Bell & Gossett
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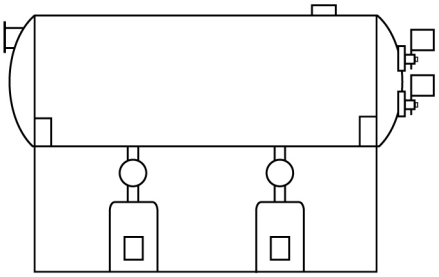
SPECIFICATIONS
150C

Domestic® Pump Series CMED™ Boiler Feed Units

Guide Specification Index

Domestic Pump Series CMED Elevated Steel Receiver with Dished Heads . . . . . Pages 2-3

For systems with high temperature returns (212°F [100°C] at a sea level), up to 260 gpm (984 L/M) discharge pressures to 175 psi (1208kPa).



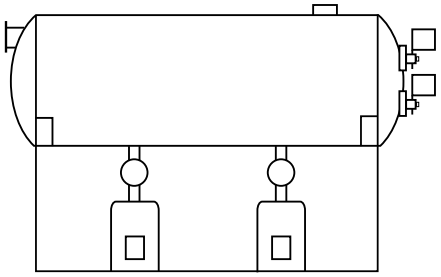
Description of Standard and Optional Equipment and Controls . . . . . Page 4

Boiler Feed Control Panel Specification . . . . . See Catalog Section 190

Guide Specification

Domestic® Series CMED™ Boiler Feed Unit

NOTE: Optional Accessories are Underlined



Part 1 – GENERAL

1.1 SECTION INCLUDES
- A. Unit shall be a Domestic Series CMED™ boiler feed pumping unit as manufactured by Bell & Gossett.
  1. Steel receiver
  2. Boiler feed pumps as scheduled
  3. Low water cutoff
  4. Water make up assembly
  5. Pump Control Panel

1.2 REFERENCES
- A. HI – Hydraulic Institute
- B. NEMA – National Electric Manufacturers Association
- C. UL – Underwriters' Laboratories
- D. CSA – Canadian Standards Association
- E. ISO – International Standards Organization
- F. IEC – International Electrotechnical Commission

1.3 SUBMITTALS
- A. Submittals shall include the following:
  1. Submittal data cover sheet
  2. Unit description sheet
  3. Dimensional print
  4. Sales bulletin
  5. Piping diagram
  6. Wiring diagram
  7. Instruction manual

1.4 QUALITY ASSURANCE
- A. The manufacturer shall have a minimum of 20 years experience in the design and construction of condensate return equipment.
- B. The manufacturer shall be fully certified by the International Standards Organization per ISO 9001. Proof of this certification shall be furnished at the time of submittal.
- C. The manufacturer shall carry a minimum product liability insurance of $5,000,000.00 per occurrence.
- D. All control cabinet components shall be U.L. listed or recognized. The control panel assembly shall be listed by Underwriters' Laboratories, Inc.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS
- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
  1. Bell & Gossett Domestic™ CMED™
  2. Pre-approved equal

2.2 COMPONENTS
- A. BOILER FEED RECEIVER
  1. Receiver shall be horizontal welded steel construction.
  2. Receiver heads shall be convex (dished).
  3. Head and shell thickness shall be a minimum of $^{3}/_{16}$" (5mm) as indicated on the drawings.
  4. Receiver shall have a net working capacity of not less than that shown on the drawings.
  5. Receiver shall have an inlet, vent and an overflow opening to provide means of secondary venting.
  6. Receiver shall be elevated 30" (762mm) on a fabricated steel base.
  7. Receiver shall be sized for a minimum 10 minutes net storage.
  8. Receiver shall be furnished with:
     a. (1) Inlet cascade baffle
     b. (1) Dial thermometer
     c. (1) Water level gauge glass.
     d. (1) Low water cutoff switch
     e. (1) Suction isolation valve shall be installed between each pump suction and receiver to permit servicing of the pumps without draining the receiver.
     f. (2) Lifting eye bolts
     g. Companion Flanges
     h. (1) Cast iron inlet strainer with vertical self-cleaning bronze screen and large dirt pocket shall be mounted on the receiver. The screen shall be easily removable for cleaning, requiring no additional floor space for servicing.
- B. WATER PUMP
  1. The water pump shall be two-staged, centrifugal design, bronze fitted with enclosed cast bronze centrifugal impeller, permanently aligned and flanged mounted for vertical operation.
  2. Capacities and electrical characteristics for the pump shall be scheduled on the drawings.
  3. Each pump shall be sized for 2 times the boiler evaporation rate.
  4. Each pump shall be close-coupled to a 3500 rpm, vertical, drip-proof motor and shall deliver its full capacity with condensate temperatures up to 210°F (99°C) at sea level, at 2 ft. NPSH (net positive suction head).
  5. Carbon/ceramic mechanical shaft seal shall be rated for 250°F (121°C).
  6. Each pump shall include:
     a. Axial flow first-stage dynamically balanced cast bronze impeller
     b. Bronze straightening vanes
     c. Renewable bronze case ring
     d. Stainless steel shaft
     e. Discharge gauge port tapping
     f. Drain tapping
- C. THE WATER MAKE UP ASSEMBLY SHALL BE INSTALLED ON THE RECEIVER OF CAPACITY EQUAL TO ONE (1) BOILER FEED PUMP.
  1. The make up assembly shall consist of:
     a. Level control switch
     b. Electric solenoid valve
        1.) The valve shall be packless, piston pilot operated type with cushioned closing feature and epoxy resin molded water proof coil.
        2.) The valve shall be equipped with a strainer, and a manual bypass shall be provided around the valve.
- D. CONTROL PANEL
  1. The control panel shall be a mounted and wired NEMA 2 control cabinet with drip lip and piano hinged door enclosing the following:
     a. (1) Combination magnetic contactor with adjustable thermal overloads with fused disconnect and cover interlock for each pump
     b. (1) "Auto-Off-Hand" selector switch for each pump
     c. (1) Numbered terminal strip
     d. (1) Fused control circuit transformer when the motor voltage exceeds 230 Volts
     e. (1) Pump running pilot light for each pump

