



# Domestic® Pump Series CS™ Condensate Units with Steel Receivers

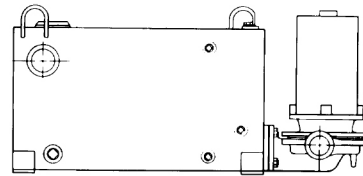
## Guide Specification Index

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### **Domestic Pump Series CS**

#### **Simplex Unit** ..... Pages 2-5

Float switch-operated; for temperatures up to 200°F.  
Discharge pressures to 90 psi. Capacities to 150,000  
sq. ft. EDR.

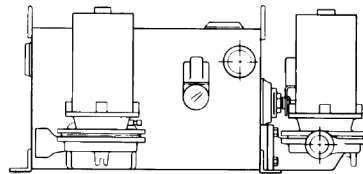


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### **Domestic Pump Series CS**

#### **Duplex Unit** ..... Pages 2-5

Float switch-operated; for temperatures up to 200°F.  
Capacities to 150,000 sq. ft. EDR and discharge pres-  
sures to 90 psi.



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### **Description of Standard and Optional Equipment and Controls** ..... Page 6

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## **PART 1 GENERAL**

### **1.01 SECTION INCLUDES**

- A. Unit shall be a Domestic® Simplex or Duplex Unit, Series CS, as manufactured by Bell & Gossett.
- B. Furnish and install an extended life pump with a capacity as indicated in the plans.

### **1.02 RELATED SECTIONS**

- A. Section 23 22 00 - Steam and Condensate Piping and Pumps
- B. Section 23 22 23 - Steam Condensate Pumps
- C. Section 23 22 23.13 - Electric Driven Condensate Pumps.

### **1.03 REFERENCES**

- A. HI - Hydraulic Institute.
- B. ANSI - American National Standards Institute.
- C. NEMA - National Electrical Manufacturers Association.
- D. UL - Underwriters Laboratories.
- E. ETL - Electrical Testing Laboratories.
- F. CSA - Canadian Standards Association.
- G. NEC - National Electric Codes.
- H. ISO - International Standards Organization.
- I. IEC - International Electrotechnical Commission.

### **1.04 SUBMITTALS**

- A. Submit data cover sheet.
- B. Unit description sheet.
- C. Dimensional print(s).
- D. Sales bulletin.
- E. Piping diagram(s).
- F. Wiring diagram(s).
- G. Installation, operation & maintenance manual.

### **1.05 QUALITY ASSURANCE**

- A. The manufacturer shall have a minimum of 30 years experience in the design and construction of condensate return equipment.
- B. The pump 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. The Unit shall be UL Listed by Underwriters' Laboratories, Inc as a complete condensate pumping package.
- E. All control cabinet components shall be UL Listed or UL Recognized. The control panel assembly shall be Listed by Underwriters Laboratories, Inc.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Subject to compliance with these specifications, the following manufacturers shall be acceptable:
  - 1. Bell & Gossett Domestic Simplex or Duplex, Series CS.
  - 2. Pre-approved equal.

### **2.02 COMPONENTS.**

- A. Condensate receiver
  - 1. The condensate receiver shall be of durable, minimum 10 gauge steel thickness and feature an inlet, vent, and overflow opening to provide a means of secondary venting.
  - 2. The receiver may have provisions for future addition of second pump.

- 3. The receiver shall be furnished with one, externally adjustable, NEMA 1, two-pole, float switch for pump control for simplex units. Duplex units with 23 gallon receivers or larger are provided with two float switches. Duplex units with 14 gallon receivers shall be provided with a single float control designed for two levels of control.

