

**SPECIFICATIONS** Domestic Pump VCD

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Division 23 – Heating, Ventilating and Air Conditioning (HVAC)

Section 23 20 00 – HVAC Piping and Pumps

**PART 1 GENERAL**

1.01 SECTION INCLUDES

# Unit shall be a Domestic® Series VCD4™, vacuum heating and condensate pumping unit as manufactured by Bell & Gossett, a Xylem Brand®.

# Furnish and install extended life pumps with capacities as

indicated in the plans.

* 1. RELATED SECTIONS
1. Section 23 22 00 - Steam and Condensate Piping and Pumps
2. Section 23 22 23 – Steam Condensate Pumps
3. Section 23 22 23.13 – Electric Driven Condensate Pumps.

1.03 REFERENCES

1. HI - Hydraulic Institute.
2. ANSI - American National Standards Institute.
3. NEMA - National Electrical Manufacturers Association.
4. UL - Underwriters Laboratories.
5. ETL - Electrical Testing Laboratories.
6. CSA - Canadian Standards Association.
7. NEC - National Electric Codes.
8. ISO - International Standards Organization.
9. IEC - International Electrotechnical Commission.

1.04 SUBMITTALS

1. Submit data cover sheet.
2. Unit description sheet.
3. Dimensional print(s).
4. Sales bulletin.
5. Piping diagram(s).
6. Wiring diagram(s).
7. Installation, operation & maintenance manual.

1.05 QUALITY ASSURANCE

1. The manufacturer shall have a minimum of 30 years experience in the design and construction of condensate return equipment.
2. 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.

# The manufacturer shall carry a minimum product liability insurance of $5,000,000.00 per occurrence.

1. The Unit shall be UL listed or recognized by Underwriters Laboratories, Inc as a complete condensate pumping unit.
2. 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**

2.01 MANUFACTURERS

# Subject to compliance with these specifications, the following manufacturers shall be acceptable:

1. Bell & Gossett, a Xylem Brand Domestic Series VCD4 vacuum heating and condensate pumping unit.
2. Pre-approved equal.

2.02 COMPONENTS

**Note: Optional accessories are Underlined**

1. Cast iron receiver
2. The receiver shall be manufactured of close grained cast iron construction (warranted for 20 years from the date of shipment against failure due to corrosion).
3. The centerline of inlet shall be no higher than 15 inches(381mm) above the floor, and shall consist of condensate receiver and independent hurling water separation chamber.
4. Condensate Receiver shall have a capacity as indicated by the drawings. Condensate receiver accessories shall include: deaerating cascade baffle, water level gauge, vacuum gauge, dial thermometer, float switches for pump level control, lifting eye bolts, and reverse acting temperature limit switch to prevent operation of air pump if the condensate temperature exceeds 180oF (82°C).
5. A vacuum unit shall consist of:
6. (2) Multi-jet vacuum producer(s) and (2) centrifugal pump and motor assembly(s) mounted on the separation chamber and shall deliver the scheduled capacity of saturated air at 5-1/2” Hg vacuum and 160 oF , rated and tested according to the latest ASHRAE Standard Code for “Return Line Low Vacuum Heating Pumps.”
7. Hurling or sealing water for the air pump shall be recirculated from an independent reservoir and shall not mix with condensate.
8. The separation chamber shall be equipped with water level gauge, thermometer, (2) suction swing check valves, air vent and overflow connections and automatic hurling water level controls, temperature limit switch to add cooling water if hurling chamber liquid reaches 160 degrees F. Vacuum pumps requiring mufflers or silencers to quiet noise shall not be accepted.
9. Both pumps shall be flange mounted centrifugal type and designed for vertical operaton. Each shall be bronze fitted, and be equipped with bronze impeller, renewable bronze wear ring, and stainless steel shaft.
10. Carbon/ceramic mechanical seal shall be rated for 250oF (121°C) for maximum life. Condesate return and vacuum capacities, motor HP and rpm, receiver size and electrical characteristics shall be as scheduled on the drawings. Condensate Pumps – each pump GPM shall be sized for 2 times the system return rate.

# Water pump

# Four water pumps shall each be a series C35™ or C17™ bronze fitted, centrifugal pump, close-coupled to a 3500 RPM or 1750 RPM motor, permanently aligned, and flange mounted for vertical operation.

# Each pump shall include:

# One cast Iron volute with:

# One discharge gauge port tapping.

# One drain tapping.

# One dynamically balanced enclosed bronze centrifugal impeller.

# One renewable bronze wearing ring.

# One stainless steel shaft.

# Carbon/ceramic/Buna N/stainless steel mechanical seal suitable for 250oF (121°C) operation.

# Each pump shall be sized for two times the system return rate.

# Each motor shall meet NEMA specifications and shall be the size, voltage, insulation class, duty rating and enclosure called for in the plans.

# Capacities and electrical characteristics for the pump shall be scheduled on the drawings.

# (Manual by-pass valve around the water make-up solenoid consisting of:

1. Two ball valves to isolate the solenoid valve.
2. One gate valve for the direct water feed line.)
3. (Air gap fitting for make-up valve.)
4. (Lifting eye bolts for unit placement.)
5. (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.)

(A NEMA 1 automatic mechanical alternator to replace two float switches.

1. (TEFC motors as required.)
2. (Consolitrol® NEMA 2, UL electrical panel(s) mounted and wired with drip lip and piano hinged door is available with the following options:)
3. (NEMA 4 and NEMA 12 Electrical panels mounted and wired as required.)
4. (
5. (Four combination magnetic starters with disconnect devices, either fusible or circuit breaker type with cover interlock and adjustable thermal overload protection.)
6. (two fused control circuit transformer when the motor voltage exceeds 230V.)
7. (four selector switches:
8. “Off-Hand-Lead-Lag” selector switches or Off-Lead-Lag-Continuous.
9. “Auto-Off-Hand” selector switches.)
10. (four pump running pilot lights.)
11. (four “Push to Test” buttons.)
12. (Two numbered terminal strip.)
13. (Four auxiliary contacts on the magnetic starters normally open for remote monitoring of pump operation.)
14. (two removable control component mounting plate.)
15. (Four elapsed time meters (UL).)
16. (An audible alarm to indicate wa ter level conditions.
17. Audible alarm is available with or without silencing relay.
18. A separate tank mounted level switch should be provided with audible alarm.
19. Alarm may be provided with alarm light to provide visual indication of alarm condition.)
20. (two single point power connection.)
21. (two electrical alternator.)
22. (Two Control power switching relay shall allow the switch over of control power from one pump to the other in the event of a power failure or pump failure.)
23. (Liquid tight conduit suitable for NEMA 2, NEMA 4 & NEMA 12 applications.

**PART 3 EXECUTION**

* 1. INSTALLATION
1. Install simplex vacuum heating unit equipment in accordance with manufacturer’s instructions.
2. 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.
3. All factory wiring shall be numbered for easy identification and the numbers shall coincide with those shown on the wiring diagram.
4. All interconnecting wiring between the pump controls and control panel shall be enclosed in liquid tight flexible conduit.
5. 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.
6. The unit manufacturer shall furnish, mount on the unit and wire a NEMA 2 control cabinet with drip lip and piano hinged door.
7. The unit shall be shipped completely assembled.
8. The factory shall provide a certified test report.
9. Unit shall be a Domestic series VCD4 as manufactured by Bell & Gossett, a Xylem brand®, Morton Grove, IL.

###### END OF SECTION

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