

Limit Alarms (with DC output) AE-UNIT

THERMOCOUPLE ALARM

MODEL **AET**

MODEL & SUFFIX CODE SELECTION

AET-□□□□□□□□

MODEL

INPUT THERMOCOUPLE

- | | |
|-------------|-------------|
| 1 : (PR) | 6 : B (RH) |
| 2 : K (CA) | 7 : R |
| 3 : E (CRC) | 8 : S |
| 4 : J (IC) | N : N |
| 5 : T (CC) | 0 : Specify |

DC OUTPUT

N : None

Current

- | | |
|---------------------|---------------------|
| A : 4 – 20mA DC | 1 : 0 – 10mV DC |
| B : 2 – 10mA DC | 2 : 0 – 100mV DC |
| C : 1 – 5mA DC | 3 : 0 – 1V DC |
| D : 0 – 20mA DC | 4 : 0 – 10V DC |
| E : 0 – 16mA DC | 5 : 0 – 5V DC |
| F : 0 – 10mA DC | 6 : 1 – 5V DC |
| G : 0 – 1mA DC | 4W : -10 – +10V DC |
| Z : Specify current | 5W : -5 – +5V DC |
| | 0 : Specify voltage |

Voltage

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)

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)

ON DELAY TIME

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

POWER ON DELAY TIME

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

POWER INPUT

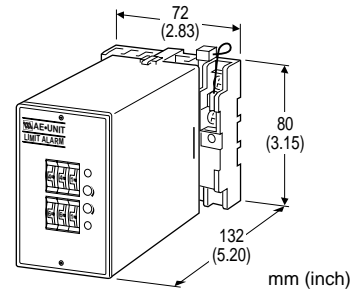
AC Power

- | | | |
|-------------|-------------|-------------|
| B : 100V AC | G : 200V AC | S : 12V DC |
| C : 110V AC | H : 220V AC | R : 24V DC |
| D : 115V AC | J : 240V AC | V : 48V DC |
| F : 120V AC | | P : 110V DC |

DC Power

OPTIONS

- /BN: No burnout
- /BL: Downscale burnout



Functions & Features

- Providing SPDT relay outputs at preset input levels
- Direct input from a thermocouple
- Dual (Hi/Lo) trip
- Additional isolated DC output proportional to the temperature
- 7-segment linearization
- Burnout protection
- High-accuracy cold junction compensation
- Energized or de-energized coil at a tripped condition selectable
- Thumbwheel switch adjustments
- Relays can be powered 110V DC

ORDERING INFORMATION

Specify code number and variables.

- **Code number** (e.g. AET-2A2101-B/BN)
- **Temperature range** (e.g. 0 – 800°C)
- **Special DC output range** (For codes Z & 0)

GENERAL SPECIFICATIONS

Construction: plug-in

Connection: M3.5 screw terminals

Housing material: flame-resistant resin (black)

Isolation: input to DC output to relay output to power

Zero/span adjustments: ±5% (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

Front LEDs: red lights turn on when coils are energized.

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

Linearization: standard

Cold junction compensation: CJC sensor attached to the input terminals

INPUT & OUTPUT

■INPUT: thermocouples

Minimum span: 3mV

Zero suppression/elevation: max. 1.5 times span

Input resistance: 30kΩ minimum

Burnout sensing: 0.1μA

Temperature range

T/C	USABLE RANGE		MIN. SPAN	
	°C	°F	°C	°F
(PR)	0 to 1760	32 to 3200	370	670
K (CA)	-270 to +1370	-450 to +2500	75	140
E (CRC)	-270 to +1000	-450 to +1830	50	100
J (IC)	-210 to +1200	-350 to +2190	60	110
T (CC)	-270 to +400	-450 to +750	75	140
B (RH)	0 to 1820	32 to 3300	780	1440
R	-50 to +1760	-50 to +3200	360	680
S	-50 to +1760	-50 to +3200	380	700
N	-270 to +1300	-450 to +2370	110	200

Remark: For the temperatures that range below 0°C, the transmitter may partially not satisfy the described accuracy. Consult factory.

DC OUTPUT

•DC Current: 0 – 20mA DC

Minimum span: 1mA

Zero suppression/elevation: max. 1.5 times span

Load resistance: output drive 7V maximum

Output	Load Resistance
4 – 20mA	: 350 (Ω maximum)
2 – 10mA	: 700
1 – 5mA	: 1400
0 – 20mA	: 350
0 – 16mA	: 430
0 – 10mA	: 700
0 – 1mA	: 7000

•DC Voltage: -10 – +12V DC

Minimum span: 5mV

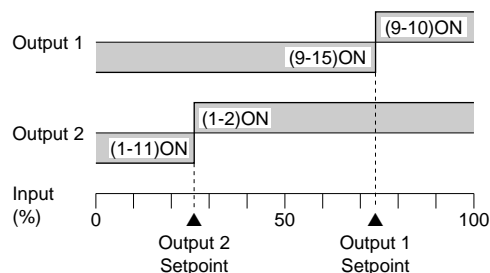
Zero suppression/elevation: max. 1.5 times span

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

Output	Load Resistance
0 – 10mV	: 10k (Ω minimum)
0 – 100mV	: 100k
0 – 1V	: 1000
0 – 10V	: 10k
0 – 5V	: 5000
1 – 5V	: 5000
-10 – +10V	: 10k
-5 – +5V	: 5000

ALARM OUTPUT

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

- Relay Contact: 120V AC @1A (cosφ=1)
240V AC @0.5A (cosφ=1)
30V DC @1A (resistive load)
electrical life 5×10^5 cycles (rate 30/min.)
 - Maximum switching voltage: 380V AC or 125V DC
 - Maximum switching power: 100VA or 30W
 - Minimum load: 5V DC @10mA
 - Mechanical life: 5×10^7 cycles
- For maximum relay life with inductive loads, external protection is recommended.

