



CSI Controls™

**TROUBLESHOOTING
GUIDE**

www.csicontrols.com

888-342-5753

Full Load Current Single-Phase Alternating-Current Motors

The following values of full load currents are typical for motors running at usual speeds and motors with normal torque characteristics.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120 and 220 to 240 volts.

| Horsepower | 115 Volts | 200 Volts | 208 Volts | 230 Volts |
|-------------------|------------------|------------------|------------------|------------------|
| 1/6 | 4.4 | 2.5 | 2.4 | 2.2 |
| 1/4 | 5.8 | 3.3 | 3.2 | 2.9 |
| 1/3 | 7.2 | 4.1 | 4.0 | 3.6 |
| 1/2 | 9.8 | 5.6 | 5.4 | 4.9 |
| 3/4 | 13.8 | 7.9 | 7.6 | 6.9 |
| 1 | 16 | 9.2 | 8.8 | 8.0 |
| 1 1/2 | 20 | 11.5 | 11.0 | 10 |
| 2 | 24 | 13.8 | 13.2 | 12 |
| 3 | 34 | 19.6 | 18.7 | 17 |
| 5 | 56 | 32.2 | 30.8 | 28 |
| 7 1/2 | 80 | 46 | 44 | 40 |
| 10 | 100 | 57.5 | 55 | 50 |

Source: National Electric Code, 2005 Edition.

Full Load Current Three-Phase Alternating-Current Motors

The following values of full load currents are typical for motors running at speeds usual for belted motors and motors with normal torque characteristics.

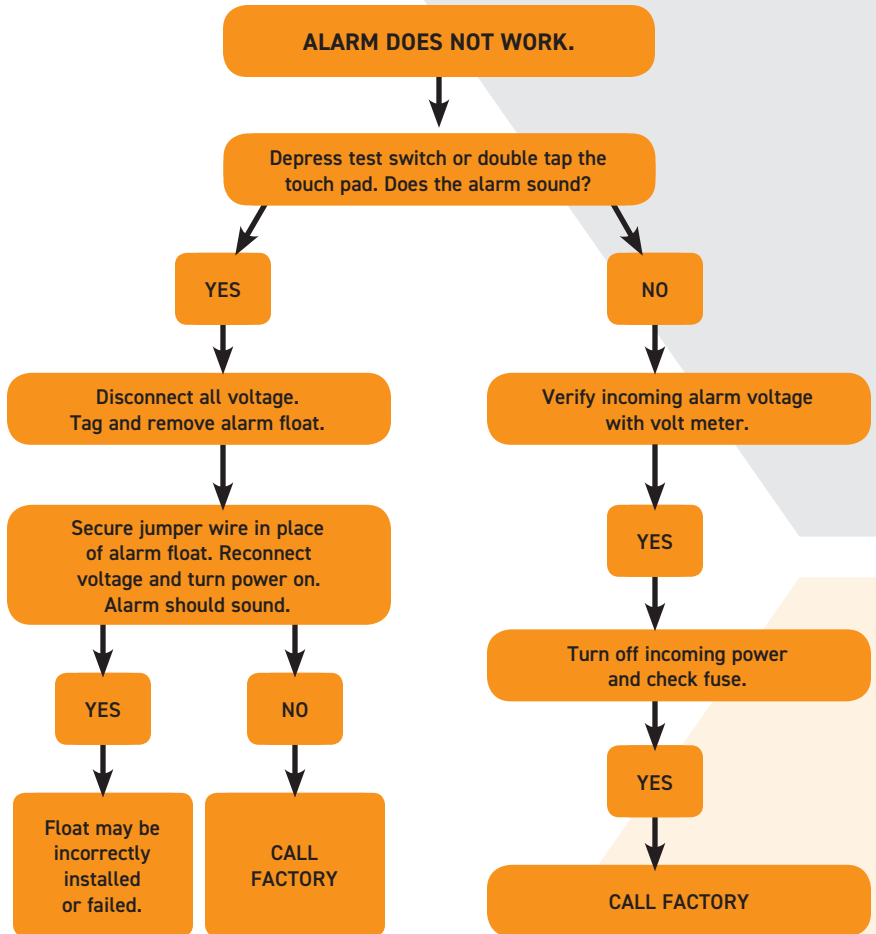
The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480, and 550 to 600 volts.

| Induction Type Squirrel Cage and Wound Rotor (Amperes) | | | | | | | | Synchronous-Type Unity Power Factor* (Amperes) | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|------------|--|-----------|-----------|------------|
| Horse-power | 115 Volts | 200 Volts | 208 Volts | 230 Volts | 460 Volts | 575 Volts | 2300 Volts | 230 Volts | 460 Volts | 575 Volts | 2300 Volts |
| 1/2 | 4.4 | 2.5 | 2.4 | 2.2 | 1.1 | 0.9 | -- | -- | -- | -- | -- |
| 3/4 | 6.4 | 3.7 | 3.5 | 3.2 | 1.6 | 1.3 | -- | -- | -- | -- | -- |
| 1 | 8.4 | 4.8 | 4.6 | 4.2 | 2.1 | 1.7 | -- | -- | -- | -- | -- |
| 1 1/2 | 12.0 | 6.9 | 6.6 | 6.0 | 3.0 | 2.4 | -- | -- | -- | -- | -- |
| 2 | 13.6 | 7.8 | 7.5 | 6.8 | 3.4 | 2.7 | -- | -- | -- | -- | -- |
| 3 | -- | 11.0 | 10.6 | 9.6 | 4.8 | 3.9 | -- | -- | -- | -- | -- |
| 5 | -- | 17.5 | 16.7 | 15.2 | 7.6 | 6.1 | -- | -- | -- | -- | -- |
| 7 1/2 | -- | 25.3 | 24.2 | 22 | 11 | 9 | -- | -- | -- | -- | -- |
| 10 | -- | 32.2 | 30.8 | 28 | 14 | 11 | -- | -- | -- | -- | -- |
| 15 | -- | 48.3 | 46.2 | 42 | 21 | 17 | -- | -- | -- | -- | -- |
| 20 | -- | 62.1 | 59.4 | 54 | 27 | 22 | -- | -- | -- | -- | -- |
| 25 | -- | 78.2 | 74.8 | 68 | 34 | 27 | -- | 53 | 26 | 21 | -- |
| 30 | -- | 92 | 88 | 80 | 40 | 32 | -- | 63 | 32 | 26 | -- |
| 40 | -- | 120 | 114 | 104 | 52 | 41 | -- | 83 | 41 | 33 | -- |
| 50 | -- | 150 | 143 | 130 | 65 | 52 | -- | 104 | 52 | 42 | -- |
| 60 | -- | 177 | 169 | 154 | 77 | 62 | 16 | 123 | 61 | 49 | 12 |
| 75 | -- | 221 | 211 | 192 | 96 | 77 | 20 | 155 | 78 | 62 | 15 |
| 100 | -- | 285 | 273 | 248 | 124 | 99 | 26 | 202 | 101 | 81 | 20 |
| 125 | -- | 359 | 343 | 312 | 156 | 125 | 31 | 253 | 126 | 101 | 25 |
| 150 | -- | 414 | 396 | 360 | 180 | 144 | 37 | 302 | 151 | 121 | 30 |
| 200 | -- | 552 | 528 | 480 | 240 | 192 | 49 | 400 | 201 | 161 | 40 |
| 250 | -- | -- | -- | -- | 302 | 242 | 60 | -- | -- | -- | -- |
| 300 | -- | -- | -- | -- | 361 | 289 | 72 | -- | -- | -- | -- |
| 350 | -- | -- | -- | -- | 414 | 336 | 83 | -- | -- | -- | -- |
| 400 | -- | -- | -- | -- | 477 | 382 | 95 | -- | -- | -- | -- |
| 450 | -- | -- | -- | -- | 515 | 412 | 103 | -- | -- | -- | -- |
| 500 | -- | -- | -- | -- | 590 | 472 | 118 | -- | -- | -- | -- |

