

McDonnell & Miller

Installation & Maintenance Instructions MM-243(B)

Replacement Head Mechanism

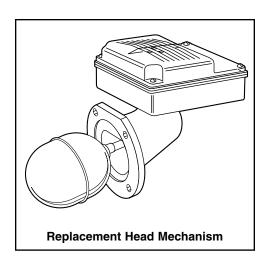






42S-HD (Snap Switch)

Replacement head mechanisms can be installed without disturbing existing equalizing connections or disassembly of components, making repairs simple and easy.



A WARNING



- Before using this product read and understand instructions.
- · Save these instructions for future reference.



• All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of plumbing, steam, and electrical equipment and/or systems in accordance with all applicable codes and ordinances.



 To prevent serious burns, the boiler must be cooled to 80°F (27°C) and the pressure must be 0 psi (0 bar) before servicing.





 This low water cut-off must be installed in series with all other limit and operating controls installed on the boiler. After installation, check for proper operation of all of the limit and operating controls, before leaving the site.



• To prevent serious personal injury from steam blow down, connect a drain pipe to the control opening to avoid exposure to steam discharge.



• To prevent a fire, do not use this low water cut-off to switch currents over 7.4A, 1/3 Hp at 120 VAC or 3.7A, 1/3 Hp at 240 VAC, unless a starter or relay is used in conjunction with it.

Failure to follow this warning could cause property damage, personal injury or death.

OPERATION

Maximum Pressure: 50 psi (3.5 kg/cm²)

Electrical Ratings

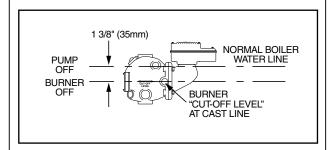
	Pump Circuit R		
Voltage	Full Load	Locked Rotor	Pilot Duty
120 VAC	7.4	44.4	345 VA at
240 VAC	3.7	22.2	120 or 240 VAC

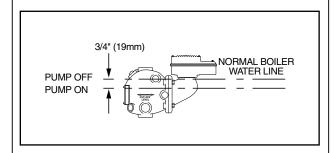
Motor Horsepower		
Voltage	Нр	
120 VAC	1/3	
240 VAC	1/3	

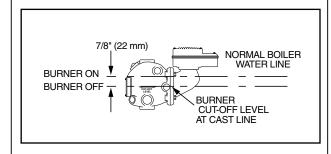
Settings and Differential Pressures

Series 42 and 42S

Pressure	Setting	Approximate Distance Above Cast Line In. (mm)	Differential In. (mm)
50 psi (3.5 kg/	Pump Off Pump On	1 ³ /8 (35) ⁵ /8 (16)	³ /4 (19)
cm ²)	Burner On Burner Off	⁷ / ₈ (22) 0 (0)	7/8 (22)







INSTALLATION –

TOOLS NEEDED:

One (1) pipe wrench, one (1) flathead screwdriver, one (1) scraper, and one (1) 9/16" socket or wrench.

STEP 1 - Preparation

A

WARNING

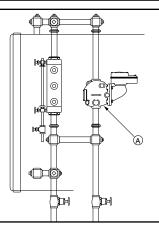


• To prevent serious burns, the boiler must be cooled to 80°F (27°C) and the pressure must be 0 psi (0 bar) before servicing.



• To prevent electrical shock, turn off the electrical power before disconnecting or making electrical connections. Failure to follow this warning could cause property damage, personal injury or death.

a. Drain water in the boiler to a level which is below the float chamber (A). Allow the boiler to cool to 80°F (27°C) and release the boiler pressure to 0 psi (0 bar).



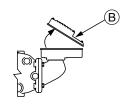
b. Using a flathead screwdriver, remove the junction box cover (B). Disconnect, mark, and remove the supply wires and conduit connections.



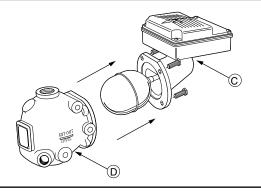
CAUTION



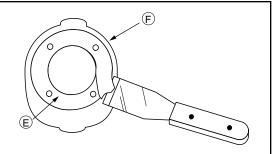
There may be more than one source of power to the boiler.



c. Remove the existing head mechanism (C) from the body (D).

