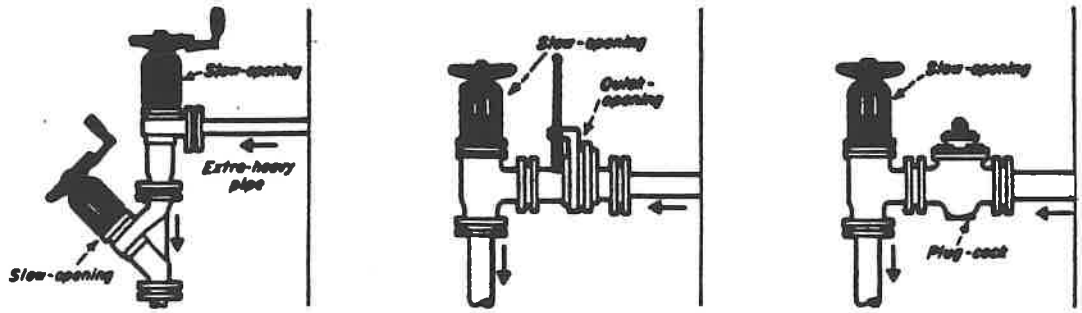
Lesson 7

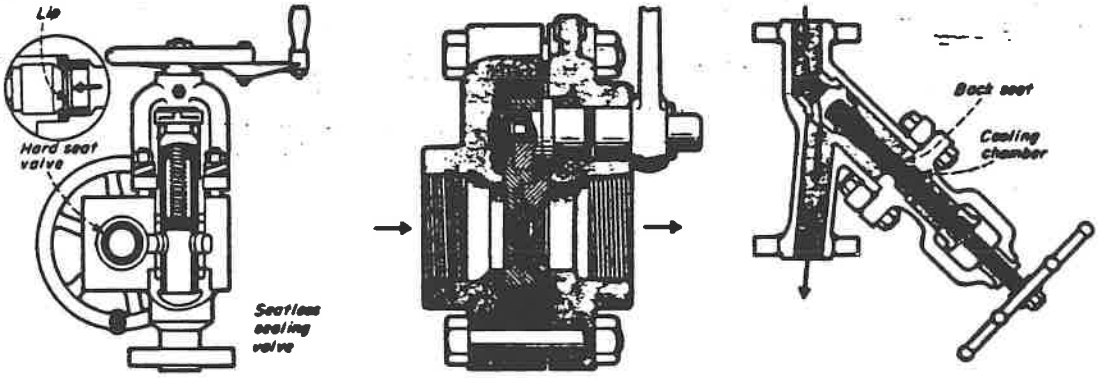
Handle Blowoff Valves

ASME CODE REQUIREMENTS



PARAGRAPH 368, *ASME Code for Power Boilers,* requires all boilers carrying over 100-psi working pressure, except traction or portable boilers, to have two blowoff valves on each blowoff pipe. These may be two slow-opening valves, or one slow-opening and one quick-opening valve, or one slow-opening valve and one plug cock. Traction and portable boilers must have one slow- or one quick-opening blowoff valve. On all types boilers, connect the blowoff valves with only extra-heavy pipe

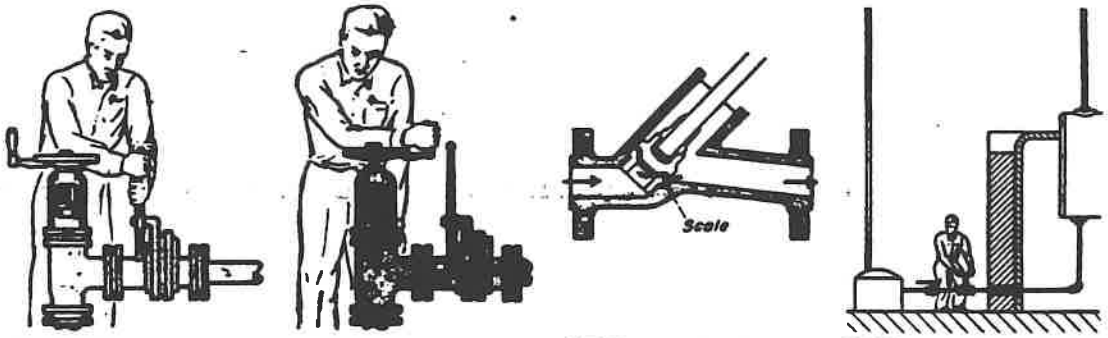
DETAILS AND OPERATION



COMBINATION seatless sealing valve in same steel block with hard-seat valve, 400-2500 psi. Lip protects seat from wire-drawing. Ported valve needs no seat

QUICK-OPENING valve, up to 600 psi. Spring holds disk to sealing surface of port. That keeps grit off sealing faces. Disk rotates in use, keeps joints tight

STRAIGHTWAY flow, good to 1800 psi. For back-seating to pack under pressure with valve open. Straight passage of sediment prevents scale clogging or eroding



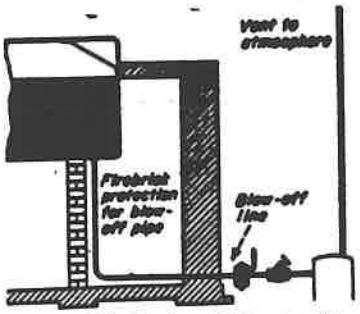
BE CAREFUL when blowing boiler. First open quick-opening valve slowly. Then open slow-opening valve slowly enough to prevent shock, but fast enough so seat won't wiredraw. To stop blowing, close slow-opening quickly, then fast-opening

NEVER jam valve if it won't close. Open few turns fast to clear, close again slow. Jamming on scale wire-draws

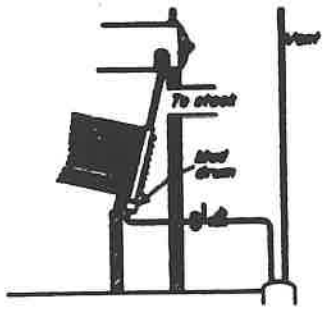
BLOW when boiler has banked fire or low loads — sediment settles more then. Watch glass, don't leave open valve

With Kid Gloves

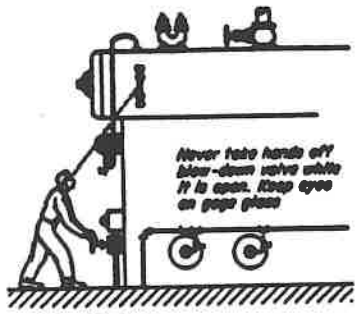
USES



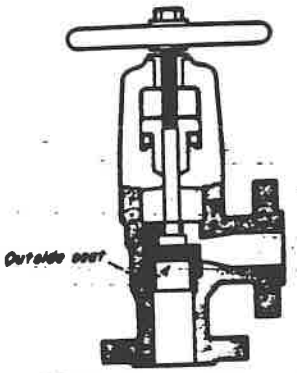
EMPTY cold boiler through blowdown line for cleaning, inspection or for repairs. Don't empty until water is fairly cool, or boiler seams and joints warp, leak



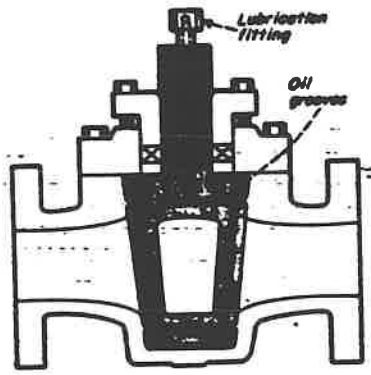
BLOW OUT mud, scale or sediment while boiler is steaming. Caution: Make sure blowdown valves are closed on idle units or scalding water will blow into them