*For 90 and 80 percent power factor, the figures shall be multiplied by 1.1 and 1.25, respectively.

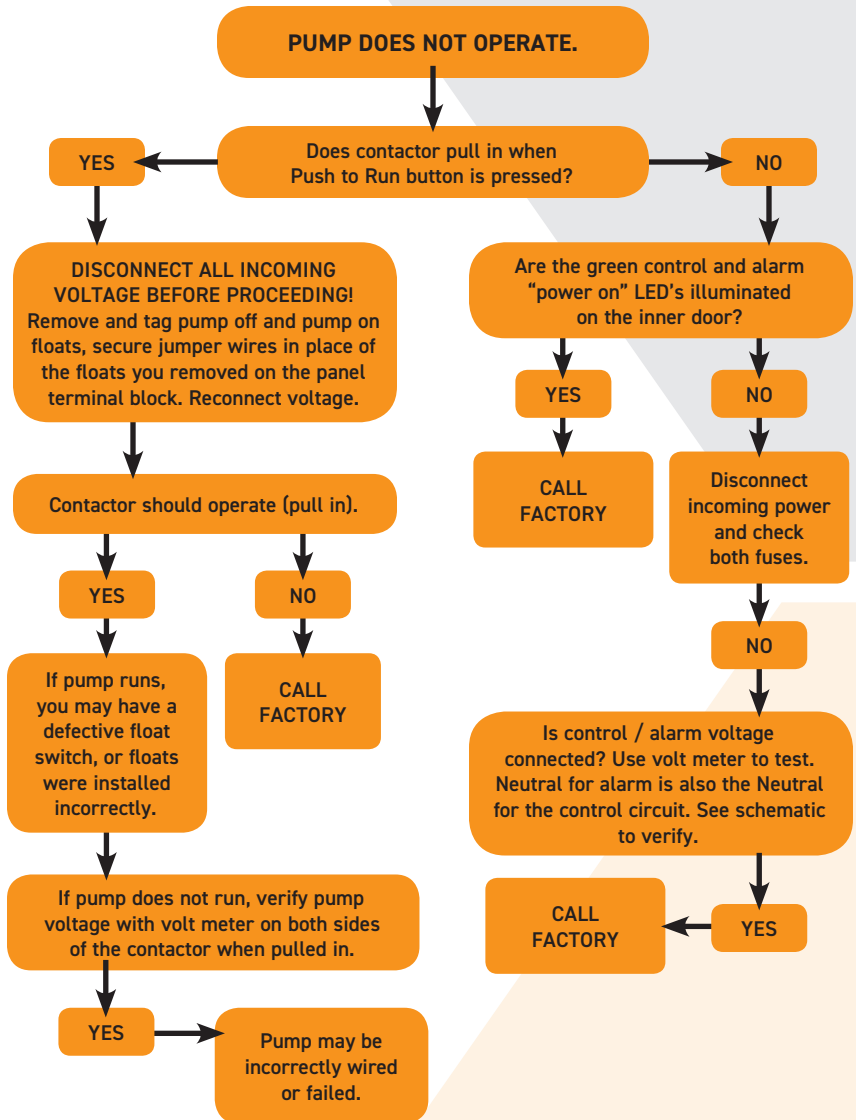
Source: National Electric Code, 2005 Edition.

Alarm Circuit Troubleshooting



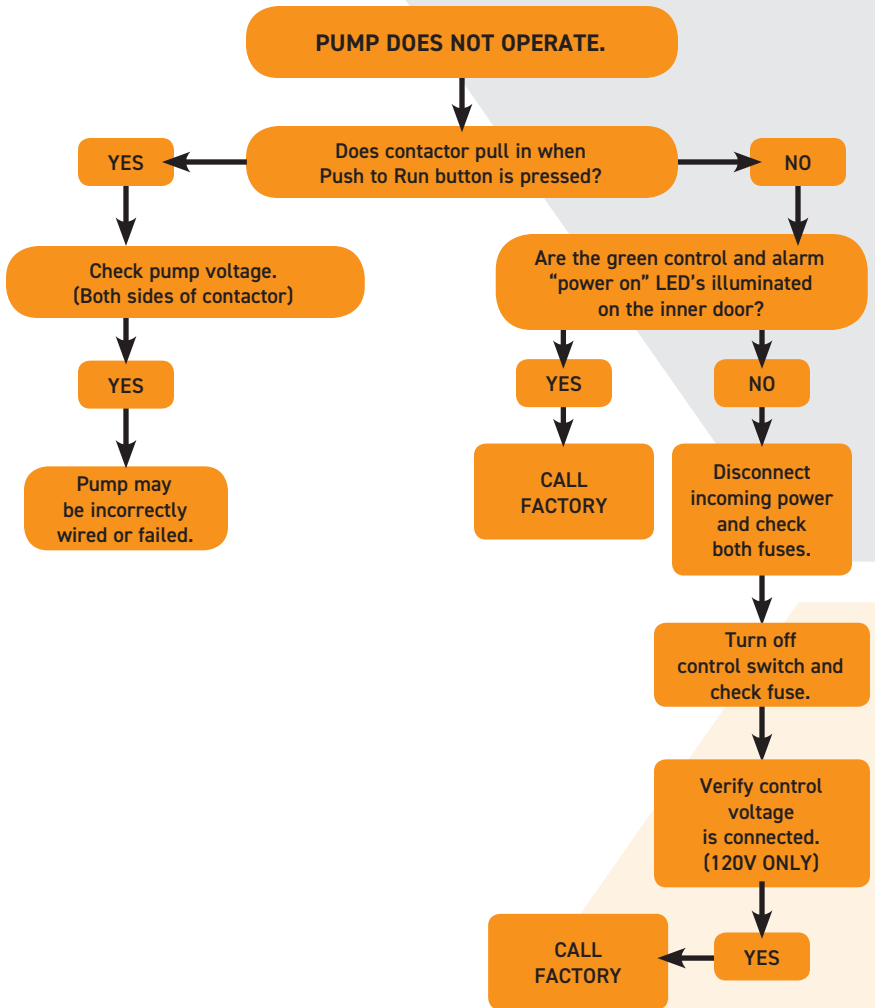
RK Series™ Simplex Panel Troubleshooting

