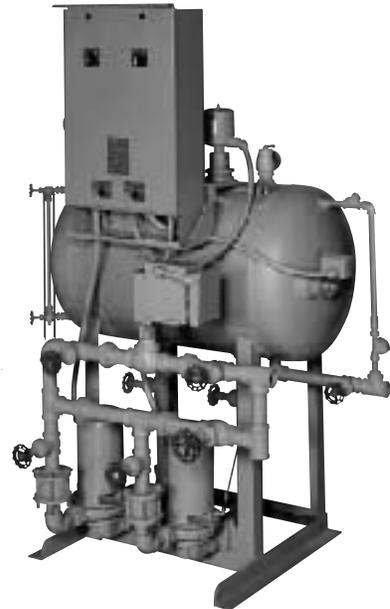




Domestic® Pump 250°F Condensate Units Series SA™ and SA-P™



SERIES SA-P™



INSTALLER: PLEASE LEAVE THIS MANUAL FOR THE OWNER'S USE.Ä



SAFETY INSTRUCTIONS

This safety alert symbol will be used in this manual and on the unit safety instruction decals to draw attention to safety-related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!** FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.ä

If the decals are missing or are illegible contact your local B&G representative for a replacement.ä

1. Electrical connections to be made by a qualified Electrician in accordance with all National, State and Local codes.ä
2. Motor must have properly sized starter with properly sized heaters to provide overload and undervoltage protection.ä
3. If pump, motor or piping are operating at extremely high or low temperatures, guarding or insulation is required.ä
4. Operating personnel should be trained in the operation of condensate return units.ä

WARNING

EXPLOSIBLE

DO NOT EXCEED PRESSURE RATING OF THE UNIT.
DO NOT ALTER OR DEFEAT PRESSURE RELIEF VALVE.
OPEN VALVES SLOWLY.
MAXIMUM PRESSURE 15 PSI.
FAILURE TO FOLLOW INSTRUCTIONS COULD RESULT IN INJURY OR PROPERTY DAMAGE.

DN0124

DN0124 ALL UNITS

DOMESTIC® PUMPS

SERIESa™

MODELa

SERIALa

GPM	PSI	PUMPa
POWER V.	PH.	HZ60a
CONTROL V.	PH. 1	HZ60a
TOTAL FL. AMP	LARGEST MOTORA FL. AMPa	

Bell & Gossett
Morton Grove, Illinois 60053

DN0019

DN0019 UNITS LESS PANEL

TMa

SERIESa™

MODELa

SERIALa

GPM	PSI	PUMPa
CFM	IN HG.	PUMPa

DWGSa

POWER V.	PH.	HZ60a
CONTROL V.	PH. 1	HZ60a
TOTAL FL. AMP	LARGEST MOTORA FL. AMPa	

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Morton Grove, Illinois 60053

