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**Pride**

**Quality**

**Craftsmanship**

**BULLETIN 186**
*Revised 4/2020*

# TYPE SHC-MU

## Steel Horizontal
## ASME Code Stamped
## Condensate Pump

## Low Inlet
## Low NPSH

## With SLC Controller
## using Shipco®
## Temperature and Level Transmitter

SHIPCO® PUMPS equipped with Mechanical Seals rated up to a standard 250°F.

*Higher temperature seals and special faces available upon request.*

**Charted units are a representation of the typical systems and sizes used.**

***Higher pump pressures and larger pump capacities are available.***

## SHC-MU UNIT DESCRIPTION

**Type SHC-MU** is ASME code stamped for 150 psig at 350˚F as standard – protects system when traps fail or can replace a flash tank in your system.

## MODIFIED MODEL U PUMP FEATURES

The Heart of the Unit is the Modified Model U Pump (U.S. patent #4,932,846), shortened to fit the height of the receiver. The pump is mounted on top of the tank and excellent for limited floor space areas where a pump mounted on the side of the tank takes up too much floor space. It eliminates the need for a suction isolation valve(s) since you can disconnect and lift the pump out of the tank. The pumps can have 2 feet of NPSH capabilities based on curve and can handle condensate at temperatures up to 210°F at sea level or more! All units come with the SHIPCO® level and temperature transmitter and type SLC controller as standard.

**Impeller** is cast bronze, enclosed vane, precision balanced, and trimmed to meet the design conditions for smooth durable operation.

**Motors** are industry standard with heavy duty ball bearing design.

**Discharge Companion Flange** allows the pump removal and eliminates the need for additional unions.

**Propeller Shaft** is 316 Stainless Steel.

**Rubber Bearing Assembly** (US patent #4,932,846).

**Standard Mechanical Seal** is EPR with a ceramic seat rated for 250°F. Other seals are available upon request up to 300°F.

**Standard Suction Column** is black steel. 304 and 316 are available upon request.

**Propeller** is 400 Series Stainless.

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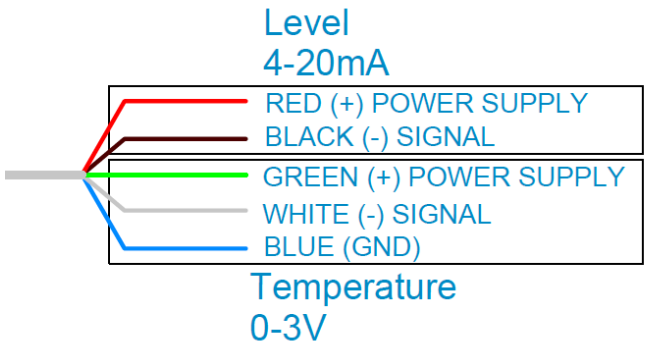
## SHIPCO® TRANSMITTER

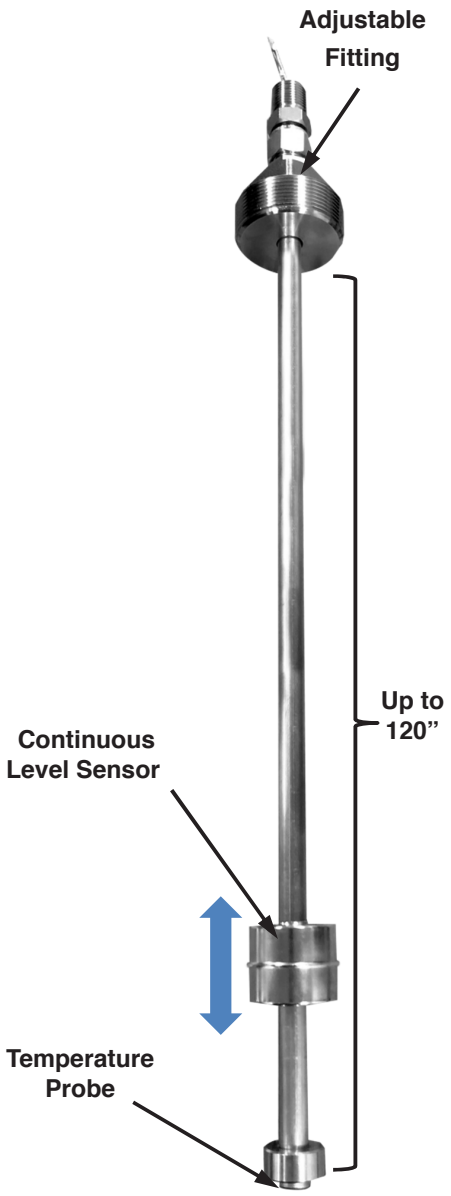
The SHIPCO® Transmitter is a UL® recognized continuous level sensor on an internal stainless steel float column with a built-in temperature probe. When coupled with the SHIPCO® Type SLC controller, the SHIPCO® Transmitter sends continuous level and temperature readings to the SLC enabling it to perform various functions such as display status, read level set points, and signal alarms. The SHIPCO® Transmitter is rated NEMA 4X and eliminates the necessity for external float switches, dial thermometers and a sight glass.

