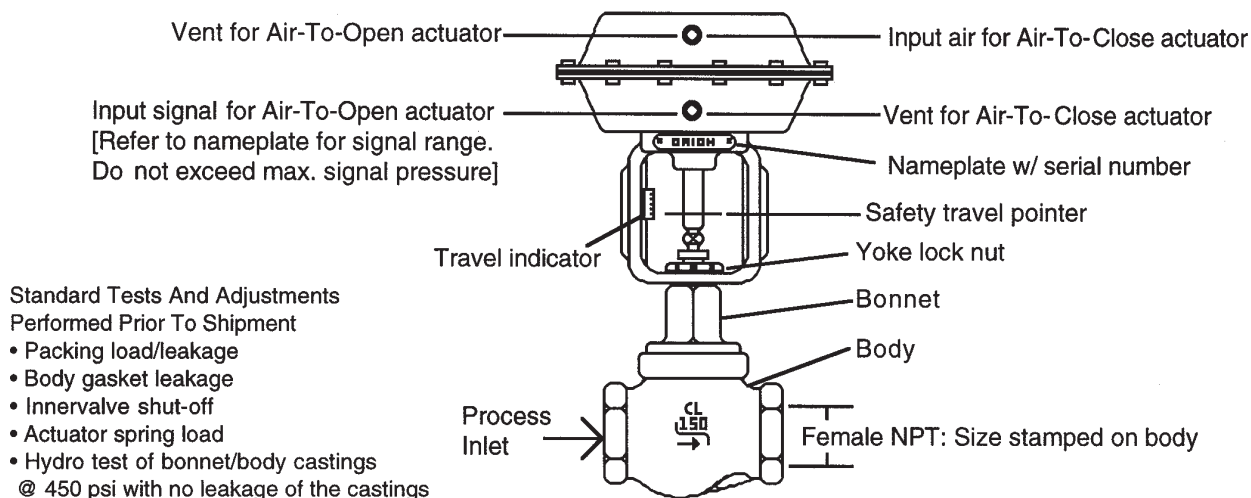


Model 9100	Series 9000 Control Valves RESEARCH® Control Valves	Instruction Manual
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INSTALLATION

- Inspect unit for shipment damage.
- Remove protective plugs from body and air signal connection. NOTE: Leave vent in place.
- Install valve in pipeline using PTFE tape or other suitable pipe thread sealant.

⚠ CAUTION

Use hex on body to tighten pipe into body. Never use the actuator as a lever.

- Install a suitable 1/4" NPT fitting in the air signal connection using TFE tape or other sealant.

⚠ CAUTION

If the air connections in the actuator needs to be re-oriented, DO NOT simply turn the actuator. If the unit is Air-to-open [ATO] the force on the innervalue from the closure springs WILL cause damage to the innervalue. If you must re-orient the actuator:

- apply an air signal to the actuator to raise the innervalue off the seat [apx. mid travel], loosen the yoke lock-nut, re-orient the actuator, tighten the yoke lock nut and THEN release the air signal pressure. To accomplish this, there is no reason to loosen either the bonnet joint or the connection between the innervalue stem and actuator stem.

If the unit comes equipped with a positioner or other devices, refer to the instructions accompanying the accessory.

Notes:

Although the actuator can handle higher pressures, Do Not exceed the signal range stamped on the nameplate. If a positioner is used, there is normally no need to use more than 40 psi of supply air unless the unit will not achieve full travel. Do not use TFE tape to pipe positioners. Small shreads of Teflon® can cause malfunction of the positioner. Do not repeatedly remove air from the actuator when an ATO valve is open. Slamming the innervalue shut when dry can cause galling of the innervalue.

OPERATION

The Model 9100 is a modulating control valve. It is normally supplied with a 35 sq.in. pneumatic multi-spring opposed diaphragm actuator in either Air To Open or Air To Close action.

The actuator positions the innervalue in response to a pneumatic signal from the controller. If the controller output is a 4-20mA signal, an i/P converter must be used to convert the 4-20 to the appropriate air signal.

e.g. In the ATO [3-15 psi] version, the valve is closed at 3 psig and open at 15 psig. The reverse is true of the ATC version. If properly sized and applied, the valve should control between 10% and 90% open, ideally around 50%. The standard equal percent innervalue characteristic provides a wide range of control for a given flow rate.

If you have questions about your valve, please call or fax your local representative or the factory for assistance.

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BadgerMeter, Inc.

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The actuator spring loading of your valve has been pre-adjusted. If your size 35 actuator is an Air-To-Open [ATO] version and the signal range stamped on the nameplate is 3-15, the unit is equipped with 3 force springs and should achieve full travel with approximately 12 psi of signal change. Since the "bench setting" is done with no upstream pressure, a 3-15 range unit is normally set to open at 3.25-3.5 psi. This provides a minimum of "closing" force to shut-off the innervalue under minimal upstream pressures, depending on innervalue size and upstream pressure. If your valve does not close against the upstream pressure, the springs can be adjusted [to shut off up to the maximum levels indicated in the general brochure.] If your valve has 6 force springs and no positioner, it should be stamped 3-27 or 6-30, indicating a 24 psi span. If your valve is an Air-To-Close version, it will be set so the innervalue touches the seat at approximately 14.5 psi.

Several factors determine a valves ability to close off with an acceptable degree of tightness. Three significant factors are: upstream pressure, orifice diameter and actuator spring loading, in the case of an Air-To-Open valve. In the case of an Air-To-Close valve, maximum output air pressure working against the innervalue and springs, determine shut-off tightness. If the upstream pressure [P1] is multiplied by the innervalue orifice area, the upward force, in "pounds of linear force" acting on the valve stem is determined. If that is divided by the effective area of the actuator, the minimum bench setting is known. Normally 1/4 to 1 psi extra is required to achieve shut-off, depending on orifice diameter, seat tightness desired and the seat/innervalue material.