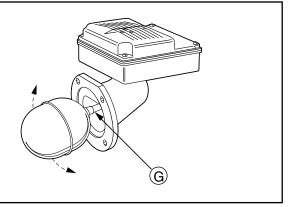


d. Using a scraper, remove the old gasket (E). Clean all debris from the float chamber. The gasket sealing surface (F) must be smooth and clean.

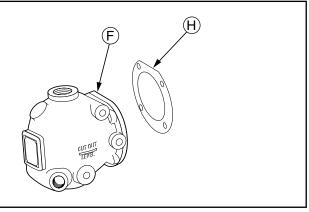


STEP 2 - Installing the Replacement Head Mechanism

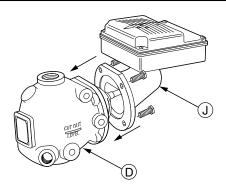
a. Carefully remove the new replacement head mechanism from the carton. Handle it carefully to prevent damage to the float rod (G).



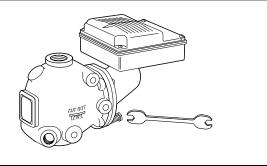
b. Align the bolt holes of the new head gasket (H) on the sealing surface (F) of the control body.



c. Install the new replacement head (J) on the body (D) by guiding the float into the control body and aligning the bolt holes.



d. Using a wrench, insert the four (4) bolts and tighten them to approximately 14-20 ft•lb (19-27 N•m) in an alternating star pattern.



STEP 3 - Electrical Wiring



WARNING



- To prevent electrical shock, turn off the electrical power before making electrical connections.
- This low water cut-off must be installed in series with all other limit and operating controls installed on the boiler. After installation, check for proper operation of all of the limit and operating controls, before leaving the site.



Failure to follow this warning could cause electrical shock, an explosion and/or a fire, which could result in property damage, personal injury or death.

Switch Operation

Boiler feed pump off, burner on.

Boiler feed pump on, burner on.

Boiler feed pump on, burner off.





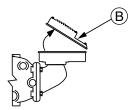








a. Using a flathead screwdriver, remove the junction box cover (B).

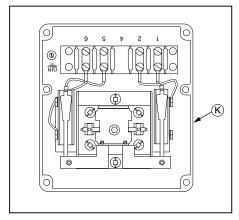


b. Following the appropriate wiring diagram, (refer to page 6) based on your application requirements, and using BX armored cable or Thinwall electrical metal tubing connector fittings, make electrical connections to the junction box (K).

Note: Follow local codes and standards when selecting the types of electrical fittings and conduit to connect to control.

IMPORTANT: There must be a minimum space of 1/2" (13mm) between connector fittings and electrical live metal parts.

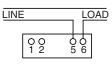
Snap Switches (Series 42S)



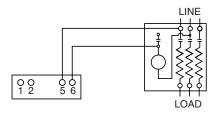
WIRING DIAGRAMS

Low Water Cut-Off Only

- 1. Main Line Switch For burner circuits within the switch's electrical rating.
- 2. Pilot Switch To holding coil of a starter when the burner circuit exceeds the switch's electrical rating.

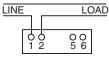


OR



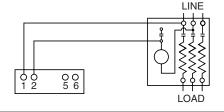
Pump Control Only

- 1. Main Line Switch For pump motors within the switch's electrical rating.
- 2. Pilot Switch To holding coil of a starter when the pump circuit exceeds the switch's electrical rating.



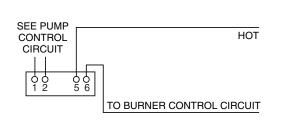
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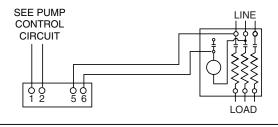
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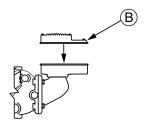
Combination Pump Control, Low Water Cut-Off and Alarm

- 1. Main Line Switch For burner circuits within the switch's electrical rating.
- 2. Pilot Switch To holding coil of a starter when the burner circuit exceeds the switch's electrical rating.





c. Re-attach the junction box cover (B).



