



# Condensate Return Feedwater Systems For Low and High Pressure Steam Boilers

Rite's feedwater return systems are engineered for the safe and efficient storage and pumping of condensate and make-up water back to the boiler. **Why Rite? Because all our receivers are made from 3/8" PVQ steel, which is up to double the thickness of other receivers. With corrosion as the number one reason why return tanks wear out and need replacing – Rite Condensate Return Systems offer up to twice the service life of other brands.** With standard receiver capacities from 46 to 250 gallons and simplex to triplex pump sets, Rite has a return system for virtually any requirement. Check out our other standard features below and see why one choice stands out – the **Rite Choice**.

- Long-lasting 3/8" (.375) steel tank construction. Up to twice the head and shell thickness of other receivers for superior corrosion resistance.

- Vented, non-pressurized tank.

- Large 5" diameter cleanout facilitates sediment removal from receiver.

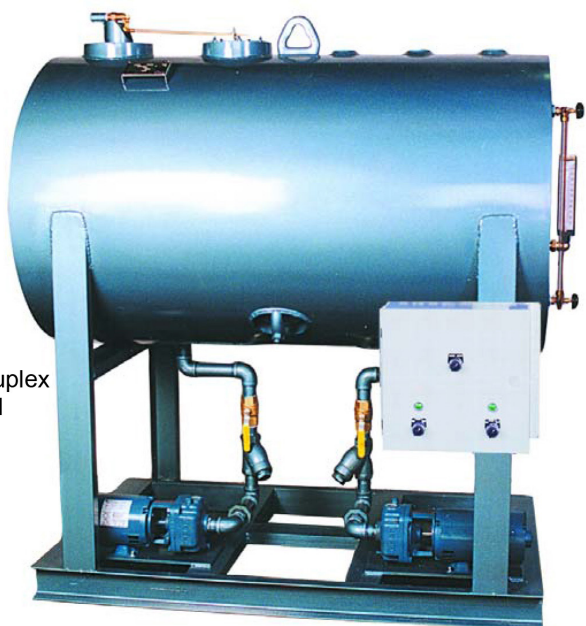
- Standard feedwater pumps are high performance Burks turbine or Goulds multistage centrifugal for long service life.

- NPSH suction piping to pumps includes shut-off valve and wye strainer.

- Automatic water make-up valve is float operated and mounted on top of the tank with built-in air gap provision. Eliminates the need for a backflow preventer.