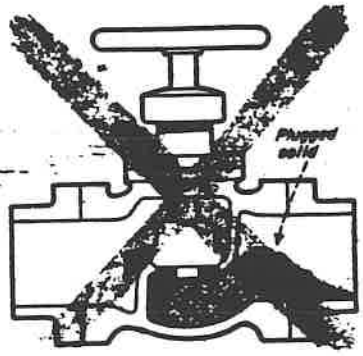
BEFORE CUTTING boiler in on line, give blowdown to reduce the alkalinity. This prevents carryover. Test the water and give blowdowns until water is just right



ANGLE blowoff valve, 200 psi. Seating surface is an outside of seat ring. That protects seat from cutting effect of the water, scale and sediment passing through



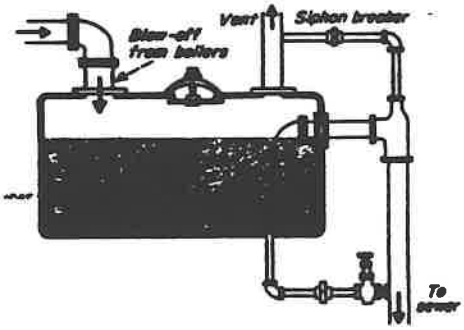
PLUGCOCK, 175 psi. Plug is pressure-lubricated through stem so tapered cock turns easily. Since valve opens, closes by turning, seating surfaces stay clean

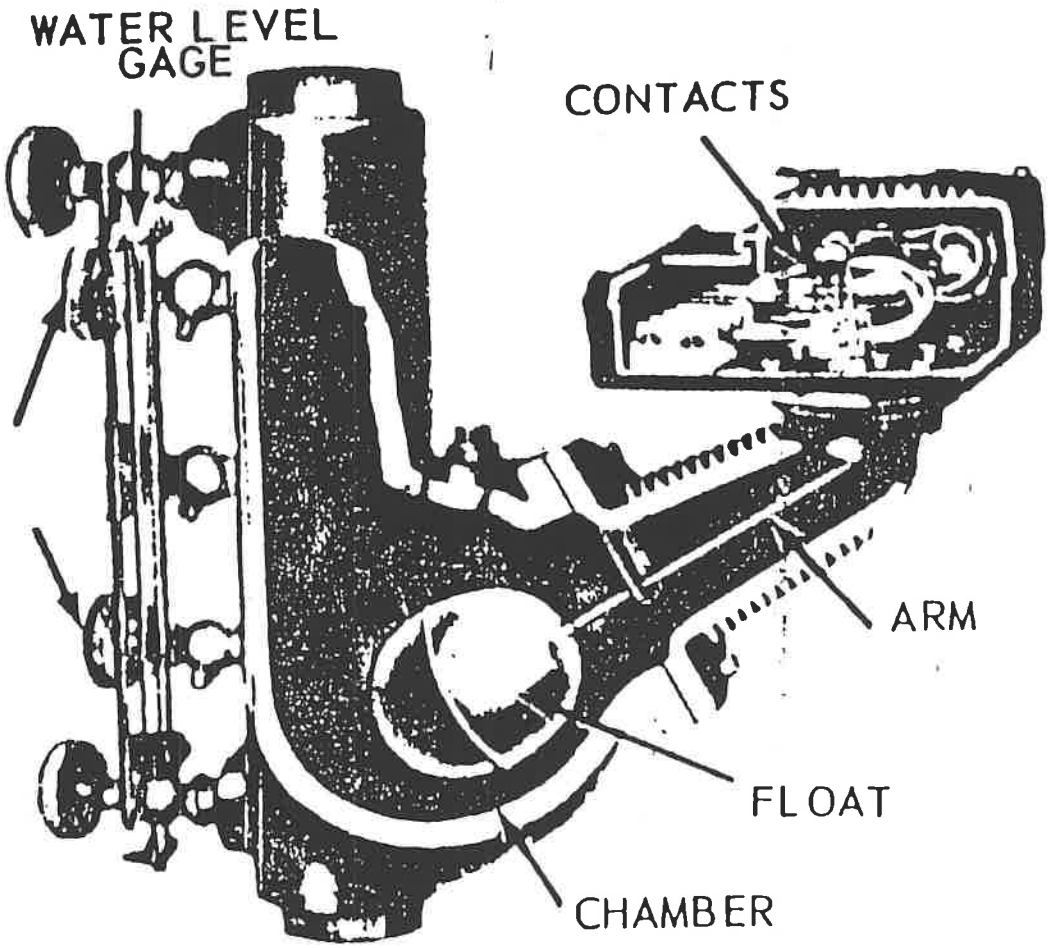


DON'T use globe valve on blowdown line. Pocket in valve clogs with mud, sediment and scale. Then boiler cannot be blown, valve can't be cleared under pressure

HERE ARE BLOWDOWN TANK DETAILS

...prevents damage. Blowing directly to sewer in-...ad to tank blows hot water and steam in other ...connections. This tank is always full of water. ...g water blows in, cooler water in bottom over-...flows as it's displaced. Large open vent pre-...sspressure. Small siphon breaker keeps tank ...emptying. Manhole is for internal inspections





54.123

.—Feed water control.

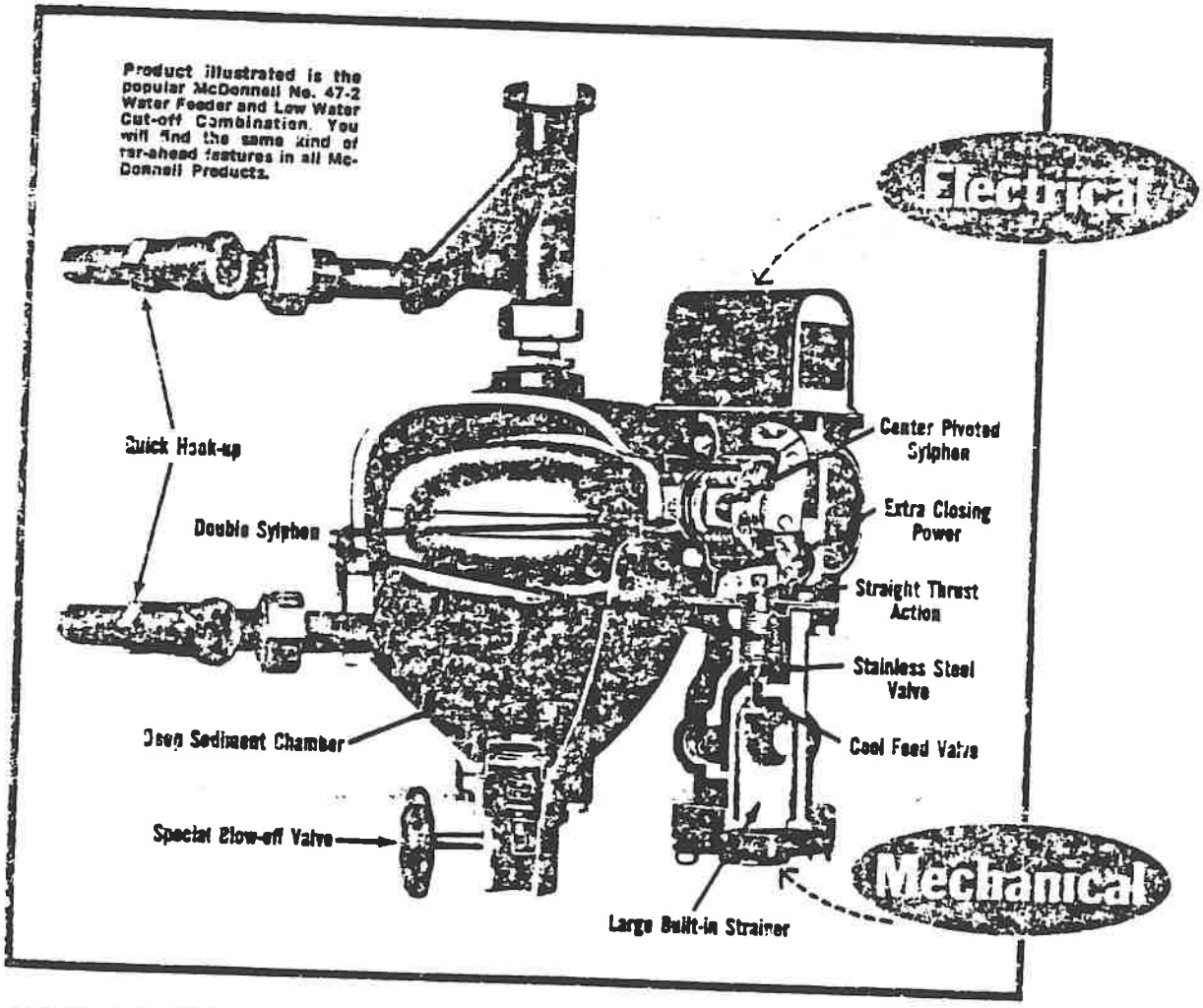
Your Best Recommendation — A McDonnell Feeder Cut-off Combination

