



GL Series Micro Flow Globe Control Valves Instructions



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1. Introduction

Valution's Model GL, Micro Flow series is designed with a traditional straight and 90 degree angular pattern flow path structure with a high 'FL factor'.

Generally, the body size is applied to 1/2"~1", the pressure rating is limited to ASME 150~2500#, and the adjustable flow rate range is limited to Rated Cv 0.00013~4.5.

This model can implement EQ-%, linear, and modified-% flow characteristics with the shape of the contoured plug. The body is streamlined, S-shaped and 90-degree angled, with less fluid resistance and plenty of space around the trim.

Since the model has a very low rated flow rate, careful attention should be paid to the conditions of use and selection such as the flow range, temperature, pressure, and connection method to be controlled.

This model can apply a spring diaphragm, cylinder and electric motor type actuator. Traditional E/P Positioners and Smart and HART Positioners are selectively applied.

2. General

These installation and maintenance instructions apply to all sizes and ratings of the GL Series control valves regardless of the type of trim used.

GL Series single ported top guided control valves are designed with built in versatility making them well-suited to handle a wide variety of process applications.

Standard construction offers a contoured plug with a threaded seat or a quick change seat.

The heavy top plug guiding provides maximum support to ensure plug stability.

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A series of reduced area trim is available to provide wide flow range capabilities in all valve sizes.

Tight Shutoff Class IV leakage is standard. Optional constructions meet IEC 534-4 and ANSI/FCI 70.2 Class V and VI.

An optional Low Emission Packing is available to assure compliance with the fugitive emission containment requests.

Replacing the conventional plug with the single stage MULTI-HOLE design provides excellent noise attenuation or cavitation control.

*Numbering System



Actuator Type	Model	Body Type	Trim Type	Flow Characteristics	Plug Type
V10. Spring Diaphragm V30. Spring Cylinder V90. Electric Motor V01. Other Type	GL	1. Straight Pattern 4. Angle Pattern	0. Undefined 1. Un-balanced 9. Disk Stack	0. Undefined 1. Linear 2. Equal % 3. Modified % 4. Quick Open	0. Undefined 1. Contoured 4. Cascade 5. Micro

3. Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Should any problems arise, contact the local Valution Representative or After Sales Department.

4. Installation

- 4.1 Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to insure leak-proof joints.
- 4.2 To allow for in-line inspection, maintenance or removal of the valve without service interruption, provide a manually operated stop valve on each side of the GL Series valve with a manually operated throttling valve mounted in the by-pass line.
- 4.3 The valve must be installed so that the controlled substance will flow through the valve in the direction indicated by the flow arrow located on the body.
- 4.4. In case of a heat-insulated installation, do not insulate the valve bonnet and take protection measures related to personal safety.

5. Air Piping

The actuators are designed to accept 1/4" NPT air supply piping. Use 1/4" OD tubing (4 x 6 mm) or equivalent for all air lines. If the supply air line exceeds 25 feet in length (7meters) or if the valve is equipped with volume boosters, 3/8" tubing (6 x 8 mm) is preferred. All connections must be free of leaks.

Caution : Do not exceed supply pressure indicated on serial plate on the yoke of actuator.

6. Body Disassembly

Access to the internal components of the body should be accomplished with the actuator removed. To remove the actuator from the body, refer to the actuator instruction type V10 spring diaphragm actuator.

Caution : Prior to performing maintenance on the valve, isolate the valve and vent the process pressure. Shut off supply air line and pneumatic or electric signal line.

After removing the actuator, disassemble the body using the following procedure :

- A. If a leak detection circuit is connected on the lateral NPT port of the bonnet, disconnect the pipe from this one.
- B. Remove body stud nuts.
- C. Remove bonnet, plug stem and plug as one unit.
- D. Since the retainer, seat and seat gasket are held in place by the bonnet, they may now be removed.

Note : Spiral wound gaskets are standard in the GL Series design and it is imperative that new gaskets be installed each time the valve is disassembled.

- E. Remove packing flange stud nuts, packing flange and packing follower.
- F. Remove plug and plug stem from the bonnet. plug and plug guide.
- G. Remove old packing [and optional lantern ring if a leak detection circuit has been installed].
- H. All components may now be inspected for wear and service damage. After determining the maintenance required, proceed to the appropriate Section of this instruction manual.

7. Maintenance/Repair

The purpose of this section is to assist maintenance personnel by suggesting methods of component maintenance which is largely dependent on the tools and machine shop equipment available.

7.1 Valve Trim

(1) Clean body gasket surface areas.

(2) Install a new seat gasket (8) and insert seat (3) in the body.

Note : Gasket (8) is temporarily placed to hold the seat during lapping.