*CR50 Simplex*

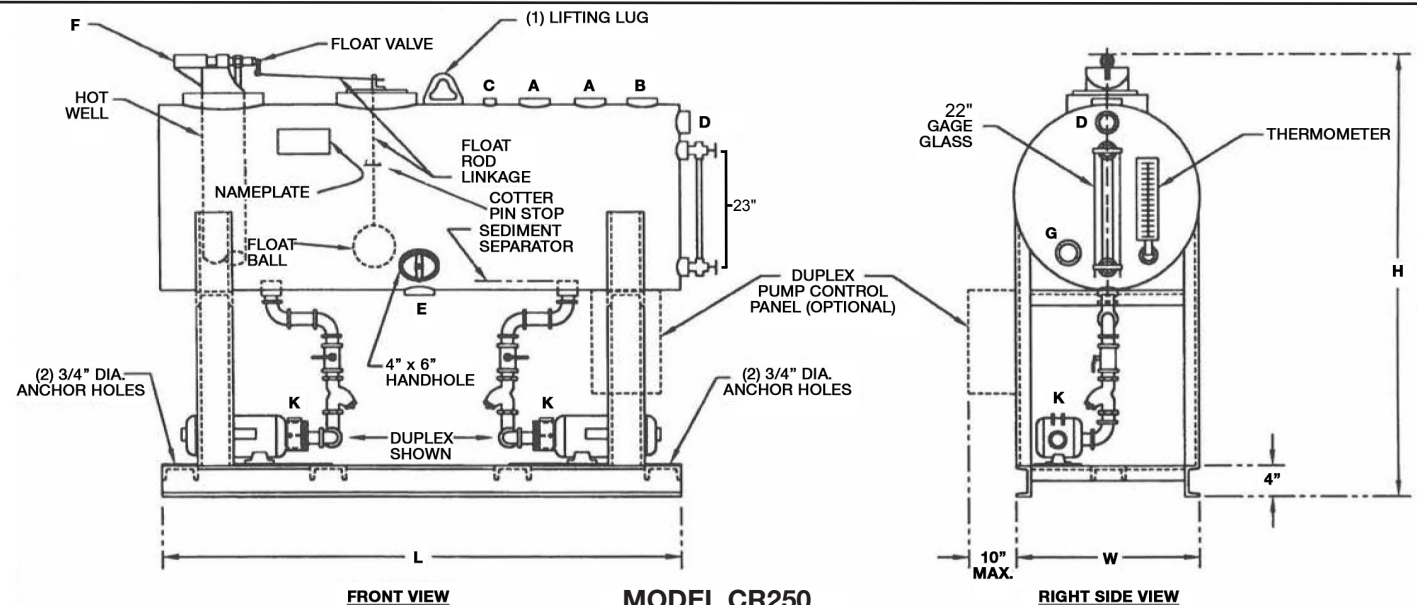
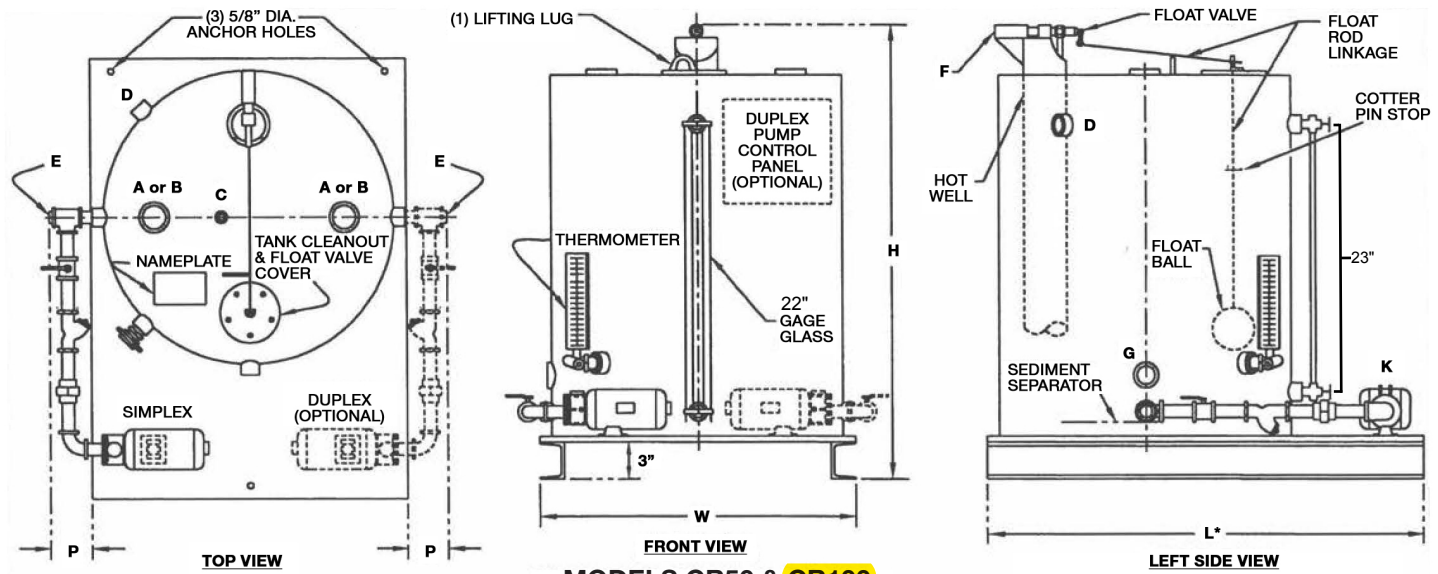


CR 250 Duplex  
With Panel  
Option # 3

- Sparge tube connection for preheating make-up water.
- Sight glass with brass gauge glass valves and rod protectors.
- Industrial grade thermometer.
- Structural steel base with anchor holes.
- Forklift skid design.
- Balanced lifting lug.
- Finished with super tuff metallic blue polyurethane paint.