E.G. P1 = 100 psi

Orifice area= 0.7854

Actuator area= 35 in²

Calculation: $100 \times 0.7854 = 78.54$ lbs. of upward force $\div 35 \text{ in}^2 = 2.25$ psi air. This means that the spring loading needs to be adjusted so that if a 3-15 psi signal is nominal, we add 2.75 [1/2 psi extra] to the minimum signal pressure [3], we know that when the controller output is 3 psi, we have the 2.75 psi extra loading to close the valve. Without upstream pressure, the valve would require $3 + 2.75 = 5.75$ psi of air to lift the innervalue off the seat. With 1 00 psi of upstream pressure, the valve should lift off the seat at aprx. 3 psi.

If you need assistance in performing this calculation, feel free to contact our sales department for assistance.

ADJUSTING ACTUATOR SPRING LOADING

[Not applicable for spring ranges (6-15, 9-15 & 10-15 psi)]

In the Air-To-Open configuration, the seating force of the actuator springs can be adjusted to provide sufficient load to shut-off the innervalue. If the unit is not closing completely when the minimum signal is sent to the actuator, the spring force needs to be increased, based on the calculation above [best done on workbench].

To increase the seating force:

- pipe a manual air regulator [with output gauge] to the air connection in the lower actuator housing. The regulator should be capable of controlling pressure over the range indicated on the nameplate.
- using the regulator, raise and lower the air pressure to determine where the valve "seats". If the seating load needs to be increased, stroke the valve to about 1/2 travel. place a 1/2" open end wrench on the lower stem nut. with another 1/2" wrench, loosen the upper nut and turn counterclockwise about 1/4 turn.
- lower the air pressure to determine the signal pressure now needed to "seat" the valve. Using the stem as the adjustor, keep threading the stem in or out as desired until the proper seating position is achieved.
- once the proper loading is reached, place a wrench on the flats machined on the actuator stem and tighten the upper nut against the actuator stem.
- place a wrench on the upper nut and lock the lower nut to the upper nut.

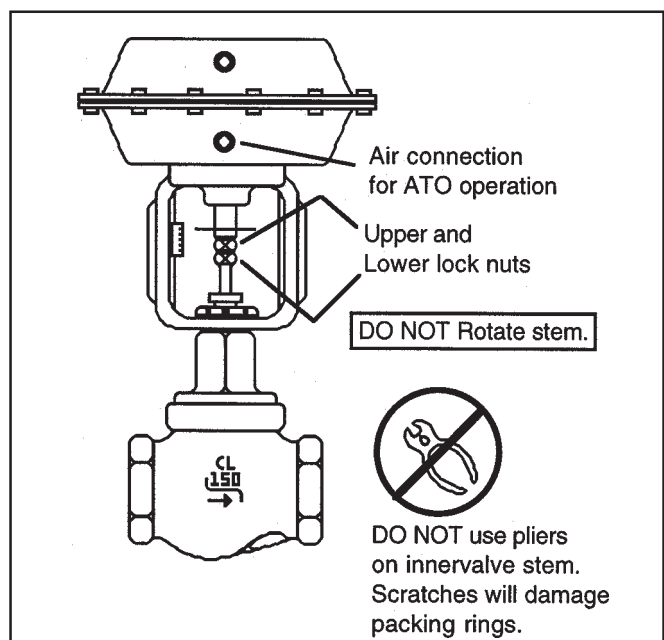
The unit is now ready for operation.

CAUTION

NEVER turn the nuts or innervalue stem while the valve is seated. This will result in innervalue damage and prevent the innervalue from seating properly.

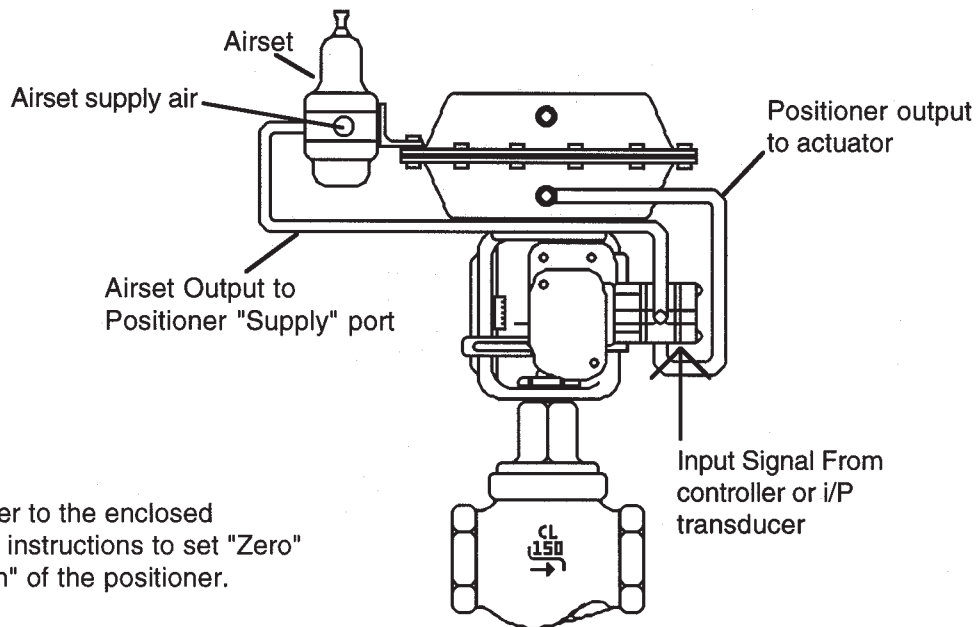
In the Air-To-Close configuration, the same procedure is used. However, the action of the unit is in reverse. Adjustments are made while checking the seating position with increasing air signal pressure.

Typically, an ATC actuator should be set to seat the innervalue at about 1/4 to 1/2 psi prior to maximum signal pressure.