PART 3 - EXECUTION

3.1 INSTALLATION
- A. Install equipment in accordance with manufacturer's instructions.
- B. Power wiring, as required, shall be the responsibility of the electrical contractor. All wiring shall be performed per manufacturer's instructions and applicable state, federal, and local codes.
- C. All factory wiring shall be numbered for easy identification and the numbers shall coincide with those shown on the wiring diagram.
- D. All interconnecting wiring between the pump controls and control panel shall be enclosed in liquid tight flexible conduit.
- E. The unit shall be factory tested as a complete unit and the unit manufacturer shall furnish elementary and connection wiring diagrams, piping diagrams, installation and operation instructions.
- F. The unit manufacturer shall furnish, mount on the unit and wire a NEMA 2 control cabinet with drip lip and piano hinged door.
- G. The unit shall be shipped completely assembled
- H. Certified test report shall be provided by the factory.
- I. Unit shall be a Domestic Series CMED™ as manufactured by Bell & Gossett, Morton Grove, IL.

Domestic® Series CMED™ Boiler Feed Unit

STANDARD UNIT FEATURES:

- Steel Receiver, minimum 3/16" thickness with dished heads and inlet cascade baffle. Receiver sized for 10 minute net storage.
- Elevated on a structural steel base with suction piping and isolation valves.
- Gauge Glass with shutoff valve
- Dial Thermometer
- Low level cut-off float switch
- Series B35™ 2' NPSH pumps with open drip proof motors. Pump capacity sized for 2 times the boiler evaporation rate.
- Float switch, 3/4" or 1" solenoid valve and "Y" strainer water make-up assembly

10 SOLID REASONS TO CHOOSE DOMESTIC®:

- Fabricated Steel Receiver elevated on a structural steel stand
- Quiet ball bearing type motor
- Bronze-fitted 2' NPSH centrifugal pump
- Mechanical seal construction
- Stainless steel pump shaft
- Renewable bronze pump wearing ring
- Factory wired and tested before shipment
- Package construction for compact installation
- Engineered reliability
- 100 years of experience

OPTIONAL EQUIPMENT AS SPECIFIED:

- Centriflo® centrifugal pumps; 1750 or 3500 RPM
- Inlet Basket Strainer
- Manhole or Handhole
- NEMA 2 – U.L. Listed Control Panel mounted and wired with liquid tight flexible conduit
- TEFC or Explosion Proof motors and controls
- Manual bypass assembly around solenoid water make-up valve with or without air gap fitting
- Hot Dip Galvanizing or Expoy Lining
- Discharge Pressure Gauges
- High or low water alarms and required controls
- Electrolytic corrosion inhibitor
- Submerged steam distribution tube for boiler water preheating

Domestic® Series CMED™ Boiler Feed Units

Description of Standard and Optional Equipment and Controls

Receiver – Fabricated of steel, with dished and flanged heads; all necessary openings and tappings are provided; manholes and handholes are available for service convenience. Single units will be furnished with provision for second (future) pump, with second opening blocked off.

On Series CMED units the receiver is elevated on a rugged structural steel base; suction piping to pumps with gate valve is standard; hot dip galvanizing is available as an option, as are manholes and handholes. An electrolytic corrosion inhibitor can be furnished as an additional option. Submerged steam distribution tube can be furnished as an option to enhance overall system efficiency.

