

PARKER RETURN SYSTEM INSTALLATION AND MAINTENANCE INSTRUCTIONS
RETURN SYSTEMS R-1 TO R-6 WITH BURKS TURBINE PUMP
FOR STEAM BOILERS 1-1/2 TO 50 H.P.

INST 106
8B

The drawing furnished illustrates the recommended installation of the Return System with the required connections that must be properly followed for correct operation of the System. The equipment should be installed in an accessible location near the boiler for efficient operation.

10. **WATER FEED LINE TO BOILER:** This line should be connected from the pump discharge to the boiler, at least 1/2" size on boilers up to 3 H.P., at 3/4" size up to 25 H.P., and 1" size on 30 H.P. and larger. If this line is over 10' in length, it should be increased one size. A 10C, check valve must be installed conveniently near the boiler feed pump and a union and 10A shut-off valve (not furnished) must be installed near the boiler. A second check valve must be installed near the boiler if this is more convenient for installation. An additional 10C, check valve (furnished only on Kompact models) should also be installed. If the water feed line is over 10' in length, one check valve should be near the pump and one check valve should be near the boiler. A relief valve (not furnished) should be installed on the pump side of the check valve to protect the pump in event of restriction or stoppage in the discharge line. On boilers 25 H.P. and smaller, the Kompact model is available with the entire water feed line piped and the pump motor wired ready for connection of utilities.
20. **PUMP INLET FROM RETURN TANK:** This line is furnished complete, piped as shown in the drawing from the Return Tank to the boiler feed pump. The 20A shut-off valve must be open at all times the boiler or pump is in operation. The 20S strainer has been installed to prevent dirt, foreign particles or scale from damaging the pump. The strainer should be cleaned at least every 30 days. A 20FH high-temperature flexible rubber hose has been installed to eliminate vibration and piping strain on the pump.
21. **BURKS TURBINE BOILER FEED PUMP:** The pump is furnished for the purpose of pumping water into the boiler under pressure. The heavy duty Burks Pump is a close coupled bronze fitted turbine type equipped with a stainless steel shaft. The pump is standardly furnished with a mechanical shaft seal so that no leakage should be experienced from the pump. The pump itself does not require any packing or lubrication. The motor bearings should be lubricated annually. After years of service it may be desirable to adjust the impeller to compensate for water wear. This may be necessary because of reduced capacity or pressure and may be done without disturbing piping or disassembling the pump by use of the external impeller adjustment. Never operate the pump without water as this may damage the seal.

Caution should be taken never to close a valve (10A) on the pump discharge line while the pump is in operation as no relief valve is built into the pump and closing the valve would seriously harm the pump. To protect from the danger of closed valves or restriction in the discharge line (10), a relief valve should be installed.

The pump must always be securely mounted to the mounting bracket and motor. All piping should be installed to the pump in the proper manner so there is no strain on the pump.

The boiler feed pump is to be wired through the boiler control circuit so that the water level control starts and stops the pump to maintain the proper water level in the boiler.
22. **RETURN TANK:** The Return Tank serves as the storage supply for water make-up and condensate return. Each tank is standardly equipped with an automatic float valve and assembly, which should be adjusted to maintain a satisfactory water level in the tank with an additional volume available for condensate return. The proper water level in the tank is at least 2" above the bottom of the well but normally not above half full. On installations where there is no condensate return, the water level can be adjusted to an increased height. The float valve is installed so that there is always an air gap between the valve discharge nozzle and the top of the tank to comply with Code Requirements. The well is designed so that the lower end is always below the water level, thereby, preventing steam returning to the tank from escaping out of the tank. The water level can be checked, by looking down the well. The dust cover cap should always be kept over the valve to prevent dirt or dust from getting into the system. Each tank is standardly furnished with a suction shut-off valve, strainer, and flexible rubber hose. The Return Tank should be inspected every 30 days and cleaned to eliminate any accumulation from damaging the pump.
23. **CONDENSATE RETURN CONNECTION:** All return lines should be properly trapped and connected back to the Return Tank. It is considered good practice to conveniently grade the return lines back to the tank so that condensate return will flow by gravity to the tank. It is very beneficial to return all clean condensate to the tank and no steam should be dissipated when the condensate can be piped to the Return Tank.
25. **CASA FLOAT VALVE** The Casa Float Valve is furnished for the purpose of admitting water to the Return Tank as required. The valve is designed with a plunger having a removable rubber disc, which should be replaced when the valve leaks. The plunger leather should also be replaced when the valve leaks around the plunger. It is considered advisable to have extra rubber discs and leather in stock available for immediate replacement. Adjustment of the tank water level can be made easily by loosening the screw on the arm of the valve and rotating to the proper shut-off point. If additional adjustment is required on Return Systems R-1 to R-4 (rectangular tanks for boilers 25 H.P. and smaller), the float rod must be bent to the proper shut-off point. If additional adjustment is required on Return Systems R-5 to R-6 (round tanks for boilers 30 H.P. and larger), the clevis must be loosened and the vertical float rod either lengthened or shortened to the proper shut-off point by screwing the clevis either up or down.
26. **WATER INLET:** The main water supply should be connected with galvanized pipe to the tee furnished on the Return Tank. A 26A shut-off valve (not furnished) should be installed near the tank with a union on the tank side. This valve should be shut off any time the System is not in use. A minimum 1/2" size line should be installed for boilers up to 12 H.P., minimum 3/4" size up to 25 H.P., and minimum 1" size 30 H.P. and larger. If the water pressure is less than 40 PSI the line should be increased sufficiently to supply at least 3 gallons per minute for boilers up to 12 H.P., and at least 8 gallons per minute for boilers up to 25 H.P., and at least 10 gallons per minute 30 H.P. and larger. If water pressure exceeds 75 PSI, a water pressure reducing valve should be installed to prevent leaks and possible damage to the float valve.
27. **RETURN TANK VENT OUTLET:** Should be connected upward to a safe location. A 1" vent size is adequate for boilers up to 12 H.P. A 1-1/4" vent size should be used on boilers up to 25 H.P. and 1-1/2" vent for 30 H.P. and larger. If the vent is not straight, size should be increased. Vent is preferably galvanized pipe installed to prevent leaks in accordance with Local Codes.
28. **RETURN TANK OVERFLOW:** Should be piped downward to a safe open drain or floor sump. Overflow should be piped minimum 3/4" size on boilers up to 3 H.P. and minimum 1" size on larger boilers. If overflow continuously leaks, the valve assembly should be properly adjusted or repaired.
29. **RETURN TANK DRAIN:** The line should be installed full 3/4" size on boilers up to 12 H.P. and full 1" size on larger boilers. Connect to a safe drain with a 29A shut-off valve (not furnished) conveniently near the tank. The Return Tank should be flushed and cleaned out every 30 days or as required.