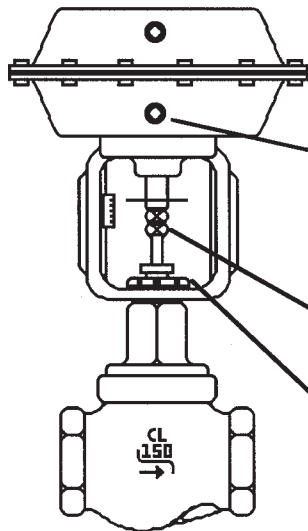
Schematic of ATO valve with Standard Moore 750 positioner and Airset [piped].

Note: Actual piping may look different than shown.



Note: Refer to the enclosed positioner instructions to set "Zero" and "Span" of the positioner.

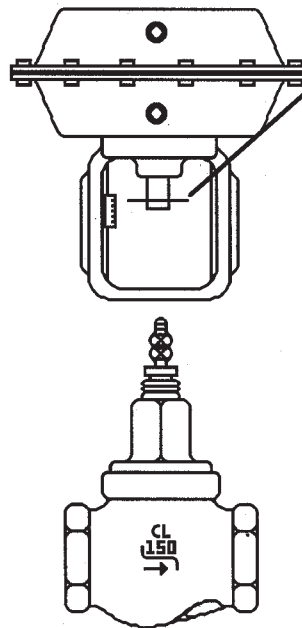
Removing Actuator From Valve Subassembly



- If actuator is ATO, Input air signal, stroking the valve to full open. [Not necessary if actuator is ATC]
- Unscrew innervalue stem from actuator stem using wrench on jam nuts.
- Unscrew yoke lock nut



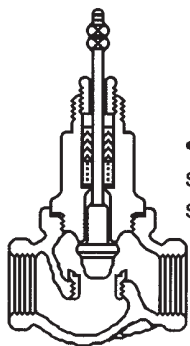
DO NOT use pliers on innervalue stem. Scratches will damage packing rings.



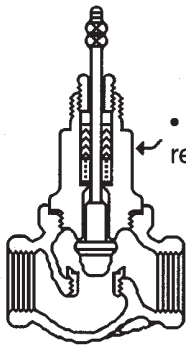
The safety nylon pointer disc can be "popped" out of it's groove and slid up the stem to facilitate maintenance if necessary.

- Lift actuator off valve subassembly. Note: The air signal can be left on the actuator if the actuator is not going to be disassembled.

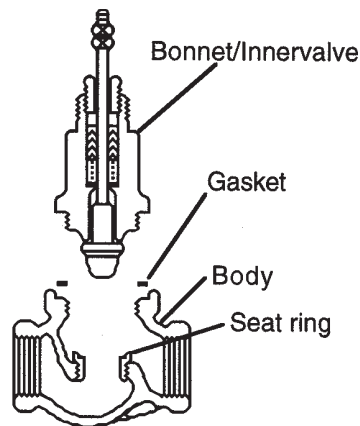
Disassembling Valve Subassembly



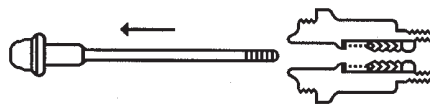
- Pull innervalue stem up until it stops.



- Unscrew and remove bonnet

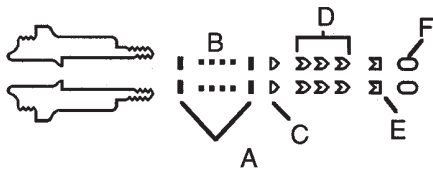


- Remove jam nuts.
- Remove packing gland

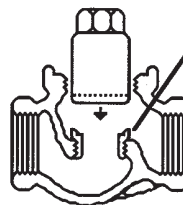


- Pull innervalue out bottom of bonnet

Remove stuffing box components. Normally the parts shown can be forced out the top of the bonnet by pushing the components out with a plastic or wooden rod [3/8"Ø] through the bottom of the bonnet.

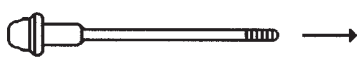


- A: SST Flat washers
- B: SST Spring
- C: Lower TFE adapter
- D: 3 chevron rings
- E: Upper adapter
- F: Follower

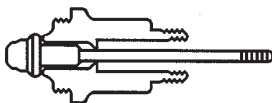


- Using special tool or flat plate, remove seat ring.

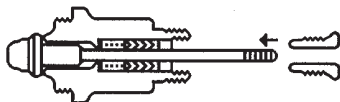
Re-Assembling Valve Subassembly



- Insert new innervalue into empty bonnet



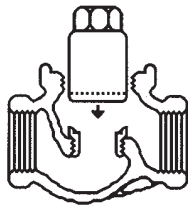
- Install stuffing box components [in the order shown] over stem. Be careful when sliding the packing rings over the stem threads.
- Lubricate [w/ silicone grease] all TFE parts and threads.



- Install packing gland. Tighten finger tight.

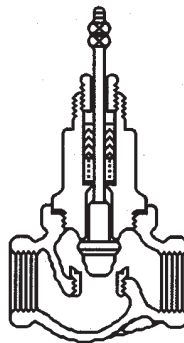


- Install 2 jam nuts onto stem [bottom of threads] and lock together with wrenches.
- Tighten packing gland until there is a 0.04"-05" [1-1.5 mm], or about the thickness of a quarter, gap between the bottom of the gland hex and the top of the bonnet.
- Note: If packing leakage occurs, the gland can be tightened [down all the way if necessary] to the bonnet without damaging the packing.



- Install new seat ring. Use lubricant on threads and seat chamfer.

