.
3. To remove coil assembly, firmly lift it from pressure vessel until lower coil seal disengages. This requires significant force. Ensure the upper coil seal is not lost in the process.
4. In the case of a multi-piece solenoid coil assembly, remove the solenoid coil from its yoke enclosure. Use new coil in place of old.
5. Install all component parts in reverse order of disassembly, ensuring that any seals, washers, and/or nameplates, are properly re-installed to valve. Utilize replacement solenoid coil seals provided in coil kit, if replacing coil.
6. Firmly press coil onto pressure vessel to properly engage lower coil seal. Proper lower coil seal engagement takes significant force and achievement of a proper seal will likely be audible. Ensure upper coil seal is installed. Tighten retaining nut with an input torque of 43-53 in-lbs.

**Pressure Vessel Maintenance****WARNING**

Prior to servicing valve, depressurize valve, turn off electrical power supply, and disconnect solenoid coil from its power supply.

Verify nameplate data and coil part number before installing replacement coil. Install only Hazardous Location replacement coils to valves equipped with Hazardous Location coils.

Do not energize coils which are not properly installed to a compatible pressure vessel.

Failure to comply could result in personal injury or death.

**Caution**

If possible, remove valve from process connections. If process connection is made to sleeve port, disconnect piping prior to disassembly.

Component parts must be replaced in the proper order and orientation. Take care not to damage seal(s) and/ or orifice(s). Valve contains loose parts. Take care not to misplace or damage them.

**Valve Disassembly (Refer to subsequent "Figure 1"):**

1. Refer to steps 1-3 under preceding "Coil Replacement" section.
2. These valves feature a 5/32" internal hex on top of sleeve assembly. Employ hex to loosen until finger tight.
3. Fully loosen and remove the sleeve, its internal parts, and seal(s).
4. Remove cover screws in crisscross pattern with 7/16" external hex tool.
5. Inspect componentry for wear. Take care not to damage seal(s) and/ or orifice(s).
6. If parts are worn or damaged, install a complete repair kit and refer to subsequent "Valve Assembly" instructions.

**Valve Assembly (Refer to subsequent "Figure 1"):**

1. Ensure all internal parts are installed in the reverse order of disassembly. Position diaphragm bleed hole above "OUT" port.
2. Hand-tighten cover screws, then fully tighten with 7/16" external hex tool to 55-60 in/lbs. in crisscross pattern.
3. Carefully hand tighten the sleeve assembly.
4. Employ 5/32" internal hex on top of sleeve and input torque of 130-150 in-lbs. to tighten sleeve assembly to body.
5. Re-install solenoid coil assembly per preceding "Coil Replacement" steps 5-6.
6. Refer to preceding "Installation" section for complete installation guidance.

**Troubleshooting****WARNING**

Prior to servicing valve, depressurize valve, turn off electrical power supply, and disconnect solenoid coil from its power supply.

Do not energize coils which are not installed to a proper pressure vessel.

Failure to comply could result in personal injury or death.

**Caution**

If possible, remove valve from process connections. If process connection is made to sleeve port, disconnect piping prior to disassembly. Component parts must be replaced in the proper order and orientation. Take care not to damage seal(s) and/ or orifice(s). Valve contains loose parts. Take care not to misplace or damage them.

**Valve Fails to Operate:**

1. Check electrical supply with voltmeter. Voltage must comply with nameplate rating. Consult catalog Technical section for additional information.
2. If supply voltage is too low, locate and correct cause of low voltage. Voltage must exceed 85% of rated voltage.
3. Check coil with ohmmeter for shorted or open coil. If open refer to "Valve Coil Burn-Out".
4. Ensure pressure complies with label rating. If conforming, refer to "Valve is Sluggish or Inoperative".

**Valve Coil Burn-Out:**

1. Continuous high voltage greater than 10% of rated voltage could result in solenoid coil failure. Validate voltage and correct if necessary. Consult catalog Technical section valve voltage range.
2. Disassemble valve as per preceding "Pressure Vessel Maintenance" section, subsection "Valve Disassembly". Clean out extraneous matter. The plunger must be free to move without binding.
3. If valve has been exposed to excessive ambient temperature, ventilate or isolate area from elevated temperatures. May require valve relocation to lower temperature area.
4. Order coil kit and replace coil assembly per preceding "Coil Replacement" section.

**Valve is Sluggish or Inoperative (Electrical, pressure conform):**

1. Disassemble valve as per preceding "Pressure Vessel Maintenance" section, subsection "Valve Disassembly". Clean out extraneous matter. The plunger and spring assembly must be free to move without binding.
2. The plunger spring(s) must not be damaged. If damaged, service valve with repair kit.
3. Ensure diaphragm bleed hole is positioned above "OUT" port.

**External Leakage (At sleeve or cover interface):**

1. Check that sleeve assembly and cover screws are torqued per preceding "Pressure Vessel Maintenance" subsection "Valve Assembly".
2. If leakage persists, remove sleeve and cover per preceding "Pressure Vessel Maintenance" subsection "Valve Disassembly". Inspect flange seal and diaphragm. If damaged or worn, service valve with repair kit per preceding "Pressure Vessel Maintenance" section.

**Internal Leakage (Leakage through valve):**

1. Disassemble valve as per preceding "Pressure Vessel Maintenance" subsection "Valve Disassembly". Clean out any extraneous matter. Ensure diaphragm bleed hole is clear of debris and positioned above "OUT" port.
2. Examine plunger, plunger seal, diaphragm and spring(s) for damage. If damaged, service valve with repair kit.
3. Inspect valve orifice(s) for damage or wear. Damaged orifice(s) may require valve replacement.
4. Under normal operation, and with coil de-energized, check power at coil wires. Power should be off. If power is present, correct faulty contacts or wiring.

**Figure 1**

The representative exploded view below identifies valve components included in repair kits and coil kits, respectively. It is intended to serve as a representative visual aid only. Specific valve models may deviate from this representation.

**Key:**

- Included in coil kit (replace solenoid coil and its seals)
- Included in repair kit (service pressure vessel, replace coil seals)