Single Phase, Three Phase and Capacitor Start/Run Panels



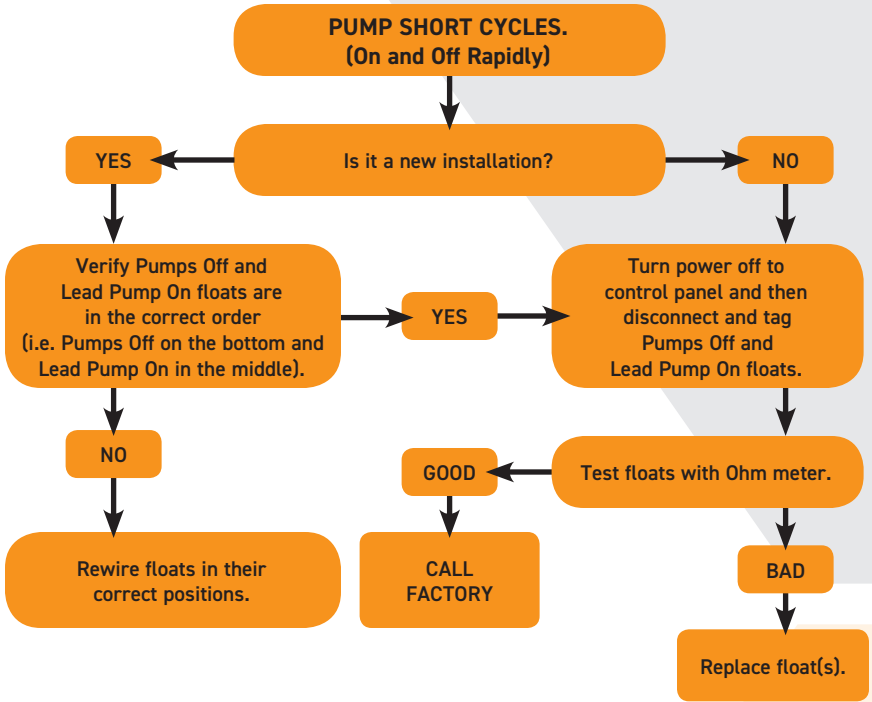
RK Series™ Duplex Panel Troubleshooting

Single Phase, Three Phase and Capacitor Start/Run Panels

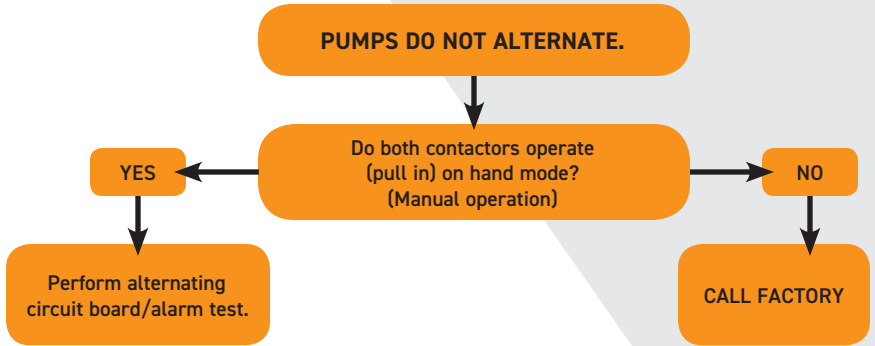


Short Cycling

Simplex and Duplex Control Panels



Duplex Alternating Board _____



Alternating Circuit Board Test

Three & Four Float System

TO TEST PUMP ALTERNATION

1. Disconnect all power to the panel.
2. Tag the floats and remove them from the terminal block in the panel.
3. Reconnect power to the panel.
4. Place a jumper wire between positions 9 and 10.
5. With first jumper wire still in place, place another jumper wire between positions 11 and 12.
6. Remove both jumper wires. Pump should turn off.
7. Repeat steps 4-6. Pump 2 should be called to run.
8. If the circuit board does not operate as indicated in steps 4-7, call the factory. If the circuit board operates as indicated, proceed to test alarm function.

TO TEST ALARM FUNCTION

9. Disconnect all power to the panel.
10. Place a jumper wire between positions 15 and 16.
11. Reconnect power to the panel.
 - a. The alarm should activate.
 - b. Test the horn silence relay by touching your hand flat against the touch pad. The horn should be deactivated.
12. If the circuit board does not operate as indicated in step 11, call the factory.

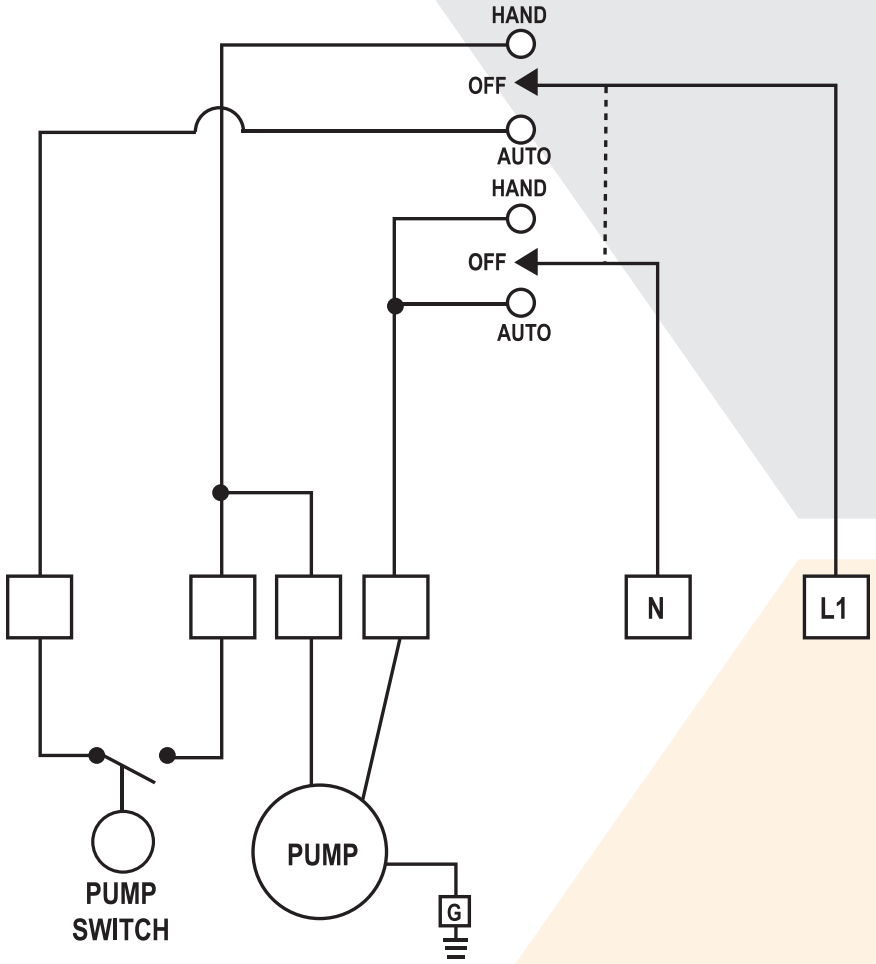
Circuit Board

WHAT IS THE PART NUMBER OF THE
CIRCUIT BOARD IN THE PANEL?