#### **B. Water pump**

##### **Items in parentheses denote optional items.**

- 1. Simplex units shall consist of one water pump. Duplex units shall consist of two water pumps. The water pump shall be a Series C35 or C17 bronze fitted centrifugal design pump, close-coupled to 3500 RPM or 1750 RPM motor, permanently aligned, and flange mounted for vertical operation.
- 2. Each pump shall include:
  - a. One cast Iron volute with:
    - 1) One discharge gauge port tapping.
    - 2) One drain tapping.
  - b. One dynamically balanced enclosed bronze centrifugal impeller.
  - c. One renewable bronze wearing ring.
  - d. One stainless steel shaft.
  - e. Carbon/ceramic/Buna N/stainless steel mechanical seal suitable for 250°F (121°C) operation.
- 3. Each pump shall be sized for two times the system return rate.
- 4. Each motor shall meet NEMA specifications with wetted portion stainless steel shaft, Open Drip Proof enclosure type (Totally Enclosed Fan-Cooled or Explosion Proof as required) and shall be the size, voltage, insulation class, duty rating and enclosure called for in the plans.
- 5. Capacities and electrical characteristics for the pump shall be scheduled on the drawings.
- C. Water level gauge glass for visual tank level inspection on 23 gallon tanks and larger.
- D. Lifting eye bolts for unit placement on 23 gallon tanks and larger.
- E. (A dial thermometer.)
- F. (Pump discharge pressure gauge.)
- G. (A bronze fitted butterfly isolation valve (up to 115 GPM (435 L/M) pump capacity) between the pump suction and receiver for easy isolation of the pump and motor assembly for servicing.)
- H. (Cast iron inlet basket strainer with vertical self-cleaning bronze screen and large dirt pocket for sediment collection. The screen shall be easily removable for cleaning, requiring no additional floor space for servicing. This option ships loose for field installation.)
- I. (A NEMA 4 or NEMA 7 float switch as required.) (A NEMA 1 automatic mechanical alternator to replace two float switches. This option is also available in NEMA 4 and 7 as required.)
- J. (Consolitrol® NEMA 2, UL electrical panel, mounted and wired with drip lip and piano hinged door is available with the following options:)
  - 1. (NEMA 4 and NEMA 12 electrical panel mounted and wired as required.)
  - 2. (NEMA 7 electrical control panel mounted and wired as required)

3. (Magnetic starters with thermal overload protection/ one per pump. The starter may be provided with a disconnect device, either:)
    - a. (Fusible disconnect with cover interlock or)
    - b. (Circuit breaker type with cover interlock.)
  4. (One fused control circuit transformer when the motor voltage exceeds 250V.)
  5. (Two types of selector switches:)
    - a. ("Auto-Off-Hand" selector switch / one per pump.)
    - b. ("Off-Hand-Lead-Lag" selector switch - Not applicable for Simplex Units.)
  6. (Pump running pilot light / one per pump.)
  7. ("Push to Test" button / one per pump.)
  8. (One numbered terminal strip.)
  9. (Auxiliary contact on the magnetic starter normally open for remote monitoring of pump operation / one per pump.)
  10. (A removable control component mounting plate.)
  11. (Elapsed time meter (UL) / one per pump.)
  12. (An audible alarm to indicate water level conditions.)
    - a. (Audible alarm is available with or without silencing relay.)
    - b. (A separate tank mounted level switch should be provided with audible alarm.)
    - c. (Alarm may be provided with alarm light to provide visual indication of alarm condition.)
  13. (One single point power connection for duplex units.)
  14. (One electrical alternator for duplex units with float switches.)
  15. (Control power switching relay shall allow the switch over of control power from one pump to the other in duplex units in the event of a power failure or pump failure.)
- K. (Liquid tight conduit suitable for NEMA 2, NEMA 4 & NEMA 12 applications. NEMA 7 unit shall be supplied with suitable rigid conduit.)

## PART 3 EXECUTION

### 3.01 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 and piping diagrams. Installation and operation instructions shall also be provided.
- 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. The factory shall provide a certified test report.
- I. Unit shall be a Domestic, Simplex or Duplex Unit, Series CS as manufactured by Bell & Gossett, Morton Grove, IL.

END OF SECTION

# Domestic® Series CS™ Simplex Condensate Unit

## STANDARD UNIT FEATURES

- Durable steel receiver minimum 10 gauge thickness. Receiver sized for 1 minute net storage. All receivers 23 gallons and larger have provision for second pump.
- Centrifugal Pumps with drip-proof motor. Pump capacity sized for 2 times the system return rate.
- Float switch, double pole and externally adjustable. Seamless float and stainless steel rod.
- Lifting eyes.

## OPTIONAL EQUIPMENT AS SPECIFIED

- Water level gauge with shutoff valve
- Dial Thermometer
- Inlet Basket Strainer
- Discharge Pressure Gauge
- Suction Butterfly Valve
- NEMA 2- U.L. Listed Control Panel wall mounted or mounted and wired with liquid tight flexible conduit
- TEFC or Explosion-Proof motors and controls
- Hot Dip Galvanizing

## 9 SOLID REASONS TO CHOOSE DOMESTIC PUMP

- Economical steel receiver
- Quiet ball-bearing type motor
- Bronze-fitted centrifugal pump
- Mechanical Seal construction
- Stainless steel pump shaft
- Renewable bronze pump wearing ring
- Factory wired and tested before shipment
- Packaged construction for compact installation
- Engineered Reliability

# Domestic® Series CS™ Duplex Condensate Unit

## STANDARD UNIT FEATURES

- Durable steel receiver minimum 10 gauge thickness.  
Receiver sized for 1 minute net storage.
- Centrifugal Pump with drip-proof motors. Pump capacity sized for 2 times the system return rate.
- Float switches, double pole and externally adjustable.  
Seamless float and stainless steel rod.
- Lifting eyes.

