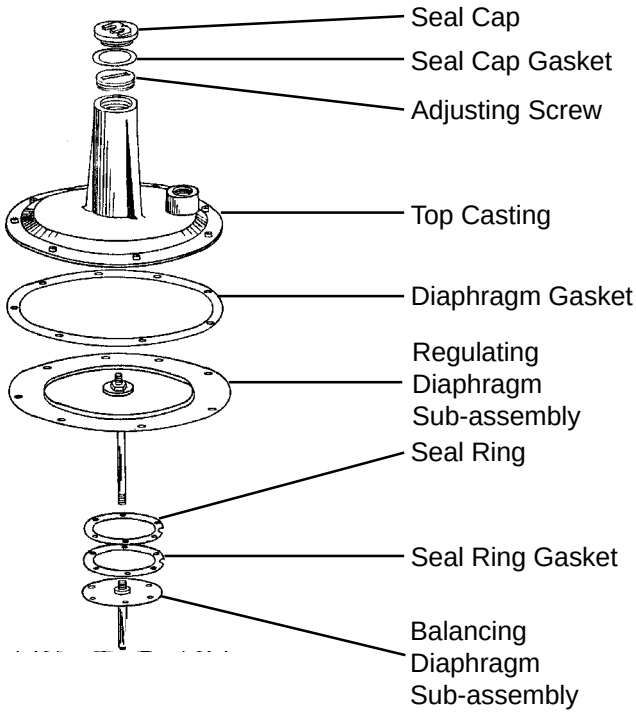
BULLETIN MP2034-08/03
REPLACED MI2039

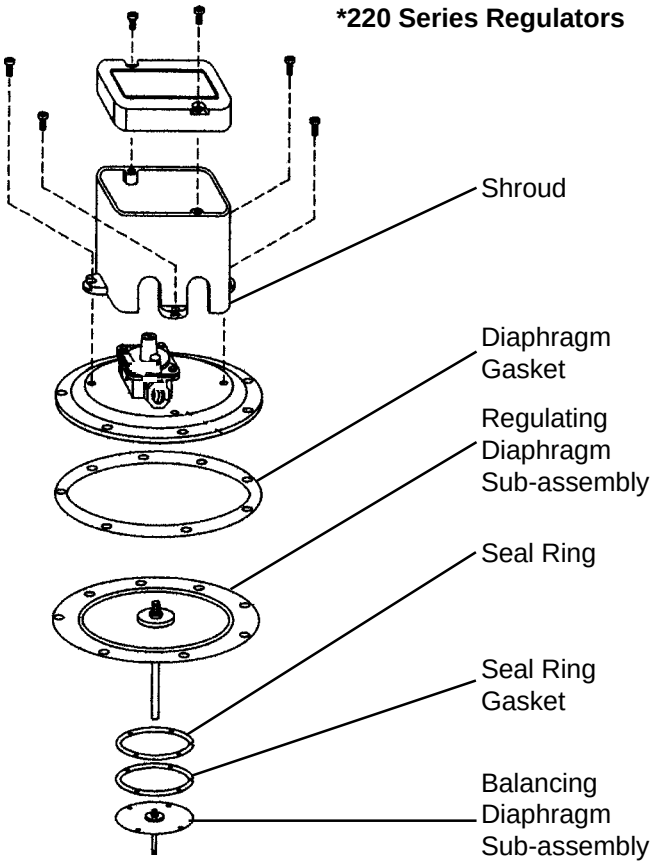
Parts and Service Bulletin for 210 & 220 Series Regulators

See Parts List for information on models manufactured prior to 1981.

