

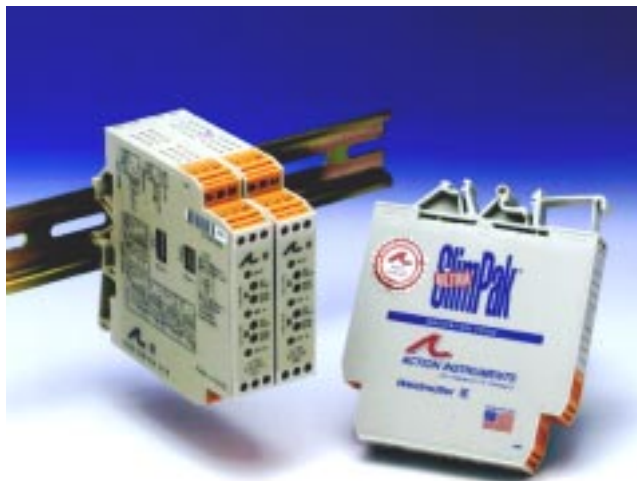
ULTRA SLIMPAK® G118-0002

MODEL



Benefits

- Easy Field Configurable Input Ranges for Platinum, Nickel and Copper RTDs
- Adjustable Setpoints Programmable HI or LO and Failsafe or Non-failsafe
- Ultra Slim 17.7mm Housing Mounts on DIN Rail for High Density Installations
- LED Trip and Input Indicators
- Flexible Power Supply Accepts 9 to 30VDC
- ASIC Technology for High Reliability
- Lifetime Warranty



RTD Input, Field Configurable Limit Alarm

Provides Relay Contact Closure(s) at a Preset RTD/Resistance Input Level

DESCRIPTION

The Ultra SlimPak G118 is a DIN rail mount, RTD input limit alarm with dual setpoints and two contact closure outputs. The field configurable input and alarm functions offer flexible setpoint capability. There are up to eight temperature ranges available for each RTD type to ensure accuracy and maximize setpoint resolution.

The G118 is configurable as a single or dual setpoint alarm, with HI or LO trips and failsafe or non-failsafe operation. Also included are adjustable deadbands (0.25 to 5% of full scale input) for each setpoint and a flexible DC power supply which accepts any voltage between 9 and 30VDC.

DIAGNOSTIC LEDs

The G118 is equipped with three front panel LEDs. The first is a dual function LED labeled IN (input). This green LED indicates line power and input signal status. Active DC power is indicated by an illuminated LED. If this LED is off, check DC power and wiring connection. If the input signal is more than 110% of full scale, the LED will flash at 8 Hz. Below -10%, the flash rate is 4 Hz.

Two red LEDs indicate the relay state for each setpoint. An illuminated red LED indicates the tripped condition.

OUTPUT

The G118 is equipped with two SPDT (form C) relays, rated at 120VAC or 28VDC at 5 amperes. Each of these relays is independently controlled by the field configurable setpoint and deadband.

OPERATION

The field configurable G118 limit alarm setpoints can be configured for HI or LO, failsafe or non-failsafe operation. Each of the setpoints has a respective HI or LO deadband. In a tripped condition, the



Protecting the Integrity of Industrial Process Signals



setpoint is exceeded and the appropriate red LED will illuminate. The trip will reset only when the process falls below the HI deadband or rises above the LO deadband (see Figure 1). For proper deadband operation the HI setpoint must always be set above the LO setpoint.

In failsafe operation, the relay is energized when the process is below the HI setpoint or above the LO setpoint (opposite for non-failsafe). In the failsafe mode, a power failure results in an alarm state output.

DYNAMIC DEADBAND

LSI circuitry in the G118 prevents false trips by repeatedly sampling the input. The input must remain beyond the setpoint for 100 milliseconds, uninterrupted, to qualify as a valid trip condition. Likewise, the input must fall outside the deadband and remain there for 100 milliseconds to return the alarm to an untripped condition. This effectively results in a “dynamic deadband” —based on time— in addition to the normal deadband.

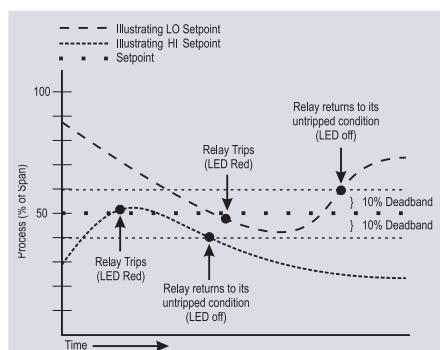


Figure 1: Limit alarm operation and effect of deadband(s).