When used on a unit, the SHIPCO® Transmitter is housed inside a pipe column to protect the rod and reduce water fluctuations for accurate level reading. The pipe column is typically mounted from the top of the receiver so as to keep it internal. The stainless steel float column is rated up to 257°F (125°C) and its adjustable tank fitting accommodates variable lengths for receivers up to 120 inches (3m) deep.

**Level Sensor**
Range: 0 – length
Output: 4 – 20 mA

**Temperature Probe**
Range: 0 – 300°F (148°C)
Output: 0 – 3 V




## SHIPCO® TYPE SLC LOGIC CONTROLLER OVERVIEW

SHIPCO® Type SLC (SHIPCO® Logic Controller) is an economical method of automating functions on a SHIPCO® condensate, boiler feed, deaerator or vacuum unit. Depending on the type of unit, the SLC can perform various functions such as pump control and alternation; display live level, temperature or pressure indication; and provide alarm status.

All SLC controllers are UL® listed and feature a factory-programmed NEMA 4X full-color touchscreen HMI display. Control panels with an SLC include audible alarm and through-door disconnects. SLC controllers also have PID functions for all modulating controls.

Remote monitoring and control override through building automation protocols BACnet® and Modbus®.

## SLC-C

### Operates Condensate Return Unit and pumps water on high level.

- Live graphical and numeric indication for water level and temperature via SHIPCO® Transmitter.
- Operates up to three pumps with alternating or manual (lead-off-lag) control.
- Failure indication and protection with high and low water alarm, high temperature alarm and shutoff. Supports adding cooling water to maintain operating temperature.


## COMMUNICATIONS

### Type SLC Communicates to Building Automation Systems via BACnet® or Modbus® for Remote Monitoring and Control.

Complete monitoring for all sensory inputs and alarms with remote control override on all outputs.

**BACnet® IP**

User configurable connection parameters
IP Address, Subnet, Gateway
Factory can preset BACnet® Device ID
RJ45 10/100 Ethernet port

**BACnet® MS/TP**

Address, Baud, BACnet® Device ID, etc. preset by factory per requested specifications
Baud rates: 9600, 19200, 38400, 57600, 115200
RS-485 via RJ45 modular jack serial port

**Modbus® TCP/UDP**

User configurable connection parameters:
IP Address, Subnet, Gateway
RJ45 10/100 Ethernet port

**Modbus® RTU**

User configurable connection parameters
Address, Baud, Parity, Data/Stop bits, Handshake
Baud rates: 9600, 19200, 38400, 57600, 115200
RS-232 or RS-485 via RJ45 modular jack serial port