# Condensate Return Feedwater Systems Data & Dimensions



REF.	DESCRIPTION	CR50	CR100	CR250
A	CONDENSATE RETURN	2" FNPT	2" FNPT	(2) 2" FNPT
B	VENT TO OUTDOORS	2" FNPT	2" FNPT	2" FNPT
C	SPARGE TUBE CONNECTION (IF USED)	1/2" FNPT	1/2" FNPT	1/2" FNPT
D	OVERFLOW	1" FNPT	1" FNPT	1 1/4" FNPT
E	TANK DRAIN	1" FNPT	1" FNPT	2" FNPT
F	SOFT WATER MAKE UP	1/2" FNPT	1/2" FNPT	1/2" FNPT
G	SPARGE TUBE REGULATING VALVE TEMPERATURE SENSOR	1" FNPT	1" FNPT	1" FNPT
K	BOILER FEED PUMP DISCHARGE	1" FNPT	1" FNPT	(2) 1/4" FNPT
L	LENGTH INCHES (cm)	36" (91 cm)*	48.5" (123 cm)*	63" (160 cm)
W	WIDTH INCHES (cm)	26" (66 cm)	38" (97 cm)	36" (91 cm)
H	HEIGHT INCHES (cm)	38" (97 cm)	38" (97 cm)	70" (178 cm)
P	PIPING (REMOVABLE) INCHES (cm)	9 1/2" (24 cm)	7" (18 cm)	N/A
RETURN TANK CAPACITY TO OVERFLOW GALLONS (LITERS)		46 GAL. (175 L)	104 GAL. (395 L)	240 GAL. (912 L)
SHIPPING WEIGHT APPROXIMATE POUNDS (KILOGRAMS)		495 LBS (223 KG)	825 LBS (371 KG)	1465 LBS (695 KG)
MAXIMUM OPERATING WEIGHT (TANK FLOODED) POUNDS (KILOGRAMS)		877 LBS (395 KG)	1688 LBS (760 KG)	3457 LBS (1556 KG)
SUGGESTED MAX. BOILER HORSEPOWER CAPACITY		50	100	250
MAXIMUM OPERATING FEEDWATER TEMPERATURE °F (°C)		225° F (107° C)	225° F (107° C)	225° F (107° C)

\* If supplied.

Rev. 2/2014



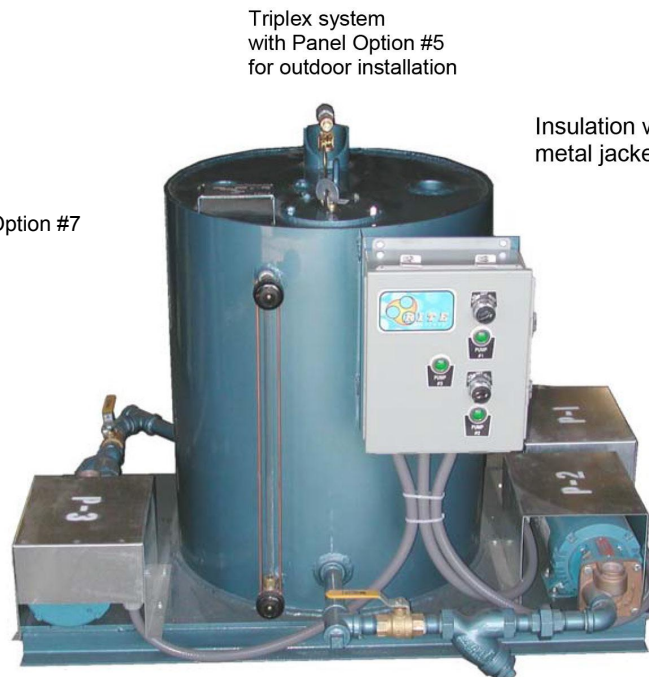


# Condensate Return Feedwater Systems Options



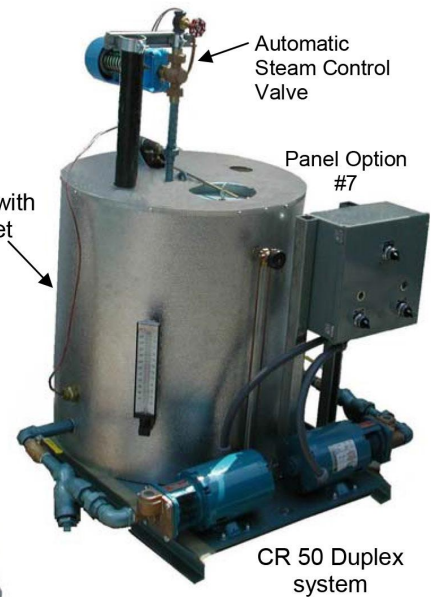
CR-100 Simplex System  
w/ Optional Sparg Tube

Panel Option #7



Triplex system  
with Panel Option #5  
for outdoor installation

Insulation with  
metal jacket



Panel Option  
#7

CR 50 Duplex  
system

## RECEIVING

Carefully inspect the equipment for any damage before signing bill of lading. Make sure the copper float ball inside the receiver (tank) has not come loose during shipment.