Torque to:
 3/4" and 1" valves: 50-60 ft/lbs
 1-1/4 and 1-1/2" valves: 100-110 ft/lbs.
 2" valves: 150-160 ft/lbs



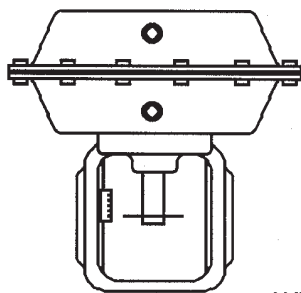
- Install new gasket and thread bonnet into body. Use lubricant on gasket and bonnet threads.

⚠ CAUTION

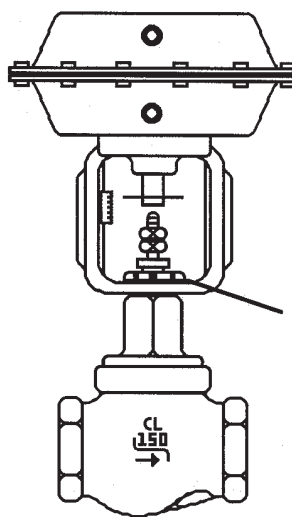
Caution: To preclude galling innervalue onto seat, pull stem up until it stops before threading bonnet into body.

Bonnet Torque: Normal Applications
 3/4" and 1" valves: 200-225 ft.lbs.
 1-1/4 to 2" valves: 450-475 ft.lbs.

Bonnet Torque: High Vibration Areas
 3/4" and 1" valves: 300-350 ft.lbs.
 1-1/4 to 2" valves: 650-700 ft.lbs.



- With air still on actuator, [if ATO] lower actuator onto body assembly.

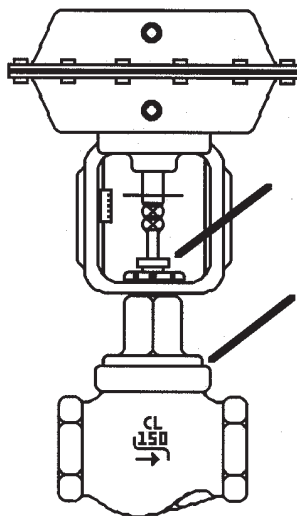


- Install yoke lock nut and tighten. A hammer and punch can be used to tighten nut.

- Thread innervalue stem into actuator stem. The bench setting can be adjusted [Ignore if using fixed rate springs such as 6-15, 9-15 or 10-15 range] at this point by varying the amount of innervalue stem threads engaged into the actuator stem. Once the proper amount is achieved, [Not to exceed 4 psi on 3-Spring unit or 8 psi on 6-Spring unit], UNLOCK the two stem nuts and lock the upper nut against the actuator stem. Then lock the bottom nut against the upper nut.

⚠ CAUTION

DO NOT rotate the actuator stem. Use a back-up wrench to hold the stem firmly in place during connection tightening.



- Using the input signal, stroke the valve to check function.
- Place the nylon travel pointer disc back in the "V" groove of the stem.
- Adjust the travel scale so that the disc points to the bottom mark when the valve is closed.
- Check for external leakage at the points indicated using 50-100 psig air and a soap/water solution. If there is leakage in the stem/packing area, tighten the gland 1/2 turn and recheck.
- If desired, seat leakage can be checked using 20-30 psi air at the inlet of the valve [with 0 pressure in the actuator on ATO units or 15 psi air in the actuator on ATC units].

The valve is now ready to be re-installed into the pipeline.

Please provide valve serial number when calling the factory with questions.

CAUTION

- Be sure to:
 - follow your companies safety rules concerning equipment installation or repairs.
 - read the instruction manual and brochure before attempting repairs.
 - never use this or any valve in an application that is above the limits of the unit.
 - never use the valve above the pressure/temperature rating listed in the brochure.
 - never use the valve in applications that attack bronze materials.
 - de-pressurize the system before disassembling the valve.
 - never rotate the innervalue when in the closed position.
- Rotation of metal on metal components causes galling and will affect the function and shut-off capability of the unit.

ON ACTUATORS WITH TWO (2) LONG ACTUATOR BOLTS, THE SPRINGS ARE UNDER TENSION EVEN WHEN ACTUATOR IS OFF THE VALVE.

WHEN DISASSEMBLING ACTUATOR, REMOVE LONG NUTS LAST TO RELEIVE SPRING COMPRESSION.

DO NOT ROTATE THE ACTUATOR STEM. Use a back-up wrench to keep stem fixed during connection of the innervalue to the stem. Rotation of the stem will cause the springs to shift, which will cause the actuator to malfunction.

- Never use the actuator as a lever to tighten the valve body onto a pipe or fitting.
 - Never clamp the body in a vice on the sides of the body. Always clamp end-to-end.
 - Replace any damaged components. It's less expensive than a shut-down.
 - Remove the actuator before disassembling the valve sub-assembly.
- Even though the model 9100 is a rugged valve, if the unit will be installed in a high vibration situation, the actuator should be braced. An angle bracket kit [fitting the actuator rim screws] is available for this purpose. The bracket can also be used to mount accessories to the actuator.

