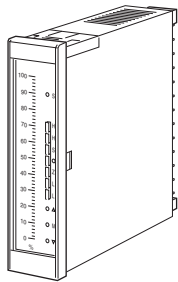


**Bargraph Indicators 48 Series**

**BARGRAPH INDICATING ALARM**

**Functions & Features**

- Displaying a process variable in graphic bargraph of 101 LED segments
- Clear LED
- Providing max. 4 alarm contact outputs
- Relays can be used with 110 V DC power
- Multi-color indicator



**MODEL: 48AV-[1][2][3][4]-[5]**

**ORDERING INFORMATION**

- Code number: 48AV-[1][2][3][4]-[5]
- Specify a code from below for each of [1] through [5].  
(e.g. 48AV-4RVA-R)
- Special input range (For codes Z & 0)
  - Scale (e.g. 0 - 100 %)
  - Color pattern for multi-color indicator (e.g. pattern 2)

**[1] ALARM OUTPUT**

- 2: 2 points
- 4: 4 points

**[2] BAR LED COLOR**

- R: Red
- Y: Amber
- G: Green
- C: Multi-color (red, amber and green)

**[3] MOUNTING DIRECTION**

- V: Vertical
- H: Horizontal

**[4] INPUT**

- Current
- A: 4 - 20 mA DC (Input resistance 10 Ω)
  - B: 2 - 10 mA DC (Input resistance 20 Ω)

- C: 1 - 5 mA DC (Input resistance 39 Ω)
  - D: 0 - 20 mA DC (Input resistance 10 Ω)
  - E: 0 - 16 mA DC (Input resistance 12 Ω)
  - F: 0 - 10 mA DC (Input resistance 20 Ω)
  - G: 0 - 1 mA DC (Input resistance 200 Ω)
  - H: 10 - 50 mA DC (Input resistance 5.1 Ω)
  - Z: Specify current (See INPUT SPECIFICATIONS)
- Voltage
- 3: 0 - 1 V DC (Input resistance 100 kΩ)
  - 4: 0 - 10 V DC (Input resistance 330 kΩ)
  - 5: 0 - 5 V DC (Input resistance 250 kΩ)
  - 6: 1 - 5 V DC (Input resistance 250 kΩ)
  - 0: Specify voltage (See INPUT SPECIFICATIONS)

**[5] POWER INPUT**

- AC Power
- K: 85 - 132 V AC  
(Operational voltage range 85 - 132 V, 47 - 63 Hz)
  - L: 170 - 264 V AC  
(Operational voltage range 170 - 264 V, 47 - 63 Hz)
- DC Power
- R: 24 V DC  
(Operational voltage range 24 V ±15 %, ripple 10 %p-p max.)

**GENERAL SPECIFICATIONS**

- Construction:** Panel flush mounting
- Connection:** M3 screw terminals (torque 0.6 N·m)
- Screw terminal:** Chromated brass
- Housing material:** ABS resin
- Isolation:** Input to output to power
- Zero adjustment:** -5 to +5 % (front)
- Span adjustment:** 95 to 105 % (front)
- Scale plate:** Aluminium (white scale & characters on black base)
- Scale**
  - Characters including decimal points:** Max. 4 characters
  - Divisions:** 22 - 54.9
  - Engineering unit:** Max. 8 characters
- Setpoint adjustment**
  - 2 points:**
    - H: [L setpoint + 1 %] to 100 %
    - L: 0 % to [H setpoint - 1 %]
  - 4 points:**
    - HH: [H setpoint + 1 %] to 100 %
    - H: [L setpoint + 1 %] to [HH setpoint - 1 %]
    - L: [LL setpoint + 1 %] to [H setpoint - 1 %]
    - LL: 0 % to [L setpoint - 1 %]
- Alarm deadband (hysteresis):** 1 %
- Bargraph:** 101-segment LED, 100 mm (3.96") long, 1.5 mm (.06") wide

## INPUT SPECIFICATIONS

■ **DC Current:** 0 – 50 mA DC; input resistor incorporated

**Minimum span:** 1 mA

**0 % input:** 0 mA DC

■ **DC Voltage:** 0 – 10 V DC

**Minimum span:** 1 V

**0 % input:** 0 V DC

## OUTPUT SPECIFICATIONS

■ **Alarm Output:** Relay contact

**Rated load:** 125 V AC @ 0.5 A ( $\cos \theta = 1$ )

30 V DC @ 2 A (resistive load)

**Maximum switching voltage:** 250 V AC or 220 V DC

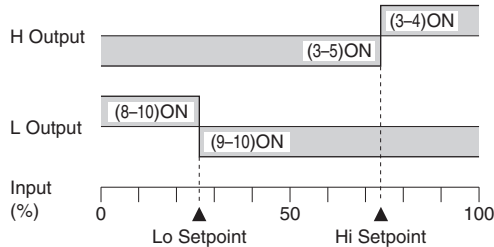
**Maximum switching power:** 125 VA or 60 W