It is imperative to use a new gasket or a false part having the same geometrical characteristics in order to insure the correct position of the seat during lapping.

This gasket (or similar part) can be kept after lapping for a future identical repair.

The gasket used for lapping must not be reused for the body reassembly.

(3) Apply grinding compound at several spots equally spaced around the seating area of the seat.

(4) Insert the retainer (5) into the body.

(5) Insert the stem and plug assembly (4) carefully into the body until it is seated.

(6) Place bonnet (2) on the body.

Caution : Insure that the seat (3), retainer (5) and bonnet (2) are properly aligned.

(7) Using four body stud nuts, spaced equally apart, fasten the bonnet to the body using only slight pressure and tighten evenly.

Caution : Do not tighten nuts to torque specifications at this time.

The bonnet is used temporarily for guiding purposes.

(8) Insert two or three pieces of packing into the packing box to assist in guiding the stem and plug during lapping.

(9) Screw a drilled and tapped rod with a T-handle on to the plug stem and secure with a locknut.

Note : As an alternative, drill a hole through a flat piece of steel and fasten to the plug stem using two locknuts.

(10) Applying a slight pressure on the stem, rotate the stem in short oscillating strokes 8 to 10 times.

Repeat this step until satisfaction.

Note : The plug should be lifted and turned 90° between repeating Step (10).

This intermittent lifting is required to keep the plug and seat concentric during lapping.

(11) After completion of the lapping operation, remove bonnet and internal parts.

The seat area of the seat and the plug must be cleaned of all lapping compound in preparation for reassembly.

7.2 Packing Box

Packing box maintenance is one of the principle chores of routine servicing. Tightness of the packing is maintained by packing compression. Compression is achieved by evenly tightening the packing flange nuts against the packing flange. Care must be taken not to over tighten as this could prevent smooth operation of the valve. If all compression is used up and the valve leaks, new packing is required.

Caution : Valve must be isolated and the pressure vented before performing packing box maintenance.

7.2.1 Aramid PTFE Rings (Standard)

Note : The Aramid PTFE packing rings have a skive cut allowing packing replacement without disconnect the plug stem from actuator connector or actuator stem.

A. Loosen and remove packing flange nuts.

B. Raise packing flange, and packing follower up the valve stem.

Note : They may be taped in place to keep them out of the way before proceeding.

C. By means of a hook remove packing, insuring not to damage the sealing surface of packing box or plug stem.

Note : On valve equipped with an optional leak detection connection, remove also the lantern ring.

D. Replace packing rings.

Note : Cram rings one by one into packing box.

The skive cut of each packing ring must be placed about 120 degrees apart.

E. Replace packing follower and packing flange.

F. Replace and tighten packing stud nuts.

Caution : Do not overtighten.

G. Put valve back in service and tighten packing only as much as is necessary to stop leaking.

Note : In an emergency, string packing may be used as a temporary repair only.

It must be replaced with the correct packing as soon as possible.

7.2.2 Expanded Graphite Rings (Optional)

Note : Expanded graphite packing rings replacement requires to disconnect the plug stem from actuator connector or actuator stem and removing of actuator.

A. *Remove actuator from the body assembly.*

B. Loosen and remove packing flange nuts.

C. Remove packing flange, and packing follower from the plug stem.

D. By means of a hook remove packing, insuring not to damage the sealing surface of packing box or plug stem.

Note : On valve equipped with an optional leak detection connection, remove also the lantern ring.

E. Replace new packing set; first one back-up ring(Carbon/Graphite/Inconel braided ring), then expanded graphite rings (smooth rings), at last, one other braided back-up ring.

Note : Cram rings one by one into packing box.

Note : On valve equipped with an optional leak detection connection,

F. Place packing follower and packing flange.

G. Place and tighten packing stud nuts.

Caution : Do not overtighten.

H. Proceed to appropriate instructions for actuator to body assembly and plug stem adjustment.

I. Place valve back in service and tighten packing only as much as is necessary to stop leaking.

8. Valve Body Reassembly

After completion of the required maintenance the valve should be reassembled using the following procedures :

Note : If any of the following steps were completed during maintenance, proceed to the next step.

A. Clean all gasketed surfaces.

B. Install seat gasket (8) and seat (3).

Note : Spiral wound gaskets (8&9) are standard in the GL Series design and it is imperative new gasket that a be installed each time the valve is disassembled.

C. Install retainer (5).

D. Carefully install plug and stem assembly.

Note : Valve should be lapped before final assembly.

E. Install bonnet gasket (9).

F. Install bonnet (2) and body stud nuts and tighten. Bonnet must be positioned so the packing flange studs are at a right angle to the flow center line.