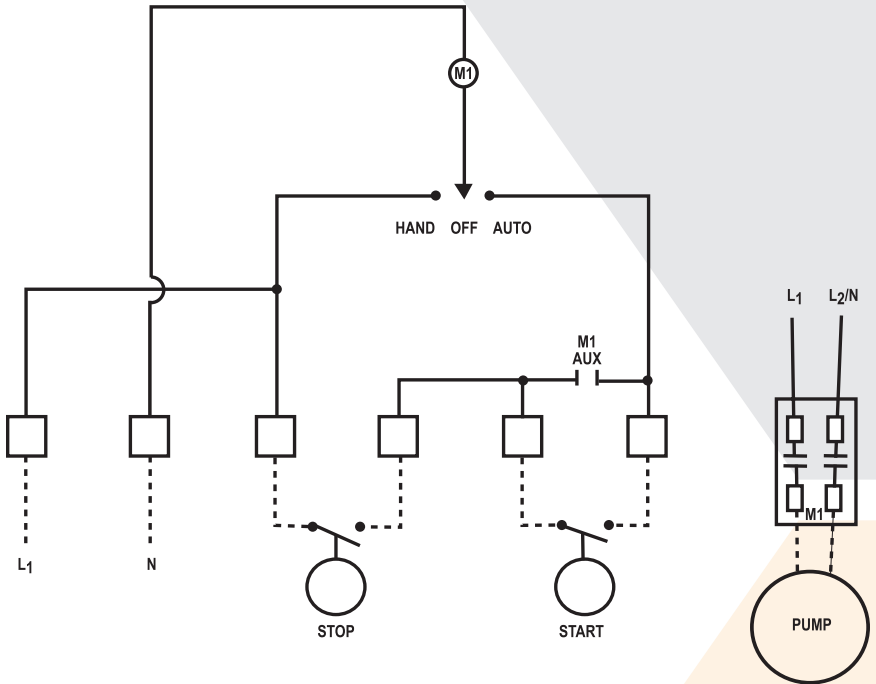


| Control Panel | |
|---------------|-----------------------------------|
| PN | Description |
| 1036293 | RK Series™ Simplex Float Board |
| 1033219 | RK Series™ Simplex Pressure Board |
| 1037502 | RK Series™ Duplex Float Board |
| 1038315 | RK Series™ Duplex Pressure Board |
| 1038031 | RKE/OSE Simplex Float Board |
| 1050780 | Minute Man Board |
| 1026107 | Power Zone Simplex |
| 1026114 | Power Zone Duplex |

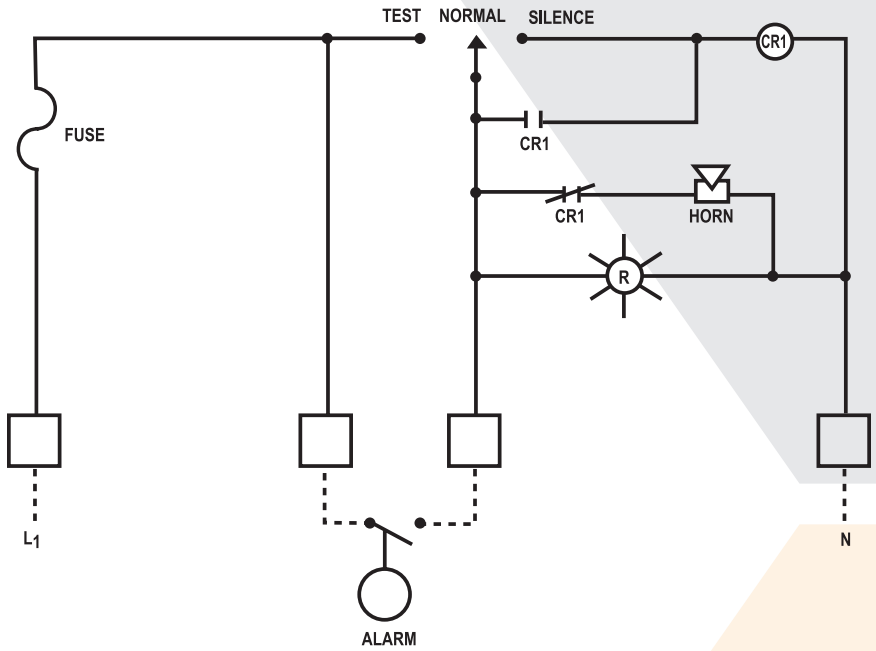
Pump Switch Control



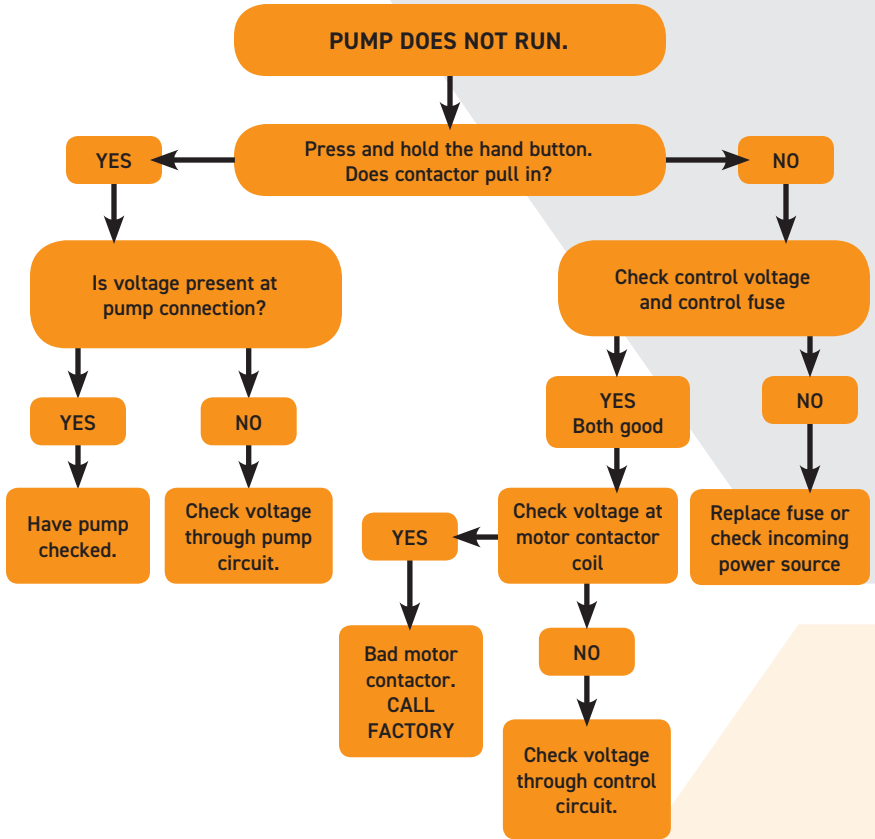
Contactor Control



Alarm Circuit



Troubleshooting a Motor Circuit



Installation Tips

Common Errors and New Installation Tips

Most Common New Installation Errors to Avoid:

Panels equipped with the redundant off option:

- Redundant off float not connected
- Pump will not run in automatic mode on a standard panel. It will however, run in hand mode
- If the float is not available, secure jumper wire in place of the redundant off float

Panels equipped with thermal cutout connection:

- Pump does not run in Hand or Automatic mode
- Verify thermal cutout is connected

To test panel operation:

- Disconnect voltage; Tag and remove the thermal cutout wires
- Use a jumper wire (on panel terminal block) in place of the thermal cutout wires
- Reconnect voltage. If pump runs in hand mode, thermal cutout connection is incorrect or possible defective thermal switch in pump

Installation Tips to Assist in New Installation:

Incoming power:

- Correct incoming voltage: Example---208V or 240V or 480V
- Control Alarm voltage: L2-----N
- Alarm-Control-Neutral
- For code some places require two 120V lines to come in and share neutral, otherwise bring in the hot lead to a L1 and neutral to N and jumper L1 and L1 together.

Floats: Have to be in correct order and on correct terminal block position

4-Float, Duplex

High Level (15 & 16)
Lag Pump On (13 & 14)
Lead Pump On (11 & 12)
Pumps Off (9 & 10)

3-Float Duplex

Lag Pump On High Level
(jumper 16 to 14)
Lead Pump On (11 & 12)
Pumps Off (9 & 10)

Simplex

High Level (15 & 16)
Pump On (11 & 12)
Pump Off (9 & 10)

Make sure:

- Breakers ON; Overload ON; Motor protective switch ON


Three Phase panels:

- Make sure the transformer is hooked up to the correct incoming voltage
















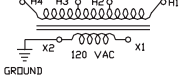










Seal Fail Thermal Cutout:

- Hooked up to correct terminal block connections
- Seal fail=infinite ohms open
- Thermal cutout=0 ohms closed

Ratings Label Example

| | | | | | |
|--|----------------------|---|----------------------|-------|----------------------|
| MODEL/SCHEMATIC # | <input type="text"/> | | | | |
| VOLTAGE | <input type="text"/> | PHASE | <input type="text"/> | HERTZ | <input type="text"/> |
| LARGEST HP | <input type="text"/> | LARGEST MOTOR F.L.A. | <input type="text"/> | | |
| DATE MFGR. | <input type="text"/> | TOTAL F.L.A. | <input type="text"/> | | |
| ENCL. TYPE | <input type="text"/> | SERIAL # | <input type="text"/> | | |
| SHORT CIRCUIT CURRENT: <input type="text"/> kA RMS | | | | | |
| SYMMETRICAL, <input type="text"/> V MAXIMUM | | | | | |
| Fusion™ | |  | CSI Controls™ | | |
| CSI Controls • 2221 Ford Drive • Ashland, Ohio 44805 | | | | | |

Schematic Symbols

| | | | |
|---|---------------------------|---|----------------------------|
|  | FUSE |  | START RELAY COIL |
|  | SPST SWITCH |  | START RELAY (N.C.) CONTACT |
|  | SPST PUSH SWITCH |  | RUN CAPACITOR |
|  | HAND, OFF, AUTO SWITCH |  | START CAPACITOR |
|  | GROUND |  | CONTROL RELAY COIL |
|  | LIQUID LEVEL (N.O.) FLOAT |  | (N.O.) CONTACT |
|  | RED ALARM BEACON |  | (N.C.) CONTACT |
|  | AUDIO ALARM (HORN) |  | MULTITAP TRANSFORMER |
|  | SOLID STATE FLASHER |  | ANTI-CONDENSATION HEATER |
|  | MOTOR CONTACTOR COIL |  | LIGHTNING ARRESTOR |
|  | ELAPSED TIME METER |  | THERMAL CUTOUT (N.C.) |
|  | EVENT COUNTER |  | PUMP (MOTOR) |
|  | GREEN INDICATOR LIGHT |  | CIRCUIT BREAKER |

Troubleshooting Alarm Systems

Alarm systems must be installed according to national and local electrical codes. Below are troubleshooting tips for some of the most common issues:

CS1200 Alarm Systems

Is the voltage being applied directly to the screw terminals on the alarm? The screw terminals are for connection of the float switch only. The screw terminals should not be connected to an external power source or to contacts which provide an external power source.

Is voltage being applied directly to the Control Duty control switch? The Control Duty control switch closes the alarm circuit inside the alarm. It should not be connected to an external power source.

Is the green “power on” light off when the unit is plugged in? There may be a problem with the alarm. Check to see if there is power to the unit. Remove the battery if one is installed. Push the “Test” button. If the red light comes on and the horn sounds then the alarm has power. There may be problems with the green LED. Return the alarm to the factory. Note: The “Test” button tests the functionality of the alarm, not the whole system. Inspect the power cord for damage.

To check for continuity: Disconnect power. Place the meter leads on flat plug terminals. If the volt/Vohm meter reads no continuity, there may be a problem with one of the alarm circuit elements. Return the alarm to the factory.

Are the warning light and horn off when the float is in the “on” position? (up for a high level application or down for a low level application) There may be a problem with the alarm wiring.

Troubleshooting Alarm Systems

CS1000 Alarm Systems

Is the green “power on” light off when power is applied? There may be a problem with the alarm. Check to see if there is power to the unit. Push the “Push To Test” switch. If the red light comes on and the buzzer sounds then the alarm has power. There may be problems with the green LED. Return the alarm to the factory. Note: The “Push To Test” switch tests the functionality of the alarm, not the whole system. Inspect the power cord for damage.

To check for continuity: Disconnect power. Place the meter leads on flat plug terminals. If the plug has been removed, place meter leads on bare wires at the end of the power cord. If the volt/ohm meter reads no continuity, there may be a problem with one of the alarm circuit elements. Return the alarm to the factory.