Through the years, engineers, contractors and boiler owners have asked the question — "What is the best method of boiler water control for steam heating systems?" The answer has always been the same — a *mechanical* Boiler Water Feeder and an *electrical* Low Water Cut-off.

A *mechanical* Boiler Water Feeder will maintain sufficient water in the boiler to prevent it from being overheated — even though power failure might occur, a fuel regulating device might become inoperative, or a burner might be placed on manual operation. The *electrical* Low Water Cut-off is constantly standing by to stop the automatic burner in case a low water condition should occur.

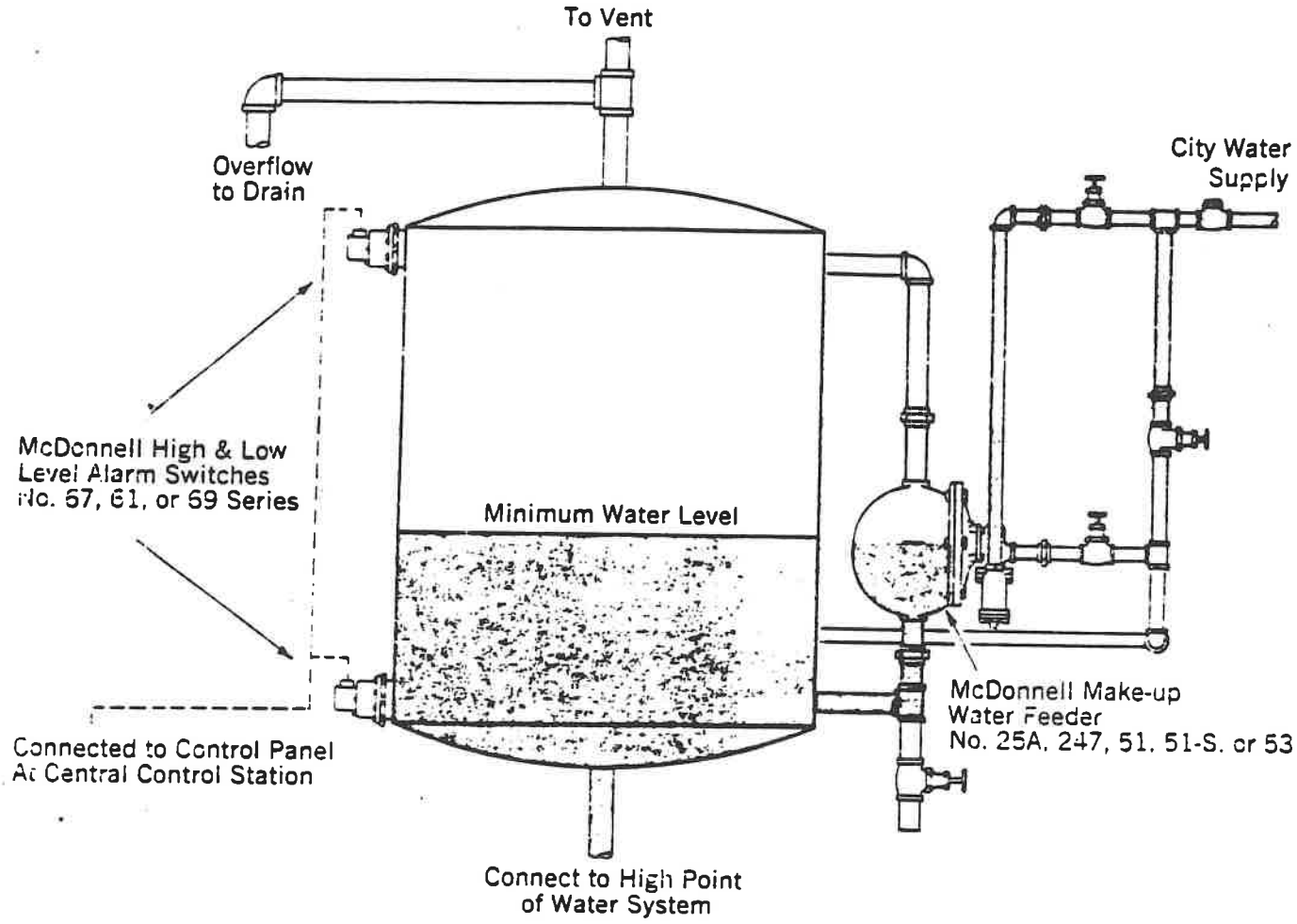
To provide AUTOMATIC OPERATION, a *mechanical* Boiler Water Feeder will maintain sufficient water in the boiler to allow it to operate under any normal conditions. This assures fully automatic heating, reduces the hazards of operator carelessness, and prevents the possibility of piping freeze-ups. Further, feeding water to the boiler only as it is needed, maintains the most efficient water level and steam space, reduces scale formation, and makes the boiler water level as automatic as the firing.

By specifying a Combination Boiler Water Feeder and Low Water Cut-off, the engineer is asking for the maximum advantage of automatic operation. By installing a Combination Boiler Water Feeder and Low Water Cut-off, the contractor is providing the boiler owner uninterrupted operation and economy.



A Feeder Cut-off Combination combines *mechanical* and *electrical* operation . . . provides completely automatic control of the boiler water level.

What about water line regulation in open expansion tanks?



In many of the larger heating systems, open expansion tanks are located above the highest point of each circulating zone to keep the system flooded, and to take care of the thermal expansion and contraction of the heated water.

Water line regulation in these tanks is essential. It is also desirable to include a high and low level alarm to indicate if maximum or minimum tank levels have been exceeded.