## MAINTENANCE

Clean the pump suction wye strainer screen every 6 months. Clean out sediment from the bottom of the tank every few years as required. Be sure make-up valve shuts off tightly (no drips) when the float reaches its upward travel limit. If the tank overflows due to condensate return, adjust the float valve linkage to lower the make-up water level. Check float valve linkages every six months to be sure connections are tight. Lubricate float rod where it passes through guide bushing into tank every 6 months with WD-40 and make sure the rod is straight and travels smoothly between the stops. Make sure there is no stray voltage between the tank and ground. As little as 3 millivolts may cause electrolysis which can lead to premature tank corrosion.

## TROUBLESHOOTING

If pump runs but the boiler at operating pressure doesn't fill, install a pressure gauge with the same range as the boiler's pressure gauge near the discharge of the pump as shown below. If the pump pressure fluctuates by more than a few P.S.I., the pump is probably cavitating (not getting enough water). Check the wye strainer screen, suction piping and sediment level in the bottom of the tank for any flow restrictions. If the pump pressure is constant but stays below the boiler pressure until the boiler pressure drops far enough for the pump to work, then either the check valve(s) in the feed line are failing or the pump impeller (Burks turbine only) needs to be adjusted for wear – see pump cut sheet for instructions.

## STORAGE - LAY-UP

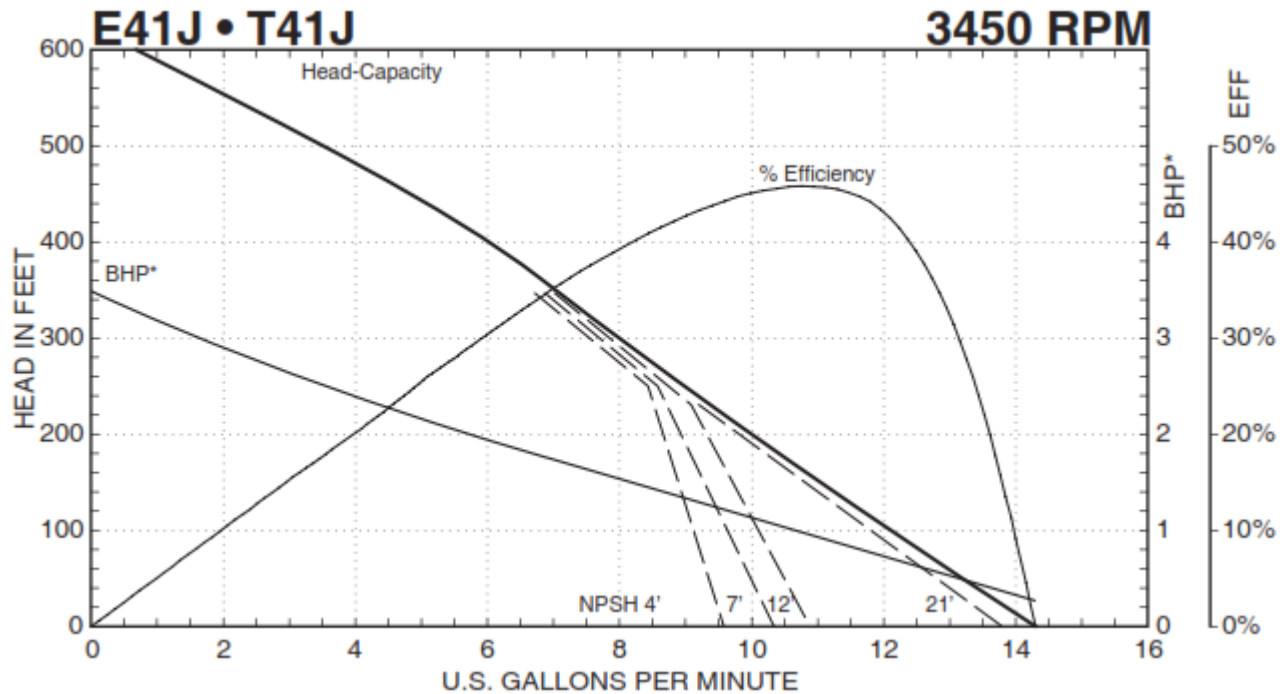
Empty tank completely using the drain fitting and a wet-dry vacuum. Remove all sediment and get the tank as dry as possible. Drain water from pump casing and leave dry. Post equipment lockout notice on receiver and pump disconnect(s).