DN0016

DN0016 UNITS PANEL

CAUTION

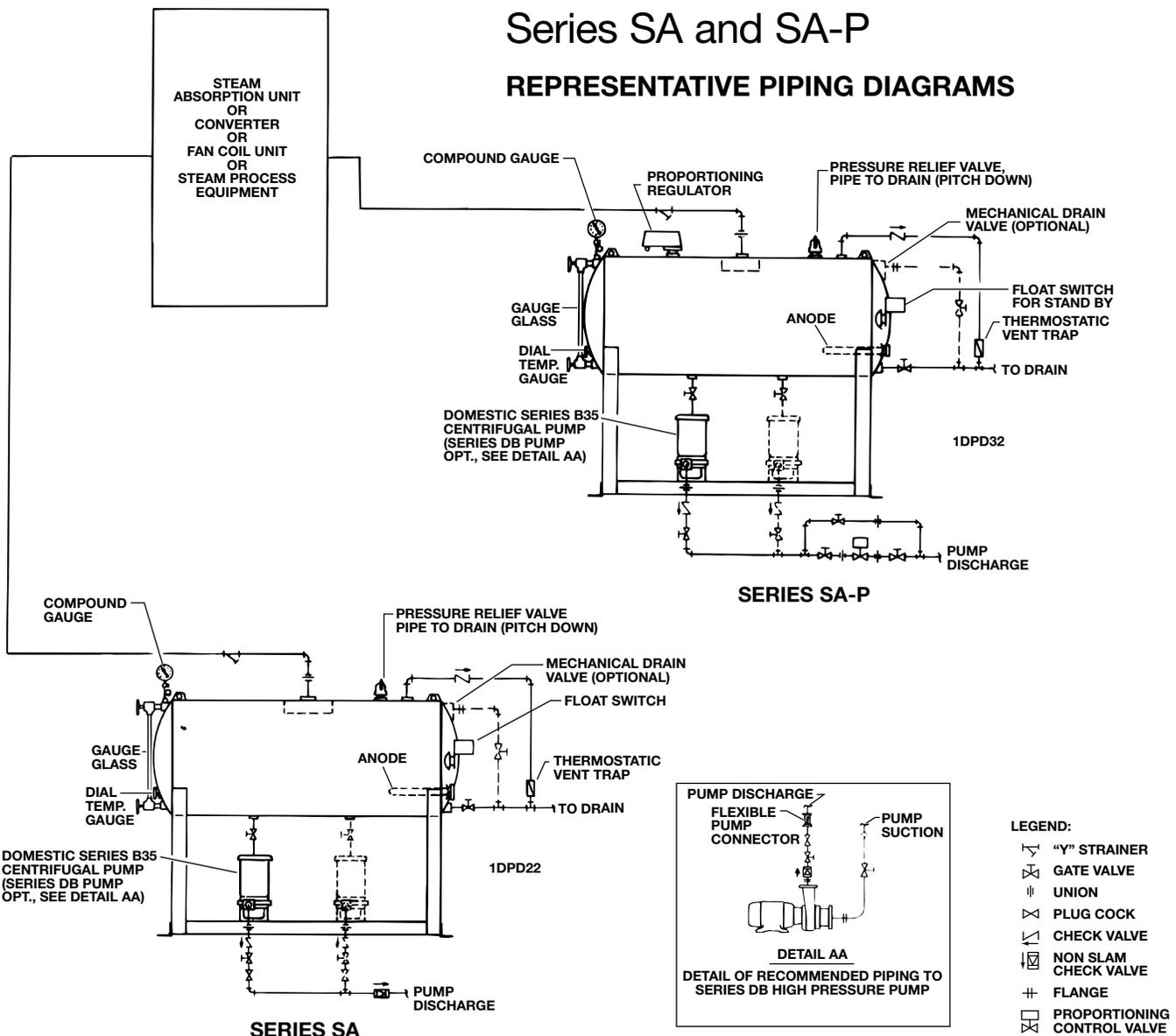
DO NOT RUN PUMP DRY, SEAL DAMAGE MAY OCCUR.
INSPECT PUMP SEAL REGULARLY FOR LEAKS, REPLACE AS REQUIRED.
FOR LUBRICATION REQUIREMENTS, CONSULT SERVICE INSTRUCTIONS.
FAILURE TO FOLLOW INSTRUCTIONS COULD RESULT IN INJURY OR PROPERTY DAMAGE.

P70644

P70644 ALL UNITS

High Temperature Condensate Units Series SA and SA-P

REPRESENTATIVE PIPING DIAGRAMS



DESCRIPTION OF EQUIPMENT

The Series SA, and SA-P units consists of an ASME Code stamped steel receiver (permitting operating under pressure up to 15 psig [1.0 Bar] and equivalent temperature up to 250°F [121°C]). Series B35 centrifugal pump(s) designed for 2 ft. (0.6M) NPSH, corrosion inhibitor (anode), water level gauge, thermometer, pressure relief valve, thermostatic air vent trap, compound gauge, valve(s) in pump suction, and a drain (gate) valve. Occasionally, Series SA units are fully vented; these receivers feature ASME Code construction except the code stamped is omitted. In addition to the above components, the Series SA-P employs a proportioning regulator and valve (electric or pneumatic). The Series SA unit uses float switch controls. Control panels and components supplied per specification.

When Series SA units are furnished with ASME Code stamped receivers, relief valve and air vent trap to permit pressurization, then the receiver inlet is directly connected to the outlet of the steam absorption unit or other steam process equipment with-

out steam traps in the return line. When used in this manner, a separate SA unit is usually required for each independently controlled heating unit.

