

# ALUMINUM ELECTROLYTIC 6.3V to 100V

## NEV, NEH SERIES

### SUBMINIATURE

#### (NEV: Radial Lead, NEH: Axial Leads)

The NEV and NEH series subminiature aluminum electrolytic capacitors are especially suitable for applications requiring high capacitance, low cost, and very small size. In fact, you'll find these capacitors in some of the most demanding applications, from precision medical electronics and automobiles to the newest personal computers and disk drives.

They operate over a broad temperature range and are available in either blister pack or bulk.

### RATINGS

**Capacitance Range:** 0.1  $\mu$ f to 22,000  $\mu$ f

**Tolerance:**  $\pm 20\%$

**Voltage Range:** 6.3V to 100V

### PERFORMANCE SPECIFICATIONS

#### Operating Temperature Range:

$-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$ )

**Leakage Current:**  $I \leq 0.01CV + 3\mu\text{A}$  (measured after 3 minutes of applied voltage)

$I$  = Leakage Current ( $\mu\text{A}$ )

$C$  = Nominal Capacitance ( $\mu\text{f}$ )

$V$  = Rated Voltage (V)

**Capacitance Tolerance (M):**  $\pm 20\%$   
measured at  $+20^{\circ}\text{C}$  ( $+68^{\circ}\text{F}$ ), 120Hz

**Dissipation Factor:** measured at  $+20^{\circ}\text{C}$  ( $+68^{\circ}\text{F}$ ), 120Hz

| Rated Voltage                  | 6.3                                          | 10  | 16   | 25   | 35   | 50-80 | 100  |
|--------------------------------|----------------------------------------------|-----|------|------|------|-------|------|
| 0.1 $\mu$ f to 1000 $\mu$ f    | 0.24                                         | 0.2 | 0.17 | 0.15 | 0.12 | 0.10  | 0.08 |
| 1000 $\mu$ f to 22,000 $\mu$ f | Values above plus 0.02 for each 1000 $\mu$ f |     |      |      |      |       |      |

#### Impedance Ratio at Low Temperature: 120Hz

| Comparison Z WV                                                                                              | 6.3 | 10 | 16 | 25 | 35 | 50-100 |
|--------------------------------------------------------------------------------------------------------------|-----|----|----|----|----|--------|
| Z @ $-25^{\circ}\text{C}$ ( $-13^{\circ}\text{F}$ ) /<br>Z @ $+20^{\circ}\text{C}$ ( $+68^{\circ}\text{F}$ ) | 4   | 3  | 2  | 2  | 2  | 2      |
| Z @ $-40^{\circ}\text{C}$ ( $-40^{\circ}\text{F}$ ) /<br>Z @ $+20^{\circ}\text{C}$ ( $+68^{\circ}\text{F}$ ) | 8   | 6  | 4  | 4  | 4  | 4      |

#### Surge Voltage:

| DC Rated Voltage | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
|------------------|-----|----|----|----|----|----|----|-----|
| Surge Voltage    | 8   | 13 | 20 | 32 | 44 | 63 | 79 | 125 |

**Load Life:** 1000  $\pm 12$ Hrs @  $+85^{\circ}\text{C}$  ( $+185^{\circ}\text{F}$ ),  
at rated voltage

Leakage Current: Within values specified above

Dissipation Factor: Within  $\pm 150\%$  of specified value

Capacitance Change Max: See Table

| Rated Voltage | Capacitance Change Max                 |
|---------------|----------------------------------------|
| 6.3V to 16V   | Within $\pm 30\%$ of the initial value |
| 25V to 100V   | Within $\pm 20\%$ of the initial value |

**Shelf Life:** 1000 Hrs @  $+85^{\circ}\text{C}$  ( $+185^{\circ}\text{F}$ ),  
no voltage applied

Leakage Current: Within  $\pm 200\%$  of specified value

Dissipation Factor: Within  $\pm 150\%$  of specified value

Capacitance Change Max: Within  $\pm 20\%$  of initial value

### MECHANICAL SPECIFICATIONS

#### Lead Solderability:

Meets the requirements of MIL-STD 202, Method 208

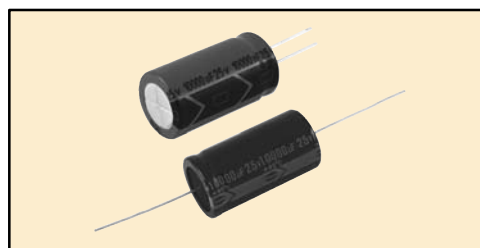
#### Marking:

Consists of series type, nominal capacitance, rated voltage, temperature range, anode and/or cathode identification, vendor identification.