STEP 4 - Testing

This control is factory calibrated for specific applications. The following testing procedure is only meant to serve as a verification of proper operating sequence. Dimensions provided are typical for a boiler not being fired and/or not at pressure. Actual operating ranges are shown on page 2 in the "Operation" section.

IMPORTANT: Follow the boiler manufacturer's start-up and operating instructions along with all applicable codes and ordinances.

a. Turn on the electric power to the boiler. With the boiler empty the pump should go on and the burner must remain off.

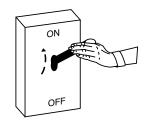


WARNING



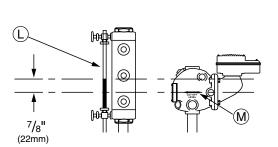
If the burner comes on, immediately turn the boiler off and make the necessary corrections.

Failure to follow this warning could cause an explosion or fire and result in property damage, personal injury or death.

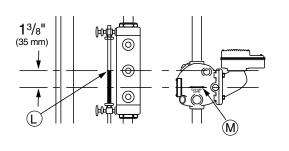


b. The boiler should begin to fill with water. Watch the gauge glass (L) until it reaches approximately %" (22mm) above the horizontal cast line (M) on the low water cut-off. When the water level reaches approximately %" (22mm) the burner should come on.

IMPORTANT: If water does not start filling the boiler, immediately turn off the the boiler and make the necessary corrections.



c. Continue watching the gauge glass (L) to see that the water continues to rise to approximately 13%" (35mm) above the horizontal cast line (M). The pump should shut off.





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d.

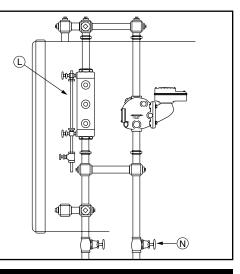
A CAUTION



To prevent serious personal injury from steam and hot water during blow down, connect piping to the discharge side of the blow down valve to avoid exposure to steam discharge.

Failure to follow this caution could cause personal injury.

When the water level is at its normal level and the burner is on, **slowly** open the blow down valve (N) until it is fully open. Watch the gauge glass (L) to see that the water level drops. Close the valve after verifying that the pump comes on and the burner shuts off. If this does not occur, immediately shut off the boiler and correct the problem and retest.



INSTALLATION COMPLETE

MAINTENANCE

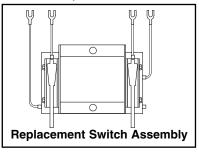
SCHEDULE:

- Blow down control as follows when boiler is in operation.
- Daily if operating pressure is above 15 psi.
- Weekly if operating pressure is below 15 psi.

NOTE

More frequent blow-down may be necessary due to unusual water or system conditions, including dirt and minerals and/or local codes.

- Disassemble and inspect low water cut-off/pump controller annually. Replace if it is worn, corroded, or if components no longer operate properly.
- Inspect the float chamber and equalizing piping annually. Remove all sediment and debris.
- Replace head mechanism every 5 years. More frequent replacement may be required when severe conditions exist such as rapid switch cycling, surging water levels, and use of water treatment chemicals.
- We recommend head mechanism replacement when the switch(es) no longer operate properly. If you choose to replace the switch(es), order the proper McDonnell & Miller replacement switch or switch assembly and follow the Repair Procedure provided.



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PROCEDURE:

A CAUTION



To prevent serious personal injury from steam and hot water during blow down, connect piping to the discharge side of the blow down valve to avoid exposure to steam discharge.

Failure to follow this caution could cause personal injury.

 Blow down the low water cut-off when the water level is at its normal level and the burner is on. Slowly open the blow down valve until it is fully open and observe the water level fall in the gauge glass. Close the valve after verifying that the pump contacts have closed and the burner shuts off. If this does not happen, immediately shut off the boiler and correct the problem.

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