It is, however, possible to use a single SA unit with multiple heating units. Detailed information and drawings will be furnished on request.

The relief valve on the unit is set at 15 psi (1.0 Bar) and rated at 1900 pph (862 Kg/hr) steam. Any additional system protection must be provided as required by others.

PRELIMINARY INSPECTION

Assure that there is no shipping damage.

Assure that nameplate ratings agree with job specifications and actual conditions.

HANDLING

Use care in installing unit.

**CAUTION: UNIT LIFTING EYE**

Use unit lifting eyes only to lift unit as shipped from factory. Unit must be empty and disconnected from pipes, anchors and other restraints. Use proper rigging procedures. Failure to follow these instructions could result in injury or property damage.

LOCATION

Place unit for easy access to all parts. Allow adequate space for servicing. Check ambient conditions.

NOTICE / TEMPERATURE LIMITS

Motors are designed to operate in 104°F (40°C) max. ambient. Insulate or ventilate as required.

**WARNING: EXPLOSIBLE**

Do not exceed pressure rating of unit (normally 15 psi [1.0 Bar]). Do not alter or defeat relief valve (must be 15 psi [1.0 Bar] max.). Pipe relief valve discharge to a safe location. Failure to follow these instructions could result in serious injury or death.

PIPING (General)

Pipe the unit per the Elementary Piping Diagram. Locate and support piping so as to not load the pump discharge.

RETURNS

Gravity return lines from system should be properly pitched to drain to unit by gravity. A “Y” strainer and gate valve should be installed in the return line.

PIPING (Relief Valve)

The discharge from the relief valve should be piped to a location for safe for potential full flow steam. There must also be provision for drainage of the liquid discharged.

**WARNING: RELIEF VALVE REQUIRED**

For safe operation the system requires a relief valve set at 15 psi (1.0 Bar) or less. The relief valve discharge must be piped to a location where 15 psi (1.0 Bar) steam can be safely discharged. Do not restrict, reduce or valve the relief valve discharge line. Failure to follow these instructions could result in serious injury or death.

**WARNING: LIMITED PRESSURE RELIEF VALVE CAPACITY**

The pressure relief valve supplied on the unit may not be sufficient to relieve rated capacity of the unit or full output of the boiler. Relief valve supplied is rated at 1900 pph (862 Kg/hr) steam. The tank is rated to withstand 125 psi (8.5 Bar), but the operating pressure must not exceed 15 psi (1.0 Bar). Professional system design or evaluation, by others, must evaluate the upstream system and provide for necessary additional protection. Discharge thru the pressure relief valve is a symptom of a system failure. The unit must be valved off immediately. Failure to follow these instructions could result in serious injury, death or extensive property damage.

THERMOSTATIC VENT TRAP OR ATMOSPHERIC VENT

Connect piping from drain line, thermostatic vent trap, and mechanical drain valve (if so equipped) to drain. Occasionally, Series SA units are furnished fully vented, without thermostatic vent trap. Oversize vent openings are then supplied; install full size vent pipe to atmosphere.

**CAUTION: NOT A CHEMICAL PUMP**

Inject boiler feed compounds from chemical feed tank into boiler feed piping – never into condensate tank. Failure to follow these instructions could result in injury or property damage.

FLOAT SWITCHES & MECHANICAL ALTERNATORS

Float switch and/or displacer switches, standard or proportional, are provided to meet system requirements.

Floats are locked in place to prevent damage during shipment. Remove shipping locks. Check factory settings. Floats and mechanical alternators are adjustable for various levels of operation. The lead pump should start with tank 3/4 full and shut off at 2" (51mm) or more above pump inlet. Lag pump should start before the tank overflows. Settings should avoid “short cycling” of the pump.

Displacer positions are adjusted by removing the controller from the top of the tank and changing cable lengths.

PROPORTIONING ELECTRIC REGULATOR AND PROPORTIONING (SLIDE WIRE) ELECTRIC VALVE

The regulator is actuated by a float-operated mechanism. Its function is to regulate the action of the proportioning type of motor operated valve, so the amount of flow through the valve is in balance with the water level change.