Are the warning light and horn off when the float is in the “on” position? (up for a high level application or down for a low level application) There may be a problem with the alarm wiring or the control switch. Push the test button. Horn and red light should come on. If they do not, return unit to the factory. Disconnect power from the unit

To test for continuity: Place the meter leads on flat plug terminals. If the plug has been removed, place meter leads on bare wires at the end of the power cord. If the volt/ohm meter reads no continuity, there may be a problem with one of the alarm circuit elements. Return the alarm to the factory.

Float: Make sure the float switch is the correct model for the application. A Normally Open (NO) float switch is used for high level alarm applications and Normally Closed (NC) float switch is used for low level alarm applications. Check the label on the float switch cable.

If the cable label is gone: Raise the float up. If the alarm activates, the float switch is a high level alarm model. Lower the float down. If the alarm activates, the float switch is a low level alarm model. Check the installation instructions for correct terminal positions. Check the connection between the float cable leads and the terminal strip. Inspect the alarm power cord for damage. Check the float for proper positioning, tether length, or obstructions which may have caused the float to hang-up. Inspect the float cable for damage.

Troubleshooting Alarm Systems

To test for continuity: Disconnect the float cable leads from the screw terminals. Connect a volt/ohm meter to the white and black leads. Move the float to the “on” position (up for high level alarm models, down for low level alarm models). If the volt/ohm meter reads no continuity, there may be a problem with the switch circuit elements.

Is the warning light on when the float is in the “off” position? (up for a for a normally closed application or down for a for a normally open application). There may be a problem with the alarm wiring or the control switch. Disconnect power from the unit.

Alarm: Check the connection between the float cable leads and the screw terminals under the alarm. Make sure the float switch is the correct model for the application. A Normally Open (NO) float switch is used for high level alarm applications and Normally Closed (NC) float switch is used for low level alarm applications. Check the label on the float switch cable.

If the cable label is gone: Raise the float up. If the alarm activates, the float switch is a high level alarm model. Lower the float down. If the alarm activates, the float switch is a low level alarm model. Check the float for proper positioning, tether length, or obstructions which may have caused the float to hang-up. Inspect the float cable for damage.



To test for continuity: Disconnect the float cable leads from the screw terminals. Connect a volUohm meter to the white and black leads. Move the float to the “off” position (down for high level alarm models, up for low level alarm models.) If the volt/ohm meter reads continuity, there may be a problem with the switch circuit elements.

Control Switch Overview

Narrow-angle control switches accurately monitor high (normally open) or low (normally closed) liquid level conditions in water and sewage applications to activate control panels and alarms. Select models have colored caps for easy identification.

| Control Switch | Type of Activation | Control Differential | Electrical Rating | Mounting Options |
|---|------------------------|--|---|---|
|  <p>Speed-E Connect™ Float Switch ■ Blue Cap = Normally Open (Narrow or Wide Angle) ■ Red Cap = Normally Closed (Narrow or Wide Angle)</p> | Mechanically Activated | Narrow 1.5 in (4 cm) Wide 4 in (10 cm) above or below horizontal | 125 VAC/30 VDC 0.160mA - 1A, 5 VDC 1mA min. | Mounting clamp or cable weight |
|  <p>Control Duty Narrow Angle Extra Large Mechanical</p> | Mechanically Activated | Approx 10° above or below horizontal | 1mA - 1A 4 VDC - 125 VAC | Internal weight |
|  <p>Control Duty Narrow Angle Mechanical ■ Yellow Cap = Normally open</p> | Mechanically Activated | Approx 1.5 in (4 cm) above or below horizontal | 5 amp 125V or 250V | Mounting clamp or cable weight |
|  <p>Control Duty Narrow Angle Mechanical <input type="checkbox"/> White Cap = Normally closed</p> | Mechanically Activated | Approx 1.5 in (4 cm) above or below horizontal | 5 amp 125V or 250V | Mounting clamp or cable weight |
|  <p>Control Duty Narrow Angle Low Current Mechanical ■ Blue Cap</p> | Mechanically Activated | Approx 1.5 in (4 cm) above or below horizontal | 125 VAC/30 VDC 0.160mA - 1A, 5 VDC 1mA min. | Mounting clamp or cable weight |
|  <p>Control Duty Low Angle Mercury</p> | Mercury Activated | Approx .5 in (1 cm) above or below horizontal | 5 amp 120V or 230V | Mounting clamp, cable weight, internal weight |
|  <p>Control Duty Narrow Angle Mini Mercury</p> | Mercury Activated | Approx .5 in (1 cm) above or below horizontal | 5 amp 120V or 230V | Mounting clamp or cable weight |

Control Switch Installation

| | | | |
|--|---|--|---|
|  WARNING | ELECTRICAL SHOCK HAZARD Disconnect power before installing or servicing this product. A qualified service person must install and service this product according to applicable electrical and plumbing codes. |  WARNING | EXPLOSION OR FIRE HAZARD Do not use with flammable liquids. Install in accordance with ANSI/NFPA 70. Suitable for usage with intrinsically safe circuit extensions as defined by UL 698A. |
| Failure to follow these precautions could result in serious injury or death. Replace product immediately if switch cable becomes damaged or severed. Keep these instructions with warranty after installation. This product must be installed in accordance with National Electric Code, ANSI/NFPA 70 so as to prevent moisture from entering or accumulating within boxes, conduit bodies, fittings, float housing, or cable. | | | |

MOUNTING THE SWITCH

WARNING: Do not install switch in direct line of incoming liquid.

1. Place the cord into the clamp as shown in Figure B.
2. Locate clamp at desired activation level and secure the clamp to the discharge pipe as shown in Figure A.
Note: Do not install cord under hose clamp.
3. Tighten the hose clamp using screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.
4. Wire switch.
5. Check installation. Allow system to cycle to insure proper operation.

Note: All hose clamp components are made of 18-8 stainless steel material. See your CSI Controls™ supplier for replacements.

CABLE WEIGHT

1. Determine desired activation level.
2. Suspend switch and cable weight at desired activation level as shown in Figure B.
3. Wire switch.
4. Check installation. Allow system to cycle to insure proper operation.

To adjust cable weight tether length:

1. Release clip.
2. Adjust cable weight to desired position.
3. Lay switch cable in weight channel.
4. Align clip with weight channel and slide towards switch cable as shown in Figure B.
5. Snap clip snugly up to cable, moving clip to tightest possible position.