# TYPE SHC-MU CONDENSATE UNITS

| CAP. SQ.FT. EDR | PUMP CAP. GPM | DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | SIMPLEX CATALOG NO. | DUPLEX CATALOG NO. | REC. CAP. GALS. | RECEIVER SIZE |
|---|---|---|---|---|---|---|---|---|---|
| | | 10 | ⅓ | 1 | | 60 SHC-MU1 | 60 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 60 SHC-MU3 | 60 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 61 SHC-MU1 | 61 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 61 SHC-MU3 | 61 SHCD-MU3 | | |
| | | 20 | ⅓ | 1 | | 62 SHC-MU1 | 62 SHCD-MU1 | | |
| 6,000 | 6 | 20 | ⅓ | 3 | ¾" | 62 SHC-MU3 | 62 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ½ | 3 | | 62.5 SHC-MU1 | 62.5 SHCD-MU1 | | |
| | | 25 | ½ | 3 | | 62.5 SHC-MU3 | 62.5 SHCD-MU3 | | |
| | | 30 | ¾ | 3 | | 63 SHC-MU1 | 63 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 63 SHC-MU3 | 63 SHCD-MU3 | | |
| | | 40 | 1 | 3 | | 64 SHC-MU3 | 64 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 65 SHC-MU3 | 65 SHCD-MU3 | | |
| | | 10 | ⅓ | 1 | | 90 SHC-MU1 | 90 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 90 SHC-MU3 | 90 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 91 SHC-MU1 | 91 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 91 SHC-MU3 | 91 SHCD-MU3 | | |
| | | 20 | ⅓ | 1 | | 92 SHC-MU1 | 92 SHCD-MU1 | | |
| 9,000 | 9 | 20 | ⅓ | 3 | ¾" | 92 SHC-MU3 | 92 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ½ | 1 | | 92.5 SHC-MU1 | 92.5 SHCD-MU1 | | |
| | | 25 | ½ | 3 | | 92.5 SHC-MU3 | 92.5 SHCD-MU3" | | |
| | | 30 | ¾ | 1 | | 93 SHC-MU1 | 93 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 93 SHC-MU3 | 93 SHCD-MU3 | | |
| | | 40 | 1 | 3 | | 94 SHC-MU3 | 94 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 95 SHC-MU3 | 95 SHCD-MU3 | | |
| | | 10 | ⅓ | 1 | | 120 SHC-MU1 | 120 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 120 SHC-MU3 | 120 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 121 SHC-MU1 | 121 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 121 SHC-MU3 | 121 SHCD-MU3 | | |
| | | 20 | ⅓ | 1 | | 122 SHC-MU1 | 122 SHCD-MU1 | | |
| 12,000 | 12 | 20 | ⅓ | 3 | ¾" | 122 SHC-MU3 | 122 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ½ | 1 | | 122.5 SHC-MU1 | 122.5 SHCD-MU1 | | |
| | | 25 | ½ | 3 | | 122.5 SHC-MU3 | 122.5 SHCD-MU3 | | |
| | | 30 | ¾ | 1 | | 123 SHC-MU1 | 123 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 123 SHC-MU3 | 123 SHCD-MU3 | | |
| | | 40 | 1½ | 3 | | 124 SHC-MU3 | 124 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 125 SHC-MU3 | 125 SHCD-MU3 | | |
| | | 10 | ⅓ | 1 | | 150 SHC-MU1 | 150 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 150 SHC-MU3 | 150 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 151 SHC-MU1 | 151 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 151 SHC-MU3 | 151 SHCD-MU3 | | |
| | | 20 | ⅓ | 1 | | 152 SHC-MU1 | 152 SHCD-MU1 | | |
| 15,000 | 15 | 20 | ⅓ | 3 | ¾" | 152 SHC-MU3 | 152 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ½ | 1 | | 152.5 SHC-MU1 | 152.5 SHCD-MU1 | | |
| | | 25 | ½ | 3 | | 152.5 SHC-MU3 | 152.5 SHCD-MU3 | | |
| | | 30 | ¾ | 1 | | 153 SHC-MU1 | 153 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 153 SHC-MU3 | 153 SHCD-MU3 | | |
| | | 40 | 1½ | 3 | | 154 SHC-MU3 | 154 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 155 SHC-MU3 | 155 SHCD-MU3 | | |
| | | 10 | ⅓ | 1 | | 180 SHC-MU1 | 180 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 180 SHC-MU3 | 180 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 181 SHC-MU1 | 181 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 181 SHC-MU3 | 181 SHCD-MU3 | | |
| | | 20 | ⅓ | 1 | | 182 SHC-MU1 | 182 SHCD-MU1 | | |
| 18,000 | 18 | 20 | ⅓ | 3 | 1½" | 182 SHC-MU3 | 182 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ½ | 1 | | 182.5 SHC-MU1 | 182.5 SHCD-MU1 | | |
| | | 25 | ½ | 3 | | 182.5 SHC-MU3 | 182.5 SHCD-MU3 | | |
| | | 30 | ¾ | 1 | | 183 SHC-MU1 | 183 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 183 SHC-MU3 | 183 SHCD-MU3 | | |
| | | 40 | 1½ | 3 | | 184 SHC-MU3 | 184 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 185 SHC-MU3 | 185 SHCD-MU3 | | |
| | | 10 | ⅓ | 1 | | 220 SHC-MU1 | 220 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 220 SHC-MU3 | 220 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 221 SHC-MU1 | 221 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 221 SHC-MU3 | 221 SHCD-MU3 | | |
| | | 20 | ½ | 1 | | 222 SHC-MU1 | 222 SHCD-MU1 | | |
| 22,000 | 22 | 20 | ½ | 3 | 1½" | 222 SHC-MU3 | 222 SHCD-MU3 | 30 | 12 x 60 |
| | | 25 | ¾ | 1 | | 222.5 SHC-MU1 | 222.5 SHCD-MU1 | | |
| | | 25 | ¾ | 3 | | 222.5 SHC-MU3 | 222.5 SHCD-MU3 | | |
| | | 30 | ¾ | 1 | | 223 SHC-MU1 | 223 SHCD-MU1 | | |
| | | 30 | ¾ | 3 | | 223 SHC-MU3 | 223 SHCD-MU3 | | |
| | | 40 | 1½ | 3 | | 224 SHC-MU3 | 224 SHCD-MU3 | | |
| | | 50 | 2 | 3 | | 225 SHC-MU3 | 225 SHCD-MU3 | | |

