BOILER FEED SYSTEM PRODUCT GUIDE

Overview

Cleaver-Brooks boiler feed systems help maintain peak efficiency and prolong the life of boilers where investment in a deaerator cannot be justified. Consisting of one or more feed pumps and a corrosion resistant receiver tank, the system automatically supplements condensate with makeup water to replace system losses. Cold water is heated by mixing with hot condensate and pumped to the boiler on demand.

Information in this section addresses tank size and typical offering of Boiler Feed Systems.

- Pump Run Options
  - Continuous
  - Intermittent
- Pumps are equipped with mechanical seals as standard.
  - Tungsten Carbide seals are available at additional cost - Contact PWS Sales.
- Pumps are 304 SS fitted construction with cast iron base and pump head.
  - 316 SS construction on special request - Contact PWS Sales.
- Pump dead head pressure must exceed the boiler safety valve setting by 3%.
- All units are factory assembled and include pump and receiver combinations suitable for feedwater temperatures up to 210°F at sea level and are F.O.B. Richfield, WI.
- 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.

FEATURES AND BENEFITS

The following features and benefits apply to Cleaver-Brooks Boiler Feed system products.

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 cavitations associated with the creation of vortices within pump suction piping.

Standard Signature Series

Receiver Tank

- Horizontal, ¼ inch thick, welded carbon steel receiver with heads, mounted on structural steel stand, with the following trim.
  - Float switch and solenoid operated make-up water valve.
  - Gauge glass set with shut-off valves.
  - Includes taps for sample and chemical feed.
  - Thermometer.
  - Piping between tank and pump including valve, strainer, and flexible coupling.
  - NOTE: High temperature diffuser tube not included

Feed Pumps

- Pump sets are Grundfos only complete with steel base, coupling, coupling guard and TEFC motors. Pumps are equipped with mechanical seals as standard. All motors are new NEMA rated, standard voltages are as follows:
  - Single Phase - Contact PWS Sales Department.
  - Three Phase - 230/460/3/60
  - Other voltages - If 208 or 550 volt motors are requested, 200/3/60 or 575/3/60 will be furnished. All motors 3450 or 3525 RPM.
  - The boiler load column for pump selections is calculated for a single pump.

Control Panel

- All systems using three phase motors are supplied with a NEMA Type 1 Control Panel enclosure which include magnetic starters, H-O-A selector switches, external resets, stand-by selector switches where required (dual units do not require a stand-by selector switch), 115 volt holding coils and starter overload heaters.
  - NOTE:
    - Duplex and Triplex units have transfer switches ONLY.
  - All control panels are UL listed and labeled as standard.
  - All wiring between control panel, pumps and other electrical devices provided with the will be factory completed. Simplex units panel provided unmounted. If the system must be broken down for shipment some field terminations might be required.
  - C-B nameplate attached showing model and unit number.

Packaging

- All systems up to and including 100 gallon are shipped whole. Systems larger than 100 Gallon will be shipped broken down and match marked.
- All systems are painted Cleaver Brooks blue except the control panel, wiring conduits electric motors, pumps and tanks that are either galvanized or of stainless steel construction.

Start – Up

- Individual pump throttling valves must be installed to insure the required GPM stated in the charts is not exceeded. This must be checked at start-up.

Guide

Tab 1: Model

Boiler Feed System Models

- Example: IDT - CR2-20U (460/3/60)
  - "I" – Intermittent Run Pump Operation
  - "D" – Number of Pumps:
    - S – Simplex
    - D – Duplex
    - D – Dual
    - T – Triplex
  - "T" – Tank Size
    - P – 45 Ga.
    - R – 75 Ga.
    - S – 100 Ga.
    - T – 200 Ga.
    - V – 270 Ga.
    - W – 340 Ga.
    - X – 500 Ga.
    - Y – 750 Ga
    - Z – 1,000 Ga.
  - "CR2-20U" – Grundfos Pump/Motor Model
  - "(460/3/60)" – Current Characteristics

- Note:
  - All Systems 100 gallon and smaller with Maximum 2 Pumps are designated **Signature** Series.
  - All Systems 200 gallon through 340 gallon with 3 pumps or less are designated **Signature** Series.
  - All other Systems are considered **Custom**.
    - Custom Systems generally add an additional 2 weeks to the lead-time.