Caution : Care must be taken to assure that the retainer, seat and bonnet are properly aligned in the body. Tighten nuts until metal to metal contact is obtained with proper bolt torque.

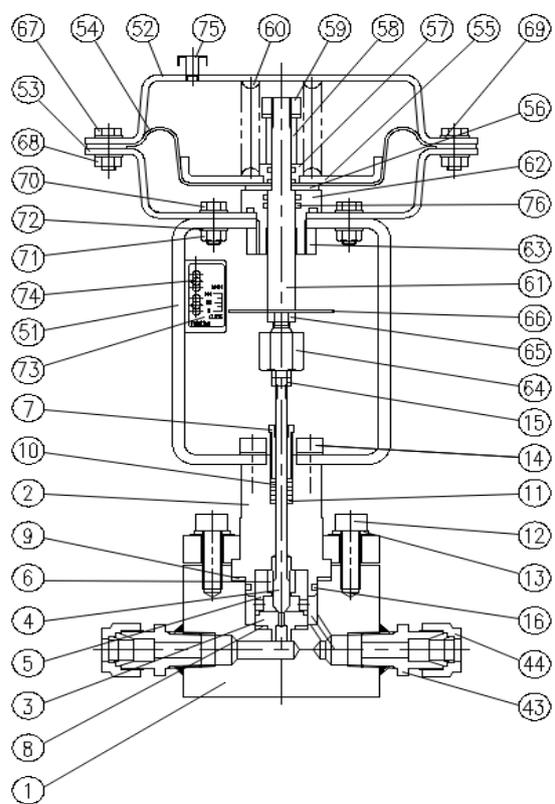
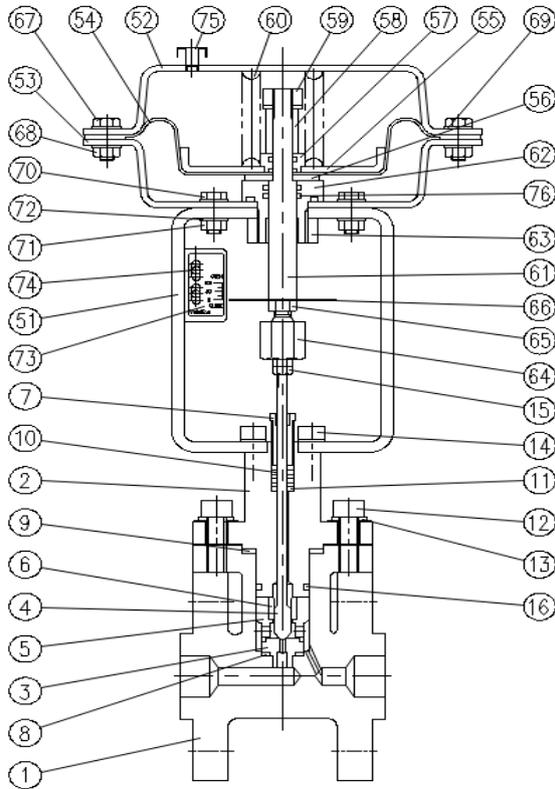
G. Insert packing (10).

H. Install packing follower and packing flange.

I. Install packing flange stud nuts.

J. For actuator to body assembly and plug stem adjustment, proceed to the actuator instruction type V10 spring diaphragm actuator

※. PART LIST
MICRO FLOW GLOBE CONTROL VALVE



No.	Part Name	Q`ty
1	Valve Body	1
2	Bonnet	1
3	Seat	1
4	Plug & Stem	1
5	Retainer	1
6	Guide	1
7	Packing Gland	1
8	Seat Gasket	1
9	Bonnet Gasket	1
10	Packing Set	1
11	Packing Washer	1
12	Bonnet Bolt	6
13	Bonnet Washer	6
14	Yoke Bolt	4
15	Stem Locknut	2
16	Bonnet Seal	1
43	Male Connector	2
44	Cap Nut	2
51	Yoke	1
52	Upper Case	1
53	Lower Case	1
54	Diaphragm	1
55	Diaphragm Plate	1

No.	Part Name	Q`ty
56	Diaphragm Washer	1
57	Adapter	1
58	Spacer	1
59	Top Nut	1
60	Spring	1
61	Top Stem	1
62	Top Stem Bush	1
63	Bush Nut	1
64	Stem Connector	1
65	Connector Nut	1
66	Ring Indicator	1
67	Case Bolt	12
68	Case Nut	12
69	Case Washer	12
70	Lower Case Bolt	4
71	Lower Case Nut	4
72	Lower Case Washer	4
73	Indicator	1
74	Indicator Screw	2
75	Vent Cap	1
76	Bush Seal	1
77	Name Plate(unshown)	1