## OPTIONAL EQUIPMENT AS SPECIFIED

- Water level gauge with shutoff valve
- Dial Thermometer
- Inlet Basket Strainer
- Discharge Pressure Gauges
- Suction Butterfly Valves
- NEMA 2- U.L. Listed Control Panel wall mounted  
or mounted and wired with liquid tight flexible conduit
- TEFC or Explosion-Proof motors and controls
- 2 types of Automatic Alternation; Mechanical or Electrical
- Hot Dip Galvanizing

## 9 SOLID REASONS TO CHOOSE DOMESTIC PUMP

- Economical steel receiver
- Quiet ball-bearing type motor
- Bronze-fitted centrifugal pump
- Mechanical Seal construction
- Stainless steel pump shaft
- Renewable bronze pump wearing ring
- Factory wired and tested before shipment
- Packaged construction for compact installation
- Engineered Reliability

# Domestic® Pump Series CS™ Units

## Description of Standard and Optional Equipment and Controls

**Receiver** - steel, minimum 10 gauge sized for 1 minute net storage with inlet, vent and overflow openings.

**Centriflo® Centrifugal Pumps** - permanently aligned, bronze fitted single stage, vertical design with enclosed bronze impellers, stainless steel shafts, and renewable bronze wearing ring. 250°F mechanical seals are furnished as standard for all sizes.

**Centriflo® Pumps** - are normally equipped with a seal cavity bleed line to provide seal lubrication and permit operation at a no flow shutoff condition minimizing the probability of premature seal failure.

**Magnetic Starters** - can be furnished in consolidated control cabinets (NEMA 2-U. L. listed cabinets are standard) to comply with NEMA or JIG specifications. Combination magnetic starters are available with fusible disconnect switches or circuit breakers. All disconnect devices are furnished with cover interlock.

Starters are provided with (3) manual reset overload relays as standard 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** - are furnished with "Auto-Off-Hand" positions for all single units or duplex pumps when automatic alternation is required (either mechanical or electrical).

Selector switches with "Off-Head-Lead-Lag" positions are furnished on duplex units which require manual sequence control.

**Electric Motors** - Drip-proof, ball bearing motors are standard. Standard voltages are: Three phase - 208-230/240 V. Single phase-115/230 V. Single phase motors, 2 H.P. and smaller have built-in overload protection.

**Special Motors** - Wound for other than standard voltages are available at extra cost. When open, drip-proof construction is not adequate, motors with totally enclosed or explosion-proof enclosures or special insulation can be furnished.

**Manual Sequence Control** - (Lead Lag), for duplex units, consists of 2 selector switches used in conjunction with 2 magnetic starters and 2 float switches. This control provides for (1), manual selection of the active pump (2), simultaneous operation of both pumps under abnormal load conditions and (3), automatic operation of the inactive or lag pump if the lead pump or its control fails.

**Automatic Mechanical Alternator** - consisting of 2 level, mechanical double pole alternating switches, operated by 1 float, can be furnished for duplex CS units only; in place of 2 float switches. This control (1), automatically alternates operation of the two pumps (2), provides simultaneous operation of both pumps to deliver double capacity under peak conditions and (3) automatically operate the second pump should the first pump fail.

**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 or servicing.

**Pressure Gauges** - Thermometers and other accessories are available.

**Float Switches** - heavy duty, 2 pole switches with seamless float and stainless steel rod.

**Companion Flanges** - are furnished as standard for pumps having a 2" or larger discharge. Pumps with 1 1/2" or smaller discharge sizes are fitted with screwed connections.

**Electric Alternator** - for duplex units. This control consists of an automatic electrical sequence relay used in conjunction with 2 magnetic starters, 2 float switches, and 2 selector switches. When magnetic starters and selector switches are furnished, the alternator is installed in "Consolitol" control cabinet.

If wired according to the recommendation, this control provides for automatic transfer of operating sequence after each cycle. Simultaneous operation of both pumps under peak load conditions and operation of the inactive or lag pump if the lead pump or its control fails, shall be provided by the standby float switch.

**Control Circuit Transformer** - is available and required for all JIG specifications and motor voltages exceeding 230 volts.

**Control Power Switching Relay** - should be supplied in Duplex unit, when a transformer is required, to allow the switchover of control power from pump #1 to pump #2 in the event of a failure or a no power condition of pump #1.

**Butterfly Isolation Valves** - between pump assemblies and receiver are available for pump capacities up to 115 gpm. They are highly recommended for duplex units to permit removing one pump assembly without shutting the system down. Valves feature bronze fitted construction for effective corrosion resistance.



Xylem Inc.  
8200 N. Austin Avenue  
Morton Grove, Illinois 60053  
Phone: (847) 966-3700  
Fax: (847) 965-8379  
[www.bellgossett.com](http://www.bellgossett.com)

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