Intermittent / Simplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
ISP	45	18 x 43	625
ISR	75	24 X 40	675
ISS	100	24 X 55	750
IST	200	30 X 67	1125
ISV	270	36 X 63	1175
ISW	340	36 X 78	1350
ISX	500	42 X 84	1800
ISY	750	48 X 96	2050

Weights do not include pump weight.

Intermittent / Duplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
IDP	45	18 x 43	675
IDR	75	24 X 40	725
IDS	100	24 X 55	775
IDT	200	30 X 67	1250
IDV	270	36 X 63	1325
IDW	340	36 X 78	1450
IDX	500	42 X 84	1875
IDY	750	48 X 96	2125

Weights do not include pump weight.

Intermittent / Dual

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
IUP	45	18 x 43	675
IUR	75	24 x 40	725
IUS	100	24 X 55	775
IUT	200	24 X 55	1250
IUV	270	36 X 63	1325
IUW	340	36 X 78	1450
IUX	500	42 X 84	1875
IUY	750	48 x 96	2125
IUZ	1000	48 x 125	2475

Weights do not include pump weight.

Intermittent / Triplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
ITT	200	30 X 67	1375
ITV	270	36 X 63	1500
ITW	340	36 X 78	1625
ITX	500	42 X 84	1950
ITY	750	42 X 84	2275
ITZ	1000	48 X 125	2625

Weights do not include pump weight.

Continuous / Simplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
CSP	45	18 x 43	675
CSR	75	24 X 40	725
CSS	100	24 X 55	800
CST	200	30 X 67	1175
CSV	270	36 X 63	1225
CSW	340	36 X 78	1400
CSX	500	42 X 84	1850
CSY	750	48 X 96	2100

Weights do not include pump weight.

Continuous / Duplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
CDP	45	18 x 43	725
CDR	75	24 X 40	775
CDS	100	24 X 55	825
CDT	200	30 X 67	1300
CDV	270	36 X 63	1375
CDW	340	36 X 78	1500
CDX	500	42 X 84	1925
CDY	750	48 X 96	2175

Weights do not include pump weight.

Continuous / Dual

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
CUP	45	18 x 43	725
CUR	75	24 X 40	775
CUS	100	24 X 55	825
CUT	200	30 X 67	1300
CUV	270	36 X 63	1375
CUW	340	36 X 78	1500
CUX	500	42 X 84	1925
CUY	750	48 x 96	2175
CUZ	1000	48 x 125	2525

Weights do not include pump weight.

Continuous / Triplex

Model	Tank Capacity (gal)	Tank Dimensions (inches)	Approx Shipping Weight. (lbs.)
CTT	200	30 X 67	1425
CTV	270	36 X 63	1550
CTW	340	36 X 78	1675
CTX	500	42 X 84	2000
CTY	750	48 X 96	2325
CTZ	1000	48 X 125	2675

Weights do not include pump weight.

Boiler Feed Components

- Tank
  - Required if select Pump and Stand
  - For Tank Only
    - Select Tank Only
    - De-Select Trim, Stand, and Pump
- Trim (Controls)
- Stand
  - Required if Tank and Pump selected
- Pump
  - For Pumpset Only
    - Select Pump Only.
    - De-Select Tank, Trim, and Stand

Tank Design

- Required if Tank is selected
  - Options
    - Cleaver-Brooks
    - Aurora
  - Available for tank only applications

Replacement Tank

- Required for Tank Only Application
- Specify whether or not a replacement tank application

Tank Unit Number

- Required for Replacement Tank Applications

Number of Boilers

- Standard: Maximum of 3

Boiler Horsepower

- Standard: Maximum of 800HP per pump

Boiler Operating Pressure

- Minimum: 6 psi
- Maximum: 200 psi

Boiler Safety Valve Setting

- Minimum
  - Operating Pressure Less than or Equal to 12
    - Operating Pressure + 3
  - Operating Pressure equal to 13
    - 15
  - Operating Pressure Less than or Equal to 135 and greater than 13
    - Operating Pressure + 15
  - Operating Pressure Greater than 135
    - Operating Pressure x 1.11