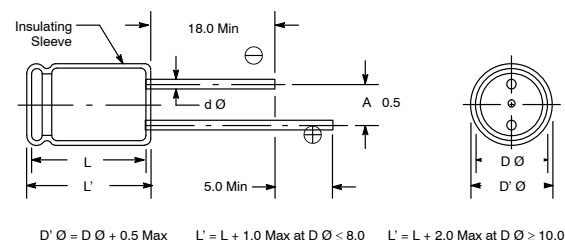
#### Recommended Cleaning Solvents:

Methanol, isopropanol ethanol, isobutanol, petroleum ether, propanol and/or commercial detergents. Halogenated hydrocarbon cleaning agents such as Freon (MF, TF, or TC), trichloroethylene, trichloroethane, or methylchloride are not recommended as they may damage the capacitor.

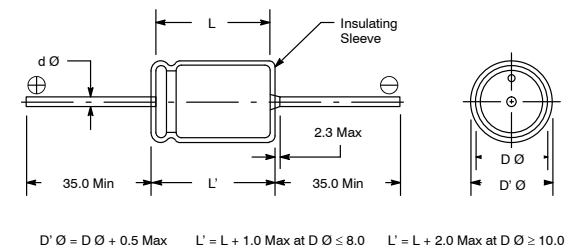
### CASE SIZE AND DIMENSIONS:



