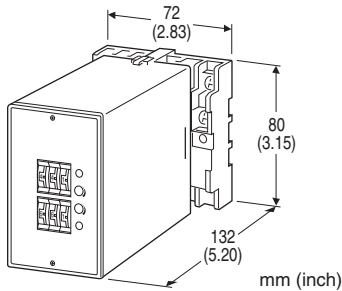


## Limit Alarms (with DC output) AE-UNIT

### RTD ALARM

#### Functions & Features

- Providing SPDT relay outputs at preset input levels
- Direct input from an RTD
- Dual (Hi/Lo) trip
- Additional isolated DC output proportional to the temperature
- Linearization
- Burnout protection
- "Active bridge" circuit containing two constant current sources allows large leadwire resistances up to 200  $\Omega$
- Energized or de-energized coil at a tripped condition selectable
- Thumbwheel switch adjustments
- Relays can be powered 110 V DC



## MODEL: AER-[1][2][3][4][5][6]-[7][8]

### ORDERING INFORMATION

- Code number: AER-[1][2][3][4][5][6]-[7][8]
- Specify a code from below for each [1] through [8]. (e.g. AER-4A2101-D/BL)
- Temperature range (e.g. 0 - 200°C)
- Special DC output range (For codes Z & 0)

#### [1] INPUT RTD (2- or 3-wire)

- 1: JPt 100 (JIS'89)  
(Usable range: -200 to +500°C, -328 to +932°F; min.span: 50°C, 90°F)
- 3: Pt 100 (JIS'89)  
(Usable range: -200 to +650°C, -328 to +1202°F; min.span: 50°C, 90°F)
- 4: Pt 100 (JIS'97, IEC)  
(Usable range: -200 to +650°C, -328 to +1202°F; min.span: 50°C, 90°F)
- 5: Pt 50  $\Omega$  (JIS'81)  
(Usable range: -200 to +500°C, -328 to +932°F; min.span: 100°C, 180°F)
- 6: Ni 508.4  $\Omega$   
(Usable range: -50 to +200°C, -58 to +392°F; min.span: 30°C, 54°F)
- 0: Specify
- Note: Consult M-System for 2-wire RTD

#### [2] DC OUTPUT

- N: None
- Current**
- A: 4 - 20 mA DC (Load resistance 350  $\Omega$  max.)  
 B: 2 - 10 mA DC (Load resistance 700  $\Omega$  max.)  
 C: 1 - 5 mA DC (Load resistance 1400  $\Omega$  max.)  
 D: 0 - 20 mA DC (Load resistance 350  $\Omega$  max.)  
 E: 0 - 16 mA DC (Load resistance 430  $\Omega$  max.)  
 F: 0 - 10 mA DC (Load resistance 700  $\Omega$  max.)  
 G: 0 - 1 mA DC (Load resistance 7000  $\Omega$  max.)  
 Z: Specify current (See OUTPUT SPECIFICATIONS)
- Voltage**
- 1: 0 - 10 mV DC (Load resistance 10 k $\Omega$  min.)  
 2: 0 - 100 mV DC (Load resistance 100 k $\Omega$  min.)  
 3: 0 - 1 V DC (Load resistance 1000  $\Omega$  min.)  
 4: 0 - 10 V DC (Load resistance 10 k $\Omega$  min.)  
 5: 0 - 5 V DC (Load resistance 5000  $\Omega$  min.)  
 6: 1 - 5 V DC (Load resistance 5000  $\Omega$  min.)  
 4W: -10 - +10 V DC (Load resistance 10 k $\Omega$  min.)  
 5W: -5 - +5 V DC (Load resistance 5000  $\Omega$  min.)  
 0: Specify voltage (See OUTPUT SPECIFICATIONS)

#### [3] SETPOINT 1 OUTPUT

- 1: Hi (coil energized at alarm)  
 2: Hi (coil de-energized at alarm)  
 3: Lo (coil energized at alarm)  
 4: Lo (coil de-energized at alarm)

#### [4] SETPOINT 2 OUTPUT

- 1: Hi (coil energized at alarm)  
 2: Hi (coil de-energized at alarm)  
 3: Lo (coil energized at alarm)  
 4: Lo (coil de-energized at alarm)

#### [5] ON DELAY TIME

- 0: 0.5 seconds  
 1: 1 second  
 2: 2 seconds  
 3: 3 seconds  
 4: 4 seconds

#### [6] POWER ON DELAY TIME

- 1: 1 second  
 2: 2 seconds  
 3: 3 seconds  
 4: 4 seconds  
 5: 5 seconds



## [7] POWER INPUT

### AC Power

B: 100 V AC  
 C: 110 V AC  
 D: 115 V AC  
 F: 120 V AC  
 G: 200 V AC  
 H: 220 V AC  
 J: 240 V AC

### DC Power

S: 12 V DC  
 R: 24 V DC  
 V: 48 V DC  
 P: 110 V DC

## [8] OPTIONS

### Burnout

blank: Upscale burnout  
 /BL: Downscale burnout

## GENERAL SPECIFICATIONS

**Construction:** Plug-in

**Connection:** M3.5 screw terminals

**Housing material:** Flame-resistant resin (black)

**Isolation:** Input to DC output to alarm output 1 to alarm output 2 to power

**Zero adjustment:** -5 to +5 % (front)

**Span adjustment:** 95 to 105 % (front)

**Setpoint adjustments:** Thumbwheel switches (front);  
 0 - 99 % independently; 1 % increments

**Hysteresis (deadband) adjustments:** Thumbwheel switches (front); 0.5, 1 - 9 % independently; 1 % increments (SW position 0 = 0.5); [Lo SP + Hysteresis] ≤ 102

