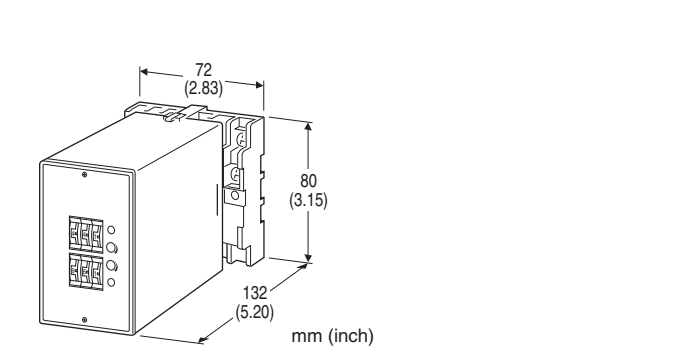


Limit Alarms (with DC output) AE-UNIT

FREQUENCY ALARM

Functions & Features

- Providing SPDT relay outputs at preset frequency levels
- Dual (Hi/Lo) trip
- Additional isolated DC output proportional to the input
- Low-end cutout
- Energized or de-energized coil at a tripped condition selectable
- Thumbwheel switch adjustments
- Relays can be powered 110 V DC



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

ORDERING INFORMATION

- Code number: AESP-[1][2][3][4][5][6]-[7][8]
- Specify a code from below for each [1] through [8]. (e.g. AESP-2A2101-D/Q)
- Frequency range (e.g. 0 - 500 Hz)
- Special DC output range (For codes Z & 0)
- Specify the specification for option code /Q (e.g. /C01/S01)

[1] INPUT

- 1: Dry contact
- 2: Voltage pulse

[2] DC OUTPUT

N: None

Current

- A: 4 - 20 mA DC (Load resistance 350 Ω max.)
- B: 2 - 10 mA DC (Load resistance 700 Ω max.)
- C: 1 - 5 mA DC (Load resistance 1400 Ω max.)
- D: 0 - 20 mA DC (Load resistance 350 Ω max.)
- E: 0 - 16 mA DC (Load resistance 430 Ω max.)
- F: 0 - 10 mA DC (Load resistance 700 Ω max.)
- G: 0 - 1 mA DC (Load resistance 7000 Ω max.)
- Z: Specify current (See OUTPUT SPECIFICATIONS)

Voltage

- 1: 0 - 10 mV DC (Load resistance 10 kΩ min.)
- 2: 0 - 100 mV DC (Load resistance 100 kΩ min.)
- 3: 0 - 1 V DC (Load resistance 1000 Ω min.)
- 4: 0 - 10 V DC (Load resistance 10 kΩ min.)
- 5: 0 - 5 V DC (Load resistance 5000 Ω min.)
- 6: 1 - 5 V DC (Load resistance 5000 Ω min.)
- 4W: -10 - +10 V DC (Load resistance 10 kΩ min.)
- 5W: -5 - +5 V DC (Load resistance 5000 Ω 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

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating
 /C02: Polyurethane coating
 /C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3.5 screw terminals

Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (black)

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

Overrange output: 0 to 120 % at 1 - 5 V

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

Span adjustment: 95 to 105 % (front)

Setpoint adjustments: Thumbwheel switches (front);

0 - 99 % independently; 1 % increments

Remark: This unit has low-end cutout function below 2 - 5 % input. A setpoint below this equals 0 %.

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 the coils are energized.

Low-end cutout: 2 to 5 %

INPUT SPECIFICATIONS

Frequency range: 0 - 50 Hz through 10 kHz

Pulse width (time) requirement: Duty ratio 20 - 80 % at 100 % input

■ **Dry Contact:** Mechanical contact or open collector

Sensing: Approx. 7.5 V DC @1 mA

ON/OFF level: ≤ 200 Ω / 0.6 V for ON, ≥ 100 kΩ / 2 V for OFF

■ **Voltage Pulse:** Square or sine waveforms

Input pulse sensing: Capacitor coupled; detecting pulse rise

Input amplitude: 2 - 50 Vp-p

Input impedance: 100 kΩ min.

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

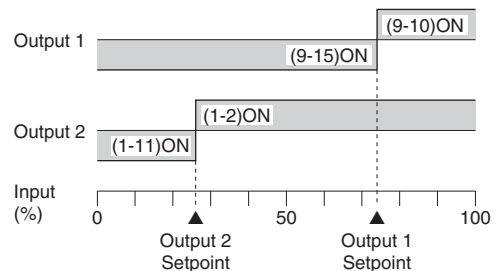
Maximum switching power: 120 VA or 30 W

Minimum load: 5 V DC @ 10 mA

Mechanical life: 5 x 10⁷ 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 $\pm 10\%$, 50/60 ± 2 Hz, approx. 3 VA
- **DC:** Operational voltage range: rating $\pm 10\%$, 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 lb)

PERFORMANCE in percentage of span

• **DC output**

Accuracy: $\pm 0.3\%$ (input 10 - 100 %)

Response time: (0 - 90 %)

Approx. 2 sec. for 0 - 50 Hz

Approx. 1 sec. for 0 - 100 Hz

Approx. 0.5 sec. for 0 - 500 Hz

Approx. 0.5 sec. for 0 - 10 kHz

• **Alarm output**

Setpoint accuracy: $\pm 0.8\%$ (input 10 - 100 %)