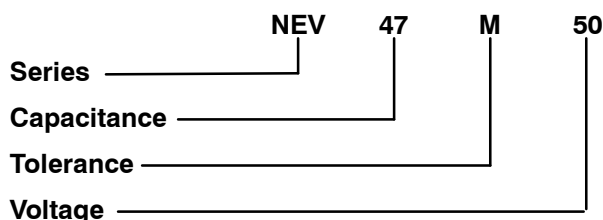
#### NEV SERIES



#### NEH SERIES (Insulating Bar = Negative)



### ORDERING INFORMATION



# ALUMINUM ELECTROLYTIC 6.3V to 100V

## NEV Series (Radial Type) Dimensions: Diameter (D Ø) x Length (L): mm

| Cap (µf) \ WV | 6.3        | 10       | 16         | 25        | 35        | 50        | 63        | 100      |
|---------------|------------|----------|------------|-----------|-----------|-----------|-----------|----------|
| 0.10          |            |          |            |           |           | 5 x 11    |           | 5 x 11   |
| 0.15          |            |          |            |           |           |           |           | 5 x 11.5 |
| 0.22          |            |          |            |           |           | 5 x 11    | 5 x 11.5  |          |
| 0.33          |            |          |            |           |           | 5 x 11    | 5 x 11.5  | 5 x 11.5 |
| 0.47          |            |          |            |           |           | 5 x 11    | 5 x 11.5  | 5 x 11.5 |
| 0.56          |            |          |            |           |           | 5 x 12    | 5 x 11.5  |          |
| 0.68          |            |          |            |           |           |           |           | 5 x 11.5 |
| 1.0           |            |          |            |           |           | 5 x 11.5  | 5 x 11.5  | 5 x 11.5 |
| 1.5           |            |          |            |           |           |           | 5 x 11.5  | 5 x 11.5 |
| 2.2           |            |          |            |           |           | 5 x 11    | 5 x 11.5  | 5 x 11.5 |
| 3.3           |            |          |            |           |           | 5 x 11    | 5 x 11    | 5 x 11   |
| 4.7           |            |          |            |           |           | 5 x 11.5  | 5 x 11.5  | 5 x 11   |
| 6.8           |            |          |            |           |           | 5 x 11    | 5 x 11.5  | 5 x 11.5 |
| 10            |            |          |            |           |           | 5 x 11    | 5 x 11    | 6.3 x 11 |
| 15            |            |          |            |           | 5 x 12    | 5 x 11.5  | 6.3 x 12  | 7 x 12   |
| 22            |            |          |            | 5 x 11    | 5 x 11    | 5 x 11    | 6.3 x 11  | 8 x 11.5 |
| 33            |            |          | 5 x 11.5   | 5 x 12    | 5 x 11.5  | 5 x 11    | 8 x 12    | 8 x 12   |
| 47            |            | 5 x 11   | 5 x 11.5   | 5 x 11    | 5 x 12    | 6.3 x 12  | 8 x 11.5  | 10 x 12  |
| 68            |            |          | 5 x 11.5   | 8 x 11.5  | 6.5 x 11  | 8 x 11.5  | 10 x 18   | 10 x 17  |
| 100           |            | 5 x 11   | 5 x 11     | 5 x 11.5  | 6.5 x 11  | 8 x 11    | 8 x 11.5  | 10 x 20  |
| 150           | 6.5 x 11.5 |          | 6.5 x 11   | 8 x 11    | 8 x 11    | 10 x 12   | 10 x 16   | 10 x 20  |
| 220           | 6.3 x 11.9 | 6.5 x 11 | 6.5 x 11.5 | 6.5 x 11  | 8 x 11    | 10 x 12   | 10 x 15   | 13 x 25  |
| 330           | 6.5 x 11.5 | 6.5 x 11 | 8 x 11.5   | 10 x 12.5 | 10 x 12.5 | 10 x 15.5 | 10 x 20   | 16 x 27  |
| 470           | 6.5 x 11.5 | 7 x 11   | 10 x 12.5  | 10 x 12   | 10 x 12   | 10 x 20   | 13 x 25.5 | 18 x 32  |
| 680           |            | 8 x 12   | 10 x 16    | 10 x 17   | 10 x 25   | 13 x 25   | 16 x 27   | 18 x 32  |
| 1000          | 10 x 16    | 10 x 12  | 10 x 15    | 10 x 20   | 13 x 21   | 16 x 26   | 16 x 27   | 18 x 41  |
| 1500          | 10 x 20    | 10 x 17  | 10 x 20    | 13 x 21   | 13 x 26   |           |           |          |
| 2200          | 10 x 20    | 10 x 20  | 13 x 20.5  | 13 x 21   | 13 x 26   | 16 x 32   | 22 x 41   |          |
| 3300          | 10 x 20    | 13 x 22  | 13 x 25    | 16 x 27   | 16 x 36   | 18.5 x 37 | 22 x 41   |          |
| 4700          |            | 13 x 25  | 16 x 26    | 16 x 32   | 18 x 37   | 22 x 43   |           |          |
| 6800          | 13 x 25    | 16 x 26  | 16 x 33    | 18 x 36   | 22 x 42   |           |           |          |
| 10000         | 16 x 26    | 16 x 32  | 18 x 40    | 22 x 43   |           |           |           |          |
| 22000         |            | 22 x 36  |            |           |           |           |           |          |

\* These dimensions are for reference only, please consult the factory for actual size.

## NEV Series (Radial Type) Mechanical Specifications: mm

| Outside Diameter (D Ø) | 5   | 6.3 | 8   | 10  | 13  | 16  | 18  | 22  |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Lead Spacing (A)       | 2   | 2.5 | 3.5 | 5   | 5   | 7.5 | 7.5 | 10  |
| Lead Diameter (d Ø)    | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 1.0 |

\* These dimensions are for reference only, please consult the factory for actual size.