NOTES

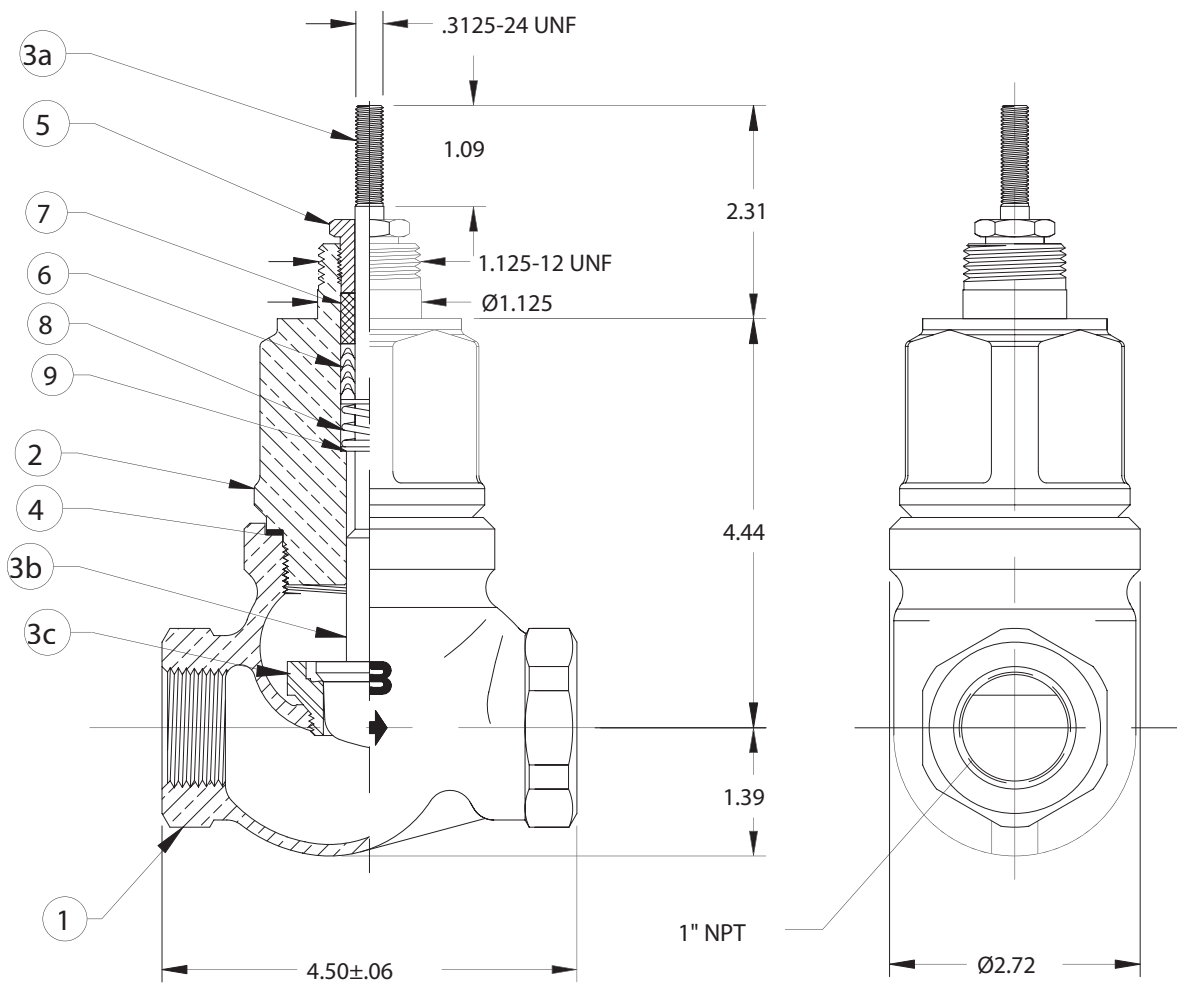
DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952006	01.03	01.02	ECN 8882	GAP	09-05-96		
		01.03	ECN 9160 EM 2001	DGD	06-21-00		

NOTES:

- TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____
- NOMINAL STROKE: .750
- RECOMMENDED SPARE PARTS ARE:
4, 6
OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3, PACKING ITEMS 7, 8 & 9
- WHEN ORDERING SPARE OR REPLACEMENT PARTS, PROVIDE FACTORY THE VALVE ASSEMBLY SERIAL NUMBER FROM THE NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY				
ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527192-0001	1	BODY	BRONZE, B62
2	527195-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNVERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512895-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST



CERTIFIED FOR: _____ P.O. : _____ LOCATION: _____ SERIAL NO.: _____ TAG NUMBER: _____ PREPARED BY: _____	APPROVALS		DATE		 BADGER METER SERIES 9000 CONTROL VALVES						
	DRAWN:				1" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9103						
	G. PRICE		11-07-95								
	CHECKED:										
	W. HALL		06-23-00								
ENGINEER:				SIZE		SCALE		DWG. NO.		ISSUE	
M.A. LOBO		10-30-00		A		1/2		CD-952006		01.03	

DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952007	01.03	01.02	ECN 8882	GAP	09-05-96		
		01.03	ECN 9160, EM 2001	DGD	06-21-00		