***210 Series Regulators**

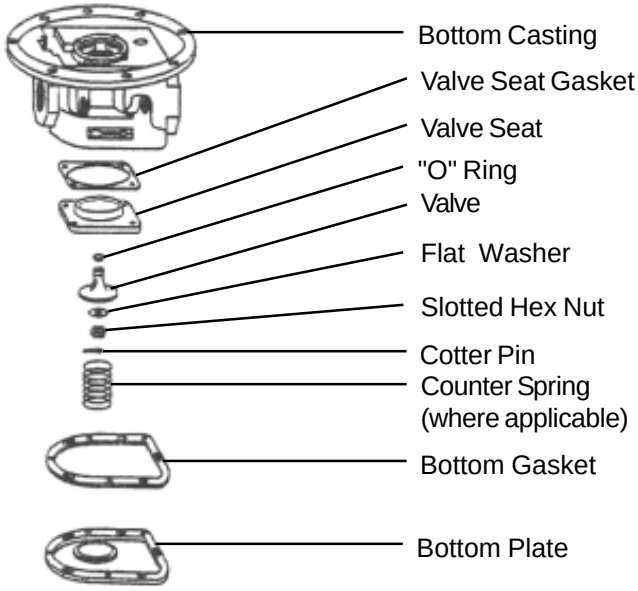


***220 Series Regulators**



Diagrams are for component identification only. Please follow printed instructions for disassembly/assembly procedures.

**Note: 210 and 220 Series Regulators share the same bottom casting design.*



CAUTION: Operation of combustion equipment can be hazardous resulting in bodily injury or equipment damage. Each burner should be supervised by a combustion safeguard and only qualified personnel should install, make system adjustments and perform any required service.

ORDAN THERMAL PRODUCTS LTD
Combustion Equipment & Controls for Industry
21 Amber St # 9, Markham Ontario Canada L3R 4Z3
Tel: (905) 475-9292 Fax: (905) 475-3286
www.ordanthermal.com

READ CAREFULLY BEFORE ATTEMPTING REPAIRS

WARNING - Only qualified personnel with knowledge of gas pressure regulator servicing should attempt repairs. Repairs made by untrained personnel could result in performance difficulties or in gas leaks.

IMPORTANT SAFETY PRECAUTIONS - After assembly and installation of regulator, check carefully for gas leaks with rich soap solution (or other accepted leak tester) around flanges, bottom plate, vent opening, pipe connections, seal cap, and other joints.

Absolutely no leakage should occur, otherwise there is a danger of fire or explosion depending on conditions.

Regulators must be installed and maintained in accordance with federal, state and local codes as these are enacted to ensure safe operation.

- When regulator is repaired while connected to gas, be sure the gas is turned off before disassembly.
- When regulator is connected to piping, be sure to install in the proper direction as indicated by the flow arrow on regulator.
- When regulator is reconnected to piping, do not apply wrench or vise pressure to any part of it except the first flat area surrounding the pipe tappings at the end being threaded to pipe. This will avoid fracture of body and possible leakage.
- Make sure regulator is properly vented.
- In case of any questions, contact Service Manager, Maxitrol Company, 248-356-1400.

INSTRUCTIONS FOR REPLACING REGULATING DIAPHRAGM SUB-ASSEMBLY:

PARTS LIST

Regulating Diaphragm Kits

KR210D3, E3, G3, or J3 for 210D, E, G, J.

KR210D3Z, E3Z, G3Z, J3Z for 210DZ, EZ, GZ, JZ.

KMR212D3, E3, G3 for 220D, E, G, J.

Kits consist of regulating diaphragm sub-assembly, valve fasteners, and gaskets.