Hysteresis (Deadband) setpoint accuracy: $\pm 0.3\%$

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

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

Trip point repeatability: $\pm 0.05\%$

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

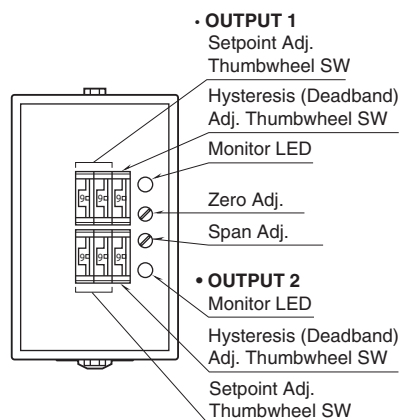
Line voltage effect: $\pm 0.1\%$ over voltage range

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

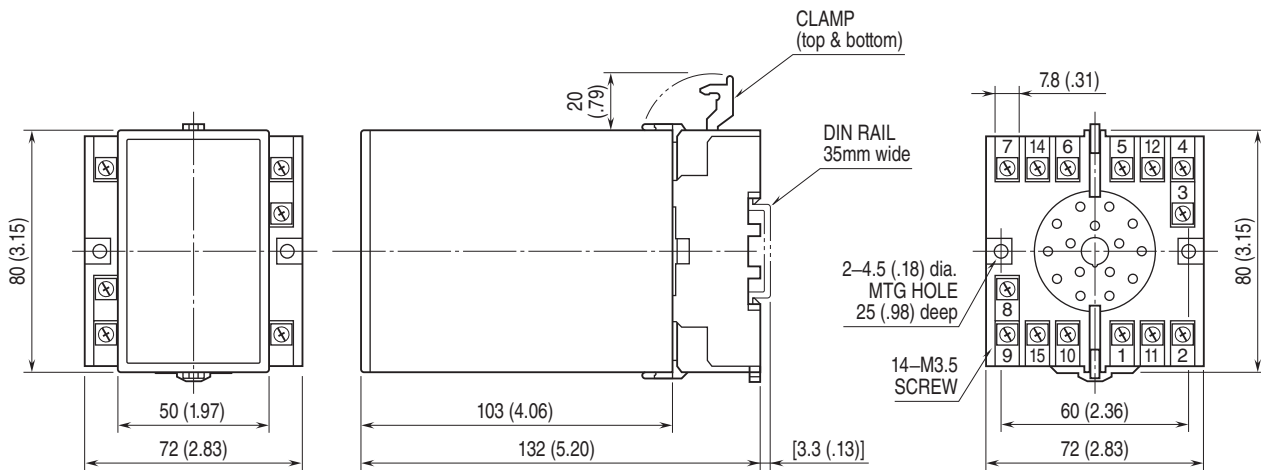
Dielectric strength: 2000 V AC @ 1 minute

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

EXTERNAL VIEW

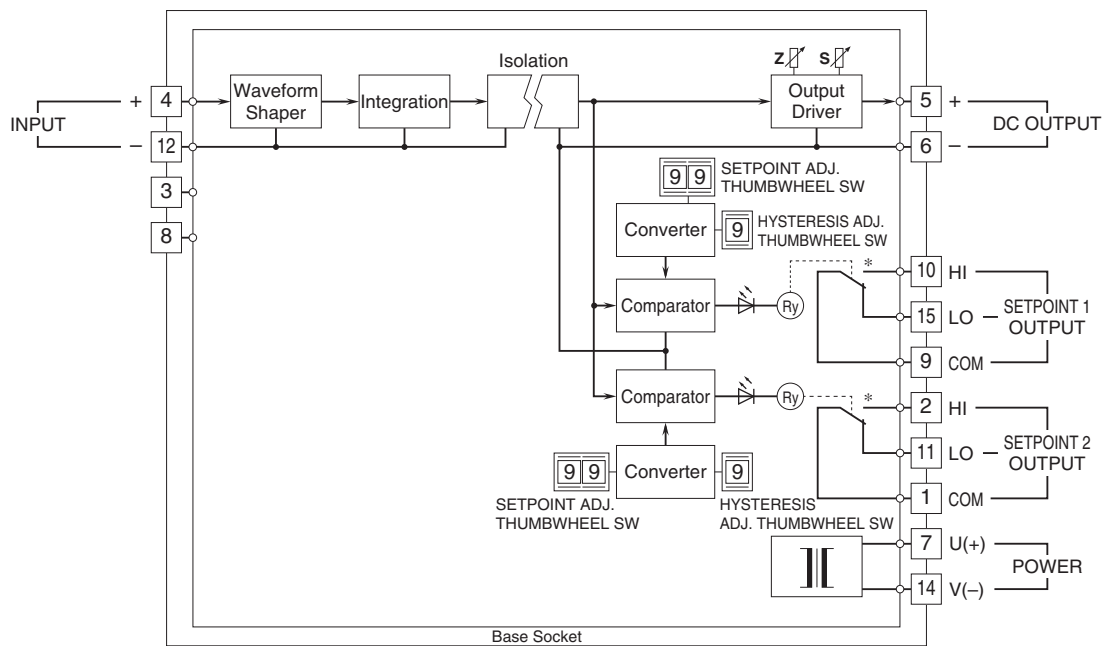


EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

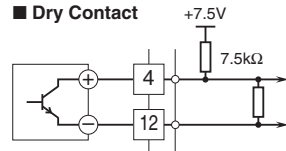
SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



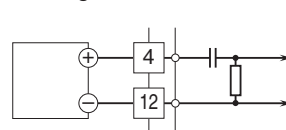
*Relay status for output codes "1" & "4", at power OFF.

Input Connection Examples

■ Dry Contact

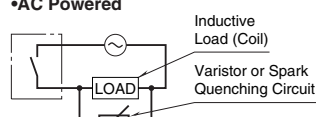


■ Voltage Pulse

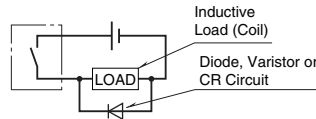


■ Relay Protection

•AC Powered



•DC Powered





Specifications are subject to change without notice.