Mode of Operation

- Options
  - Intermittent (On/Off)
  - Continuous

Additional Pressure Drop

- 15psi pressure allowance included within the pump selection for an economizer
- Only an option:
  - Continuous Mode of Operation
  - Operating Pressure is between 30 and 185

Pumpset Configuration

- Simplex
  - Available if
    - Number of Boilers = 1
  - For 1-boiler operation, consist of:
    - (1) packaged pump: (1) TEFC motor coupled to a vertical multistage pump on steel channel base with flexible coupling and coupling guard between pump and motor;
    - (1) steel receiver with extra suction and preheat tapping
    - Float switch and solenoid make-up valve
    - Gauge glass with shutoff valves and thermometer
    - Suction piping from receiver to pump is complete with isolation valve, Y-type strainer, flexible hose, gate valve, and expansion type flexible coupling.
- Duplex
  - Available if
    - Number of Boilers = 1
    - Number of Boilers = 2 and Backup Boiler = Yes
  - For 1- boiler operation with stand-by,
    - Similar to Simplex with (2) pumps;
    - (1) steel receiver
    - NEMA 1 control panel
    - Magentic starters (where required) mounted in a NEMA I Enclosure
    - H-O-A switch and manual transfer switch for standby pump.
- Dual
  - Available if
    - Number of Boilers = 2
    - Number of Boilers = 3 and Backup Boiler = Yes
  - For 2-boiler operation,
    - Similar to duplex with large receiver size for two boiler operation - individually controlled.
    - Two H-O-A switched (one for each starter).
    - Transfer switch not required.

- Triplex
  - Available if
    - Number of Boilers = 2 or 3
  - For 2-boiler operation with stand-by,
    - Similar to dual units except 3 pumps are furnished (third pump is stand-by).
    - Two selector switches are furnished to allow pumps 1 & 2, 1 & 3, or 2 & 3 to operate.
      - (If 3-boiler operation is required, it must be specified and priced accordingly.)

Triplex Boiler Adder

- Line item included for 3 boiler / 3 pump applications

Increase Tank Size

- Substitute Larger Size Tank for Standard Tank Size
- Physical dimensions of the pump and motor prohibit substitutions of smaller receivers on packaged units in most cases

Original Tank Capacity	Increase Tank Capacity (Gal)	Add Additional Weight (Lbs)
45 Gal. Tank 18 X 43	75 100 200	45 195 350
75 Gal. Tank 24 X 40	100 200 270	150 305 330
100 Gal. Tank 24 X 55	200 270 340	155 180 215
200 Gal. Tank 30 X 67	270 340 500	25 60 315
270 Gal. Tank 36 X 63	340 500	25 290
340 Gal. Tank 36 X 78	500 750	255 705
500 Gal. Tank 42 X 84	750 1000	450 1000
750 Gal. Tank 48 X 96	1000	550

Storage Time Display

- Displays Final Tank Size and Actual Storage Time

Storage Time Error Display

- If Storage Time is less than 10 Mins a message will display the following
  - Actual Storage Time is less than 10 mins. A larger storage tank is required, please contact MKE PWS Sales.

Voltage

- 460/3/60
- 230/3/60
- 208/3/60
- 575/3/60
- 380-415/3/50

Pump Dead Head Pressure Display

- If Pump dead head pressure does not exceed the boiler safety valve setting by 3% the following is displayed:
  - Warning - NBIC Section I requires that the boiler feedpump must be able to produce a pressure equal to or greater than 3% above the highest boiler safety valve setting. The selected pump does not meet this requirement. This issue usually arises when the boiler operating pressure is significantly below the safety valve setting. Consider selecting a lower safety valve setting or over sizing the pump by entering a higher operating pressure.

