# INSTALLATION & OPERATIONS MANUAL

## FEEDWATER SYSTEMS

MCKENNABOILER

ESTABLISHED IN 1921

# SAFETY WARNINGS AND PRECAUTIONS

This manual is provided as a guide to the correct operation and maintenance of your McKenna Feedwater System and should be permanently available to the staff responsible for the operation of the feedwater system.

These instructions must not be considered as a complete code of practice, nor should they replace existing codes.

## NOTE

The installation of the McKenna Feedwater System should be carried out by competent personnel in accordance with all relevant safety regulations.

Prior to shipment the following tests are made to assure the customer the highest standards of manufacturing:

A) Material Inspections

B) Manufacturing Process Inspections

C) Welding Inspections

D) Hydrostatic Test Inspection

E) Electrical Components Inspection

F) Operating Test

G) Final Engineering Inspection

# FOR YOUR SAFETY

The following WARNINGS, CAUTIONS, and NOTES appear in various sections of this manual. They are repeated on these safety summary pages as an example and for emphasis.

**WARNINGS** must be observed to prevent serious injury, or death to personnel.

**CAUTIONS** must be observed to prevent damage or destruction of equipment or loss of operating effectiveness.

**NOTES** must be observed for essential and effective operating procedures, conditions, and as a statement to be highlighted.

It is the responsibility and duty of all personnel involved in the operation and maintenance of this equipment to fully understand the WARNINGS, CAUTIONS, and NOTES by which hazards are to be eliminated or reduced. Personnel must become familiar with all aspects of safety and equipment prior to operation or maintenance of the equipment.

# INSTALLATION AND OPERATION

## INSTALLATION LOCATION

The Feedwater and Condensate Return System should be located to permit access to operating controls, instruments and inspection openings.

The foundation should be level and designed to support the load. Calculations should be based upon the maximum or filled weight of the system.

## RIGGING

Qualified riggers should be used to place the system on the foundation. All rigging equipment must be carefully placed to avoid damaging or loosening piping, nozzles and other parts of the assembly. The system shoud be securely bolted to the foundation.

## PIPING

(Figures 1 and 2)

1. Prior to piping, all foreign material or debris must be removed to prevent possible malfunctions. Clean tank by flushing with hose.

2. Avoid imposing any piping strain on the pump(s). Provide expansion joints and independently supported pipe hangers where necessary.

3. Isolating valves are installed to allow for cleaning or repairs.

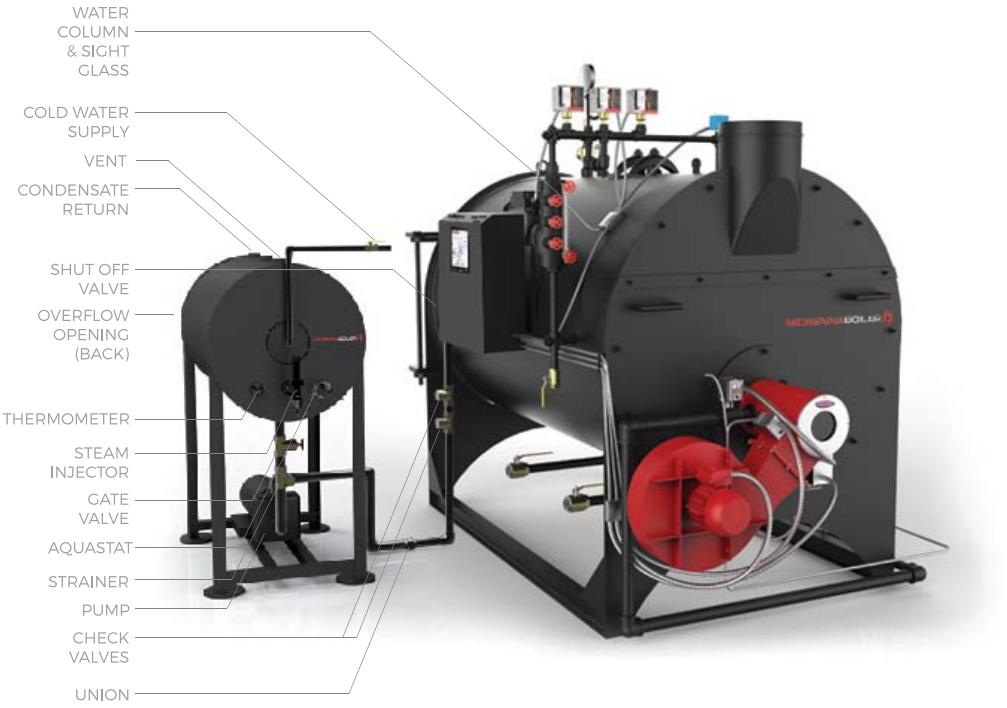
4. Make-up water and pump discharge piping must be sized in accordance with any applicable local or state codes. Sizing should be determined by flows, pressures, and distances, not pump size.