## RECOMMENDED PIPING

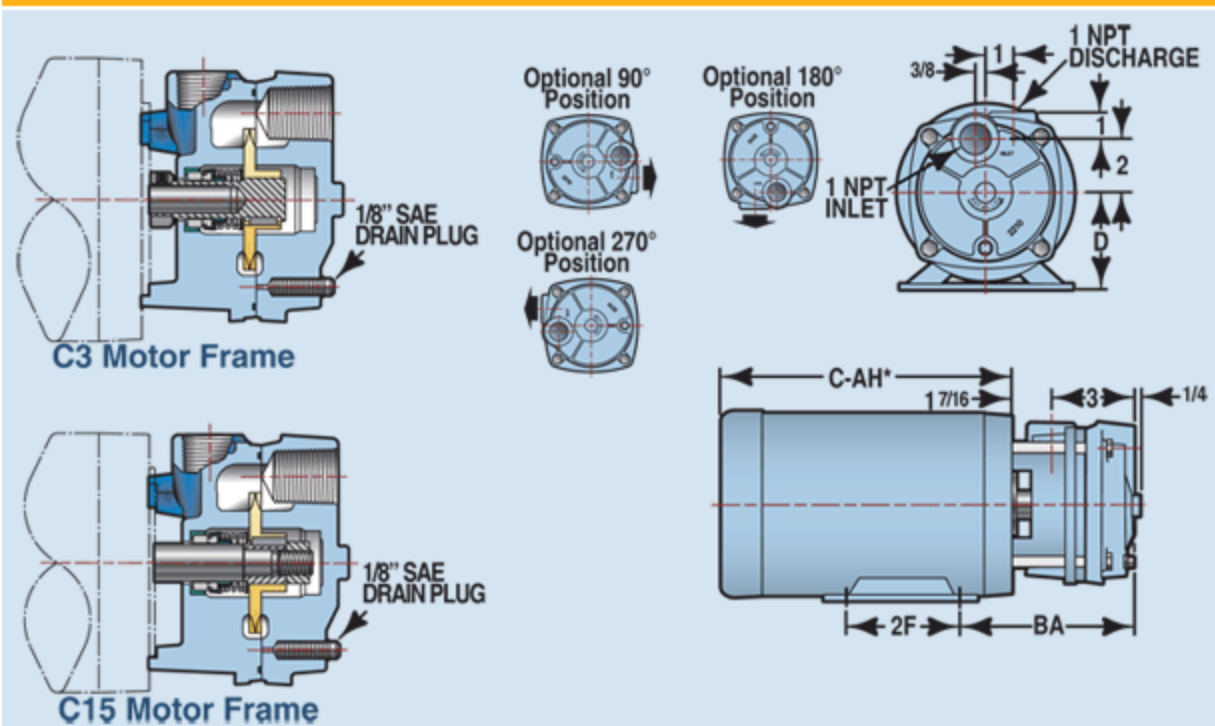




# Condensate Return Feedwater Systems Pump Data & Dimensions



## T41 - C3 & C15 Motor Frames



	Horsepower	Frame	A	D	E	BA	2F
T41	1/3 ~ 5 ODP, TEFC, & EXP	56C	*	3 1/2	2 7/16	6 3/16	3





# Condensate Return Feedwater Systems Specification and Order Form

SN \_\_\_\_\_

Provide one Rite model CR- 100 Condensate Return Feedwater System. Steel receiver shall be 3/8" (.375") minimum head and shell thickness for corrosion resistance. Receiver (tank) shall have 2" vent connection for non-pressurized operation and shall have additional fittings for the following: condensate return, sparge tube, sparge tube temperature sensor, overflow, drain, float fange cover and cleanout opening, gauge glass valves, thermometer, (2) pump suction connections, and soft water make-up. All fittings shall be seal welded both inside and outside the tank. A sediment separator shall be incorporated into the receiver design. Receiver capacity shall be \_\_\_\_\_ gallons.

Pump suction piping shall be complete and consist of a wye strainer with 20-mesh stainless steel screen, brass shut-off valve and pump flange or union. The tank and suction piping shall deliver the required NPSH (net positive suction head) to the boiler feed pumps without cavitation or vortexing. Pump baseplates shall be through-bolted to feedwater system base without transmitting undue stress to the pump or suction piping. Pump arrangement shall be \_\_\_\_\_ (simplex, duplex or triplex). Pump(s) shall be MTH (Make) T41J-BF (Model), capable of delivering \_\_\_\_\_ GPM to a boiler operating at a maximum pressure of \_\_\_\_\_ PSIG.

