

# CONDENSATE STORAGE TANKS



Boiler Book  
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The Cleaver-Brooks Condensate Storage Tank is an atmospheric surge tank designed to accommodate low-pressure low-temperature returns. By collecting condensate for re-use in the boiler, the CST can reduce dependence on cold, untreated raw water to replace boiler system losses.

The CST receives returning condensate and is supplemented by raw make-up water to maintain the desired operating level.

## **FEATURES AND BENEFITS**

### **All Pumps Deliver the Required Capacity at 210 °F:**

- Guaranteed pump performance.

### **All Pumps Have Mechanical Seals (Standard):**

- Reduces maintenance when compared to packing type seals.

### **Specifically Designed for Compatibility With Cleaver-Brooks Boilers:**

- Quick, accurate equipment selection.
- Single source responsibility.
- Proven performance.

### **Provides Additional Storage Time and Handles Volume-Swings in Condensate Return:**

- Feedwater tank collects intermittent condensate returns and supplies water at a relative constant volume.
- Minimizes problem from unpredictable condensate flow rates.

### **Boosts Condensate Return Pressure:**

- Acts as a collecting point for low pressure and gravity returns.
- Allows the introduction of returns to a high pressure vessel.

### **Accepts Gravity Returns:**

- Vessels are vented to atmosphere, providing no pressure resistance that would inhibit gravity return.

### **Internal Pump Suction Vortex Breakers:**

- Eliminates the problems of loss in NPSHA and cavitation associated with the creation of vortices within pump suction piping.

## PRODUCT OFFERING

Selection of a Condensate Storage Tank is based on boiler size, pump required flow, and water storage requirements. Contact your local Cleaver-Brooks authorized representative for detailed component sizing information.

When equipped with an automatic steam preheater, feedwater temperature can be maintained at 210 °F. At this higher temperature, oxygen and carbon dioxide are released, reducing corrosion problems in the boiler. Pre-heating is recommended if return condensate constitutes 50% or less of the feedwater required.

Cleaver-Brooks packaged CST systems include pumps, control panel with magnetic starters, and necessary switches. Systems are available in simplex, duplex, dual and triplex arrangements. Custom arrangements are also available. Accessories include high temperature diffuser tube, automatic preheater, make-up valves, electrolytic corrosion inhibitor, stainless steel tanks, galvanized tank, high & low water alarms, and Warrick probes.

The receiver should be sized for a capacity sufficient to allow feed water for a minimum of 10 to 15 minutes of boiler operation at rated horsepower. The run time is essential because of unpredictable surges of condensate returns. Since 0.069 gpm is the theoretical rate of evaporation per boiler horsepower, the maximum tank size should be approximately 0.069 boiler hp x 10 minutes.

The receivers are manufactured as a non-code tank for venting to atmosphere. As an option, Cleaver-Brooks offers receivers constructed for ASME Section VIII, Division 1 of the ASME Pressure Vessel Code. When an ASME Code receiver is required, contact your local Cleaver-Brooks authorized representative for additional factors to be considered in this application. Coded tanks supplied will normally be furnished unlined because of possible increased operating temperature limitations.

### Simplex Units

Simplex units include one pump set complete with TEFC motor coupled to a vertical multistage pump, one large receiver mounted on structural steel stand, make-up valve, gauge glass with shutoff valves, thermometer, and suction piping from receiver to pump with Y-type strainer and gate valve.

### Duplex Units

Duplex units are similar to simplex units, but with two pumps and one receiver. Magnetic starters (where required) are mounted in a NEMA I enclosure, with manual transfer switch for standby pump.

### Dual Unit

Dual units are similar to duplex units, except that receiver tank is sized for two boiler operation. Transfer switch is not required.

### Triplex Units

Triplex units are similar to Dual units but with three pumps and one receiver.

**Standard equipment:**

Surge tank  
 Thermometer  
 Gauge glass  
 Required tappings and manway

**Optional equipment :**

Water level controller with make-up valve  
 Three valve bypass and strainer  
 Suction shutoff valve  
 Suction strainer  
 Discharge check valve  
 Discharge shutoff valve  
 Discharge pressure gauge  
 Discharge manifold  
 High water alarm  
 Low water alarm  
 Low water pump cut off  
 Condensate diffuser tube  
 Control panel  
 Transfer pump and motor  
 Recirculation orifice  
 Insulation and lagging  
 Chemical feed quill  
 Stand  
 Packaging  
 Fully packaged, factory piped and wired  
 Magnesium anode  
 Half packaged, suitable for field erection with interconnecting piping  
 and wiring by others  
 Seismic construction

**Tank Sizes**

Model Number	Flooded Capacity (Gallons)
CST-45	45
CST-75	75
CST-100	100
CST-200	200
CST-270	270
CST-340	340
CST-500	500
CST-750	750
CST-1000	1000
CST-1200	1200
CST-1400	1400
CST-1800	1800
CST-2200	2200