# TYPE SHC-MU CONDENSATE UNITS

| CAP. SQ.FT. EDR | PUMP CAP. GPM | DISCH. PRESS. PSIG | MOTOR HP 3500 RPM ONLY | PHASE | DISCH. SIZE INCHES | SIMPLEX CATALOG NO. | DUPLEX CATALOG NO. | REC. CAP. GALS. | RECEIVER SIZE |
|---|---|---|---|---|---|---|---|---|---|
| | | 10 | ⅓ | 1 | | 300 SHC-MU1 | 300 SHCD-MU1 | | |
| | | 10 | ⅓ | 3 | | 300 SHC-MU3 | 300 SHCD-MU3 | | |
| | | 15 | ⅓ | 1 | | 301 SHC-MU1 | 301 SHCD-MU1 | | |
| | | 15 | ⅓ | 3 | | 301 SHC-MU3 | 301 SHCD-MU3 | | |
| 30,000 | 30 | 20 | ½ | 1 | 1½" | 302 SHC-MU1 | 302 SHCD-MU1 | 30 | 12 x 60 |
| | | 20 | ½ | 3 | | 302 SHC-MU3 | 302 SHCD-MU3 | | |
| | | 25 | ¾ | 1 | | 302.5 SHC-MU1 | 302.5 SHCD-MU1 | | |
| | | 25 | ¾ | 3 | | 302.5 SHC-MU3 | 302.5 SHCD-MU3 | | |
| | | 30 | 1 | 3 | | 303 SHC-MU3 | 303 SHCD-MU3 | | |
| | | 40 | 1½ | 3 | | 304 SHC-MU3 | 304 SHCD-MU3 | | |
| | | 50 | 3 | 3 | | 305 SHC-MU3 | 305 SHCD-MU3 | | |
| | | 10 | ½ | 1 | | 370 SHC-MU1 | 370 SHCD-MU1 | | |
| | | 10 | ½ | 3 | | 370 SHC-MU3 | 370 SHCD-MU3 | | |
| | | 15 | ½ | 1 | | 371 SHC-MU1 | 371 SHCD-MU1 | | |
| | | 15 | ½ | 3 | | 371 SHC-MU3 | 371 SHCD-MU3 | | |
| 37,000 | 37 | 20 | ¾ | 1 | 1½" | 372 SHC-MU1 | 372 SHCD-MU1 | 40 | 14 x 60 |
| | | 20 | ¾ | 3 | | 372 SHC-MU3 | 372 SHCD-MU3 | | |
| | | 25 | 1 | 3 | | 372.5 SHC-MU3 | 372.5 SHCD-MU3 | | |
| | | 30 | 1½ | 3 | | 373 SHC-MU3 | 373 SHCD-MU3 | | |
| | | 40 | 2 | 3 | | 374 SHC-MU3 | 374 SHCD-MU3 | | |
| | | 50 | 3 | 3 | | 375 SHC-MU3 | 375 SHCD-MU3 | | |
| | | 10 | ¾ | 1 | | 450 SHC-MU1 | 450 SHCD-MU1 | | |
| | | 10 | ¾ | 3 | | 450 SHC-MU3 | 450 SHCD-MU3 | | |
| | | 15 | ¾ | 1 | | 451 SHC-MU1 | 451 SHCD-MU1 | | |
| 45,000 | 45 | 15 | ¾ | 3 | 1½" | 451 SHC-MU3 | 451 SHCD-MU3 | 55 | 16 x 60 |
| | | 20 | 1 | 3 | | 452 SHC-MU3 | 452 SHCD-MU3 | | |
| | | 25 | 1½ | 3 | | 452.5 SHC-MU3 | 452.5 SHCD-MU3 | | |
| | | 30 | 1½ | 3 | | 453 SHC-MU3 | 453 SHCD-MU3 | | |
| | | 40 | 3 | 3 | | 454 SHC-MU3 | 454 SHCD-MU3 | | |
| | | 50 | 3 | 3 | | 455 SHC-MU3 | 455 SHCD-MU3 | | |
| | | 10 | 1½ | 3 | | 600 SHC-MU3 | 600 SHCD-MU3 | | |
| | | 15 | 2 | 3 | | 601 SHC-MU3 | 601 SHCD-MU3 | | |
| | | 20 | 2 | 3 | | 602 SHC-MU3 | 602 SHCD-MU3 | | |
| 60,000 | 60 | 25 | 3 | 3 | 1½" | 602.5 SHC-MU3 | 602.5 SHCD-MU3 | 75 | 18 x 60 |
| | | 30 | 3 | 3 | | 603 SHC-MU3 | 603 SHCD-MU3 | | |
| | | 40 | 3 | 3 | | 604 SHC-MU3 | 604 SHCD-MU3 | | |
| | | 50 | 5 | 3 | | 605 SHC-MU3 | 605 SHCD-MU3 | | |