CONFIGURATION

Unless otherwise specified, the factory pre-sets the Model G118 as follows:

Input: Platinum (100W)
 Range: 0 to 250°C
 Output: Dual, SPDT
 Trip: A:HI, B:LO
 Failsafe: No
 Deadband: A, B: 1.0%

The DC power input accepts any DC source between 9 and 30V; typically a 12V or 24VDC source is used (see Accessories).

For other I/O ranges, refer to Tables 1 through 3 and reconfigure switches SW1 and SW2 for the desired input type, range and function.

WARNING: Do not attempt to change any switch settings with power applied. Severe damage will result!

INPUT

1. With DC power off, position input switches 1 through 6 on “SW2” for RTD type (see Table 1).
2. Set position 1 through position 4 of input range switch “SW1” for the desired RTD type and input temperature range (Table 3).
3. Set position 5 and 6 of input range switch “SW1” to ON for a HI trip setpoint or OFF for a LO trip setpoint (Figure 4).
4. Set position 7 of input range switch “SW1” to ON for non-failsafe operation or OFF for failsafe operation (e.g. alarm trips upon power failure).

CALIBRATION

1. After configuring the DIP switches, connect the input to a calibrated RTD source or a resistance decade box and apply power. (Figure 6).
2. Setpoint Calibration: Before adjusting the setpoint, adjust deadband pot to its minimum (20 turns counter clockwise). With the desired trip

RTD resistance input applied, adjust setpoint pot until the relay trips. For HI trip calibration, start with the setpoint pot above the desired trip (20 turns clockwise). For LO trip calibration, start with the setpoint pot below the desired trip (20 turns counter clockwise).

3. Deadband Calibration: Set deadband pot to its minimum (20 turns counter clockwise). Adjust the setpoint pot to desired trip. Adjust RTD resistance input until relay trips. Readjust deadband pots to 5% (20 turns clockwise). Set RTD resistance input to desired deadband position. Slowly adjust deadband (counter clockwise) until relay untrips.

Note: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1 to 2 hours for warm up and thermal equilibrium of the system.

Table 1: RTD Input Type switch settings (SW2 - 1 through 6)

	SW2
	1 2 3 4 5 6
Cu 10	1 2 3 4 5 6
Pt 100, Cu 100	1 2 3 4 5 6
Pt 500, NiFe 604	1 2 3 4 5 6
Pt 1000	1 2 3 4 5 6
Ni 120	1 2 3 4 5 6

Table 2: Setpoint Function switch settings (SW1 - 5 through 8)

	SW1
	5 6 7 8
TRIP B HI	5 6 7 8
TRIP A HI	5 6 7 8
NON-FAILSAFE	5 6 7 8

KEY: = ON

Table 3: Input Range switch settings (SW1-1 through 4)