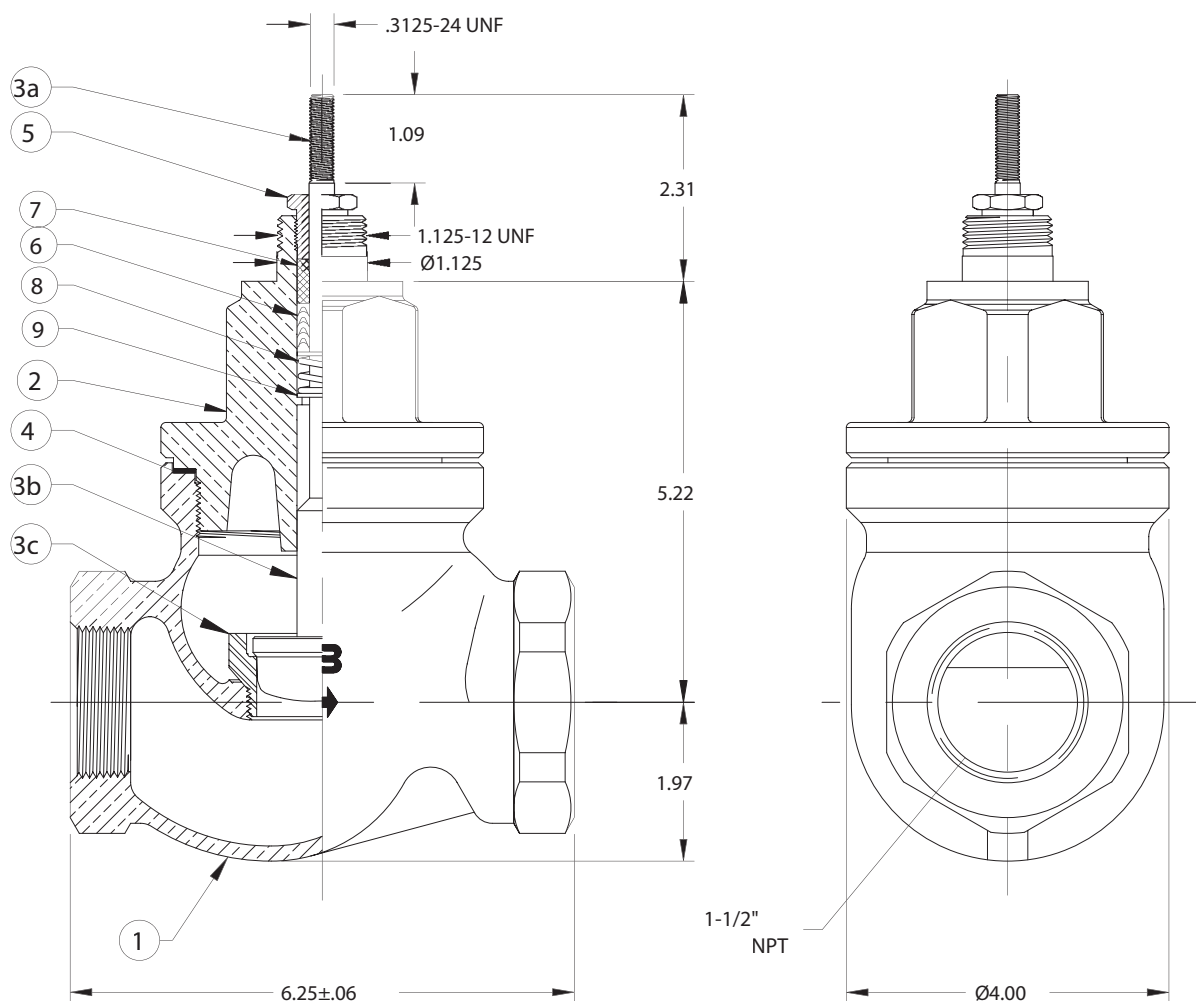
NOTES:

- 1.) TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____
- 2.) NOMINAL STROKE: 1.00
- 3.) RECOMMENDED SPARE PARTS ARE:
4, 6
OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3, PACKING ITEMS 7, 8 & 9
- 4.) WHEN ORDERING SPARE OR REPLACEMENT PARTS, PROVIDE FACTORY THE VALVE ASSEMBLY SERIAL NUMBER FROM THE NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY

ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527191-0001	1	BODY	BRONZE, B62
2	527193-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512893-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST



CERTIFIED FOR: _____ P.O.: _____ LOCATION: _____ SERIAL NO.: _____ TAG NUMBER: _____ PREPARED BY: _____ DATE: _____	APPROVALS	DATE	 BADGER METER SERIES 9000 CONTROL VALVES 1-1/2" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9105	
	DRAWN:			
	G. PRICE	11-09-95		
	CHECKED:			
	W. HALL	06-30-00	SIZE A	SCALE 7/16
	ENGINEER:			
	M.A. LOBO	10-30-00		
			DWG. NO.	ISSUE
			CD-952007	01.03

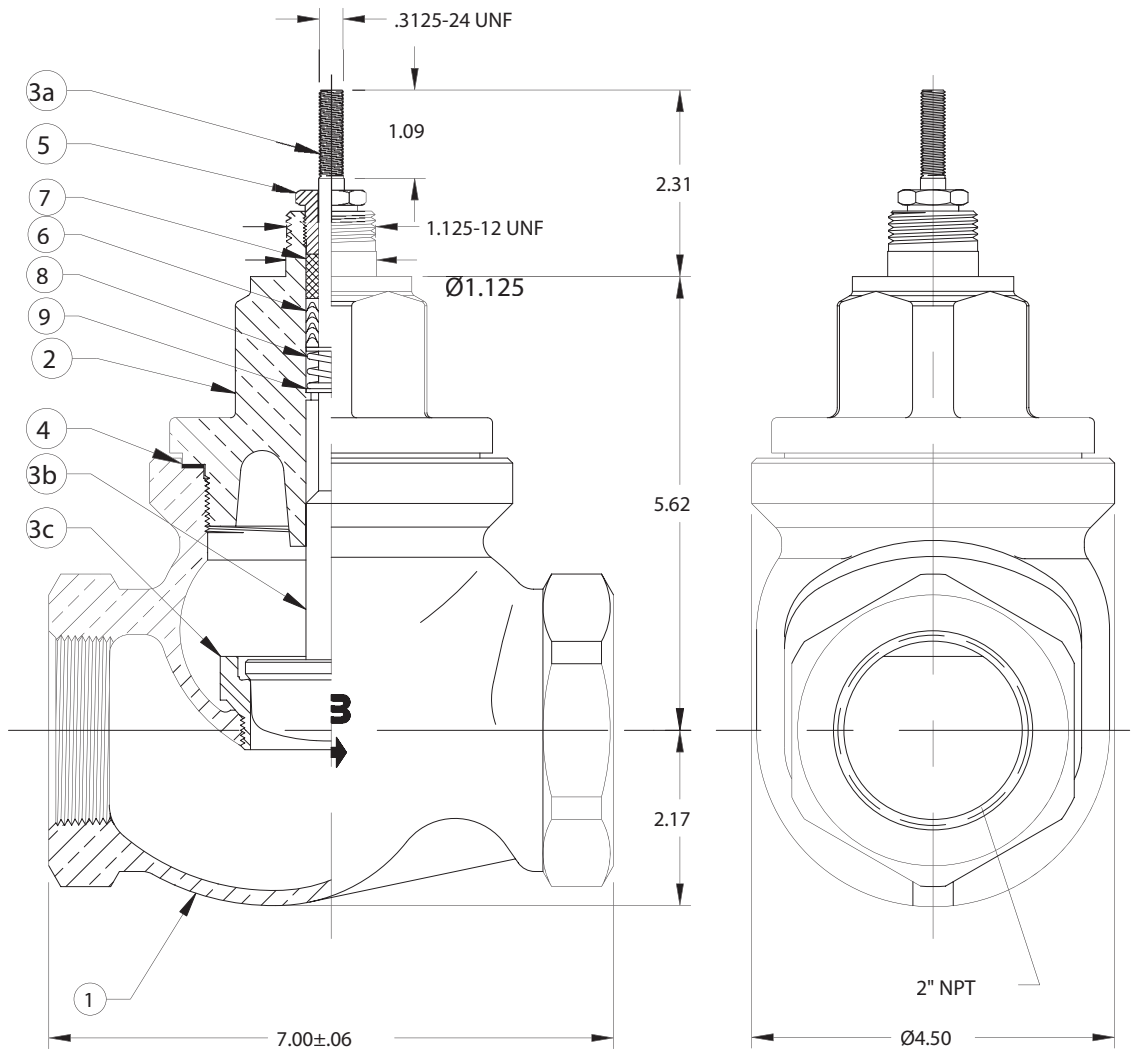
DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952008	01.03	01.02	ECN 8882	GAP	09-05-96		
		01.03	ECN 9160, EM 2001	DGD	06-21-00		