Tab 2: Signature Series Options

Make Up Valve

- Square D
  - Standard - Default
  - Tank mounted internal float switch and solenoid valve

Tank Size (gal)	Solenoid Size
45 – 100	½ inch
200 – 270	¾ inch
340 – 500	1 inch
750 – 1000	1 ½ inch

- Warrick
- McD-M 25 External Tank Piped
- McD-M 21 Internal Tank Mounted

Alarm Package Type

- McD-M63
  - Not an option if the Warrick Make Up Valve is selected
- Warrick

Alarm Packages

- Includes: Alarm switch, alarm horn, silence push button, alarm light and two relays
- High Water Alarm
- Low Water Alarm
- Low Water Cutoff with Alarm

Low Discharge Pump Pressure Package

- Available for Continuous Operation

Air Gap Fitting

- Option

Chemical Feed Quill

- Tapping Standard on Tank

Magnesium Anode

- Tapping Standard on Tank

Pump Discharge Pressure Gauge (4-1/2")

- Siphon and Valve

Pump Suction Pressure Gauge (4-1/2")

- Siphon and Valve

3 Valve By Pass

- Sized based on required Make Up Valve By Pass Pipe Area
- Sizes
  - ¾"
  - 1"
  - 1-1/2"

High Temperature Diffuser Tube

- (Perforated) Schedule 40 SS pipe (not to exceed receiver length)
  - Size 2-1/2" x 37" lg (Use with 45 - 270 gal tanks)
  - Size 2 1/2" x 60" lg. (Use with 340 - 1000 gal tanks)

Additional Tapings

- Up to 5 additional tapings
  - If additional tapings are required utilize the special engineering tab
- Specify the Taping Size, Location, and function for each additional taping

Tab 3: Pressure Vessel

Tank Construction

- Carbon Steel
  - Standard – Default
- Galvanized
  - Hot dipped galvanized tank
- Stainless Steel (304SS)
  - Not an option if an Aurora Tank
  - Tank Constructed out of grade 304 stainless steel.
  - No manway required
  - Tank has an extended 5-year warranty at no additional cost.

Manhole

- 11" X 15" (limited to sizes 200 – 1000 gallon)

Insulation and Lagging

- Special Quotation is required
- Enter the Quotation Number, Description, and Pricing in the appropriate fields

ASME Construction Tank

- Special Quotation is required
- Enter the Quotation Number, Description, and Pricing in the appropriate fields
- Receiver tanks constructed to various ASME pressure (50#, 100#, 150#)

Seismic Calculations

- Special Quotation is required
- Enter the Quotation Number, Description, and Pricing in the appropriate fields
- Calculations
- Upgrade of Stand

Special Wiring and/or Motors

- Special Quotation is required
- Enter the Quotation Number, Description, and Pricing in the appropriate fields

Tab 4: Control Panel

Nema Enclosure

- Not Available if Trim or Pump is not selected
- Options
  - Nema 4
  - Nema 12

Main Power Disconnect

- Not available if
  - Main Circuit Breaker is selected
  - Pumps is not selected
- Options
  - Main Fused Disconnect (40 AMP)
    - Not available if
      - Voltage is 208/3/60 and Pump HP is greater than 11 HP
      - Voltage is 280/3/50 and Pump HP is greater than 20 HP
  - Main Unfused Disconnect (40 AMP)
    - Not available if
      - Voltage is 208/3/60 and Pump HP is greater than 11 HP
      - Voltage is 280/3/50 and Pump HP is greater than 20 HP
      - Pumpset Configuration is Simplex
  - Main Unfused Disconnect (80 AMP)
    - Not available if
      - Pumpset Configuration is Simplex

Pump Protection

- Not available if
  - Pumps or Trim is not selected
- Required if
  - Main Power Disconnect is Main Unfused Disconnect (40 AMP) or Main Unfused Disconnect (80 AMP) and Pumpset Configuration is Duplex
  - Main Power Disconnect is any selection and Pumpset Configuration is Dual or Triplex

- Options
  - Individual Pump Fused Disconnect (40 AMP)
    - Not available if
      - Voltage is 208/3/60 and Pump HP is greater than 11 HP
      - Voltage is 280/3/50 and Pump HP is greater than 20
  - Individual Pump Fused
    - Not available if
      - Main Power Disconnect if Main Fused Disconnect (40 AMP)
  - Pump Circuit Breaker (per Pump) with Interlock

Main Circuit Breaker with Interlock

- Not Available if
  - Pumps is not selected
  - Main Power Disconnect is selected
- Options
  - 3 Pole 380/460/575 V
  - 3 Pole 208/230 V