Figure A

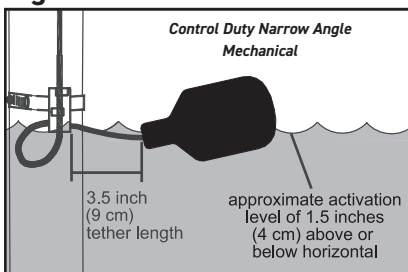
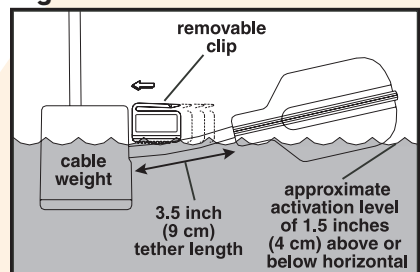









Figure B



Pump Switch Overview

Wide-angle pump switches directly control pumps up to 3 HP at 250 VAC. Each switch features an adjustable pumping range.

| Pump Switch | Type of Activation | Pump Control | Max Pump Run Current | Max Pump Start Current | Pumping Range |
|---|------------------------|--------------------------------------|------------------------|------------------------|-------------------------------|
|  Heavy Duty Wide Angle Mechanical | Mechanically Activated | 3/4 HP, 120V 2 HP, 230V | 15A, 120V 15A, 230V | 85A, 120V 85A, 230V | 7 - 36 in (18 - 91 cm) |
|  Medium Duty Wide Angle Dual Mechanical | Mechanically Activated | 15 FLA, 90LRA 120 or 240V | 15A, 120V 15A, 240V | 90A, 120V 90A, 240V | 3 - 48 in (7.6 - 122 cm) |
|  Medium Duty Limited Space <small>(For Limited Space Applications)</small> | Mechanically Activated | 1/2 HP, 120V 1 HP, 230V | 13A, 120V 12A, 230V | 60A, 120V 60A, 230V | .75 - 6.5 in (2 - 17 cm) |
|  Medium Duty Wide Angle Mechanical | Mechanically Activated | Use pump run and start current | 13A, 125V 13A, 250V | 78A, 125V 78A, 250V | 8 - 36 in (20 - 91 cm) |
|  Medium Duty Wide Angle Mini Mercury | Mercury Activated | 1/2 HP, 120V 1 HP, 230V | 13A, 120V 8A, 230V | 40A, 120V 20A, 230V | 6.5 - 19 in (16.5 - 48 cm) |
|  Medium Duty Wide Angle Mercury | Mercury Activated | 1 HP, 120V 2 HP, 230V | 15A, 120V 12A, 230V | 55A, 120V 35A, 230V | 6.5 - 13.5 in (17 - 34 cm) |
|  High Temperature | Mechanically Activated | Use pump run and start current | 13A, 125V 13A, 250V | 78A, 125V 78A, 250V | 8 - 36 in (20 - 91 cm) |

Pump Switch Tether Lengths

Heavy Duty Wide Angle Mechanical



Mechanically-activated pump switch for direct control of pumps in:

- Sewage
- Water

U.S. Patent Nos. 5,087,801 & 5,142,108

| | | | | | | | |
|------------------------|----------|----|----|----|----|----|---------|
| tether length (inches) | 3.5 min. | 6 | 10 | 14 | 18 | 22 | 24 max. |
| pumping range (inches) | 7 | 10 | 16 | 22 | 28 | 33 | 36 |

Medium Duty Wide Angle Mini Mercury



Mercury-activated pump switch for direct control of pumps in:

- Sewage
- Water
- Non-turbulent applications

U.S. Patent Nos. 4,429,854 & 4,572,934

| | | | | | | | |
|------------------------|----------|-----|----|----|----|----|---------|
| tether length (inches) | 3.5 min. | 6 | 8 | 10 | 12 | 15 | 17 max. |
| pumping range (inches) | 6.5 | 8.5 | 11 | 13 | 14 | 17 | 19 |

Medium Duty Wide Angle Mercury



Mercury-activated pump switch for direct control of pumps in:

- Sewage
- Water

U.S. Patent No. 4,302,641

| | | | | | | |
|------------------------|----------|-----|-----|----|------|---------|
| tether length (inches) | 3.5 min. | 5 | 7 | 9 | 13 | 15 max. |
| pumping range (inches) | 6.5 | 7.5 | 8.5 | 11 | 12.5 | 13.5 |

Common Pump Switch

Part Numbers

| Medium Duty Wide Angle Mechanical Pump Switch | | | |
|---|----------------------------|-----------------|-------------|
| Pump Down | | Pump Up | |
| Part # | Description | Part # | Description |
| 1031520 | 20PSD1WP | 1031521 | 20PSU1WP |
| 1031522 | 20PSD2WP | 1031523 | 20PSU2WP |
| Heavy Duty Wide Angle Mechanical Pump Switch | | | |
| Pump Down | | Pump Up | |
| Part # | Description | Part # | Description |
| 1031540 | 20PSPD1WP | 1031543 | 20PSPU1WP |
| 1031541 | 20PSPD2WP | 1031544 | 20PSPU2WP |
| 1031542 | 20PSPDWOP | 1031545 | 20PSPUWOP |
| Medium Duty Wide Angle Mercury Pump Switch | | | |
| Normally Open | | Normally Closed | |
| Part # | Description | Part # | Description |
| 1032561 | 20PSVD1WP | 1032564 | 20PSVU1WP |
| 1032562 | 20PSVD2WP | 1032565 | 20PSVU2WP |
| 1032563 | 20PSVDWOP | 1032566 | 20PSVUWOP |
| Medium Duty Wide Angle Mini Mercury Pump Switch | | | |
| Normally Open | | Normally Closed | |
| Part # | Description | Part # | Description |
| 1032543 | 20PSJVD1WP | 1032546 | 20PSJVU1WP |
| 1032544 | 20PSJVD2WP | 1032547 | 20PSJVU2WP |
| 1032545 | 20PSJVDWOP | 1032548 | 20PSJVUWOP |
| Medium Duty Limited Space Pump Switch | | | |
| Part # | Description | | |
| 1032427 | 20PSLSD1WP | | |
| Medium Duty Wide Angle Dual Pump Switch | | | |
| Part # | Description | Part # | Description |
| 1033137 | 20PSDFD1WP | 1033141 | 20PSDFU1WP |
| 1033138 | 20PSDFD2WP | 1033142 | 20PSDFU2WP |
| 1033139 | 20PSDFD1WOP | 1033143 | 20PSDFU1WOP |
| 133140 | 20PSDFD2WOP | 1033144 | 20PSDFU2WOP |
| High Temperature Pump Switch | | | |
| Part # | Description | | |
| 1046752 | 20 ft. HTM with plug, 120V | | |
| 1046753 | 20 ft. HTM with plug, 230V | | |
| 1046754 | 20 ft. HTM without plug | | |

D = Pump Down U = Pump Up 1 = 120 VAC 2 = 230 VAC WP = With Plug WOP = Without Plug

Troubleshooting Pump and Control Switches

CSI Controls™ pump and control switches must be installed according to national and local electrical codes. Below are troubleshooting tips for some of the most common issues:

- Is the pump load OFF when the float is in the “on” position or is the pump load ON when the float is in the “off” position?
- Is proper voltage being applied to the system?
- Is the Medium Duty Wide-Angle Dual pump switch short cycling on one float?
- Is the control panel or alarm off when the control switch is in the “on” or “off” positions?
- Is there sloshing in the float?
- Was the switch used in an application other than those recommended in the product literature?