By accurately following the changes in the water level, the float actuates a potentiometer slide wire located in the proportioning regulator. Connected to a similar potentiometer in a relay and valve operator, the regulator causes the valve to open, close, or hold in a fixed position.

PNEUMATIC PROPORTIONING REGULATOR AND CONTROL VALVE

The pneumatic proportional control utilizes controlled air pressure to modulate the discharge valve opening. An air pressure switch set a 2-3 psi (0.1-0.2 Bar) starts and stops the pump(s) while the discharge valve is essentially closed.

DISCHARGE CONNECTION – SERIES SA AND SA-P UNITS

A check valve, gate valve and square head steam plug cock should be located close to pump in discharge line. The plug cock(s) may be omitted on Series SA-P units equipped with proportioning discharge valves. If discharge line is more than 100 ft. (30M) long, it should usually be one size larger than the pump tapping. When the pump is to discharge to a vented receiver at approximately the same elevation, the steam pressure in the receiver may be greater than the static head at the pump discharge causing condensate and steam to be forced through the pump. This condition can be corrected by installing a back-pressure valve with a spring pressure approximately equal to the maximum receiver pressure.

ELECTRICAL WIRING & CONTROLS

Connect power wiring per NEC. Recheck nameplate vs. specifications and conditions. All single phase motors have internal thermal protection.

**WARNING: HIGH VOLTAGE ELECTRICITY**

Disconnect and lock out power before connecting or servicing unit. Failure to follow these instructions could result in serious injury or death.

Three phase motors must use starters with properly sized overload relays. Overload relays furnished are designed for manual reset.

A variety of electrical controls are available to meet system specifications. Wiring diagrams are enclosed in electrical panels when the panels are furnished as part of the unit.

Consult wiring diagrams for specific electrical control information.

PUTTING THE UNIT INTO SERVICE

1. Assure that the unit is piped in accordance with instructions on pages 2, 3 and 4.



WARNING: EXPLOSIBLE

Do not exceed 15 psi (1.0 Bar) rated pressure. Do not restrict relief valve discharge. Open valves slowly. Failure to follow these instructions could result in serious injury or death.

2. Check floats and alternators for free operation.
3. Check power leads in accordance with wiring diagram enclosed in control cabinet (when furnished).



WARNING: HIGH VOLTAGE

Disconnect and lock out power before connecting or servicing unit. Failure to follow these instructions could result in serious injury or death.

4. Install drain plugs.
5. Fill receiver half full of water to prime pump(s) and prevent possible damage to pump seals. Avoid freezing conditions after unit receiver has been filled.
6. Check for proper rotation of all three phase motors. Rotation must be clockwise looking down on the motor as indicated by directional arrow on pump casting. If pump runs backwards, interchange two wires (3 phase only).

INSULATION

Series SA units frequently handle condensate at temperatures up to 250°F (121°C). Insulating the receiver and return piping will effectively conserve heat otherwise lost through radiation and convection from the receiver shell and reduce ambient temperatures.



CAUTION: DO NOT REVERSE

Reverse operation can cause extensive damage to pumps. Jog the motor to test for direction of rotation. Failure to follow these instructions could result in injury or property damage.

7. Throttle plug cock in discharge line until pressure at pump (while pump is discharging) approaches pump rated pressure. Tighten plug nut to secure adjustment.



CAUTION: DO NOT RUN DRY. SEAL DAMAGE MAY OCCUR.

Inspect pump seal regularly for leaks. Replace as required. Failure to follow these instructions could result in injury or property damage.

8. Remove start-up label (below) from panel (if applicable) after complying with instructions.



ELECTRICIAN / INSTALLER / OPERATOR

- Remove and destroy this tag after –
1. Assuring that all pumps rotate clockwise per arrows cast on volutes. (Jog pump momentarily to test – interchange any two motor power wires to reverse 3Hp motors.)
 2. Assuring that shipping locks have been removed from all float switches.

9. If possible, observe operation thru several cycles.

OPERATION AND MAINTENANCE

Operators must be familiar with all sections of this manual to understand the operation of the unit.

Hot water, steam and electricity can be hazardous.