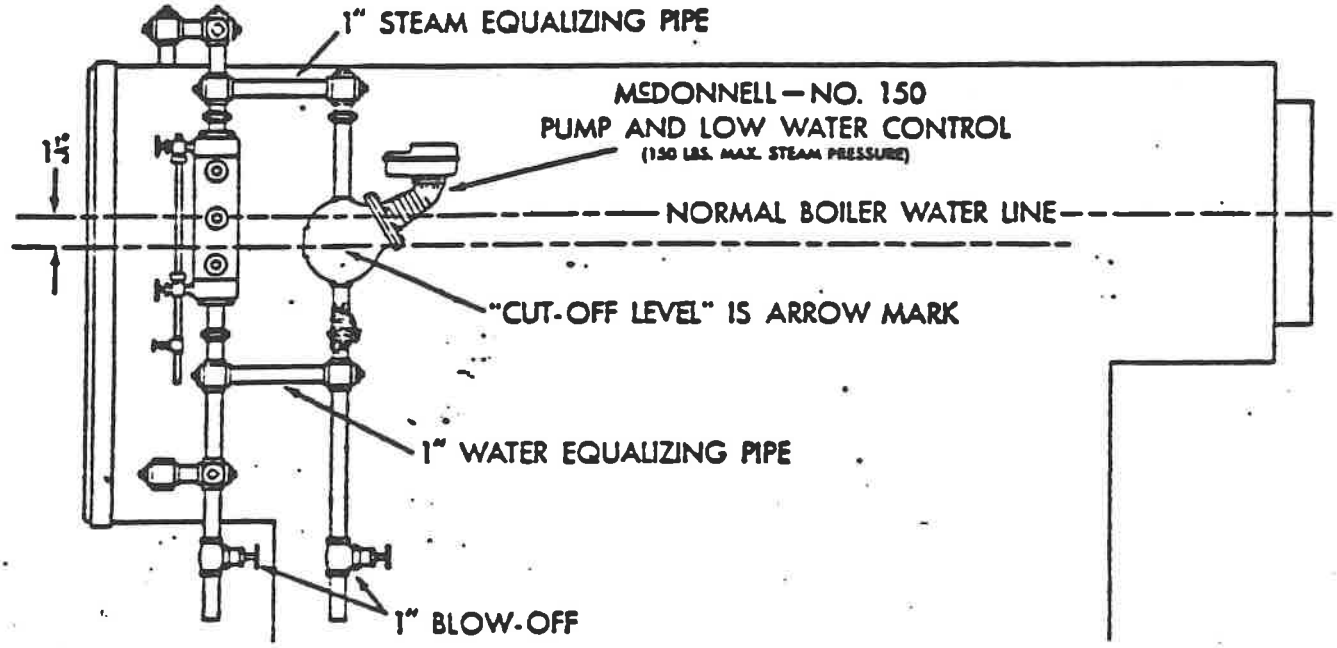
The desired minimum water level for any particular application in maintained by a float actuated McDonnell Water Feeder installed on the expansion tank. Selection of the feeder would depend upon the available make-up supply pressures, and the water feeding rate required.

A float actuated McDonnell Cut-off, installed at the high and low levels of the tank, and connected to the central control panel, will signal the plant operator if either of these limits has been exceeded.

BULLETIN No. I-150G
REVISION 1

How to install the McDONNELL No. 150

Low Water Cut-off—Pump Control—Low Water Alarm —for steam pressures up to 150 lbs.

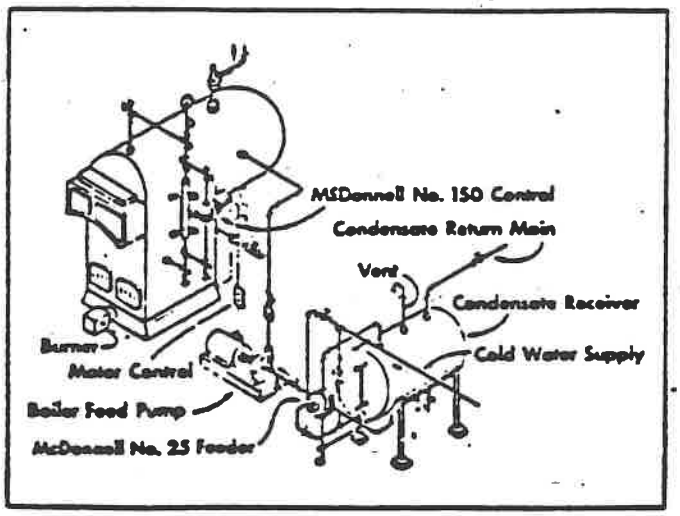


When used as a low water cut-off

Arrow mark on body casting of No. 150 is burner cut-off level. Install control so arrow mark will be 1½" to 2" below normal boiler water level, but never lower than ¾" of water in gauge glass. "On" level is ¾" above "off" level. See diagram above for installation and separate sheet for wiring diagram.

When used as pump control

Pump "cut-off" level is 1½" above arrow mark on body of No. 150 (factory setting). Install control so arrow mark will be 1½" below normal water level of boiler. Pump "on" level (factory setting) is ¾" below "off" level. See diagram above and separate sheet covering wiring.



McDonnell No. 150 controlling electric pump and providing low water cut-off.

Typical pump-control hook-up is shown at left. Complete facts and installation instructions will be gladly furnished covering the McDonnell No. 25 Feeder for maintaining the proper level in the receiving tank as shown in this diagram.

Terminals are provided in the No. 150 for the installation of a low water alarm as covered on reverse side of this sheet.

TEST THE No. 150 BEFORE TURNING IT OVER TO OWNER

This can be easily done by opening the blow-off valve, causing the water line to drop in the float chamber. As the float drops the pump circuit (if used) will close first; then, on a further drop, the cut-off circuit will open and the alarm circuit will be closed.

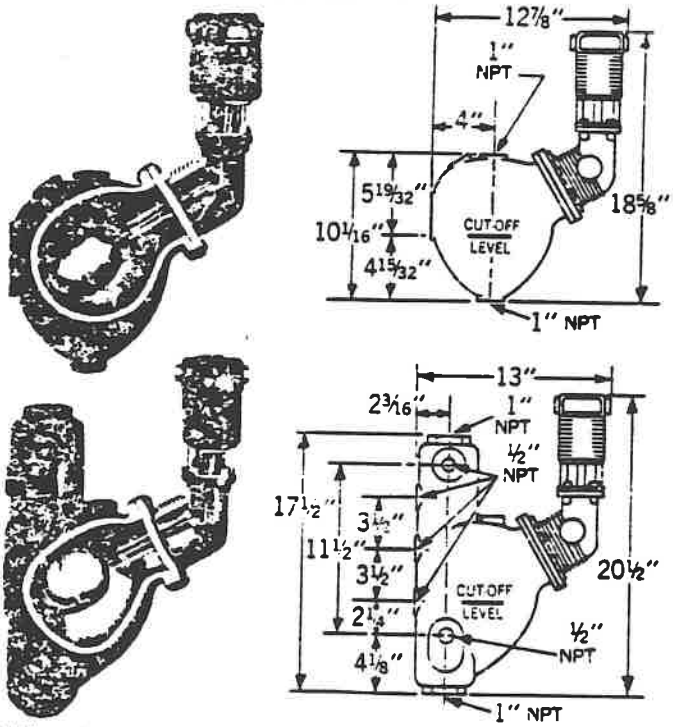
IMPORTANT — Impress the boiler attendant with the fact that the No. 150 should be blown down at least once each day when boiler is in operation.

