

FOR

**THE INSTALLATION, OPERATION AND MAINTENANCE OF
W910 SERIES DIAPHRAGM CONTROL VALVE**



AIR OPERATED



428 Jones Boulevard
Limerick Airport Business Center
Pottstown, PA 19464

Phone: (610)495-5131
Fax: (610)495-5134
www.watsonmcdaniel.com

INSTALLATION AND MAINTENANCE INSTRUCTIONS **FOR THE W910 SERIES DIAPHRAGM CONTROL VALVE**

DESCRIPTION

The W910 Series Control Valve is spring and diaphragm operated and is intended primarily for use with a 0 – 20 or 2 – 15 PSIG air signal source. It uses a cast frame and diaphragm housing and the spring adjuster is easily turned through the bronze bushing using the bar provided.

TYPES

The W910A, W910B & W910C are used for On/Off control applications, providing a quick-opening flow response when used with single or double seated valves.

The W910TB is used for proportional or PID control applications, providing a throttling flow response when used with single seated, double seated or 3-way valves.

The W910EPA & W910EPC is used for proportional or PID control applications, providing an equal percentage flow response when used with single seated valves.

RATINGS – TEMPERATURE & PRESSURE

STANDARD BODY TYPE	STANDARD BODY RATINGS	
	TEMPERATURE	PRESSURE
Bronze*	406F	250 psig
125 Lb. Iron	353F	125 psig
250 Lb. Iron	406F	250 psig

Per ANSI B16.1. *With 250 Lb. union ends. **Consult factory for higher conditions.

INSTALLATION

VALVE

Make sure steam supply is safely shut off. It is recommended that the unit be installed in a vertical position in horizontal piping. Observe flow direction arrow on side of valve body. When used on a service of 50 psi or over, stainless steel trim valves are recommended. A strainer should be installed immediately before the control valve, to eliminate scale, sediment or other foreign matter which could otherwise interfere with proper seating of the valve. In addition, a by-pass line should be installed. MAX DIAPHRAGM PRESSURE: 30 psig. Connect the pressure signal line to the 1/8" NPT thread at the top center of the cover.

VALVE ACTION

A normally open valve requires the air signal to the diaphragm to close. A normally closed valve requires the air signal to the diaphragm to be open against the spring load. Adjust the spring load after installation to obtain the valve stroke at the desired diaphragm pressure.

ADJUSTING VALVE

The valve adjusting screw must be positioned after installation to balance the pressure drop occurring at the valve, and to be sure the valve is fully closed at the proper diaphragm pressure and is opening at the diaphragm pressure desired. Turn screw to the right to increase and to the left to decrease the diaphragm pressure at which the valve strokes, as indicated by the high and low marks on the yoke scale. The adjusting bar is provided and attached to the topworks, and the adjusting screw has holes for turning with the bar.

LUBRICATION

The valve stem must be kept clean where it travels into the packing. It is advisable to periodically oil the valve stem where it enters the gland nut. Packing material, under certain conditions, may dry out and create a binding effect. Mineral deposits and scale, if allowed to accumulate on the stem, can inhibit motion and damage the stem seals.

REMOVING THE VALVE BODY ASSEMBLY

Make sure steam supply is safely shut off. Allow sufficient time for valve to cool completely. Turn the adjusting screw up to 4 to expose the stem locknuts. Remove the bonnet nut holding the yoke and then screw the valve stem out of the upper stem using the two locked jam nuts for a wrench grip. **If the valve is spring closed (C.N.), the seat must be opened by applying air pressure on the diaphragm, before turning the stem & plug assembly.** This avoids galling the seat surfaces.

ATTACHING THE VALVE BODY ASSEMBLY

Be sure the stem locknuts on the valve are located as tabulated (see chart below) with the valve closed. Dim. "A" on all N.O. (stem to close) 910EP Valves is 1-7/8". Put the valve stem through the yoke hole and then through the bonnet nut and screw the exposed stem fully into the upper stem and against the two stem locknuts. A normally closed valve will require air pressure on the diaphragm to open the seats during assembly. Tighten the bonnet nut onto the yoke. The valve is now ready to use.