5. Install a stop valve and two check valves in the pump discharge line.

6. Vent piping should be vertical, full size, free of valves, bends or restrictions and piped to a safe location.

7. Over flow piping should be full size, free of obstructions and piped to a safe location.

FIGURE 1




*SUPPLIED WITH OPTIONAL PREHEAT KIT ASSEMBLY

FIGURE 2

# INSTALLATION AND OPERATION

## WATER GAUGE & GAUGE GLASS INSTALLATION INSTRUCTIONS

NOTE

Only properly trained personnel should install and maintain water gauge glass and connections. Wear safety glasses during installation. Before installing, make sure all parts are free of chips and debris. Keep gauge glass in original packaging until ready to install.

1. Verify the proper gauge has been supplied.

2. Examine the gauge glass and packings carefully for damage before installation. Do not use the glass if it contains any scratches, chips or any other visible signs of damage.

3. Do not subject the gaue glass to bending or torsional stresses.

4. Apply teflon tape or pipe dope to pipe threads. Install top gauge fitting (fiting wihtout a drain valve) into the upper-most tapping. Wrench tighten the fitting until it is snug and the glass outlet is pionting at five o'clock (about 1/8 turn from its final downward position).

5. Install the bottom gauge fitting (the fitting with a drain valve) until it is snug and the glass outlet is pointing directly upward. Verify top and bottom fittings are threaded into the tappings the same number of turns (distance A - distance B).

6. Remove glass packing nut, friction washer and glass packing from the fitings, and replace them in the same order on both ends of the gauge glass. Push both packings about an inch up the gauge glass.

7. Gently insert one end of the glass into the top gauge fitting. Keeping the glass inside the top fitting, gently rotate the top gauge fitting clockwise until vertically aligned with the botom gauge fitting, then insert glass into bottom fitting until glass bottoms out on the should inside the bottom fitting.

8. Carefully raise glass about 1/16" and slide lower glass packing down until the glass packing contacts the lower gauge fitting. Do not allow the glass to remain in contact with any metal.

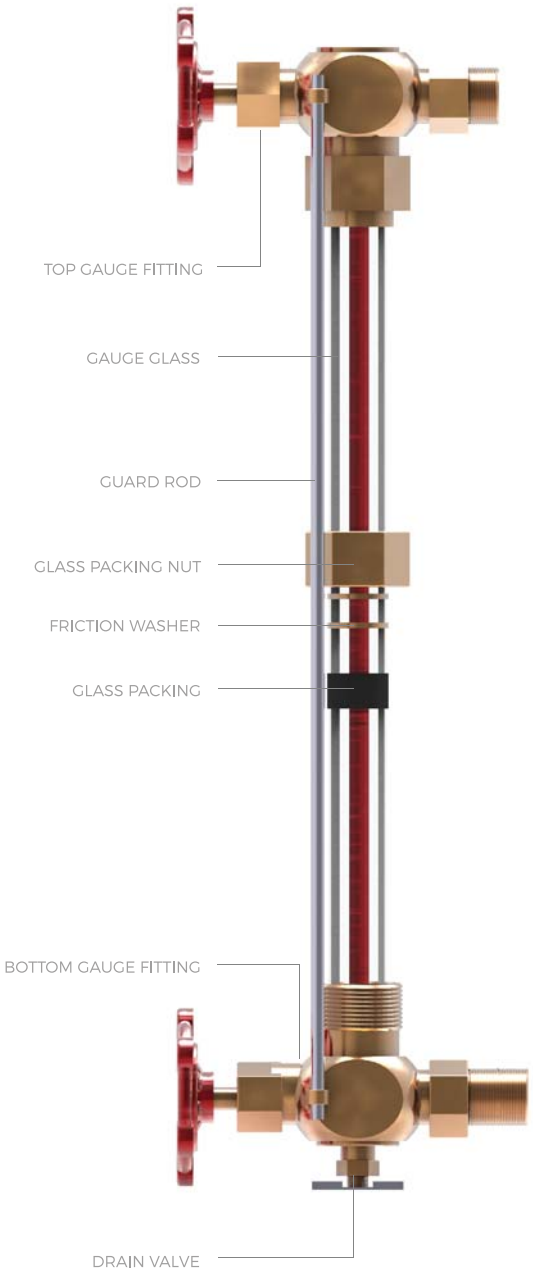
9. Carefully slide upper glass packing up as far as possible.