SAFETY INSTRUCTIONS

SEE COVER OF THIS MANUAL



WARNING: EXPLOSIBLE

Do not exceed 15 psi (1.0 Bar) rated pressure. Do not restrict relief valve discharge. Open valves slowly. Failure to follow these instructions could result in serious injury or death.



WARNING: HIGH VOLTAGE

Disconnect and lock out power before connecting or servicing unit. Failure to follow these instructions could result in serious injury or death.

Check motor nameplate for any lubrication requirements. Pumps require no lubrication.

NOTICE / AUTO RESTART

Single phase motors will restart automatically after thermal overload protector trips.

Overload thermal relays in starters must be reset manually.

A properly installed unit should function unattended for long periods of time. Periodic checks to assure proper operations are highly recommended. Refer to trouble shooting section when necessary.

A variety of control options are available and are furnished in accordance with user specifications. Refer to wiring diagrams (when furnished) to determine control switch settings.

The inlet strainer (when furnished) is intended to protect the pump and system. Periodic cleaning should be included in the maintenance schedule. Check frequently in new systems.



CAUTION: SUBSEQUENT DAMAGE

A unit showing symptoms of possible problems (overflow, noise, leaks, vibrations, continual operation, etc.) must be corrected immediately. Failure to follow these instructions may result in full liability for subsequent injury or property damage.

MAINTENANCE PROCEDURE FOR RED LINE GAGE GLASS



WARNING: EXPLOSIBLE

Improper installation or maintenance of tubular glass can cause immediate or delayed glass breakage resulting in bodily injury. To avoid breakage observe the following Do's and Do Not's and Use and Care Instructions, as well as tubular gage manufacturer's instructions. If a gage glass breaks, contained substances can be released and glass can be blown out of the unit with great force. Always wear safety glasses when looking toward a gage or working on a gage glass assembly. Guard against the possibility of fire and explosion. Protect glass from impact, scratches, other surface damage and sudden temperature changes. These can weaken or stress the glass and lead to breakage. Failure to observe the following Do's and Do Not's can result in glass breakage and its explosive release of pressurized system contents and flying glass particles.

DO NOT'S

DO NOT work on any gage until you have carefully read these warnings & instructions.

DO NOT reuse any tubular glass, packing, or seals.

DO NOT use glass that is scratched, chipped, or otherwise damaged. Used glasses may contain damage and are poor safety risks.

DO NOT exceed the glass or gage manufacturer's recommended working pressure or maximum recommended gage glass length.

DO NOT bump, impact or scratch the glass.

DO NOT tighten gland nut and packing beyond gage manufacturer's recommendations.

DO NOT operate gages unless gage valve sets are equipped with drain vent and safety ball check.

DO NOT attempt to clean glass while the unit is in operation. Cleaning should be done without removing the gage glass.

DO NOT attempt to inspect the glass, to adjust tie rods, packing nuts or glands, to inspect or tighten other fittings without isolating the gage from the pressure vessel and opening the drain vent.

DO NOT weld, impact, or sandblast in the gage glass area without protecting the glass.

DO NOT have glass-to-metal contact.

DO NOT subject gage glass to bending or twisting stresses.

DO NOT allow the gage glass to contact the bottom of the packing gland.

DO's

DO inspect the gage glass daily, keep maintenance records, and conduct routine replacements.

DO install protective guards where necessary to protect personnel.

DO protect the outside of the gage glass from sudden temperature changes, such as drafts, water spray, etc.

DO remove all deposits from the seal areas, the gland nuts, glands (where used) and use new packing before installing a tubular gage glass.

DO examine gage glass for damage and seals for hard deposits and tears.

DO verify that the tubular gage glass, gland, nuts, packing, etc. are the correct size and type before installing.

DO ensure that system is protected by safety shut-off system (e.g. safety ball check).

MAINTENANCE

Examine the gage glass regularly for any signs of clouding, scratching, erosion, or corrosion. In new processes, the glass should be inspected daily until the need for replacement becomes apparent. This will help establish the routine inspection and routine replacement cycles.

CLEANING

Keep gage glass clean using non-abrasive commercial glass cleaners. Where regular cleaners do not seem to work, use dilute acids such as Hydrochloric (muriatic) acid. Always observe safety rules when handling hazardous cleaning solutions. Never use wire brushes, metal scrapers, or harsh abrasives which could scratch the glass.