McDONNELL & MILLER
FLUID HANDLING DIVISION

For Wiring Instructions see other side →

Pump Controllers and High Pressure Low Water Cut-offs

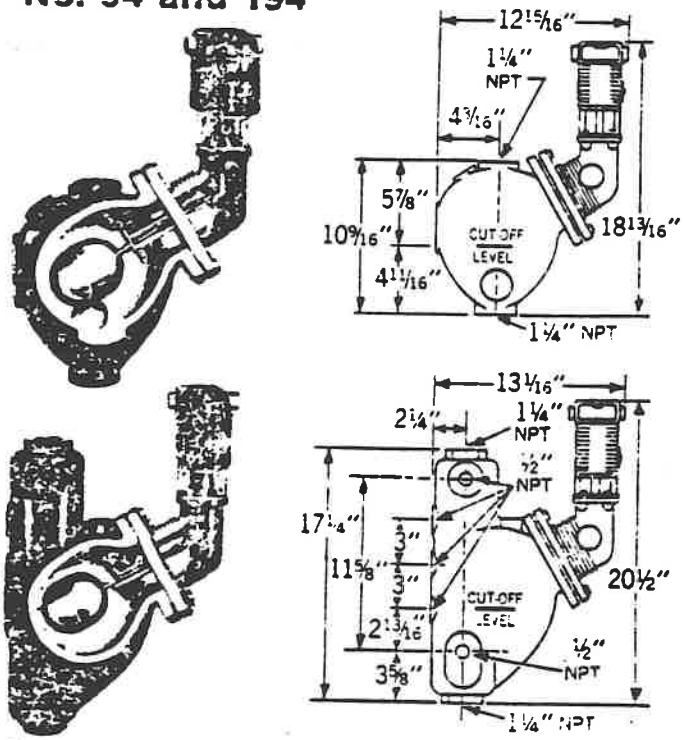
No. 93 and No. 193A



Utilizes the principle of repulsion magnetic operation for positive opening and closing. Permits wider adjustment of operating levels between pump switch and cut-off switch. No. 93 is for boilers with separate water columns. No. 193A has water column type body with integral tappings for gauge glass tricocks. For manual reset of cut-off switch order No. 93-M and No. 193A-M. (Electrical ratings on page 10.)

For boilers of any size.
Maximum boiler pressure, 150 psi.

No. 94 and 194

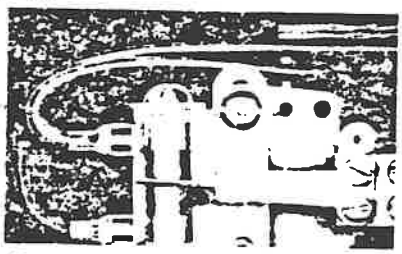


Magnetic switching controls for high pressure boilers, up to 250 psi. Permit wide adjustment of operating levels. No. 94 is for boilers with separate water columns. No. 194 has water column type body with integral tappings for gauge glass and tricocks. For manual reset of cut-off switch order No. 94-M and No. 194-M. (Electrical ratings on page 10.)

For boilers of any size.
Maximum boiler pressure, 250 psi.

Electric Proportioning Controls

These controls are used where it is desirable to modulate the supply of feed water into a boiler in proportion to the boiler load. Proportioning action is obtained by use of a potentiometer slide wire, which follows the water level through a float mechanism and controls a proportioning type electric valve in the feed water supply line. Valve operates so amount of make-up water flowing through the valve is in proportion to boiler demand at that particular time; valve automatically closes when no make-up water is needed. Controls also include a cut-off switch to stop burner if water supply fails.



Potentiometer Slide Wire 93-7B Series and 94-7B Series Controls

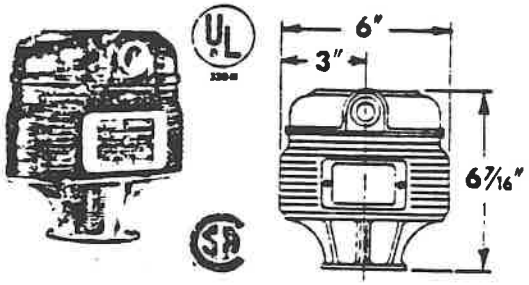
Potentiometer Slide Wire 135 ohms 24 VAC

No. 93-7B and No. 94-7B—For boilers with separate water columns. Basic construction and dimensions like No. 93 and No. 94.

No. 193A-7B and No. 194-7B—Has water column type body with all tappings for steam trim. Basic construction and dimensions like No. 193A and No. 194.

Maximum boiler pressure: No. 93-7B and No. 193A-7B, 150 psi.
No. 94-7B and No. 194-7B, 250 psi.

No. 5, No. 6 and No. 7B
Switch Assemblies

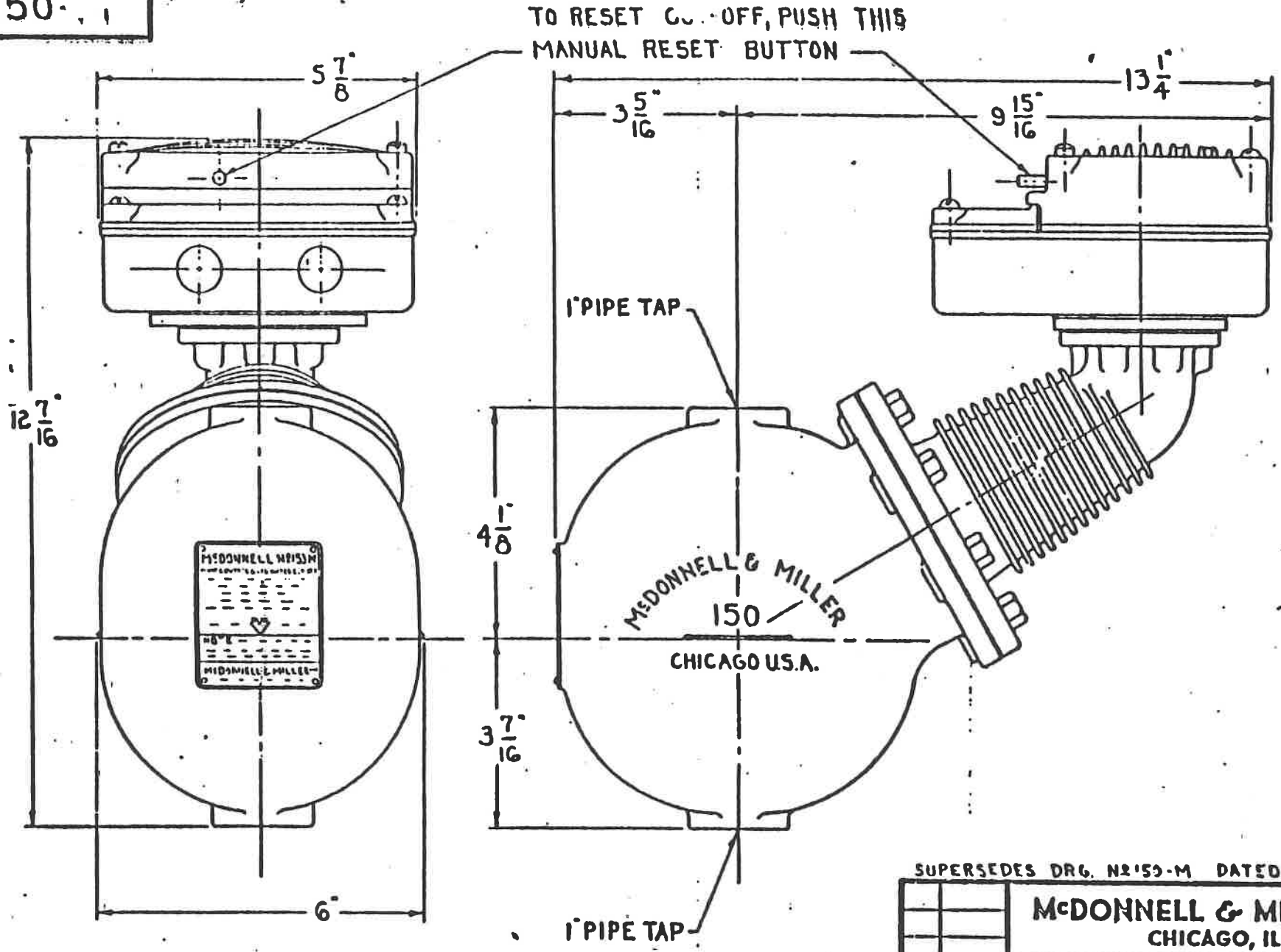


These are repulsion magnetic switches as used on McDonnell 93 and 94 Series Pump Controllers. Switch assemblies are interchangeable.