10. Hand tighten both glass packing nuts, then tighten 1/2 turn more by wrench. Tighten only enough to prevent leakage. Do not over tighten! If any leakage should occur, tighten slightly, a quarter turn at a time, checking for leakage after each turn.

WARNING

Improper installation or maintenance of gauge glass and connections can cause immediate or delayed breakage resulting in bodily injury and/or property damage.

FIGURE 3



# INSTALLATION AND OPERATION

## FLOAT VALVE ASSEMBLY INSTRUCTIONS FOR HORIZONTAL RETURN SYSTEM

1. Remove top plate and gasket.

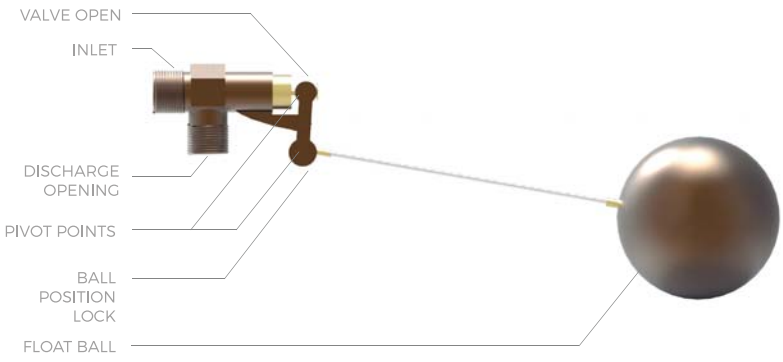
2. Apply teflon tape or pipe dope to all pipe threads. Assemble rod to float and valve.

3. Screw flat assembly into the cold water supply fitting welded in the tank.

4. Adjust flat valve with the ball position lock. (water level should be approximately 1" from the top of sight glass).

5. Replace top plate and gasket.

FIGURE 4




## FLOAT VALVE ASEEMBLY INSTRUCTIONS FOR VERTICAL RETURN SYSTEM

1. Remove end plate and gasket.

2. Apply teflon tape or pipe dope to all pipe threads. Assembly rod to float and valve.

3. Screw float assembly into the cold water supply fiiting welded in the end plate.

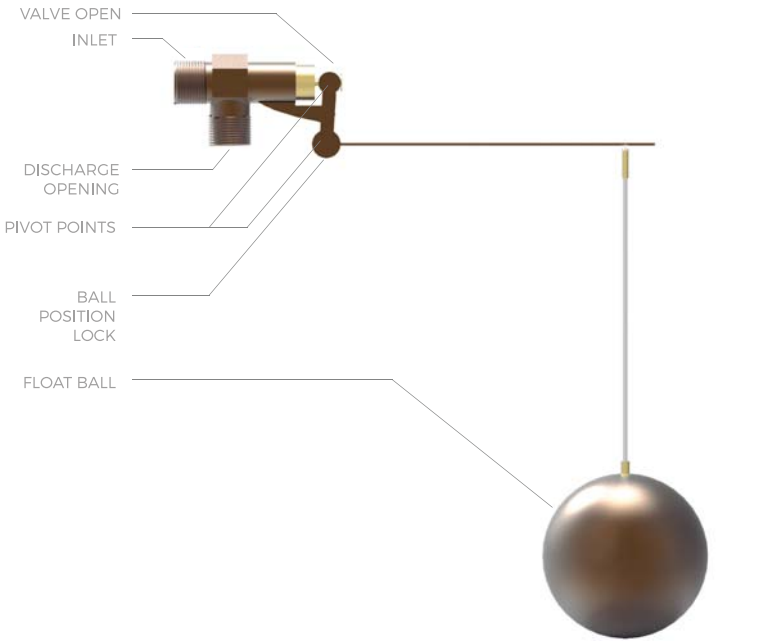
4. Adjust float valve with the ball position lock (water level should be approximately 1" from top of sight glass).