**Burnout protection:** Upscale standard; downscale optional; Both DC and relay outputs respond respectively for upscale input.

**Linearization:** Standard

**Front LEDs:** Red lights turn on when the coils are energized.

## INPUT SPECIFICATIONS

**Maximum leadwire resistance:** 200 Ω per wire (3-wire)

**Sensing current:** 2 mA

## OUTPUT SPECIFICATIONS

### ■ DC Output

•DC Current: 0 - 20 mA DC

**Minimum span:** 1 mA

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 7 V maximum

•DC Voltage: -10 - +12 V DC

**Minimum span:** 5 mV

**Offset:** Max. 1.5 times span

**Load resistance:** Output drive 1 mA maximum; at ≥ 0.5 V

### ■ Alarm Output: Relay contact

100 V AC @ 1 A (cos φ = 1)

120 V AC @ 1 A (cos φ = 1)

240 V AC @ 0.5 A (cos φ = 1)

30 V DC @ 1 A (resistive load)

**Maximum switching voltage:** 380 V AC or 125 V DC

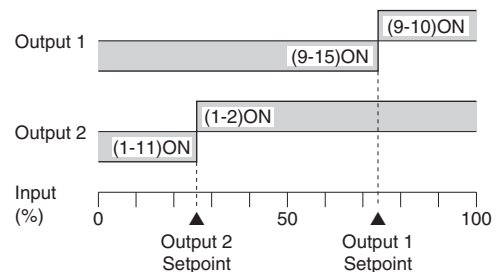
**Maximum switching power:** 120 VA or 30 W

**Minimum load:** 5 V DC @ 10 mA

**Mechanical life:** 5 × 10<sup>7</sup> cycles

For maximum relay life with inductive loads, external protection is recommended.

### Alarm Trip Operation Terminal No. in parentheses



### Trip Operation in Power Failure

- Output Code: 1 & 4: Terminals 1 - 11, 9 - 15 turn ON
- Output Code: 2 & 3: Terminals 1 - 2, 9 - 10 turn ON

## INSTALLATION

### Power input

•AC: Operational voltage range: rating ±10 %, 50/60 ±2 Hz, approx. 3 VA

•DC: Operational voltage range: rating ±10 %, or 85 - 150 V for 110 V rating (ripple 10 % p-p max.)

Approx. 2 W (80 mA at 24 V)

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Mounting:** Surface or DIN rail

**Weight:** 450 g (0.99 lbs)

## PERFORMANCE in percentage of span

### •DC output

**Accuracy:** ±0.2 %

**Response time:** ≤ 0.5 sec. (0 - 90 %)

### •Alarm output

**Setpoint accuracy:** ±0.7 %

**Hysteresis (Deadband) setpoint accuracy:** ±0.3 %

**ON delay time accuracy:** Rating ±20 % or 0.3 sec., whichever is greater.

**Power ON delay time accuracy:** Rating ±30 %



**Trip point repeatability:**  $\pm 0.05\%$

**Temp. coefficient:**  $\pm 0.015\%/^{\circ}\text{C}$  ( $\pm 0.008\%/^{\circ}\text{F}$ )

**Burnout response:**  $\leq 10$  sec.

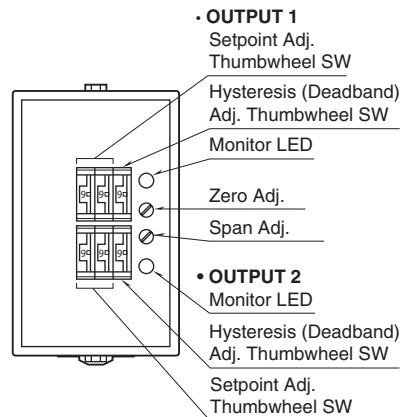
**Line voltage effect:**  $\pm 0.1\%$  over voltage range