No. 5 has two switches, operating at two different levels; No. 6 has one switch. All switches are single pole, double throw type. Manual reset available; order No. 5-M or No. 6-M. (Electrical ratings on page 10.)

No. 7B Switch is used with Proportioning Controllers and has one switch for low water cut-off; write factory for data.

150-M



NOTE:

Nº 150-M IS THE SAME AS Nº 150 EXCEPT FOR THE MANUAL RESET FEATURE ON THE CUT-OFF TUBE, PUMP TUBE IS FULLY AUTOMATIC

SUPERSEDES DRG. Nº 150-M DATED 8-7-40

McDONNELL & MILLER Inc.
CHICAGO, ILL.

Nº 150-M PUMP & LOW WATER CUT-OFF

MAT'L

No. REQ'D | SCALE 3/8" = 1" | DATE 6-1-50

DR. BY | APPR. BY

DATE OF ISSUE

No. | DATE

Nº 150-M

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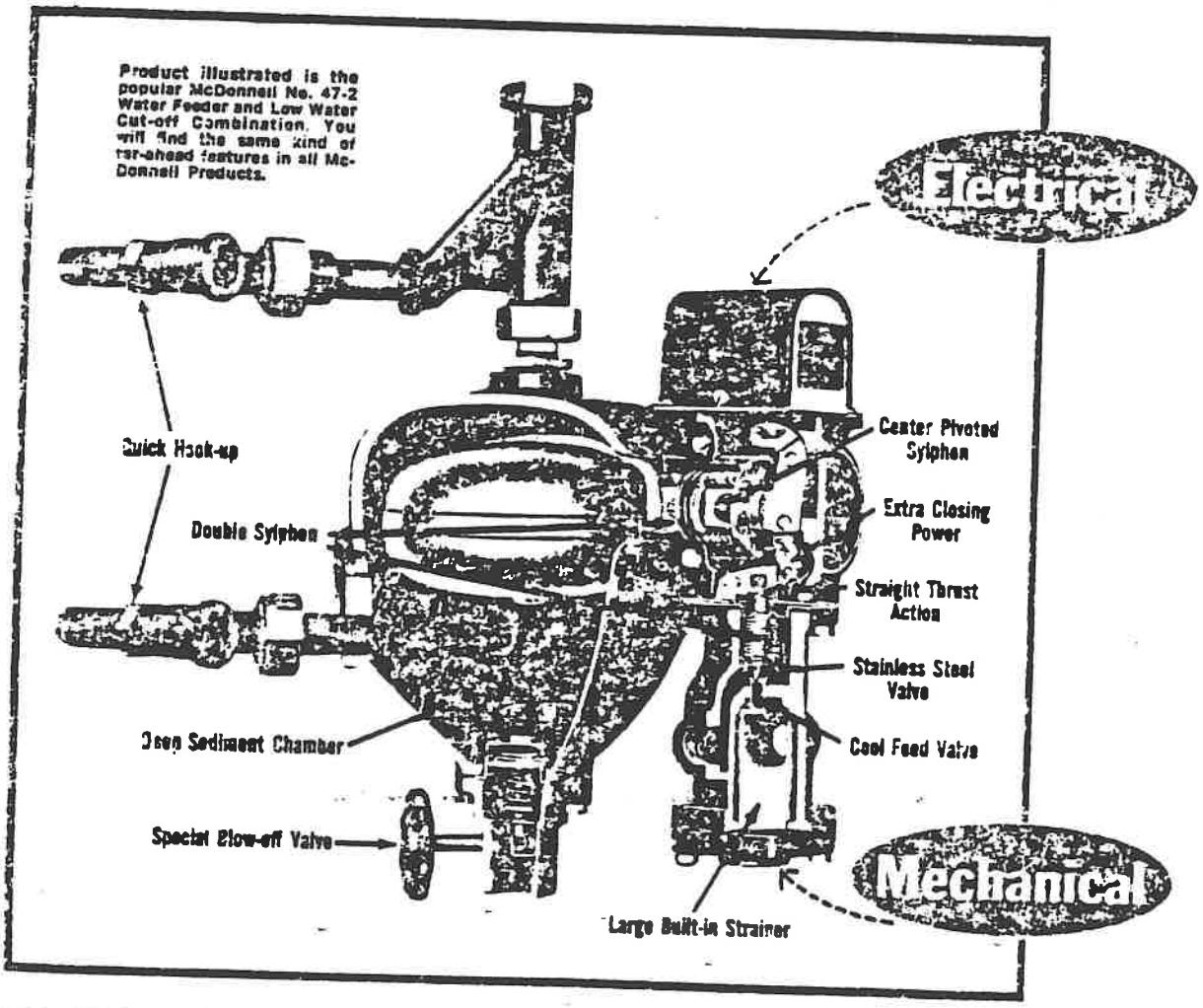

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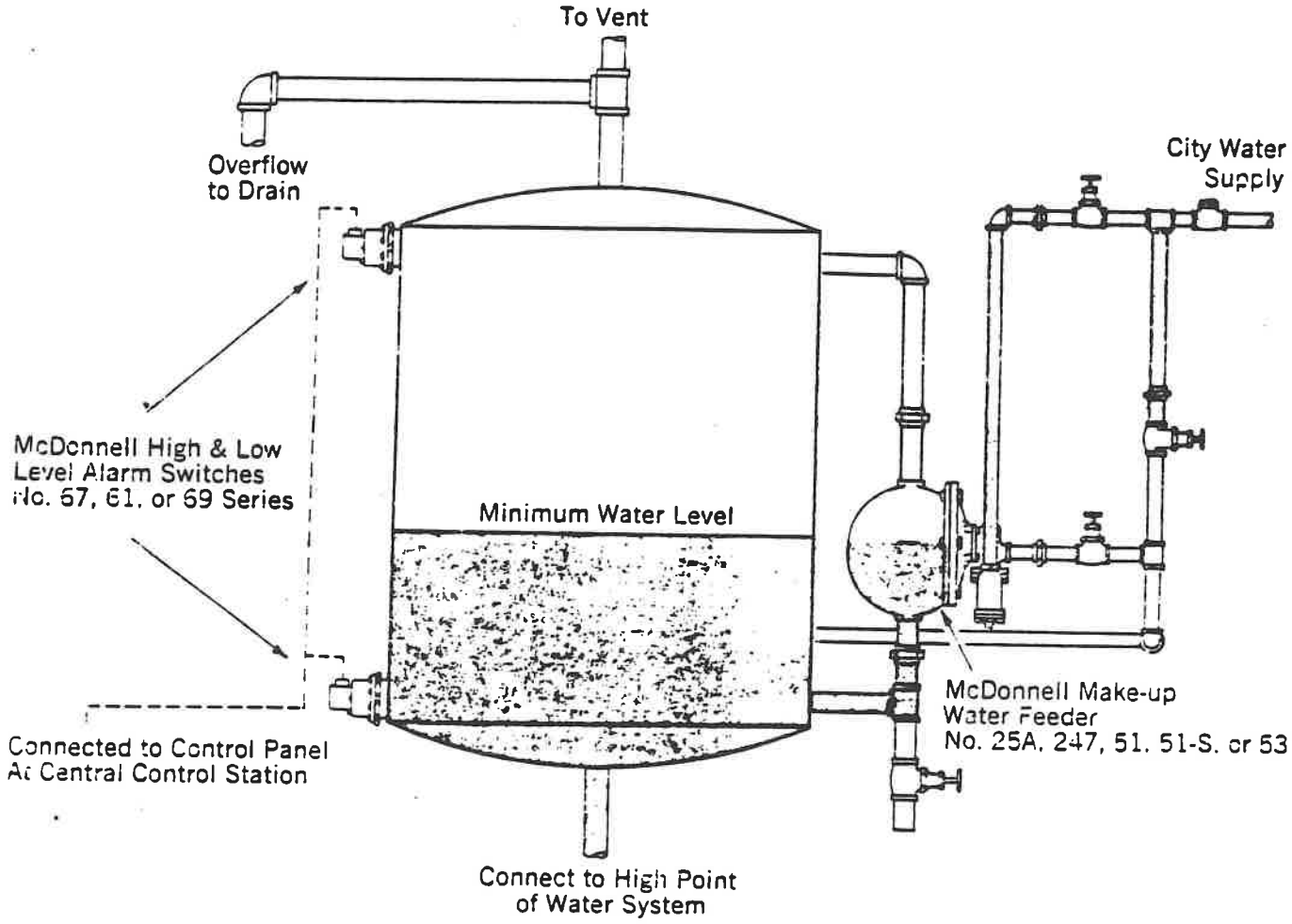

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Water line regulation in these tanks is essential. It is also desirable to include a high and low level alarm to indicate if maximum or minimum tank levels have been exceeded.