NOTES:

- TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____
- NOMINAL STROKE: 1.00
- RECOMMENDED SPARE PARTS ARE:
4, 6
OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3, PACKING ITEMS 7, 8 & 9
- WHEN ORDERING SPARE OR REPLACEMENT PARTS, PROVIDE FACTORY THE VALVE ASSEMBLY SERIAL NUMBER FROM THE NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY				
ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527190-0001	1	BODY	BRONZE, B62
2	527193-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNVERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512893-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST



CERTIFIED FOR: _____ P.O.: _____ LOCATION: _____ SERIAL NO.: _____ TAG NUMBER: _____ PREPARED BY: _____ DATE: _____	APPROVALS		DATE				BADGER METER SERIES 9000 CONTROL VALVES				
	DRAWN:				2" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9106						
	G. PRICE		11-09-95								
	CHECKED:										
	W. HALL		06-23-00								
ENGINEER:				SIZE		SCALE		DWG. NO.		ISSUE	
M.A. LOBO		10-30-00		A		7/16		CD-952008		01.03	

DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952035	01.03	01.02	8882	GAP	09-05-96		
		01.03	ECN 9160, EM 2001	DGD	06-21-00		

NOTES:

1.) TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____

2.) NOMINAL STROKE: .750

3.) RECOMMENDED SPARE PARTS ARE:
4, 6



OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3, PACKING ITEMS 7, 8 & 9

4.) WHEN ORDERING SPARE OR REPLACEMENT
PARTS, PROVIDE FACTORY THE VALVE
ASSEMBLY SERIAL NUMBER FROM THE
NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY

ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527304-0001	1	BODY	BRONZE, B62
2	527195-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNVERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512895-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST

CERTIFIED FOR:	APPROVALS	DATE	 BADGER METER SERIES 9000 CONTROL VALVES			
P.O.:	DRAWN:	11-07-95				
LOCATION:	G. PRICE					
SERIAL NO.:	CHECKED:	06-23-00				
TAG NUMBER:	W. HALL		3/4" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9102			
PREPARED BY:	ENGINEER:	06-23-00	SIZE	SCALE	DWG. NO.	ISSUE
	M.A. LOBO	10-30-00	A	1/2	CD-952035	01.03

DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952036	01.03	01.02	ECN 8882	GAP	09-05-96		
		01.03	ECN 9160, EM 2001	DGD	06-20-00		

NOTES:

1.) TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____

2.) NOMINAL STROKE: 1.00

3.) RECOMMENDED SPARE PARTS ARE:
4, 6



OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3 , PACKING ITEMS 7, 8 & 9

4.) WHEN ORDERING SPARE OR REPLACEMENT
PARTS, PROVIDE FACTORY THE VALVE
ASSEMBLY SERIAL NUMBER FROM THE
NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY

ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527305-0001	1	BODY	BRONZE, B62
2	527193-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNVERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512893-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST

CERTIFIED FOR:	APPROVALS	DATE	 BADGER METER SERIES 9000 CONTROL VALVES			
	DRAWN:				1-1/4" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9104	
	G. PRICE	11-09-95				
	CHECKED:					
	W. HALL	07-14-00				
	ENGINEER:		SIZE	SCALE	DWG. NO.	ISSUE
	M.A LOBO	10-31-00	A	7/16	CD-952036	01.03

P.O. :
LOCATION:
SERIAL NO. :
TAG NUMBER:
PREPARED BY: _____ DATE: _____

DWG NO.	ISSUE	ISS	CHANGE	BY	DATE	UNLESS OTHERWISE SPECIFIED DIMENSIONS FOR REFERENCE ONLY LENGTH UNITS ARE INCHES	ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER SHOWN ON THIS DRAWING ARE THE EXCLUSIVE PROPERTY OF BADGER METER INCORPORATED.
CD-952482	01.01	01.01	ECN 9160, EM 2001	DGD	06-20-00		