**Insulation resistance:**  $\geq 100\ \text{M}\Omega$  with 500 V DC

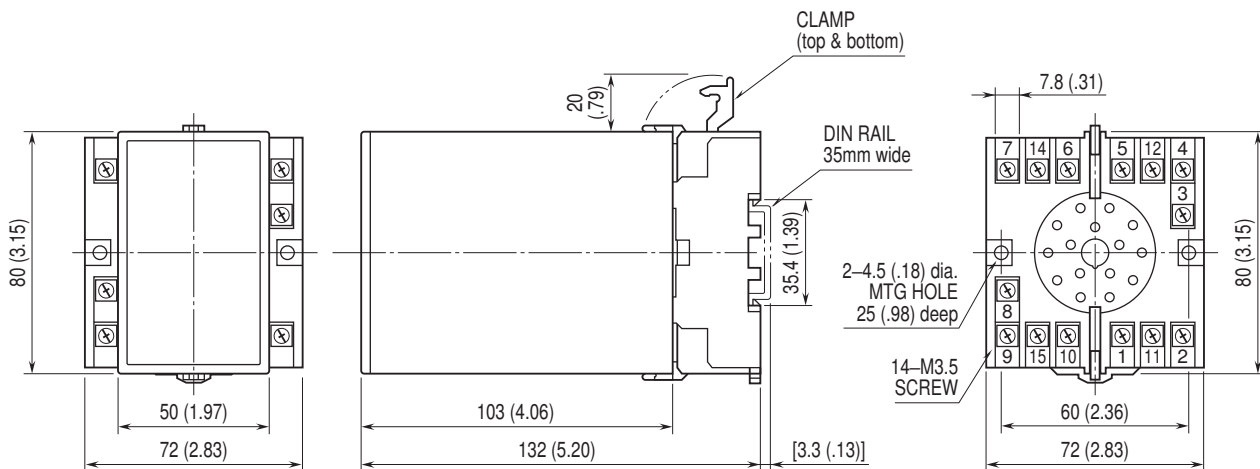
**Dielectric strength:** 2000 V AC @ 1 minute

(input to DC output to alarm output 1 to alarm output 2 to power to ground)

## EXTERNAL VIEW



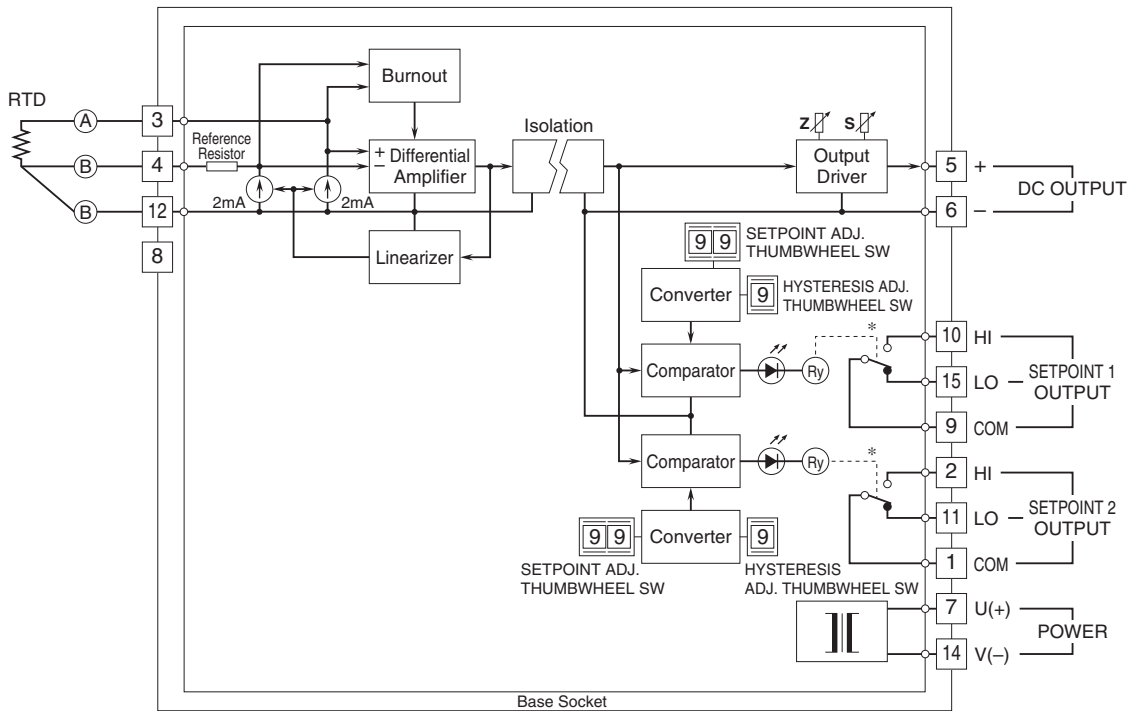
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



• When mounting, no extra space is needed between units.



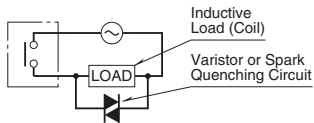
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



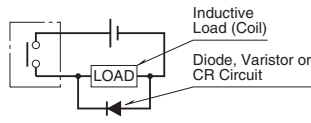
\*Relay status for output codes "1" & "4", at power OFF.

### ■ Relay Protection

#### •AC Powered



#### •DC Powered



Specifications are subject to change without notice.