INSPECTION

Scratches, corrosion, chips, surface flaws, or nicks on the surface or edges weaken the gage glass. To examine for these, shine a very bright concentrated light ("Burton Lite" or powerful flashlight) at about 45° angle. Anything which glistens and catches the fingernail or any star-shaped or crescent-shaped mark which glistens, is cause for replacement. Any gage glass which appears cloudy or roughened and will not respond to cleaning procedures, should be replaced.

STORING

Keep gage glasses in original packaging until ready to install.

HANDLING

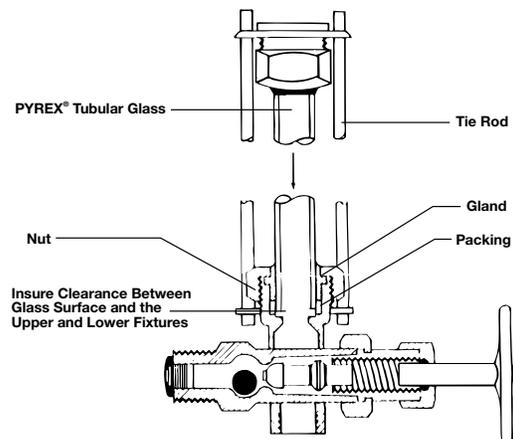
Avoid bumping, chipping, or scratching glass. Any glass-to-glass contact can cause scratches and must be avoided.

INSTALLATION

Always follow tubular gage manufacturer's recommended procedures for glass replacement.

Before installing a gage glass, remove all deposits from the seal contact surfaces of the gland nut and the gland (where used). Check sealing surfaces for cleanliness and smoothness. Once a gage glass has been removed from its mounting, regardless of the reason for its removal. Discard the glass and replace with a new piece.

Always use new packing, seals, and/or O-rings (if required) when replacing a tubular gage glass. Used packing seals and O-rings will not properly support the gage glass or provide the proper pressure seal without stressing the glass.



1. Hold fittings rigidly to prevent misalignment, which can cause severe bending stresses in the glass, when packing nuts are tightened.
2. Provide metal washers so nuts can be tightened without twisting packing or tube.
3. Provide positive, but not excessive, clearance between glass, packing nuts, and bearing washers.
4. Keep glass short enough to allow for expansion.
5. Provide positive clearance between the ends of the gage glass and the metal fittings. Glass-to-metal contact will keep the gage glass from expanding and cause breakage.
6. Tighten packing nuts enough to prevent leakage, but not so much that you hinder expansion and contraction. Follow gage manufacturer's recommendations.
7. Generally, you can use cylindrical or conical rubber packings for LOW and MEDIUM pressures. HIGHer pressures and HIGH temperatures may require specialized packings. In all cases you should follow the recommendations of the gage manufacturer.

TROUBLE SHOOTING PROCEDURES

All units are thoroughly tested at the factory before shipment. They should operate satisfactorily without further adjustment if properly installed and providing they have not been damaged by rough handling in transit. If system or unit performance is not satisfactory, refer to the following check list.

Pump Will Not Start

1. The power supply has been interrupted, disconnect switch is open, or selector switch is improperly positioned.
2. Incorrect voltage for motor. Check voltage and wiring with motor characteristics.
3. Incorrect starter coil for power supply.
4. The overload relays the starter have tripped out and must be reset. Ambient temperature may be too high.
5. Check pump controls or other controls for proper operation.
6. Wiring to control cabinet is incorrect or connections are loose.
7. The strainer is dirty thus retarding flow. Clean periodically.

Pump Runs Continuously

1. Pump is running backward. Rotation of three phase motors may be corrected by interchanging any two of the three wires. Rotation should be clockwise looking down on motor.
2. The total required pressure at the pump discharge is greater than the pressure for which the pump was designed. Check the total pressure which includes atmospheric pressure, the friction head and the static head.
3. A valve in the discharge line is closed or throttled too tightly. Check valve is installed backwards.
4. The impeller eye is clogged.
5. Pump is too small for system.

Condensate Pump is Noisy

1. The pump is working against a lower pressure than designed for. While pump is discharging, adjust plug cock in discharge line until pressure at pump approaches pump rated pressure.