# ALUMINUM ELECTROLYTIC 6.3V to 100V

## NEH Series (Axial Type) Dimensions: Diameter (D Ø) x Length (L): mm

| Cap (µf) \ WV | 6.3      | 10         | 16      | 25         | 35         | 50       | 63         | 100       |
|---------------|----------|------------|---------|------------|------------|----------|------------|-----------|
| 0.10          |          |            |         |            |            | 6 x 12.5 | 5 x 13     |           |
| 0.22          |          |            |         |            |            | 5 x 13   | 5 x 13     | 5 x 12.5  |
| 0.33          |          |            |         |            |            | 5 x 12.5 | 5 x 12.5   | 5 x 13    |
| 0.47          |          |            |         |            |            | 5 x 13   | 5 x 12.5   | 6 x 13    |
| 0.68          |          |            |         |            |            |          | 6 x 12.5   |           |
| 1.0           |          |            |         |            |            | 6 x 12.5 | 6 x 13     | 6 x 13    |
| 1.5           |          |            |         |            |            |          |            |           |
| 2.2           |          |            |         |            |            | 6 x 13.5 |            | 5 x 12.5  |
| 3.3           |          |            |         |            |            | 6 x 12.5 | 6 x 13     | 5 x 12.5  |
| 4.7           |          |            |         |            |            | 6 x 13   | 6 x 12.5   | 6 x 12.5  |
| 6.8           |          |            |         |            |            | 6 x 13   | 6.3 x 13   |           |
| 10            |          |            |         | 5 x 12.5   | 5 x 13     | 6 x 13   | 6.3 x 12.5 |           |
| 15            |          |            | 6 x 13  | 6 x 13     | 6.3 x 11   | 6.3 x 13 | 8 x 11.5   |           |
| 22            |          |            | 6 x 13  | 6.3 x 13   | 6.3 x 14   | 6 x 13   | 6 x 13     | 8 x 16    |
| 33            |          | 5 x 12     | 5 x 13  | 6.3 x 12.5 | 6.3 x 13   | 6 x 16.5 |            | 8 x 20    |
| 47            | 6 x 14   | 6.3 x 12.5 | 6 x 13  | 6.3 x 13   | 6.5 x 17.5 | 8 x 16   | 8 x 16     | 10 x 20   |
| 68            | 6 x 13   | 6.3 x 11   |         | 6 x 17     | 8 x 14     | 8 x 16   | 10 x 16    |           |
| 100           | 6 x 12.5 | 6.3 x 13   | 6 x 13  | 8 x 16     | 8 x 17     | 8 x 16   | 10 x 20    | 10 x 20   |
| 150           | 8 x 13.5 |            | 6 x 13  | 10 x 16    | 8 x 17     | 8 x 20.5 |            |           |
| 220           |          | 8 x 16     | 8 x 16  | 8 x 16     | 10 x 17    | 10 x 20  | 10 x 26    | 13 x 27   |
| 330           | 8 x 14   | 8 x 16     | 8 x 16  | 8 x 16     | 10 x 20    | 10 x 21  | 13 x 26.5  |           |
| 470           | 8 x 16   | 8 x 16     | 58 x 21 | 10 x 21    | 13 x 22    | 13 x 27  | 13 x 26    | 16 x 31.5 |
| 680           | 10 x 21  | 10 x 17    |         | 10 x 21    | 13 x 25    | 13 x 30  | 13 x 36    | 16 x 39   |
| 1000          | 10 x 17  | 10 x 21    | 10 x 21 | 13 x 22    | 13 x 27    | 16 x 23  | 16 x 32    | 22 x 42   |
| 1500          | 13 x 25  | 10 x 21    | 13 x 22 | 13 x 26    |            |          |            |           |
| 2200          | 13 x 25  | 13 x 22    | 13 x 26 | 16 x 27    | 16 x 31    | 18 x 35  | 18 x 39    |           |
| 3300          | 13 x 30  | 13 x 30    | 16 x 28 | 16 x 32.5  | 18 x 36    | 18 x 39  | 22 x 50    |           |
| 4700          | 16 x 26  | 16 x 25    | 16 x 31 | 16 x 38.5  | 22 x 42    | 13 x 26  |            |           |
| 6800          | 16 x 40  | 16 x 40    | 16 x 41 | 18 x 34    | 21.5 x 41  |          |            |           |
| 10000         | 16 x 31  | 18 x 40    | 18 x 39 | 22 x 41    |            |          |            |           |
| 22000         |          | 22 x 42    |         |            |            |          |            |           |

\* These dimensions are for reference only, please consult the factory for actual size.

## NEH Series (Axial Type) Mechanical Specifications: mm

| Outside Diameter (D Ø) | 5   | 6.3 | 8   | 10  | 13  | 16  | 18  | 22  | 25  |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lead Diameter (d Ø)    | 0.6 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |

\* These dimensions are for reference only, please consult the factory for actual size.