Fused Control Circuit Transformer including Pump Motor Fuses

- Always selected if Pump and Trim is selected

Single Point Connection

- Included if Main Power Disconnect or Main Circuit Breaker is selected

Fused Magnetic Starter

- Not available if
  - Pumps is not selected

Electric Alternator

- Available if
  - Pumps is selected
  - Pumpset Configuration is Duplex
  - Continuous operation is selected

Audible Alarm

- Options
  - Horn
  - Bell

Alarm Silence Pushbutton

- Available if Audible Alarm is selected

Additional Contacts

- Not available if
  - Trim is not selected
- Options
  - Remote Low Water Alarm
    - Available if Low Water Alarm Package is selected
  - Remote Low Water Cut-Off Alarm
    - Available if Low Water Cut-Off Alarm Package is selected
  - Remote High Water Alarm
    - Available if High Water Alarm Package is selected
  - Pump Running Status (Per Pump)

Additional Pilot Lights

- Not available if
  - Trim is not selected
- Options
  - Power On Light
  - Pump Run Light (Per Pump)

Push To Test Pilot Light

- Available if Additional Pilot Light Option is selected

Additional 3 Pole Relay

- Not available if
  - Trim is not selected
- Options
  - Chemical Feed
  - Pump (Per Pump)
  - Remote Alarm

Hour Meter

- Not available if
  - Pump is not selected

Tab 5: Preheating Equipment

Preheating Equipment

- All standard tanks are supplied with extra openings for preheating equipment.
- Preheating systems are provided with thermostatically controlled steam pressure regulators, Sarco or equal connected to a perforated tube installed in tank by means of special bushing.
- Feed systems with preheat also include a sentinel relief valve installed on the tank.

Internal Steam Heater

- Not Available
  - Tank is not selected
  - Evaporation Rate is greater than 192.8
- Options
  - Low Pressure (5-15 psig)
    - Available if Evaporation Rate is less than 102
    - For low pressure systems (5 – 15 psi steam)
    - Operation on steam supply pressures less than 5 psig – Consult Sales
    - Thermostatic Temperature Regulating Valve without pressure reducing attachment
    - Following equipment is furnished:
      1. Perforated heater tube with special bushing.
      2. Temperature regulating valve.
      3. Strainer for temperature regulating valve.
      4. Pressure gauge.
      5. Sentinel Relief valve in tank.

Model Number	Heating Rate (GPM)			Size of Steam Control Valve & Strainer (Inches)	Min Steam Supply Line (Inches)
	50 deg. Temp Rise	100 deg. Temp Rise	150 deg. Temp Rise		
E2T14 - 1"	9.6	4.8	3.2	1"	1.25"
E2T14 - 1.5"	14.4	7.2	4.8	1.5"	2
E2T14 - 2"	25.5	12.7	8.5	2"	2.25"
E2T14 - 2.5"	39.6	19.2	12.8	2.5"	3"
E2T14 - 2.5"	51	25.5	17	2.5"	3"
E2T14 - 2.5"	72	36.2	24	2.5"	3"
E2T14 - 3"	102	51	34	3" flg	4"

- High Pressure (30-250 psig)
  - Not Applicable for Steam Pressures over 250 psi
  - Thermostatic Temperature Regulating Valve without pressure reducing attachment
  - Following equipment is furnished:
    1. Perforated heater tube with special bushing.
    2. Temperature regulating valve.
    3. Strainer for temperature regulating valve.
    4. Pressure gauge.
    5. Sentinel Relief valve in tank.

Model Number	Heating Rate (GPM)			Size of Steam Control Valve & Strainer (Inches)	Min Steam Supply Line (Inches)	Min Steam Supply Pressure	Max Steam Supply Pressure
	50 deg. Temp Rise	100 deg. Temp Rise	150 deg. Temp Rise				
ET134 1	19.3	9.6	6.4	1	1.25	30	50
ET134 .75				3/4	1	50	100
ET134 .5				1/2	3/4	100	125
ET134 .5				1/2	3/4	125	150
ET134 .5				1/2	3/4	150	200
ET134 .5				1/2	3/4	200	250