GENERAL

Diaphragm Control Valves are fine precision instruments. They are manufactured under the highest standards and when requiring service should, if at all possible, be returned to the factory. Consult your nearest service representative.

Make sure steam supply is safely shut off. Allow sufficient time for valve to cool completely

VALVE SIZE NPT	ACTION	
	DIM. A	
	N.O. STEM IN TO CLOSE	N.C. STEM OUT TO CLOSE
1/2"	2-1/4	2-3/8
3/4"	2-3/16	2-3/8
1"	2-3/16	2-3/8
1-1/4"	2-1/8	2-3/8
1-1/2"	2-1/8	2-3/8
2"	2-1/8	2-3/8
2-1/2"	2-1/8	2-3/8
3"	2-1/8	2-3/8
4"	2-1/8	2-3/8

* INCLUDES ALL REDUCED PORT SIZES

*For 915 3-Way – Dim. A is 2-3/8 through 2" size with stem out (Top Seat Closed). Dim. A is 3" on all flanged 915 3-way. For 910EP N.O. (Stem in to close) – Dim. A is 1-7/8.

TO REPLACE VALVE STEM SEALS

The standard valve uses Teflon "V" ring seals with male and female end rings and a stainless steel compression spring. The spring maintains proper compression on the seals.

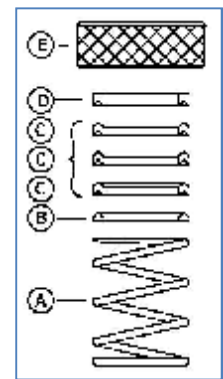
- 1. Make sure steam supply is safely shut off. Allow sufficient time for valve to cool completely.** Remove actuator from the valve assembly bonnet. This is done by removing the valve bonnet nut holding the yoke to the bonnet and unscrewing the valve stem from the regulator stem. Use the two stem locknuts as a wrench grip to turn the valve stem. If the nuts should turn on the stem, lock then more tightly together so that the stem will turn. **Never grip the polished stem itself since marring of this finish will result in a stem that is impossible to replace and seal properly.** If the valve is in the closed position, connect enough air pressure to the diaphragm to the valve to avoid galling of valve trim by turning of the plug against the seat.

2. Before loosening the stem locknuts, measure and record the location of the location of the nuts so that they can later be repositioned to the original location. Remove both locknuts from the stem.
3. Remove the packing nut from the valve bonnet.
4. Remove all old packing, adapters, washers and spring from the valve bonnet. This is most easily accomplished by admitting a small amount of pressure to the valve body until the packing is forced out of the stuffing box. Shield the bonnet as some spray may occur as the packing emerges. **DO NOT SCRATCH BORE OF STUFFING BOX WITH SHARP TOOLS.**
5. Clean all surfaces of the stuffing box and stem. Remove all accumulations of mineral deposits or other debris before rebuilding. A .4375 diameter reamer is ideal to remove deposits from the bonnet. Do not use abrasives on the valve stem since scratches will cause leakage. The stem originally was polished to a 12 micro-inch finish and this polish should be preserved. If the stem is corroded, worn, or marred, it must be replaced.
6. Blow all debris from the stuffing box and the replacement packing before repacking. **PACKING MUST BE CLEAN AND FREE OF FOREIGN MATERIAL.**

7. Install new packing set as follows:

- A - Spring
- B - Male adapter with flat side in first against spring.
- C - V-rings with lips in first.
- D - Female adapter with cavity in against V-rings and flat side out.
- E - Packing nut.

V-rings must be carefully installed over the stem threads and into the stuffing bore to avoid snagging of the lips on threads or bore entrance, since the clean edge on these lips is imperative for proper sealing.



8. Tighten packing nut all the way down on bonnet to push all rings down into the stuffing box and to obtain proper spring load on the assembled rings.
9. Replace the stem locknuts and reposition and lock in place as previously measured before disassembly. If measurement was not available, use dimension from the bonnet mounting face to the top surface of the top locknut as shown in this instruction book.
10. Reverse step #1 and replace actuator and bonnet nut and reassemble stem connection again using the locknuts as wrench grips on the stem. A normally closed valve will require air pressure on the diaphragm to open the seats to avoid galling of the trim while connecting the stem.