WATLOW
Power Controls
Watlow Controls, 1241 Bundy Blvd.,
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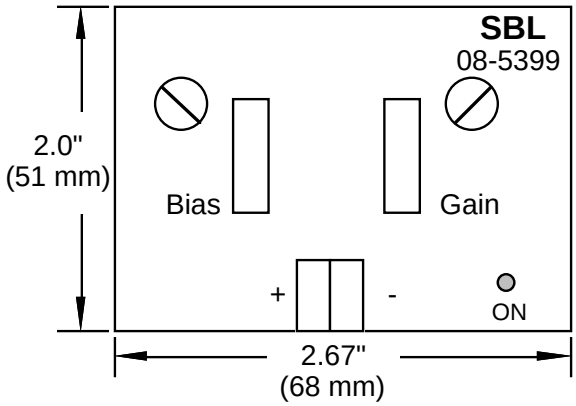
SBL Card

Specifications

- **Power Requirements:** 4-20mA DC current. Temperature controls must provide at least 7.5VDC (375Ω SBL input impedance).
- **Linearity:** Within ± 3% over a 20 to 80% power region.
- **Operating Temperature:** 32 to 122°F/ 0 to 50°C 0 to 90% RH, non-condensing.
- **Firing Mode:** Variable Time Base @ 50% power, 3 cycles ON, 3 cycles OFF, zero-cross switching with 1/2 cycle resolution.
- **Output:** 3.5VDC minimum. Current is dependent upon the SSR input impedance.

Dimensions



General Description

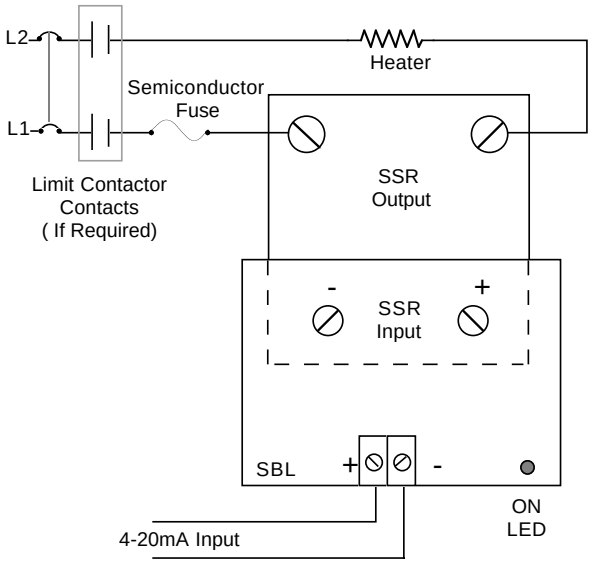
The Watlow SBL card is a stand-alone control card which accepts a proportional 4-20mA command signal from a temperature control. It provides a variable time-base, proportional output for a zero cross-fired, DC input solid state relay (SSR). The SBL can drive one SSR for single phase or two SSRs for three-phase, two-leg applications. The SBL is loop powered from the 4-20mA, so there is no need for an external power supply. It easily attaches to the SSR input terminals, making it a compact power control with a variety of voltages and amperages limited only by the SSR's output.

Setup Procedure

1. Set the temperature control command signal to 20mA.
2. Adjust the Gain potentiometer until the SSR output is just full ON (LED full on).
3. Set the temperature control command signal to 4mA.
4. Adjust the Bias potentiometer for ZERO output at 4mA (LED full off).
5. Repeat Steps 1 through 4 until no further adjustment is required.

WSBL-XDSN Rev A00
January, 1996

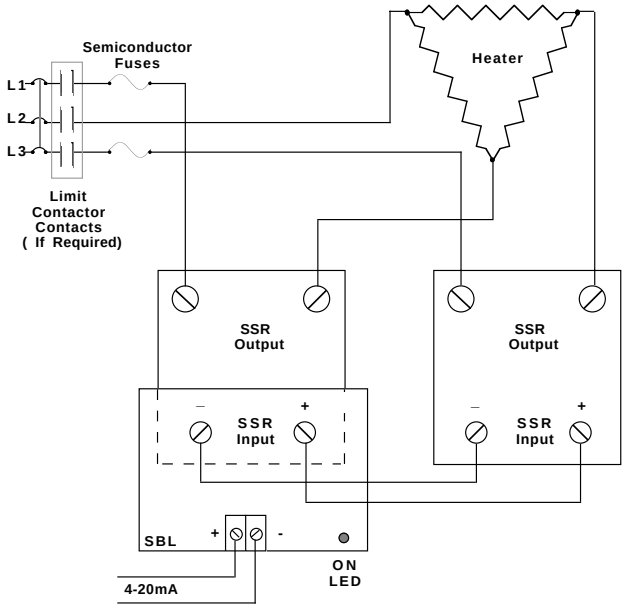
Wiring Diagrams



Single Phase

WARNING: Wiring examples show L2 in 240V~ (VAC) or 480V~ (VAC) configuration. In 120V~ (VAC) or 277V~ (VAC) applications, L2 is neutral and must not be fused or switched. Failure to follow this guideline could result in death or personal injury.

NOTE: The SBL Card can operate a maximum of 2 SSR's wired for 3 phase-2 leg control.



Three Phase, Two Leg

Troubleshooting

Symptom

- No Output

Possible Causes

- No command signal
- No VAC to the heater
- Blown fuse
- Defective SSR
- Defective SBL
- Impedance mismatch between temperature control and SBL input

Troubleshooting Procedure

1. Make sure the "ON" LED located on the SBL card is cycling or full ON. If not, check the 4-20mA command signal. The SBL card requires at least 5mA to cycle. **The SBL will not accept a voltage input.**

2. If the 4-20mA command signal is good and the LED is cycling or full ON, check for VAC to the heater. First, remove AC power from the system.

   WARNING: Proceed with caution. The remainder of step #2 has a potential shock hazard. This is high voltage and is electrically hot (120VAC or greater). Only qualified electrical personnel should continue with the remainder of this procedure.

   Next, using an AC voltmeter, connect the voltmeter leads across the heater terminals and reapply power with the command signal at 20mA. If there is no voltage present, remove power and check for a blown fuse. To check for a blown fuse, either replace the fuse, or measure it with an ohmmeter and replace if necessary. The ohmmeter should read around 0 ohms.

3. If the fuse is good, measure the voltage across the terminals where the temperature control and SBL connect. It should be 7.5 VDC minimum with the input signal at 20mA. If the voltage is less, there is probably an impedance mismatch between the temperature control and SBL.

   A quick way to check for an impedance mismatch is to disconnect the SBL from the temperature control. Replace the SBL with a 375Ω resistor, and set the input signal to 20mA. Measure the voltage across the resistor; it should be 7.5VDC minimum. If the voltage is less than 3.5VDC @ 4mA input signal, the SBL is defective and should be returned for repair or replacement.

   If the LED works on the SBL, but the SSR will not turn on, there may be a mismatch between the SBL and SSR. Try a different SSR.