## UNIT ACCESSORIES

These units can be fitted with any of the following accessories:

**Basket Inlet Strainers** are a recommended feature of the units. The large dirt pocket and vertical self-cleaning screens help prevent unnecessary wear and problems with the pumps.

**Discharge Pressure Gauges** provide a quick check of the pump operation at design conditions.

**Type SHC-MU** has the ability to add cooling water directly to the receiver, or into a stainless steel vent condenser, to capture BTU's leaving the vent from flash steam.

**All units are completely assembled, piped, wired, and individually tested before shipment. Testing includes a complete hydrostatic test for leaks, electrical tests for controls and accessories, and performance test for pumps at design conditions. After testing, the units are packaged for shipment.**

**The complete package unit bears a UL stamp since the complete package requires a control panel to house the SLC Controller.**

## ENGINEERING SELECTION DATA

**Receiver Sizing – SHC-MU Units**

The receivers in this series of units are sized to allow for approximately one minute net storage capacity (where practical). The condensate return pumps need to run for approximately a one minute period to prolong the life of the motors in intermittent operation. The condensate is returned to the boiler room as quickly as possible to reduce make-up requirements and heat loss.

**Condensate Pump Sizing – SHC-MU Units**

The condensing rate for 1,000 sq. ft. EDR is .5 GPM (see table). The type SHC-MU Condensate return pumps are sized at twice (2 times) the normal condensing rate or 1.0 GPM per 1,000 sq. ft. EDR. The low NPSH requirements and minimal capacity loss of centrifugal pumps from normal wear has shown from experience to provide more than adequate pump capacity.

### Table — Values of Heat and Power

| | GPM | BTU | Lbs/Hr | Sq. Ft. EDR |
|---|---|---|---|---|
| 1 Boiler Horsepower | .069 | 33,475 | 34.5 | 139.4 |
| 1,000 sq. ft. EDR | .50 | 240,000 | 247.3 | 1,000 |





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