Make-up water valve shall be float operated type and mounted on top of the tank with built-in air gap provision. It shall be readily accessible for service.

The following options shall also be required: (Click Options for pictures)

\_\_\_\_\_ Duplex pump arrangement. (2 Pumps)

\_\_\_\_\_ Triplex pump arrangement. (Add 12" to "L" dimension of CR-50, CR-75, CR-100, and CR-150 receivers).

\_\_\_\_\_ **Panel Option # 1** – Duplex pump control panel, NEMA \_\_\_\_\_, with rotary hand-auto switch, pump alternator and lead-lag feature to bring on both pumps when there is a low water condition. Includes rotary on-off switches, 1" indicating lights and contactors of sufficient rating for each single-phase fractional horsepower pumps. Supply power disconnect(s) and overload protection by others (single-phase fractional horsepower motors have built-in thermal overload protection). Wiring to pumps shall be furnished in liquid tight conduit.

\_\_\_\_\_ **Panel Option # 2** – Same as above except with hand-off-auto switch and without lead-lag feature. Pumps will automatically alternate each time there is a call for feedwater as above, but the second pump will not come on when there is a low water condition.

\_\_\_\_\_ **Panel Option # 3** – Same as Panel Option 1, except where 3 phase pump motors require IEC type motor starters with overload protection in lieu of single phase motor contactors. Specify voltage \_\_\_\_\_ phase \_\_\_\_\_ and cycles \_\_\_\_\_.

\_\_\_\_\_ **Panel Option # 4** – Same as Panel Option 2, except where 3 phase pump motors require IEC type motor starters with overload protection in lieu of single phase motor contactors. Specify voltage \_\_\_\_\_ phase \_\_\_\_\_ and cycles \_\_\_\_\_.

\_\_\_\_\_ **Panel Option # 5** – For triplex systems feeding two boilers with dedicated pumps and a third standby pump. Features NEMA 1 panel with rotary auto-off-pump #3 switches that allow pump #3 to operate in lieu of pump #1 or #2. With 1" indicating lights and contactors for each single-phase fractional horsepower pump.

\_\_\_\_\_ **Panel Option # 6** – Same as Panel Option #5, except where 3 phase pump motors require IEC type motor starters with overload protection in lieu of single phase motor contactors. Specify voltage \_\_\_\_\_ phase \_\_\_\_\_ and cycles \_\_\_\_\_.

\_\_\_\_\_ **Panel Option # 7** – Simplex pump control panel, NEMA \_\_\_\_\_ with combination disconnect switch, circuit breaker, IEC starter with overload relay and Hand-Off-Auto switch with light. (Specify Motor Horsepower \_\_\_\_\_ Voltage \_\_\_\_\_ Phase \_\_\_\_\_ and Cycles \_\_\_\_\_). Specify NEMA Rating \_\_\_\_\_ (NEMA 1 for indoor or NEMA 3R for outdoor)

\_\_\_\_\_ Low water alarm \_\_\_\_\_ with indicating light \_\_\_\_\_ with silencing switch \_\_\_\_\_ with dry contacts for remote signal.

\_\_\_\_\_ High water alarm \_\_\_\_\_ with indicating light \_\_\_\_\_ with silencing switch \_\_\_\_\_ with dry contacts for remote signal.

\_\_\_\_\_ NEMA 4 panel in lieu of NEMA 1.

\_\_\_\_\_ Open drip proof pump motors covered for wet or outdoor location.

\_\_\_\_\_ TEFC pump motors in lieu of O.D.P.

\_\_\_\_\_ Sparge tube with automatic steam control valve to regulate feedwater temperature.

\_\_\_\_\_ Receiver shall be insulated with 1" thick fiberglass and covered with metal jacket.

\_\_\_\_\_ Metal Dome cover over CR-50, CR-75, CR-100, or CR-150 for outdoor rain protection.

\_\_\_\_\_ Other: \_\_\_\_\_

---

---

---

---

---

---

---

---

System is for a Rite Model \_\_\_\_\_ S/N \_\_\_\_\_ A# \_\_\_\_\_ Scheduled ship date \_\_\_\_\_ Other \_\_\_\_\_

Representative \_\_\_\_\_ Job Name \_\_\_\_\_ Ship to: \_\_\_\_\_

Requested Ship Date \_\_\_\_\_ Purchase Order # \_\_\_\_\_

Price: \_\_\_\_\_ Freight \_\_\_\_\_