2. Excessive condensate temperature. Correct system conditions. However, this applies to certain units only; others are designed to handle boiling water.
3. Magnetic hum or bearing noise in motor. Consult motor manufacturer's authorized service station nearest unit location.
4. Starter chatters. Trouble is caused by low line voltage, poor connections, defective starter coil, or burned contacts.
5. Pump is running backward.

The System is Noisy

1. Banging in the steam main is usually caused by steam "imploding" in condensate lying in low points in lines. These problems can be eliminated by dripping low points, properly supporting the pipe, or by increasing the pitch of the lines.
2. Improper dripping of the steam mains and risers; where there is a rise in the steam main, or where it branches off into a riser, a drip trap must be installed in the drain line.
3. The piping is too small to drain properly.

Steam Flow is Restricted

1. Thermostatic vent not open when cold.
2. Valve closed between vent line and drain or checkvalve installed backwards.

Relief Valve Discharging

1. Incoming steam pressure exceeds 15 psi (1.0 Bar) – upstream pressure must not exceed 15 psi (1.0 Bar). Correct system.

SA-P Pumps Don't Start or Run Continuously

1. If pneumatic system, check pressure setting or pneumatic pressure switch. Air pressure to engage switch at 2-3 psi (0.1-0.2 Bar).
2. If electric, check displacer adjustments.

DEALER SERVICING

If trouble occurs that cannot be rectified, contact your local B&G representative. He will need the following information in order to give you assistance.

1. Complete nameplate data of pump and motor. SEE RATING NAMEPLATE.
2. Suction and discharge pipe pressure gauge readings.
3. Ampere draw of the motor.
4. A sketch of the pump hook-up and piping.

TM		
SERIES TM		
MODEL		
SERIAL		
GPM	PSI	PUMP
CFM	IN HG.	PUMP
DWGS		
POWER V.	PH.	HZ60
CONTROL V.	PH. 1	HZ60
TOTAL F.L. AMP	LARGEST MOTOR F.L. AMP	
Bell & Gossett Morton Grove, Illinois 60053		

PUMP SERVICE INSTRUCTIONS FOR SERIES B35 PUMPS AS USED ON SA & SA-P UNITS

1. Close pump isolation valve or system return line valve. Operate pump momentarily to discharge as much water as possible. Close pump discharge valve.



CAUTION: HOT SURFACES

Surfaces are hot when system is in operation. Do not touch hot receiver, let unit cool before servicing. Failure to follow these instructions could result in serious injury or death.

2. Shut-off and lock out power.



WARNING: HIGH VOLTAGE

Disconnect and lock out power before connecting or servicing unit. Failure to follow these instructions could result in serious injury or death.

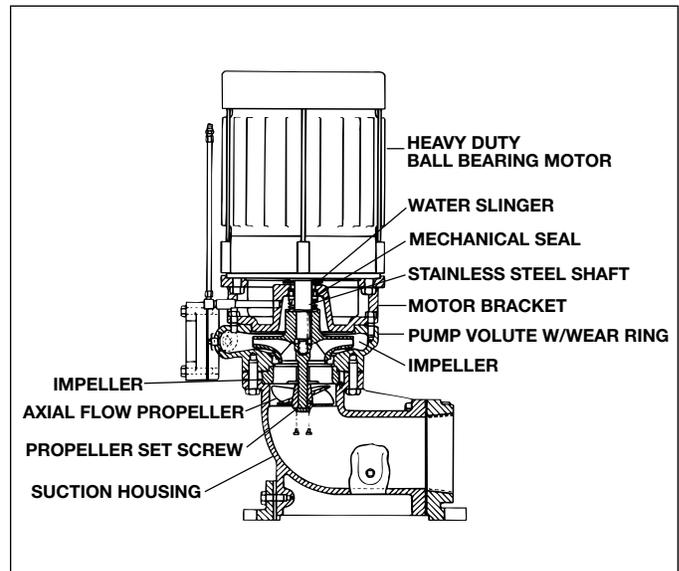
3. Make sure unit is cool enough that pump can be handled safely. Open drain to remove remaining liquid.
4. Carefully remove pump drain plug and bleed line. Wait for complete drainage.
5. Loosen both the discharge connection and the suction housing to pump volute fasteners. Assure that pressure is relieved per caution note.