INSTALLATION

Power input

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

DC: operational voltage range: rating ±10%, or
85 – 150V for 110V rating; ripple 10% p-p
max.; approx. 2W (80mA at 24V)

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

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

Mounting: surface or DIN rail

Dimensions: W72×H87×D132 mm (2.83"×3.43"×5.20")
See General Spec. Sheet Figure A-1.

Weight: 450 g (0.99 lbs)

Terminal assignment: See General Spec. Sheet Figure B-3.

PERFORMANCE in percentage of span

DC output

Accuracy: $\pm 0.3\%$

Response time: ≤ 0.5 seconds (0 – 90%)

Alarm output

Setpoint accuracy: $\pm 0.8\%*$

Hysteresis setpoint accuracy: $\pm 0.3\%$

ON delay time accuracy: rating $\pm 20\%$ or 0.3 sec.,
whichever is greater.

Power ON delay time accuracy: rating $\pm 30\%$

Trip point repeatability: $\pm 0.05\%$

Cold junction compensation error

(at $20^\circ\text{C} \pm 10^\circ\text{C}$ or $68^\circ\text{F} \pm 18^\circ\text{F}$)

K, E, J, T & N: $\pm 0.5^\circ\text{C}$ or $\pm 0.9^\circ\text{F}$ maximum

S, R & PR: $\pm 1^\circ\text{C}$ or $\pm 1.8^\circ\text{F}$ maximum

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

Burnout response: ≤ 10 seconds

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

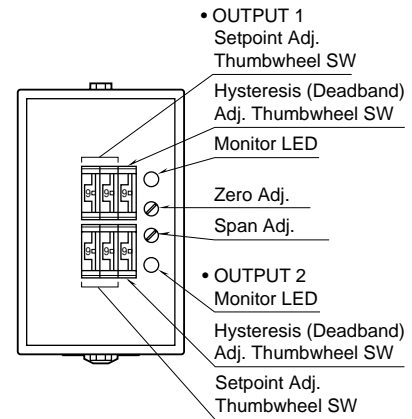
Insulation resistance: $\geq 100\text{M}\Omega$ with 500V DC

Dielectric strength: 2000V AC @1 minute

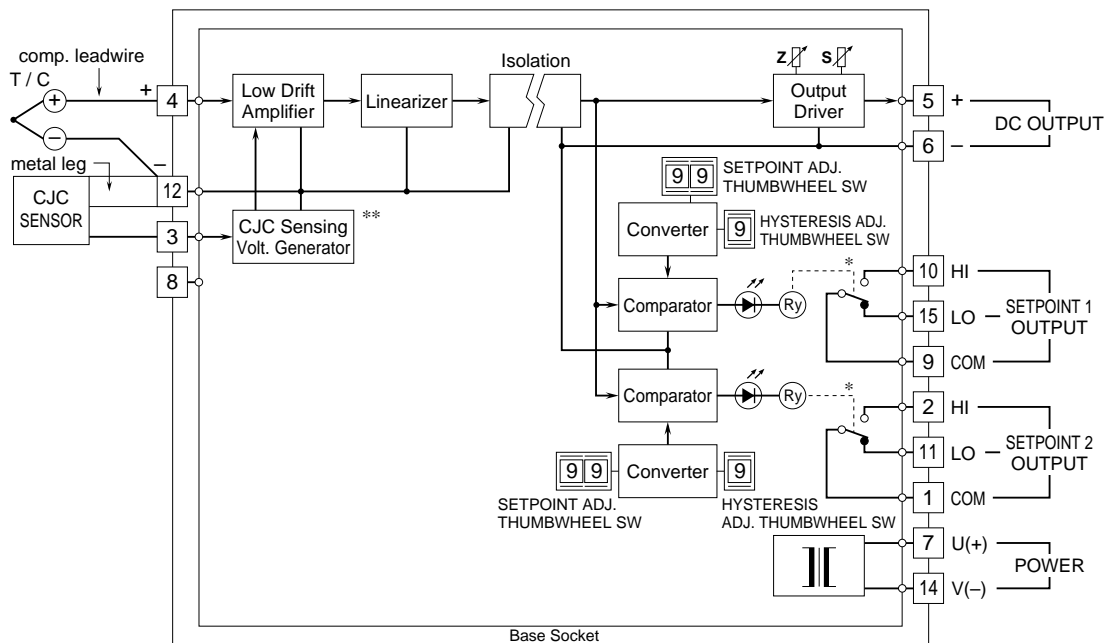
(input to DC output to alarm output 1 to
alarm output 2 to power to ground)

*at over 400°C or 750°F for R, S and PR; over 770°C or 1420°F for B

FRONT PANEL CONFIGURATION



SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

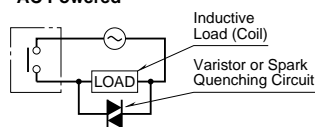


*Relay status for output codes "1" & "4", at power OFF.

**Deleted with B thermocouple

Relay Protection

AC Powered



DC Powered