	SW1	Resistance
Pt 100, 500, 1000 (α :.00385)	1 2 3 4	*Pt 100 (Ω)
0 to 50°C (32 to 122°F)	1 2 3 4	100 to 119.4
-50 to 50°C (-58 to 122°F)	1 2 3 4	80.3 to 119.4
0 to 100°C (32 to 212°F)	1 2 3 4	100 to 138.5
-100 to 100°C (-148 to 212°F)	1 2 3 4	60.2 to 138.5
0 to 250°C (32 to 482°F)	1 2 3 4	100 to 194.1
-200 to 250°C (-328 to 482°F)	1 2 3 4	18.5 to 194.1
0 to 550°C (32 to 1022°F)	1 2 3 4	100 to 297.4
0 to 850°C (32 to 1562°F)	1 2 3 4	100 to 390.3
Cu10	1 2 3 4	Cu 10 (Ω)
25 to 70°C (77 to 158°F)	1 2 3 4	10.0 to 11.74
-30 to 70°C (-22 to 158°F)	1 2 3 4	7.876 to 11.74
25 to 120°C (77 to 248°F)	1 2 3 4	10.0 to 13.67
-70 to 120°C (-94 to 248°F)	1 2 3 4	6.318 to 13.67
25 to 260°C (77 to 500°F)	1 2 3 4	10.0 to 19.116
-200 to 260°C (-328 to 500°F)	1 2 3 4	1.058 to 19.116
Cu 100	1 2 3 4	Cu 100 (Ω)
25 to 75°C (77 to 167°F)	1 2 3 4	100.0 to 115.5
-25 to 75°C (-13 to 167°F)	1 2 3 4	80.7 to 115.5
25 to 150°C (77 to 302°F)	1 2 3 4	100 to 148.3
-100 to 150°C (-148 to 302°F)	1 2 3 4	51.3 to 148.3
25 to 260°C (77 to 500°F)	1 2 3 4	100 to 191.2
-200 to 260°C (-328 to 500°F)	1 2 3 4	10.6 to 191.2
Ni 120	1 2 3 4	Ni 120 (Ω)
-30 to 30°C (-22 to 86°F)	1 2 3 4	99.4 to 142.1
-80 to 30°C (-112 to 86°F)	1 2 3 4	66.6 to 142.1
-30 to 100°C (-22 to 212°F)	1 2 3 4	99.4 to 200.6
-30 to 200°C (-22 to 392°F)	1 2 3 4	99.4 to 303.5
-30 to 320°C (-22 to 608°F)	1 2 3 4	99.4 to 471.2
NiFe 604	1 2 3 4	NiFe 604 (Ω)
-40 to 0°C (-40 to 32°F)	1 2 3 4	499.1 to 604.0
-40 to 50°C (-40 to 122°F)	1 2 3 4	499.1 to 751.8
-200 to 50°C (-328 to 122°F)	1 2 3 4	245.3 to 751.8
-200 to 100°C (-328 to 212°F)	1 2 3 4	245.3 to 917.3
-200 to 240°C (-328 to 464°F)	1 2 3 4	245.3 to 1475.6

*Note: Resistance values for Pt 500(Ω) and Pt 1000(Ω) are 5 and 10 times the resistance value of Pt100 (Ω), respectively.

SPECIFICATIONS

Inputs	Sensor Types: Pt100, Pt500, Pt1000 (0.00385W/W ² °C); Cu10, Cu100; Ni120, NiFe604 Sensor Connection: 3-wire. Input Ranges: see table 1.
Excitation Current (Max)	<2mA for Pt100, Pt500, Pt1000, Ni120, Cu100 or NiFe604 <10mA for Cu10
Leadwire Resistance	40% of base sensor resistance or 100Ω (whichever is less), maximum per lead.
Leadwire Effect	Less than 1% of selected span over entire leadwire resistance range.
Input Protection	Normal Mode: Withstands ±5VDC. Common Mode (Input to Ground): 1800VDC, max.
LED Indicators	Input Range (Green): >110% input: 8Hz flash; >-10% input: 4Hz flash Setpoint (Red): Tripped: Solid red; Safe: Off
Limit Differentials (Deadbands)	.25% to 5% of span
Response Time	Dynamic Deadband: Relay status will change when proper setpoint/process condition exists for 100msec. Normal Mode (analog filtering): <250mSec. (10-90%)
Setpoints	Effectivity: Setpoints are adjustable over 100% of the selected input span Repeatability (constant temp.): ±0.2% of full scale
Stability	Line Voltage: ±0.01%/%, max. Temperature: ±0.05% of full scale/°C, max.
Common Mode Rejection	DC to 60Hz: 120dB / >60Hz: 100dB

Isolation	1800VDC between contacts, input and power
EMC Compliance (CE Mark)	Emissions: EN50081-1 Immunity: EN50082-2 Safety: EN50178
Humidity (Non-Condensing)	Operating: 15 to 95% (@45°C) Soak: 90% for 24 hours (@65°C)
Temperature Range	Operating: -15 to 55°C (5 to 131°F) Storage: -25 to 75°C (-13 to 158°F)
Power	Consumption: 1.5W typical, 2.5W max. Supply Range: 9 to 30VDC, inverter isolated
Relay Contacts	2 SPDT (2 form C) Relays, 1 Relay per setpoint Current Rating (resistive) 120VAC: 5A 240VAC: 2A 28VDC: 5A Material: Gold flash over silver alloy Electrical Life: 10 ⁵ operations at rated load <i>Note: External relay contact protection is required for use with inductive loads (see Figures 2 & 3).</i> Mechanical Life: 10 ⁷ operations
Weight	0.56lbs.
Agency Approvals	CSA certified per standard C22.2, No. 0-M91 and 142-M1987 (File No. LR42272) UL recognized per standard UL508 (File No. E99775) CE Compliance per EMC directive 89/336/EEC