1. Remove seal cap, adjusting screw and spring (210 only). Remove shroud covering top loading mechanism (220 only).
2. Remove top casting flange screws, top casting and diaphragm gasket.
3. Remove bottom plate, counter spring (where applicable), cotter pin, hex nut, washer, valve, and valve "O" ring. A screw driver slot is provided in bottom of stem to prevent assembly from rotating while nut is being removed.
   NOTE: *If manufactured prior to October 1980, the valve will be attached to the stem with a truarc retaining ring.*
4. Remove regulating diaphragm sub-assembly.
5. If internal parts are dirty or sticky, clean with a petroleum based solvent. Be careful not to get solvent on diaphragms or rubber parts. Use kerosene or alcohol on rubber parts, **do not soak**.
6. Insert regulating diaphragm sub-assembly so that diaphragm lays flat across flange of bottom casting with holes in line with screw holes in flange. Make sure that it is completely flat with no wrinkles or creases that might cause leakage. Be sure that bleed hole (220 only), which is centered between 2 of the screw holes, is positioned over bleed hole in bottom casting flange.
7. Replace valve "O" ring, valve, washer, hex nut, and cotter pin. Hex nut should be snug against washer. Do not use excessive torque. Use screwdriver slot to prevent rotation during reassembly. **Important - make sure that hole alignment of main diaphragm is maintained during replacement of valve so that rotation of diaphragm after replacement of valve is not necessary.**
8. Place new flange gasket over diaphragm and be sure that all holes, including the bleed hole (220 only), are aligned.
9. Place top casting on gasket with screw holes lined up. Be sure top is in same position as when it was removed.
10. Insert screw driver through adjusting stack (210 only) and push lightly on top diaphragm plate to full diaphragm travel. The outer edge of the diaphragm will be drawn inward so its holes will line up with screw holes in flanges. Be sure it is flat with no wrinkles or folds that might cause leakage.
11. Replace flange screws (being sure valve is down in full open position) and alternately tighten on opposite sides of regulator.
12. Using new gasket, replace counter spring (where applicable) and bottom plate.
13. Replace shroud (220 only).
14. Close manual firing valve downstream from 210 and 220 valve and open automatic valve(s). (If no firing valve is present, bring heater to high fire setting). Check reassembled connections for leaks with rich soap solution. **Absolutely no leakage should occur. Discontinue operation immediately if leakage is detected.**
15. Adjust outlet pressure of 210 or 220 valve to equipment manufacturer's specifications, if necessary.

Additional Parts & Kits for 210 & 220 Series Regulators

Parts List	210D	210E	210G	210J
Seal Cap w/Gasket	KR8112	KR9112	KR11112	KR13112
Adjusting Screw	R8111	R9111	R11111	R13111

Gasket Kits

KR210D-G, KR210E-G, KR210G-G, or KR210J-G for 210D, E, G, J and 220D, E, G, J.

Kits consist of seal cap gasket, regulating diaphragm gasket, balancing diaphragm gasket, bottom gasket, “O” ring, and valve fasteners.

Note: a gasket kit and regulating diaphragm kit (KR210_3) are required for models manufactured prior to 1981.

INSTRUCTIONS FOR REPLACING BALANCING DIAPHRAGM SUB-ASSEMBLY:

PARTS LIST

Balancing Diaphragm Sub-assembly Kits

KR210D4, E4, G4, J4 for 210D, E, G, J and 220D, E, G, J.

Kits consist of balancing diaphragm sub-assembly, valve fasteners, and gaskets.

Note: a balancing diaphragm and regulating diaphragm kit (KR210_3) are required for regulators manufactured prior to 1981.