Model Number	Heating Rate (GPM)			Size of Steam Control Valve & Strainer (Inches)	Min Steam Supply Line (Inches)	Min Steam Supply Pressure	Max Steam Supply Pressure
	50 deg. Temp Rise	100 deg. Temp Rise	150 deg. Temp Rise				
ET134 1.25	28.8	14.4	9.6	1.25	1.5	30	50
ET134 1				1	1.25	50	100
ET134 .75				3/4	1	100	125
ET134 .75				3/4	1	125	150
ET134 .5				1/2	3/4	150	200
ET134 .5				1/2	3/4	200	250
ET134 1.5	48.2	24	16	1.5	2	30	50
ET134 1.25				1.25	1.5	50	100
ET134 1				1	1.25	100	125
ET134 .75				3/4	1	125	150
ET134 .75				3/4	1	150	200
ET134 .75				3/4	1	200	250
ET134 2	72	36	24	2	2.5	30	50
ET134 1.5				1.5	2	50	100
ET134 1.25				1.25	1.5	100	125
ET134 1				1	1.25	125	150
ET134 1				1	1.25	150	200
ET134 .75				3/4	1	200	250
ET134 2.5	96.4	48.2	32	2.5	3	30	50
ET134 2				2	2.5	50	100
ET134 1.2				1.25	1.5	100	125
ET134 1.2				1.25	1.5	125	150
ET134 1				1	1.25	150	200
ET134 1				1	1.25	200	250
ET134 3	144	72	48	3	4	30	50
ET134 2.5				2.5	3	50	100
ET134 1.5				1.5	2	100	125
ET134 1.5				1.5	2	125	150
ET134 1.2				1.25	1.5	150	200
ET134 1.2				1.25	1.5	200	250
ET134 4	192.8	96.4	64	4	4	30	50
ET134 2.5				2.5	3	50	100
ET134 2				2	2.5	100	125
ET134 2				2	2.5	125	150
ET134 1.5				1.5	2	150	200
ET134 1.2				1.25	1.5	200	250

Enter Steam Pressure

- Minimum
  - Low Pressure: 5 psi
  - High Pressure: 30 psi
- Maximum
  - Low Pressure: 15 psi
  - High Pressure: 250 psi

Requested Temperature Rise

- 50° F
- 100° F
- 150° F

Heating Rate

- Determined by Low or High Pressure, Entered Steam Pressure, and Requested Temperature Rise

Internal Steam Heater Model

- Selection based on Low or High Pressure, Entered Steam Pressure, Heating Rate, and Requested Temperature Rise

Tab 6: Special Engineering

Special Quotations

- PWS List
- PWS Net

Additional Startup

- Optional

Ship Inland Freight

- Canada
- Thomasville

BOILER FEED SYSTEMS
SAMPLE SPECIFICATIONS

PART 1 GENERAL

1.1 GENERAL

A. The following sample specifications are provided by Cleaver-Brooks to assist you in specifying your customer's specific needs and application

B. Boiler Feed System shall be Cleaver-Brooks Model _____ (Specify simplex, duplex, dual, or triplex) packaged boiler system suitable for _____gpm, at a discharge pressure of _____psig. (Refer to Table H6-2, Table H6-3, and Table H6-4.)

PART 2 PRODUCTS

SYSTEM COMPONENTS

A. The unit shall consist of the following components:

1. One (substitute two for duplex or dual; three for triplex) stainless steel cast iron fitted pump(s) certified by Cleaver-Brooks for a minimum of _____gpm or 212°F water at _____psig. The pump(s) shall be guaranteed for one year against defects in workmanship and material. The pump(s) shall be equipped with mechanical seals for temperatures up to 225°F.
2. One non-code welded receiver made of structural grade steel.

   The tank shall be furnished with integral supports and connections for inlet, outlet drain, makeup valve, thermometer, and gauge glass.
3. Tank size shall be _____inches diameter with _____gallon capacity.
4. One fresh water makeup valve consisting of a float switch and solenoid valve suitable for tight shutoff against 100 psig inlet pressure.
5. Piping between the receiver and the pump shall consist of one (substitute two for duplex or dual; three for triplex) section(s) containing a gate valve(s), one flexible hose(s) and Y-type strainer(s) to ensure minimum pressure drop between receiver and pump.