Boiler Feed Pump Assemblies – Series B35 2-stage Centrifugal pumps are standard; pumps are designed and rated for 2' NPSH; bronze axial flow propeller as first stage, bronze straightening vanes, enclosed bronze centrifugal impeller as second stage. Close-coupled design; stainless steel shaft, mechanical seals suitable for 250°F (121.1°C) operation, bronze-fitted construction; standard on all Series CMHD boiler feed units.

Optional Boiler Feed Pump Assemblies – Lower-cost Centriflo single stage pumps are available on CMHD units. Centriflo pumps are available in 1750 rpm or 3500 rpm but are not rated for 2' net positive suction head. Please refer to catalog section 410 on Centriflo centrifugal pumps.

For higher discharge pressures (100 psig [690 kPa] and up), "Domestic" Series DB 2' NPSH pumps represent a great improvement over regenerative turbine pumps, especially in terms of longevity. Please refer to catalog section 150 for applications with discharge pressures above 100 psig (690 kPa).

Electric Motors – Drip-proof, ball bearing motors are standard. Standard voltages are: Three phase – 208-230/460 V. Single phase – 115/230 V. Single phase motors 2 HP and smaller have built-in overload protection.

Combination Magnetic Starters – are available with fusible disconnect switches or circuit breakers. Safety cover interlocking switches are furnished with combination starters. Enclosures are available to comply with JIC specifications. NEMA 2 enclosures are standard.

Magnetic Starters – automatic across-the-line type are furnished. Manual reset over-loads are standard equipment … for the protection of all windings of 3 phase motors against open circuit and/or unbalanced conditions.

A starter is capable of interrupting ten times motor full load current, but short circuit currents may be many times greater. Fuses or a circuit breaker must be installed ahead of the starter to clear any such faults that may occur to protect the line wiring.

Selector Switches – can be furnished with "Auto-Off-Hand" positions for all single units and duplex pumps except when "Lead-Lag" controls are supplied. Selector switches with "Off-Hand-Lead-Lag" positions are furnished with "Lead-Lag" controls.

Control power switching relay – should be supplied in Duplex or Triplex units when individual pump disconnect switches are specified and a control power transformer is required. This relay is recommended in order to maintain control power in the event pump #1's disconnect switch is turned off or pump #1 fails. In this event the control power will be automatically supplied by pump #2.

Electric Alternator – for duplex units. This control consists of an automatic electrical sequence relay used in conjunction with 2 magnetic starters and 2 selector switches. When magnetic starters and selector switches are furnished, the alternator is installed in "Consolitrol" control cabinet. This control provides for (1), automatic transfer of operating sequence after each cycle (2), simultaneous operations of both pumps under peak load conditions and (3), automatic operations of the inactive or lag pump if the lead pump or its control fails*.

Automatic Make-up Assembly – Standard make-up assembly consists of a float switch-operated solenoid valve, sized to equal the capacity, in gpm, of one boiler feed pump, at the available water supply pressure, as tabulated below:

Approximate solenoid valve capacity in gpm for valve sizes at various supply pressures.

Valve Size	Water Supply Pressure, psig (kPa)						
	25 (172)	30 (207)	40 (276)	50 (345)	60 (414)	75 (518)	100 (690)
½" (13mm)	15 (103)	17 (117)	19 (131)	22 (152)	23 (159)	27 (186)	30 (207)
¾" (19mm)	33 (228)	37 (255)	42 (290)	47 (325)	50 (345)	58 (400)	67 (463)
1" (25mm)	60 (414)	67 (463)	72 (497)	80 (552)	85 (587)	95 (636)	10 (750)
1¼" (32mm)	90 (621)	98 (677)	111 (766)	123 (849)	133 (918)	150 (1036)	175 (1208)
1½" (38mm)	117 (888)	127 (822)	142 (980)	156 (1079)	167 (1153)	200 (1381)	233 (1609)
2" (51mm)	200 (1381)	217 (1498)	250 (1726)	266 (1837)	300 (2071)	333 (2299)	400 (2762)

Accessories – The water level gauge, dial thermometer, and low water cut-off switch are heavy-duty industrial items of reputable manufacture. The low water cut-off switch protects the boiler feed pumps against running dry, should the make-up supply fail.

Boiler Level Controls – refer to catalog Section 190 Boiler Feed piping & control. Indicate piping arrangement desired in specification and on purchase order. (Automatic stand-by protection on second pump requires a 2 level pump control independent of boiler low water cut off and alarms).

Control Circuit Transformers – are available. They are required for all JIC specifications and voltages exceeding 230 volts.

Inlet Strainer – cast iron, has vertical self-cleaning screen with large dirt pocket. The screen is easily removable for cleaning or replacement, requiring no additional floor space for servicing.

***NOTE** that a 2 level pump control on the boiler is required for automatic standby pump operation.

xylem
Let's Solve Water

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