RELAY PROTECTION AND EMI SUPPRESSION

When switching inductive loads, maximum relay life and transient EMI suppression is achieved using external protection (see Figures 2 and 3). Place all protection devices directly across the load and minimize all lead lengths. For AC inductive loads, place a properly-rated MOV

across the load in parallel with a series RC snubber. Use a 0.01 to 0.1mF pulse film capacitor (foil polypropylene recommended) of sufficient voltage, and a 47W, 1/2W carbon resistor. For DC inductive loads, place a diode across the load (PRV > DC supply, 1N4006 recommended) with (+) to cathode and (-) to anode (the RC snubber is an optional enhancement).

FACTORY ASSISTANCE

For additional information on calibration, operation and installation please contact Action's Technical Services Group. Call toll-free:

800-767-5726

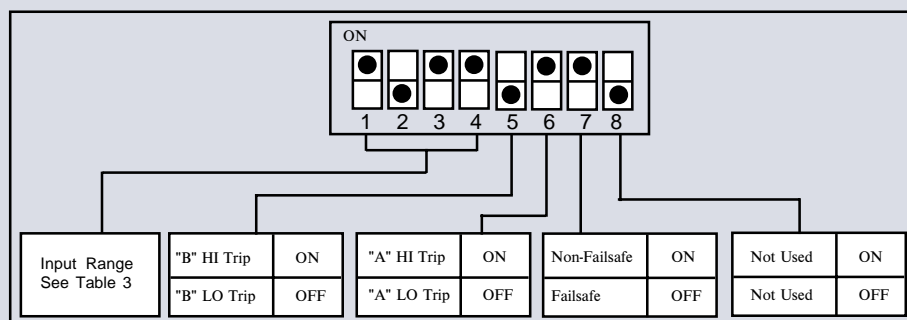
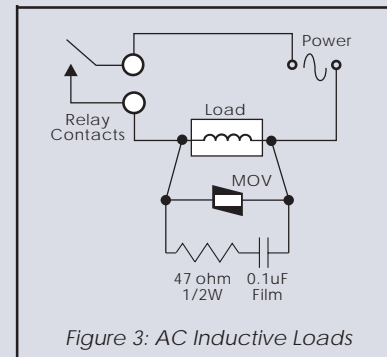
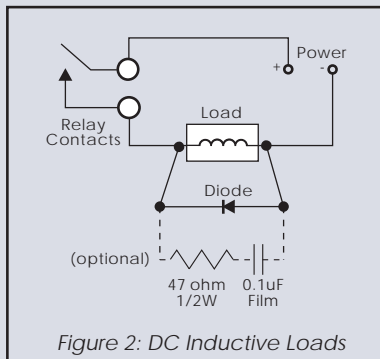