1. Remove seal cap, adjusting screw and spring (210 only). Remove shroud covering top loading mechanism (220 only).
2. Remove top casting flange screws, top casting, and diaphragm gasket.
3. Remove bottom plate, counter spring (where applicable), cotter pin, hex nut, washer, valve, and valve "O" ring. A screw driver slot is provided in bottom of stem to prevent assembly from rotating while nut is being removed.
   NOTE: *If manufactured prior to October 1980, the valve will be attached to the stem with a truarc retaining ring.*
4. Remove regulating diaphragm sub-assembly.
5. If internal metal parts are dirty or sticky, clean with a suitable solvent. Be careful not to get solvent on diaphragm or rubber parts. Use kerosene or alcohol for rubber parts, **do not soak**.
6. Remove balancing diaphragm seal ring, gasket, and diaphragm sub-assembly.
7. Place new balancing diaphragm sub-assembly in position with screw holes lined up.
8. Using new balancing diaphragm seal ring gasket, replace seal ring. Be sure that all screw holes are properly aligned and that outer edges of diaphragm lays flat with no creases or wrinkles that might cause leakage.
9. Insert regulating diaphragm sub-assembly so that diaphragm lays flat across flange of bottom casting with holes in line with screw holes in flange. Be sure that bleed hole (220 only), which is centered between 2 of the screw holes, is positioned over bleed hole in bottom casting flange.
10. Replace valve "O" ring, valve, washer, hex nut, and cotter pin. Hex nut should be snug against washer. Do not use excessive torque. Use screwdriver slot to prevent rotation during reassembly. **Important - make sure that hole alignment of main diaphragm is maintained during replacement of valve so that rotation of diaphragm after replacement of valve is not necessary.**
11. Place new flange gasket over diaphragm and be sure that all holes, including the bleed hole (220 only), are aligned.
12. Place top housing on gasket with screw holes lined up. Be sure top is in same position as when it was removed.
13. Replace flange screws (being sure valve is down in full open position) and alternately tighten on opposite sides of the regulator.
14. Using new gasket, replace counter spring (where applicable), and bottom plate.
15. Replace shroud (220 only).
16. Close manual firing valve downstream from 210 and 220 valve and open automatic valve(s). (If no firing valve is present, bring heater to high fire setting). Check reassembled connections for leaks with rich soap solution. **Absolutely no leakage should occur. Discontinue operation immediately if leakage is detected.**
17. Adjust outlet pressure of 210 or 220 valve to equipment manufacturer's specifications, if necessary.

INSTRUCTIONS FOR REPLACING VALVE OR VALVE SEAT:

PARTS LIST

Valve Kits

KR210D03, E03, G03, J03 for 210D, E, G, J. *

KR210D03Z, E03Z, G03Z, J03Z for 210DZ, EZ, GZ, JZ, and 220D, E, G, J. **

Kit consists of valve, valve fasteners, and gaskets.

**** Note: a valve kit and regulating diaphragm kit (KR210_3) are required for models manufactured prior to 1981.***

***** Note: a valve kit and regulating diaphragm kit (KR210_3Z) are required for models manufactured prior to 1981.***

Valve Seat Kits

KR210D15, E15, G15, J15 for 210D, E, G, J. *

KMR212D15, E15, G15, J15 for 220D, E, G, J. **

Kit consists of valve seat, valve fasteners, and gaskets.

**** Note: a valve seat kit and regulating diaphragm kit (KR210_3) are required for models manufactured prior to 1981.***

***** Note: a valve seat kit and regulating diaphragm kit (KMR212_3) are required for models manufactured prior to 1981.***

1. Remove bottom plate, cotter pin, hex nut, washer, valve, and "O" ring. A screwdriver slot is provided in bottom stem to prevent assembly from rotating while nut is being removed.

   NOTE: *If manufactured prior to October 1980, the valve will be attached to the stem with a truarc retaining ring.*
2. If internal metal parts are dirty or sticky, clean with a suitable solvent. Be careful not to get solvent on diaphragm or rubber parts. Use kerosene or alcohol for rubber parts, **do not soak**.
3. Remove and replace seat. Use new gasket if applicable.
4. Replace "O" ring, valve (new valve if provided), washer, hex nut, and cotter pin. Hex nut should be snug against washer. Do not use excessive torque. Use screwdriver slot to prevent rotation during reassembly. **Important - make sure that hole alignment of main diaphragm is maintained during replacement of valve so that rotation of diaphragm after replacement of valve is not necessary.**
5. Using new gasket, replace bottom plate.
6. Close manual firing valve downstream from 210 or 220 valve and open automatic valve(s). (If no firing valve is present, bring heater to high fire setting). Check reassembled connections for leaks with rich soap solution. **Absolutely no leakage should occur. Discontinue operation immediately if leakage is detected.**
7. Adjust outlet pressure of regulator to equipment manufacturer's specifications, if necessary.

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Bulletin MP2034 Field Service Check List for 210 & 220 Series Regulators

Safety Notice:

Before attempting to service a regulator, be sure to carefully read Maxitrol's "Safety Warning" sheet. This check list is **not** intended to be comprehensive and if the problem persists, contact the Service Manager at Maxitrol Company. Phone: 248/356-1400.