5. Insert into tank, replace gasket and bolt end plate into place.

WARNING

Incoming water pressure to flat valve cannot exceed 40 PSIG.

FIGURE 5




## WIRING

1. Check voltage, phase and hertz available against motor name-plate for compatibility.

2. Be sure leads for dual voltage motors are connected properly.

3. Install power and control wiring to magnetic starter in accordance with the National Electric Code and local requirements.

## ACCESSORIES

Optional accessories should be installed in accordance with the manufacturers instructions.

Preheat kit: If the tank is equipped with a preheat kit, follow mounting and wiring instructions included in preheat kit parts box.

## SYSTEM START UP

Inspect all pipe connections to be sure they are secure. Examine all controls and valves to assure each is operating freely and properly.

Thoroughly flush vessel and all associated piping until there is no indication of rust or foreign debris.

Make certain pump rotates in direction shown by arrow on pumping casing.

Open all valves on suction, discharge and make-up water lines.

Make sure there is sufficient water in reciever (approximately 1/2 full).

# MAINTENANCE

## MAINTENANCE

1. Inspect all controls for proper operation. Lubricate all moving parts as required.

2. Clean and check water gauge glass for presence of oil. If detected, find the source and eliminate it.

3. Make periodic inspection of the pump mechanical seal(s) for leakage. Replace seal if necessary following the pump manufacturer's instructions.

4. Pump bearings may or may not require lubrication depending on a particular pump. Follow the pump manufacturer's instructions.

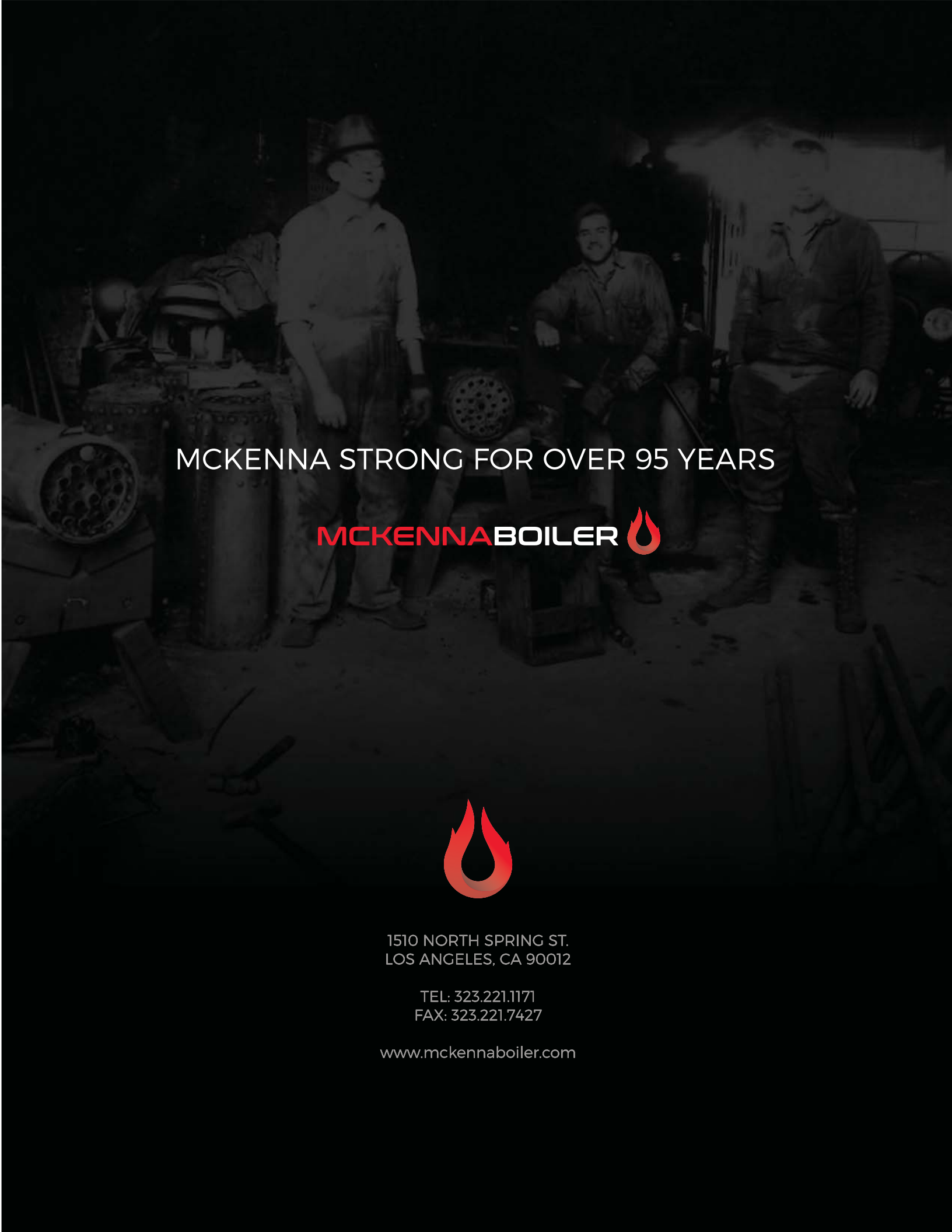
5. Clean pump strainer of debris.