**Minimum load:** 10 mV DC @ 10  $\mu$ A

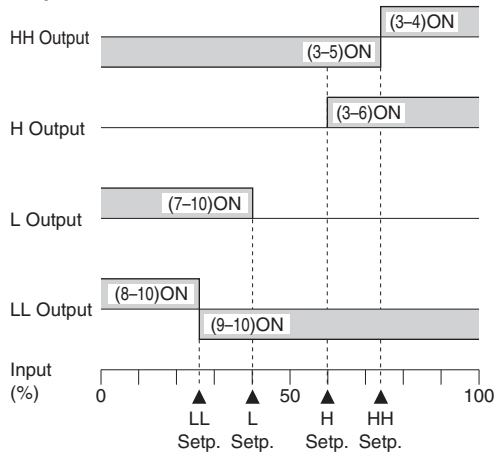
**Mechanical life:**  $\geq 10^8$  cycles

**Alarm Trip Operation** Terminal No. in parentheses

•**Output Code : 2**



•**Output Code : 4**



**Trip Operation in Power Failure:**

Terminals 3 – 5, 9 – 10 turn ON

## INSTALLATION

**Power consumption**

•**AC:** Approx. 5 VA (7 VA for multi-color LED)

•**DC:** Approx. 4 W (6 W for multi-color LED)

**Operating temperature:** 0 to 45°C (32 to 113°F)

**Operating humidity:** 40 to 80 %RH (non-condensing)

**Mounting:** Panel flush mounting

**Weight:** 590 g (1.30 lb)

## PERFORMANCE in percentage of span

**Accuracy:**  $\pm 1\%$   $\pm 1$  digit

**Setting accuracy:**  $\pm 1\%$

**Response time:** 0.5 sec.

**Insulation resistance:**  $\geq 10\text{ M}\Omega$  with 500 V DC (input to output to power)

**Dielectric strength:** 1500 V AC @ 1 minute

(input to power or ground)

1000 V AC @ 1 minute (power to ground, output to input or power or ground)

## STANDARD SCALE & UNIT EXAMPLES

### ■ DIVISIONS

Number of divisions depends upon the scale range.

### ■ STANDARD SCALES & DIVISIONS (example)

	Pattern 1		Pattern 2		Pattern 3		Pattern 4		Pattern 5	
Span of Scale Range	1.1 ≤ SPAN < 1.3		1.3 ≤ SPAN < 2.0		2.0 ≤ SPAN < 2.6		2.6 ≤ SPAN < 5.5		5.5 ≤ SPAN < 11.0	
Standard Divisions	22 through 25.9		26 through 39.9		40 through 51.9		26 through 54.9		27.5 through 54.9	
Ratio	20		20		20		10		5	
Standard Scales	1.1 —	1.29 —	1.3 —	1.99 —	2 —	2.59 —	2.6 —	5.49 —	5.5 —	10.9 —
	1 —	1.2 —	1.2 —	1.8 —	1.5 —	2.5 —	2.5 —	5 —	5 —	10 —
	.8 —	1 —	.9 —	1.5 —	1 —	2 —	2 —	4.5 —	4 —	9 —
	.6 —	.8 —	.6 —	1.2 —	.5 —	1.5 —	1.5 —	4 —	3 —	8 —
	.4 —	.6 —	.4 —	.9 —	1 —	1 —	1 —	3.5 —	2 —	7 —
	.2 —	.4 —	.3 —	.6 —	.5 —	.5 —	.5 —	3 —	1 —	6 —
	0 —	.2 —	.2 —	.3 —	0 —	0 —	0 —	2.5 —	0 —	5 —
		0 —	0 —	0 —	0 —	0 —	0 —	2 —	0 —	4 —
								1.5 —	0 —	3 —
								1 —	0 —	2 —
							.5 —	0 —	1 —	
							0 —	0 —	0 —	
	22 div.	25.9 div.	26 div.	39.9 div.	40 div.	51.9 div.	26 div.	54.9 div.	27.5 div.	54.9 div.