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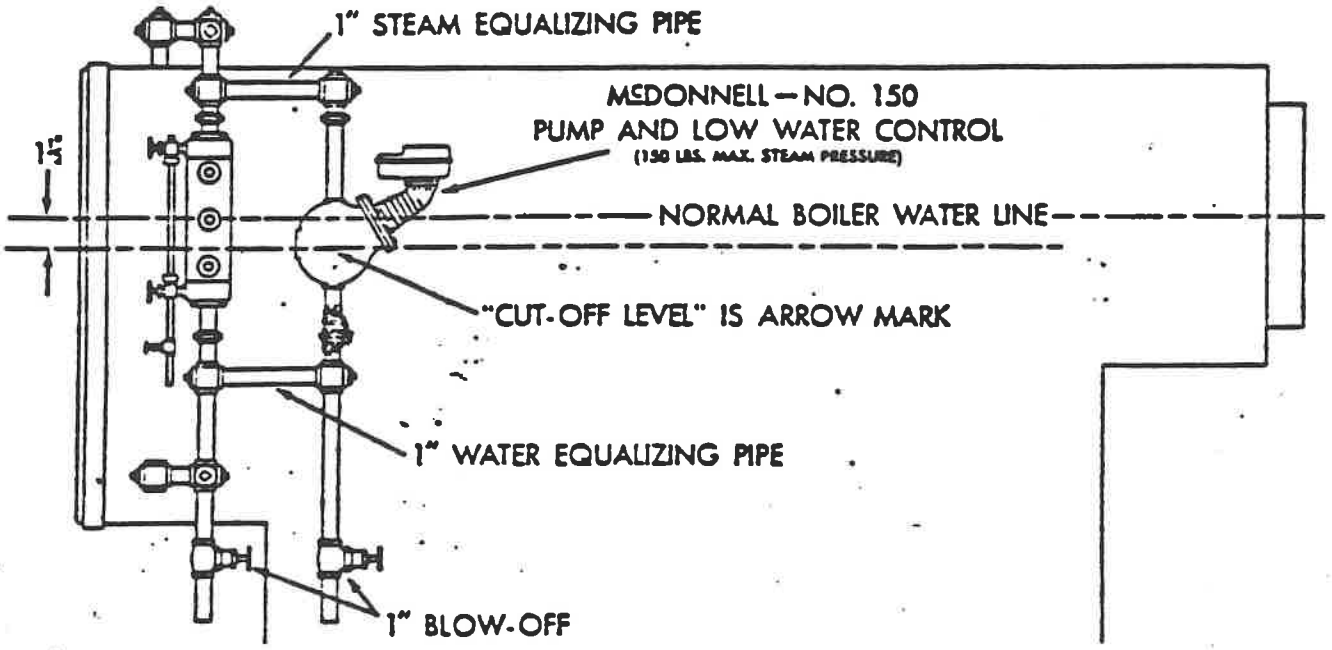

When used as a low water cut-off

Arrow mark on body casting of No. 150 is burner cut-off level. Install control so arrow mark will be 1½" to 2" below normal boiler water level, but never lower than ¾" of water in gauge glass. "On" level is ¾" above "off" level. See diagram above for installation and separate sheet for wiring diagram.

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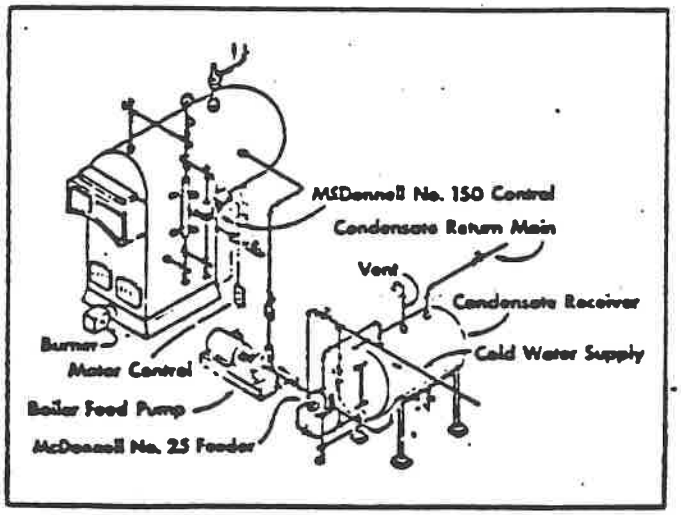

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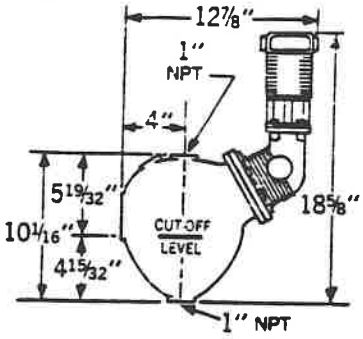
IMPORTANT — Impress the boiler attendant with the fact that the No. 150 should be blown down at least once each day when boiler is in operation.

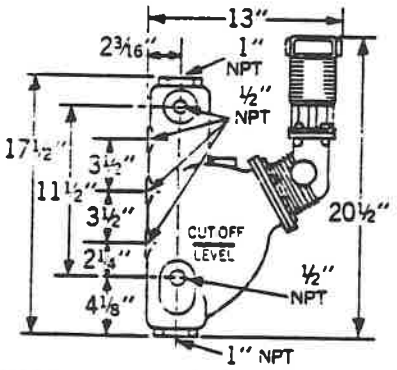
McDONNELL & MILLER ITT
FLUID HANDLING DIVISION

For Wiring Instructions see other side →

Pump Controllers and High Pressure Low Water Cut-offs

No. 93 and No. 193A

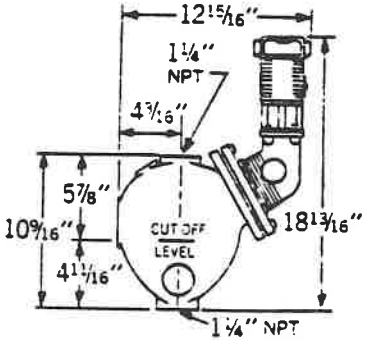


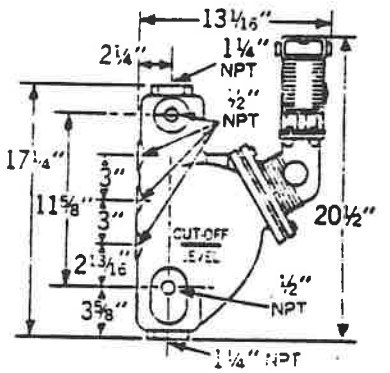


Utilizes the principle of repulsion magnetic operation for positive opening and closing. Permits wider adjustment of operating levels between pump switch and cut-off switch. No. 93 is for boilers with separate water columns. No. 193A has water column type body with integral tappings for gauge glass tricocks. For manual reset of cut-off switch order No. 93-M and No. 193A-M. (Electrical ratings on page 10.)