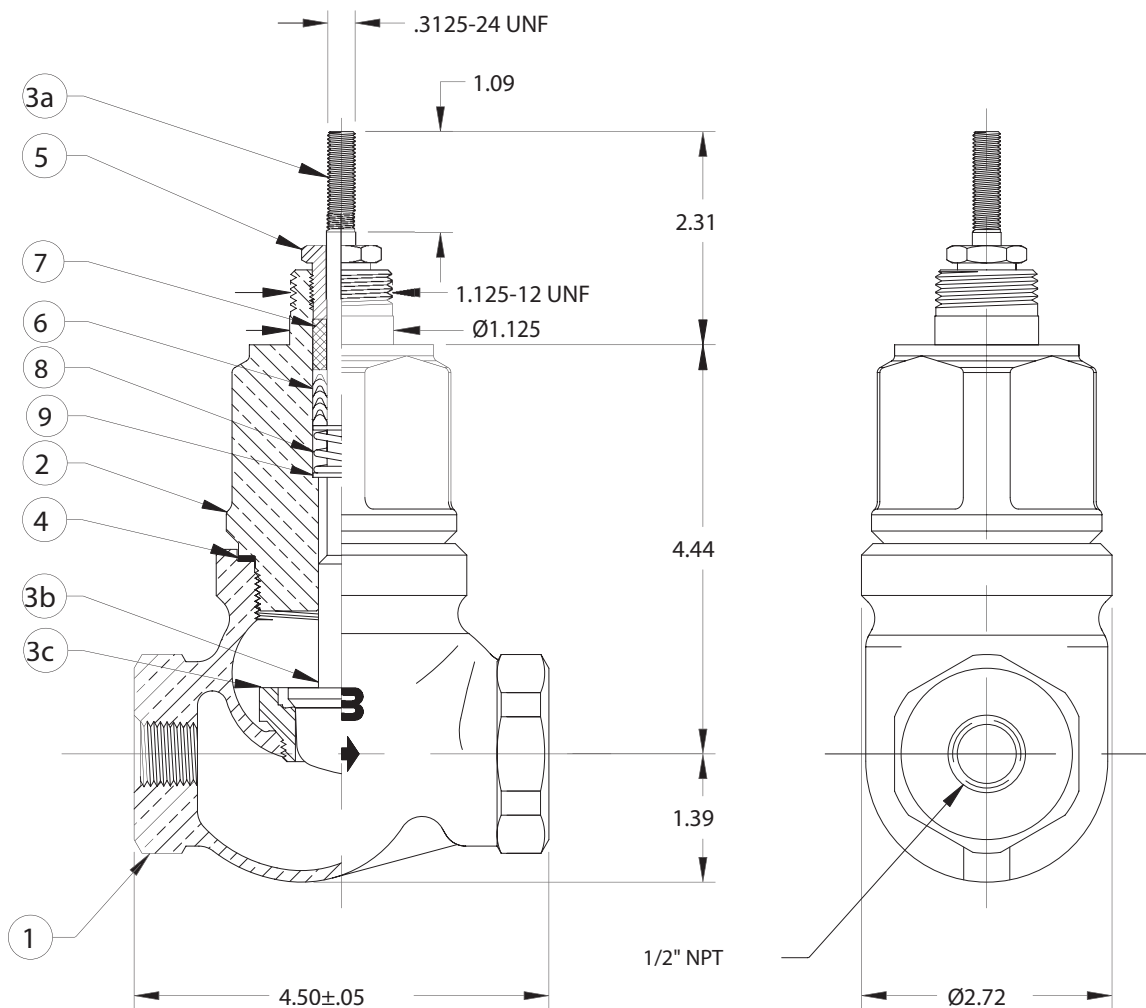
NOTES:

- 1.) TRIM ASSEMBLY P/N _____
Cv: _____ CHAR: _____
- 2.) NOMINAL STROKE: .750
- 3.) RECOMMENDED SPARE PARTS ARE:
4, 6
OPTIONAL SPARE PARTS ARE:
TRIM SET ITEMS 3, PACKING ITEMS 7, 8 & 9
- 4.) WHEN ORDERING SPARE OR REPLACEMENT PARTS, PROVIDE FACTORY THE VALVE ASSEMBLY SERIAL NUMBER FROM THE NAMEPLATE ON THE ACTUATOR.

PARTS & MATERIAL LIST

QUANTITIES ARE FOR ONE (1) UNIT ONLY

ITEM NO.	PART NO.	QTY	DESCRIPTION	MATERIAL
1	527759-0001	1	BODY	BRONZE, B62
2	527195-0001	1	BONNET	BRONZE, B62
3a	NOTE 1	1	STEM	316L SST
3b	NOTE 1	1	INNVERVALVE	316L SST
3c	NOTE 1	1	SEAT	316L SST
4	512895-0001	1	GASKET	COPPER
5	525950-0001	1	GLAND	316 SST
6	543242-0001	1	PACKING SET	TFE
7	527241-0001	1	FOLLOWER	PFA
8	510031-0158	1	SPRING	302 SST
9	430002-0115	2	WASHER	316 SST



CERTIFIED FOR: _____ P.O.: _____ LOCATION: _____ SERIAL NO.: _____ TAG NUMBER: _____ PREPARED BY: _____ DATE: _____	APPROVALS	DATE	<div>  BADGER METER SERIES 9000 CONTROL VALVES </div> <div>  </div>			
	DRAWN:					
	CHECKED:					
	ENGINEER:		1/2" CAST GLOBE BODY, STANDARD BONNET, CV RING PACKING, MODEL 9101			
	G. PRICE	05-27-98	SIZE	SCALE	DWG. NO.	ISSUE
	W. HALL	07-14-00	A	1/2	CD-952482	01.01
	M.A. LOBO	10-30-00				



Please see our website at
www.badgermeter.com
for specific regions and contacts.

Due to continuous research, product improvements and enhancements, Badger Meter reserves the right to change product or system specifications without notice, except to the extent an outstanding bid obligation exists.



BadgerMeter, Inc.

6116 E. 15th Street, Tulsa, Oklahoma 74112
(918) 836-8411 / Fax: (918) 832-9962

www.badgermeter.com