**Engineering unit:** %, °C, Nm<sup>3</sup>/h, m<sup>3</sup>/h, t/h, km<sup>3</sup>/h, kg/h, l/h, Pa, kPa, abs, ppm, pH, psi, kg/cm<sup>2</sup>G, N/m<sup>2</sup>, N/cm<sup>2</sup>, lb/h, J, kJ, NI, m<sup>3</sup>, lbs, Ω, μΩ, 1°

Span of Scale Range = (Full Scale – Zero Scale) × 10<sup>n</sup>

where n = integer (Determine 'n' so that the span of scale range is 1.1 or greater than 1.1, and smaller than 11.0.)

**[Example 1]** Scale range 0 to 100

Span of Scale Range = (100 – 0) × 10<sup>-1</sup> = 10

Span of 10 falls into Pattern 5 according to the above table. Number of divisions is calculated from the Span of Scale Range multiplied by the ratio (10 × 5).

The scale range 0 to 100 is provided with 50 divisions.

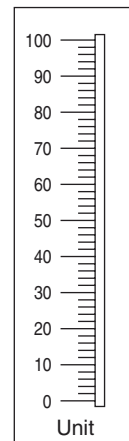
**[Example 2]** Scale range -10 to +10

Span of Scale Range = (10 – (-10)) × 10<sup>-1</sup> = 2

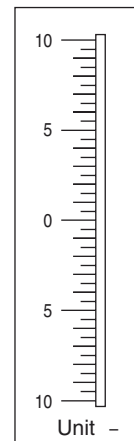
Span of 2 falls into Pattern 3 according to the above table. Number of divisions is calculated from the Span of Scale Range multiplied by the ratio (2 × 20).

The scale range -10 to +10 is provided with 40 divisions.

**Example 1**

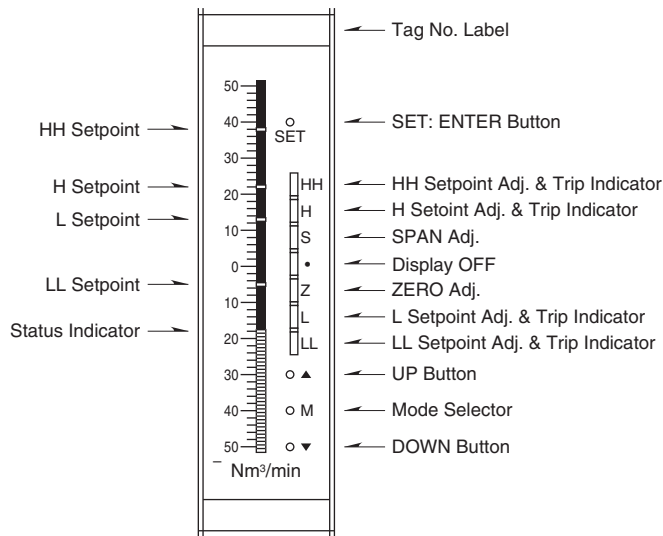


**Example 2**



## EXTERNAL VIEW

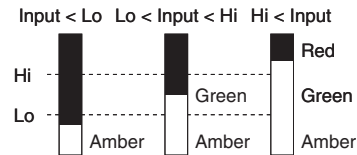
### VERTICAL MOUNTING



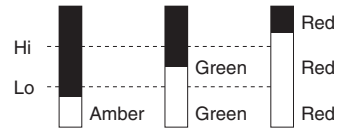
HH and LL Setpoint Adj. are deleted with model 48AV-2.

### Multi-Color Indication

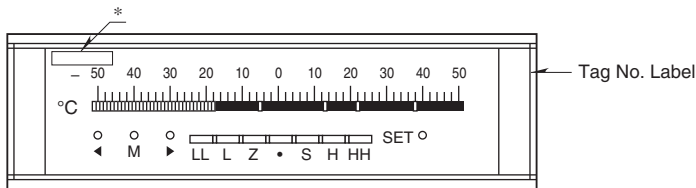
#### Pattern 1



#### Pattern 2



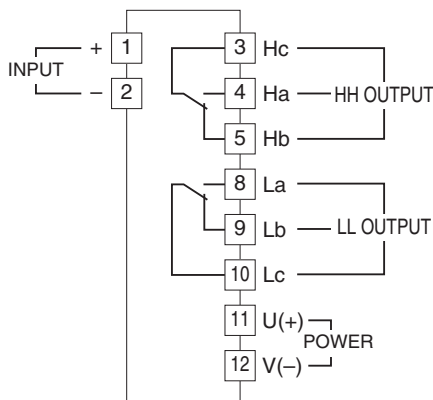
### HORIZONTAL MOUNTING



\*Engineering units longer than 3 characters are indicated here.  
HH and LL Setpoint Adj. are deleted with model 48AV-2.