Figure 4: G118 Input Range/Function Selection (SW1) Factory Default Settings

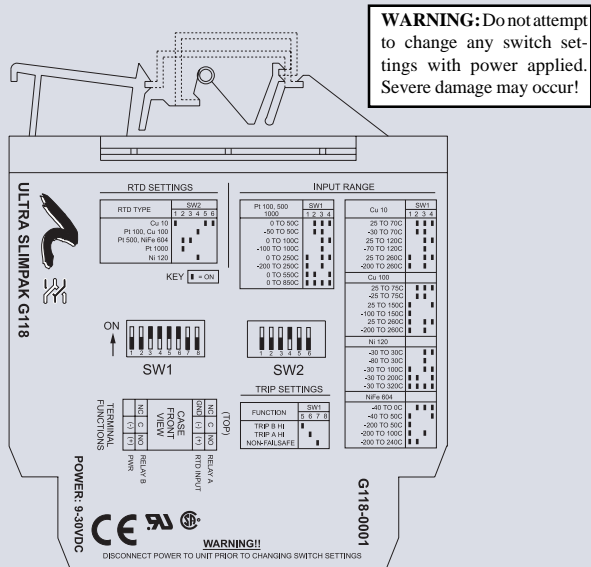


Figure 5: G118 Factory Calibration; 0-250°C (Pt 100), A-HI/B-LO, Non-Failsafe

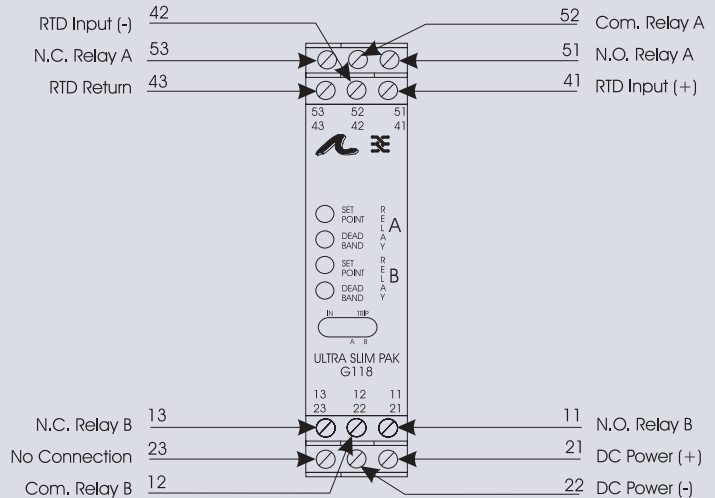


Figure 6: Wiring Diagram for G118

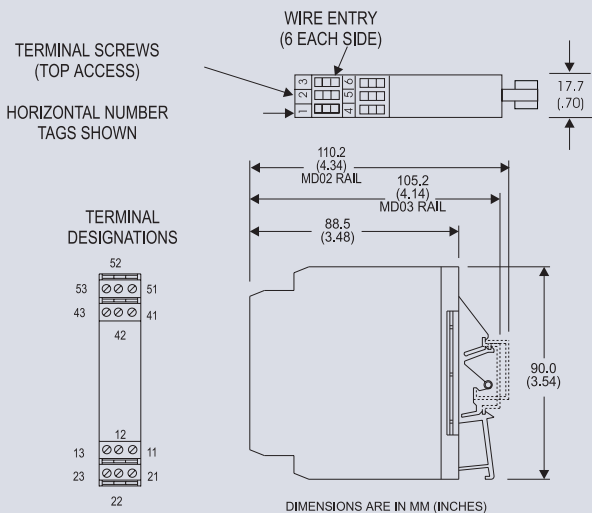
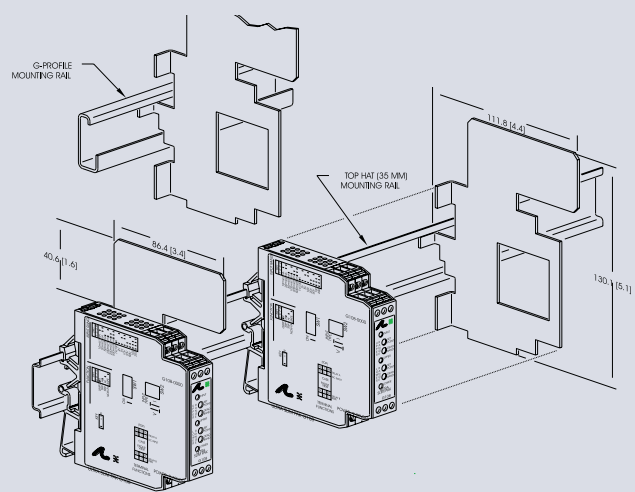


Figure 7: Mechanical Dimensions for G118



MODELS & ACCESSORIES

Accessories

All SlimPak "G" series modules will mount on standard TS32 (model MD02) or TS35 (model MD03) DIN rail. In addition, the following accessories are available:

- HS01 Heat Sink
- MD03 TS35 x 7.5 DIN Rail
- G905 24VDC Power Supply (0.5 Amp)
- H910 24VDC Power Supply (1Amp)
- H915 24VDC Power Supply (2.1 Amp)
- MB03 End Bracket for MD03
- C664 I/O Descriptive Tags

Ordering Information

Specify:

1. Model: **G118-0002**
2. Accessories: (see Accessories)
3. Optional Custom Factory Calibration; specify **C620** with desired input and output range.

Pin Connections

- 11 N.O. Relay B
- 12 Com. Relay B
- 13 N.C. Relay B
- 21 DC Power (+)
- 22 DC Power (-)
- 23 No Connection
- 41 RTD Input (+)
- 42 RTD Input (-)
- 43 RTD Return
- 51 N.O. Relay A
- 52 Com. Relay A
- 53 N.C. Relay A

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