Is the pump load OFF when the float is in the “on” position or is the pump load ON when the float is in the “off” position?

The “on” position is up for a Pump Down model or down for a Pump Up model. The “off” position is down for a Pump Down and up for a Pump Up model. If so, there may be a problem with the wiring, the pump, or the float. Disconnect power before proceeding.

Wiring: Inspect the cable for damage. Double-check your wiring against the wiring diagram on the installation instructions.

Pump (to test the pump)

Without Plug Models - If wiring is consistent with installation instructions, remove the pump switch wires and install a jumper wire across terminals where pump switch wires were connected (red and black wires for the Medium Duty Wide-Angle Dual). Turn on the power. If pump does not run, consult pump/control panel operation instructions. Note: a Medium Duty Wide-Angle Mini Mercury pump switch should not be directly wired to control a motor contactor or relay.

With Plug Models - Plug in the pump only. If the pump does not run, consult the pump operation instructions. Note: The pump may have experienced a thermal overload. Allow time for the pump to cool down and then test the motor again as defined above.

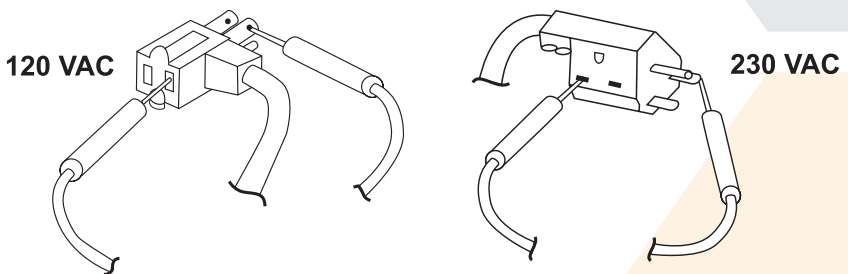
Troubleshooting Pump and Control Switches

Float: Make sure the float switch is the correct model for the application. (A Pump Up float switch is used for filling applications and a Pump Down float switch is used for emptying applications.) Check the label on the float switch cable. To determine float model in the absence of a label:

- Lower the float. If the pump activates, the float switch is a pump up model.
- Raise the float. If the pump activates, the float switch is a pump down model.

Check the float for proper positioning, tether length, or obstructions which may have caused it to hang-up. For the Medium Duty Wide-Angle Dual, the gray float is always the top float and the black float is always the bottom float.

To test for continuity: Connect a volt/ohm meter to the black and white leads, see figure below for units with plug. Move the float to the "on" position (up for pump down models, down for pump up models). For a Medium Duty Wide-Angle Dual, both floats must be moved to the "on" position. If the volt/ohm meter reads no continuity, there may be a problem with the switch circuit elements. Return the float to your supplier.



Is proper voltage being applied to the system?

The voltage of the switch is listed on the label attached to the cable. A 120 VAC Medium Duty Wide-Angle Dual will be damaged if 230 VAC is applied. A 230 VAC Medium Duty Wide-Angle Dual will not operate on 120 VAC. In the absence of a cord label the voltage of a Medium Duty Wide-Angle Dual can be discovered by measuring the resistance of the relay coil inside the switch. Disconnect power before proceeding. Disconnect the red and white wires, connect the volt/ohm meter leads to the wires. For a switch with a plug, place leads as shown below. The resistance values are: 120 VAC Switch - 3.6 ohms resistance, 230 VAC Switch - 13.6 ohms resistance.

Troubleshooting Pump and Control Switches

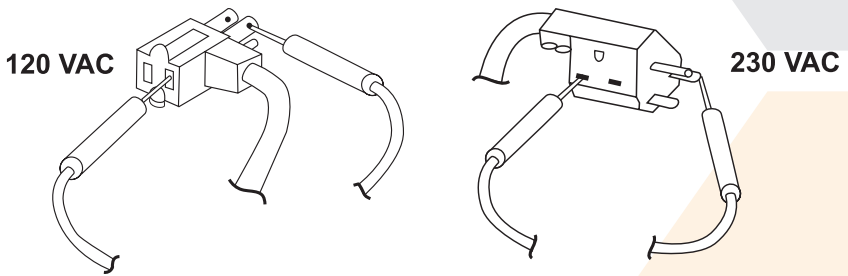
Is Medium Duty Wide-Angle Dual short cycling on one float?

If so, there may be a problem with the wiring, the floats or the relay. Disconnect power before proceeding.

Wiring: Inspect the cable for damage. Double-check your wiring against the wiring diagram on the installation instructions.

Float: Inspect float positioning. Check the float for proper positioning, tether length, or obstructions which may have caused it to hang-up. For the Medium Duty Wide-Angle Dual the gray float is always the top float and the black float is always the bottom float.

Relay: To check the relay on pump up or pump down models, use a volt/ohm meter, touch one lead to the black wire and one lead to the white wire. For units with plug, see figure below. Lift the black float up and leave gray float hanging down. If the meter reads continuity, return float to your supplier.



Is the control panel or alarm off when the control switch is in the “on” or “off” positions?

(“ON” position is up for a normally open application or down for a normally closed application; “OFF” position is down for a normally open application or up for a normally closed application) There may be a problem with the wiring, the control switch, or other panel components. Disconnect power before proceeding.

Control Panel/Alarm: Inspect the power cord for damage. Check the control panel/ alarm installation instructions for correct wiring positions for power.

Troubleshooting Pump and Control Switches

Control Switch: Make sure the float switch is the correct model for the application. A Normally Open (NO) float switch is used for high level alarm applications and Normally Closed (NC) float switch is used for low level alarm applications. NOTE: On an SPDT switch, the black and white wires are used for a N/O switch and the red and white wires are used for a N/C switch.

Check the label on the float switch cable. If the cable label is gone:

- Raise the float up. If there is continuity through the switch, it is a normally open switch.
- Lower the float down. If there is continuity through the switch, it is a normally closed switch.

Check the control panel/alarm installation instructions for correct terminal positions. Check the connection between the float cable leads and the terminal strip. Check the float for proper positioning or obstructions which may have caused the float to hang-up. Inspect the float cable for damage.

To test for continuity: Disconnect the float cable leads from the terminal strip. Connect a volt/ohm meter to the black and white float leads. Move the float to the "on" position (up for high level alarm models, down for low level alarm models). If the volt/ohm meter reads no continuity, return the switch to your supplier.

Is there sloshing in the float?

Gently shake the float. If there is excessive sloshing, or if the float feels heavier than normal, there may be liquid in the float housing. If these conditions exist, return the float to the factory. NOTE: CSI Controls™ mercury switches will have some sloshing sound due to the mercury in the switch. Mechanical switches utilize metal components that will cause some sound as well.

Was the switch used in an application other than those recommended in the product literature?

Gather information from the customer or installer and consult the product literature or call the factory at 888-342-5753.



CSI Controls™

Toll Free: 888-342-5753

www.csicontrols.com