For boilers of any size.
Maximum boiler pressure, 150 psi.

No. 94 and 194





Magnetic switching controls for high pressure boilers, up to 250 psi. Permit wide adjustment of operating levels. No. 94 is for boilers with separate water columns. No. 194 has water column type body with integral tappings for gauge glass and tricocks. For manual reset of cut-off switch order No. 94-M and No. 194-M. (Electrical ratings on page 10.)

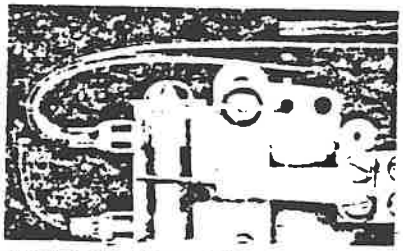
For boilers of any size.
Maximum boiler pressure, 250 psi.

Electric Proportioning Controls

These controls are used where it is desirable to modulate the supply of feed water into a boiler in proportion to the boiler load. Proportioning action is obtained by use of a potentiometer slide wire, which follows the water level through a float mechanism and controls a proportioning type electric valve in the feed water supply line. Valve operates so amount of make-up water flowing through the valve is in proportion to boiler demand at that particular time; valve automatically closes when no make-up water is needed. Controls also include a cut-off switch to stop burner if water supply fails.

Potentiometer Slide Wire 93-7B Series and 94-7B Series Controls

Potentiometer Slide Wire 135 ohms 24 VAC

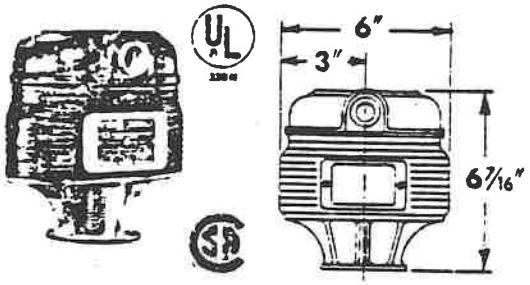


No. 93-7B and No. 94-7B—For boilers with separate water columns. Basic construction and dimensions like No. 93 and No. 94.

No. 193A-7B and No. 194-7B—Has water column type body with all tappings for steam trim. Basic construction and dimensions like No. 193A and No. 194.

Maximum boiler pressure: No. 93-7B and No. 193A-7B, 150 psi.
No. 94-7B and No. 194-7B, 250 psi.

No. 5, No. 6 and No. 7B
Switch Assemblies

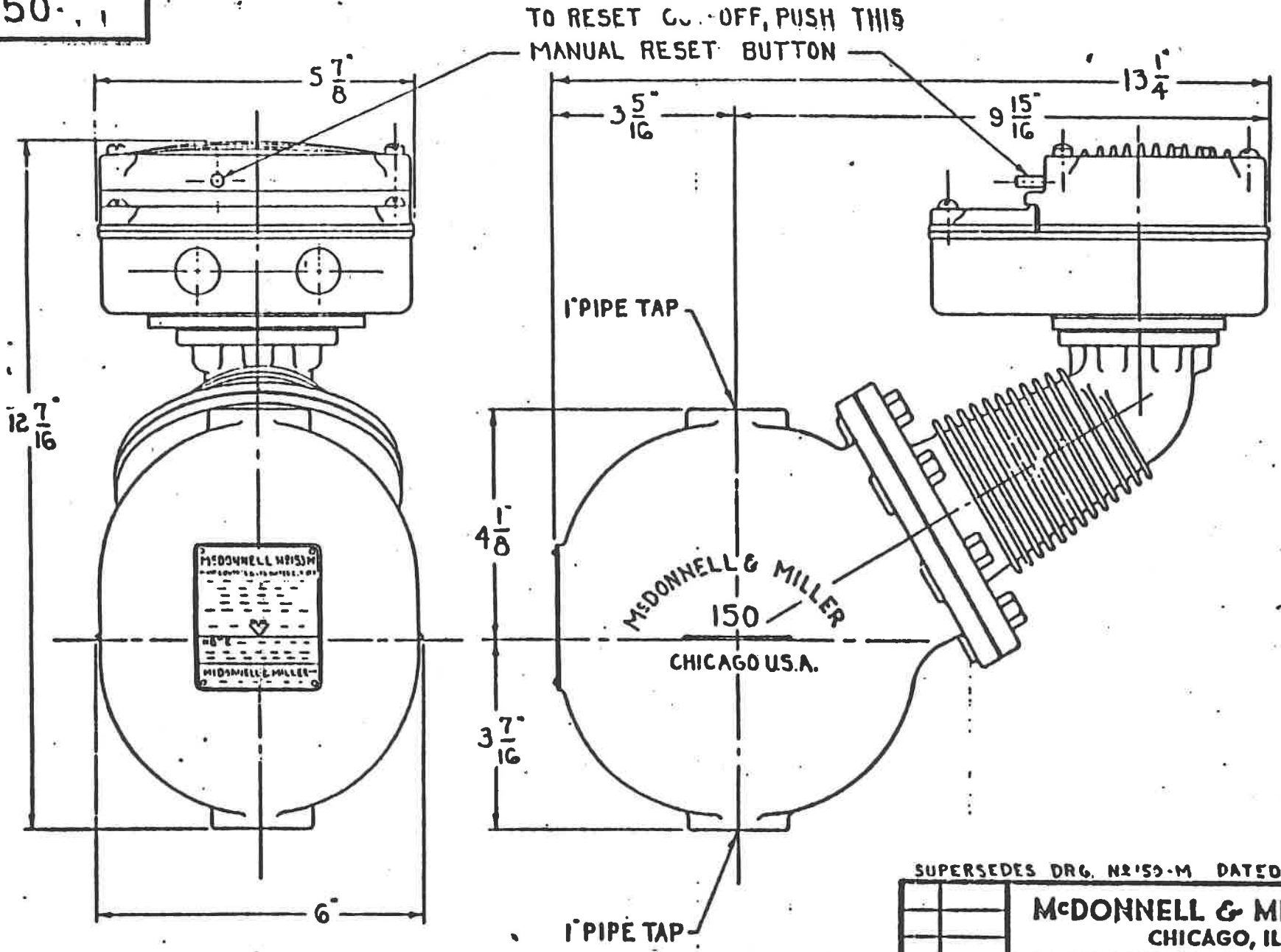


These are repulsion magnetic switches as used on McDonnell 93 and 94 Series Pump Controllers. Switch assemblies are interchangeable.

No. 5 has two switches, operating at two different levels; No. 6 has one switch. All switches are single pole, double throw type. Manual reset available; order No. 5-M or No. 6-M. (Electrical ratings on page 10.)

No. 7B Switch is used with Proportioning Controllers and has one switch for low water cut-off; write factory for data.

150-M



NOTE:

№ 150-M IS THE SAME AS № 150 EXCEPT FOR THE MANUAL RESET FEATURE ON THE CUT-OFF TUBE, PUMP TUBE IS FULLY AUTOMATIC

SUPERSEDES DRG. № 150-M DATED 8-7-40

McDONNELL & MILLER Inc.
CHICAGO, ILL.

№ 150-M PUMP & LOW WATER CUT-OFF

MAT'L

No. REQ'D | SCALE 3/8" = 1" | DATE 6-1-50

DR. BY | APPR. BY | № 150-M

DATE OF ISSUE | No. | DATE