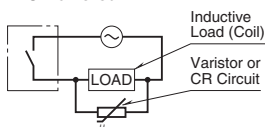
## CONNECTION DIAGRAM

### 48AV-2

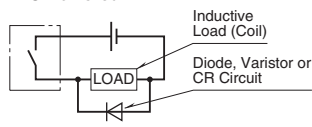


#### Relay Protection

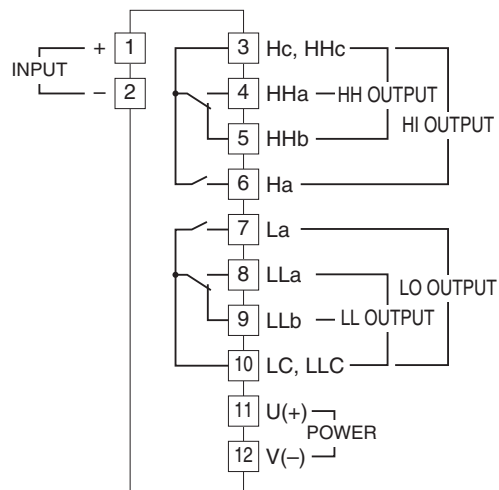
##### AC Powered



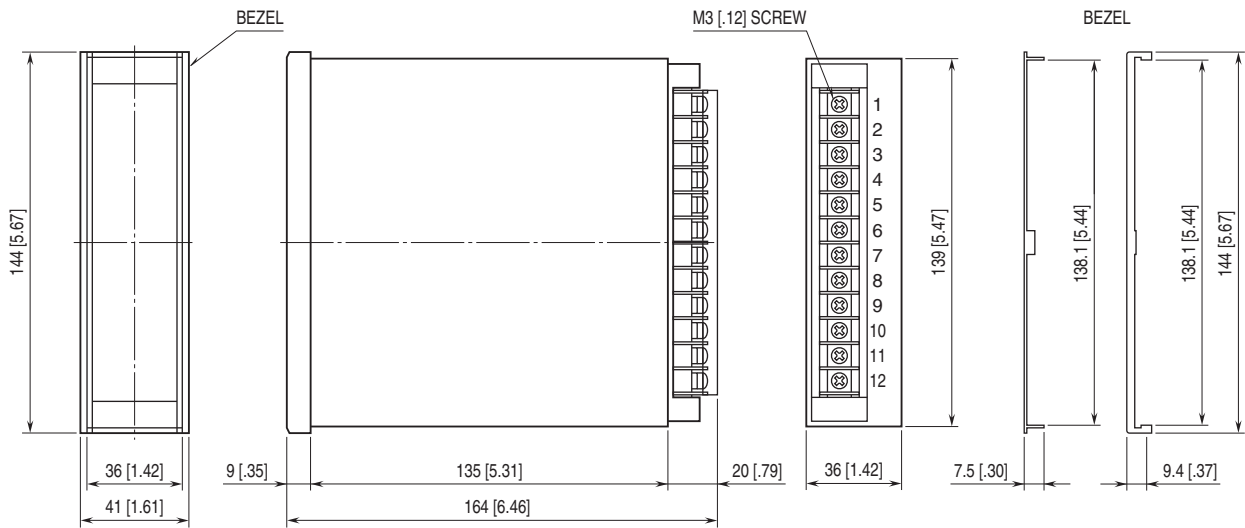
##### DC Powered



### 48AV-4



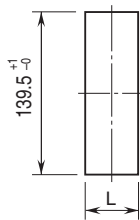
## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



## PANEL CUTOUT unit: mm

### ■ VERTICAL MOUNTING

Panel thickness: 1.6 – 5.5 mm



$$L = (38 \times n) \text{ } \begin{matrix} +1 \\ -0 \end{matrix}$$

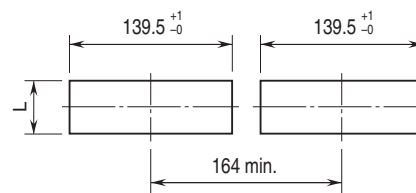
(n: number of units)

Note 1. A bezel is required between units for high-density mounting.

Note 2. Observe at the minimum of 5 cm above and below the units for heat dissipation.

### ■ HORIZONTAL MOUNTING

Panel thickness: 1.6 – 5.5 mm



$$L = 38 \times (n-1) + 36.5 \text{ } \begin{matrix} +1 \\ -0 \end{matrix}$$

(n: number of units)

Note 1. A bezel is required between units for high-density mounting.



Specifications are subject to change without notice.