6. Drain and flush tank yearly.

# TROUBLESHOOTING

The following troubleshooting guide will assist in the diagnosis and correction of minor field problems. In any case requiring additional assistance, contact your local authorized McKenna Representative.

| PROBLEM | CHECK |
|---|---|
| Pump rotates freely but does not pump | 1. Excessive feed water temperature (normal max. 130 F) will result in flashing at pump inlet. This is usually caused by leaky check valve between pump and boiler or failure of steam traps. Repair or replace defective equipment at once before causing damage to pump.<br>2. Obstruction to suction line. This can be determined by a visual check or installing a compound gauge (reading vacuum and pressure) in the pump suction line close to the pump. An unrestricted line will produce a pressure reading on the gauge of approximately 1 PSIG while the pump is running. A vacuum reading on the gauge indicates an obstruction which must be eliminated. Be sure to remove strainer basket, scrub clean and reinstall.<br>3. Motor not up to rated speed. Check speed with tachometer.<br>4. Wrong direction of rotation. Check arrow on pump casing.<br>5. Broken pump shaft. Check shaft at both ends.<br>6. Pump sized too small. |
| Pump vibrates or is very noisy | 1. Misalignment of pump and motor. Check coupling and piping strain.<br>2. Bent or broken shaft.<br>3. Pump impeller binding. Check for foreign matter in pump, bent impeller, or mineral deposits on impeller, channel ring or spacer. If mineral deposits occur, have the water analyzed and treated by a reliable chemical treatment company. Remove any mineral deposits from pump parts.<br>4. Worn bearings. Replace.<br>5. Pump cavitation. High water temperatures or a suction line restriction, such as a clogged strainer, will cause cavitation. Any restriction must be corrected immediately or severe pump damage will result. |
| Receiver overflows constantly | 1. Make-up valve seat worn, not sealing tight. Replace valve.<br>2. Make-up valve float water logged or disconnected. Replace.<br>3. Lower the level of make-up water to allow more tank volume for condensate. |
| Motor Failure | 1. Tripped starter overload. Reset and check motor and pump for proper operation.<br>2. Improper power supply. Check voltage and motor nameplate data.<br>3. Incorrect connections. Check wiring diagram.<br>4. Mechanical failure. Check for free rotation and examine bearings.<br>5. Short circuited windings. Indicated by blown fuse or failure to start. Motor must be replaced.<br>6. Overload. Check pump for proper operation and free rotation.<br>7. One phase open in three phase circuit. Check power supply lines. |
| Starter overload tripped | 1. Reset and inspect pump and motor for proper operation. |
| Motor fails to start | 1. Make certain boiler level switch is functioning properly.<br>2. Check control circuit for continuity. |



MCKENNA STRONG FOR OVER 95 YEARS

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