CAUTION: PRESSURIZED SYSTEM

Operating system may contain very hot water and steam under pressure. Close inlet and open drains before servicing. When servicing, *loosen* screws and move components to assure pressure is relieved before *removing* screws. Keep drains open during servicing. Failure to follow these instructions could result in injury or property damage.

6. Complete the removal of the above hardware. Remove pump/motor assembly and place on work bench.



- 7a. Remove the suction housing capscrews and separate the pump/motor assembly from the suction housing. Note, the diffuser should separate from the suction housing to allow the pump/motor assembly to be removed.
- 7b. Remove propeller, propeller stem and diffuser from the assembly as follows:
 - (1) Threaded Motor Shafts (3Hp and less). Remove propeller lock nut. Remove propeller with propeller stem as an assembly with the diffuser. To install a new propeller, remove the propeller set screws and separate from the stem.
 - (2) Keyed Motor Shafts (5Hp and larger). Remove propeller set screws. Remove propeller, remove diffuser, and unscrew the propeller stem.

8. Remove capscrews holding motor bracket and pump volute together. Remove motor and bracket assembly from volute by lifting straight away from volute.
- 9a. To remove impeller from motor shaft proceed as follows:
 - (1) Keyed Shafts. Remove impeller with gear puller or other means which will not damage impeller or bend motor shaft.
 - (2) Threaded Shafts. Hold end of motor shaft opposite pump with large screwdriver or other suitable tool and back impeller off with a rectangular bar or other flat tool inserted between the vanes of the impeller.
- 9b. Remove rotating part of seal from shaft, being careful not to break carbon face.
10. Remove capscrews holding motor bracket to motor and remove bracket.
11. Remove stationary part of seal assembly, being careful not to chip or break ceramic seal.
12. To install seal proceed as follows:
 - (1) Clean recess in bracket thoroughly. Coat recess and "rubber" portion of seat with soap solution. Press seat into recess firmly by hand making certain both parts bottom evenly. If seal cannot be bottomed with fingers place cardboard shipping disc on ceramic and force into place with tool.
 - (2) Carefully place bracket in position on motor shaft without displacing ceramic seat and secure bracket to motor with capscrews.
 - (3) Place motor vertically with pump end up. Do not attempt assembly of seal and impeller with shaft horizontal.
 - (4) The "carbon" of rotating part of seal should not be loose. If it is, hold in place with grease. Using clean, lint free cloth, wipe mating surfaces perfectly clean. Soap shaft and push seal onto shaft so that carbon with contact ceramic seal. If spacer is required, use grease to cause spacer to adhere to bottom of seal after seal has been put on shaft. Be sure spacer is on larger diameter of shaft so that it will not catch between shoulder and impeller.
13. Place impeller on shaft. Make sure impeller is seated.
14. Reassemble volute to bracket.
15. Install stem over drive pin in impeller eye. Tighten lock nut.
16. Set stem to .004 Total Indicator Reading (TIR).
17. Install diffuser.
18. Install propeller and tighten set screws.
19. Using new gasket and noting alignment pin, install assembly on suction housing.
20. Install suction housing and discharge fasteners and tighten.
21. Reconnect pump bleed line and motor wiring.



**CAUTION: DO NOT RUN DRY.
SEAL DAMAGE MAY OCCUR.**

Inspect pump seal regularly for leaks. Replace as required. Failure to follow these instructions could result in injury or property damage.

22. Close drain and slowly open inlet valves. See warning.



WARNING: EXPLOSIBLE

Do not exceed pressure rating of unit (normally 15 psi [1.0 Bar]). Do not alter or defeat relief valve (must be 15 psi [1.0 Bar] max.). Pipe relief valve discharge to a safe location. Failure to follow these instructions could result in serious injury or death.

23. Jog to check motor rotation. See caution.



CAUTION: DO NOT REVERSE

Reverse operation can cause extensive damage to pumps. Jog the motor to test for direction of rotation. Failure to follow these instructions could result in injury or property damage.

24. Observe operation thru several cycles.



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