Notes:

1. Before making tests listed below, make sure that the regulator is installed in the line properly and that pressure conditions and flow rates are within design limitations of the regulator.
2. The possible cause for any of the symptoms outlined could be misalignment or damage to any of the regulator parts due to excessively rough handling or faulty field servicing. To check on freedom of movements of the working parts, manually turn off gas upstream of regulator, remove bottom plate and work valve mechanism up and down with finger. The valve should work freely and without binding.
3. In the event the regulator is vented to the firebox or some other remote location be sure the connecting tube is free of dirt, ice or other obstructions.
4. In order to check outlet pressure, a certain minimum flow rate must be maintained through the regulator.

A. Symptom	B. Possible Cause	C. Field Test	D. Remedy
Outlet pressure too high.	1. Incorrect spring adjustment.	1. Remove seal cap.	1. Adjust spring to proper compression.
	2. Ruptured regulator diaphragm.	2. Apply soap solution to vent outlet. Bubbles indicate leaky diaphragm.	2. Install new regulating diaphragm assembly.
	3. Stretched spring.	3. Manually turn off gas. Remove seal cap and adjusting screw. If spacings between spring turns are not uniform.	3. Replace with new spring. In accordance with Maxitrol specifications.
	4. Damage to valve retaining clip.	4. Remove bottom plug or plate to determine if valve clip is intact and properly assembled.	4. Replace valve retaining clip.
	5. Gas is turned on upstream with solenoid/automatic control valve open.	5. Close solenoid/automatic control valve before opening manual valve upstream. Wait 30 seconds, then open solenoid/automatic control valve.	5. This is a temporary condition and will rectify itself in less than 30 seconds.
Outlet pressure too low.	6. Incorrect spring adjustment.	6. Remove seal cap.	6. Adjust spring to proper compression.
	7. Inlet pressure too low.	7. Measure inlet pressure with a water manometer or pressure gauge with gas flowing. Difference between measured inlet pressure and desired outlet pressure must be greater than pressure drop value appearing in Maxitrol capacity charts.	7. Replace with larger regulator, or increase inlet pressure if possible.
	8. Regulator impoperly installed.	8. See that arrow on bottom or side of regulator points in direction of gas flow.	8. Install regulator properly.
	9. Wrong spring.	9. Remove spring. Hold diaphragm down with screwdriver. Rise to correct outlet pressure indicates stronger spring is required.	9. Replace with correct spring in accordance with Maxitrol specifications.
	10. Inlet pressure too high.	10. Measure inlet pressure to regulator.	10. If inlet pressure exceeds the maximum inlet pressure recommended for the regulator, replace with regulator of proper size.
Regulator responds but action is slow or sluggish.	11. Obstruction in vent opening or vent line preventing free diaphragm movement.	11. Inspect vent opening or vent line for obstructions.	11. Clean and free of any obstructions.
Regulator, previously operating satisfactorily, will no longer control outlet pressure.	12. Change in inlet pressure conditions.	12. Check pressure as suggested in C-7 & 10.	12. Follow remedies in D-7 & 10.
	13. Loss of flexibility of regulating diaphragm such as caused by hard or gummy tarlike deposit due to chemical action of gas. (This condition virtually unknown where natural gas is fuel).	13. Remove top cover an inspect regulator diaphragm for flexibility.	13. Install new regulating diaphragm assembly.
Excessive pressure climb on pilot, or regulator will not lock up.	14. Gummy deposit on valve or seat.	14. Inspect valve and seat for gummy deposit.	14. Clean seat and valve with solvent such as kerosene or alcohol. **Do not soak.**
Outlet pressure changes after each ON-OFF cycle. General erratic behavior.	15. Exposures to excessive inlet pressure.	15. Remove top cover and inspect diaphragm plate. If the top diaphragm plate is bent, regulator has been exposed to excessive inlet pressure.	15. Install new diaphragm assembly.