



General Purpose Snap-In – Terminal HL, LL Series – Type HL&LL

ALUMINUM ELECTROLYTIC CAPACITORS

- * Large capacitance and low profile.
- * Assembly to the P.C. Board easily and steadily. Need not any mounting hardware or tool.
- * Excellent shock resistance.

Operating temperature range:

16~100WV: -40°C~+85°C
 160~450WV: -25°C~+85°C

Capacitance and tolerance:

Capacitance measurements shall be made by the bridge method at a frequency of 120Hz_{-5}^{+10} Hz. 25°C

The capacitance shall be within the specified tolerance of ±20%.

Leakage Current: Measurement shall be made at rated DC voltage with an application of a steady source of power. A current-limiting resistor of 1,000 ohms shall be connected in series with each capacitor under test. Rated DC working voltage shall be applied to the capacitor for 5 minutes before making the leakage current measurements.

The maximum leakage current shall not exceed the value determined from the following equation or 3000UA, whichever is greater:

$$I = 0.02CV$$

where : I = Leakage current (μA)
 C = Nominal capacitance (μF)
 V = Rated DC voltage (V.DC)

Dissipation Factor: Measured at a frequency of 120Hz_{-5}^{+10} Hz, the dissipation factor shall be less than the values in Table 1.

Table 1.

Rated Voltage (V.DC)	CV ≤ 100,000 Dissipation Factor (%)	CV ≤ 330,000 Dissipation Factor (%)	CV > 330,000 Dissipation Factor (%)
16, 25	40	50	60
35, 50, 63	30	40	50
80, 100, 160	25	35	45
180, 200, 250	20	30	40
350, 400, 450	30	—	—

Low temperature characteristics: The ratio of the impedance of -25°C or -40°C to that of +20°C shall be less than the values listed in Table 2.

Table 2.

Rated Voltage (V.DC)	Ratio of Impedance	
	$\frac{Z @ -40^\circ\text{C}}{Z @ +20^\circ\text{C}}$	$\frac{Z @ -25^\circ\text{C}}{Z @ +20^\circ\text{C}}$
16~100	12	3
160 ~ 450	—	3

Life test: The capacitors shall be placed in an air-circulating thermostatic test chamber and application of rated DC voltage through a series protective resistor (1,000 ohms) for a period of 1,000 hours at a temperature of 85°C±2°C (shielded from direct heat radiation). The capacitors shall then be removed from the test chamber and allowed to cool to room temperature after which they shall meet each of the requirements listed in Table 3.

Table 3.

Leakage current	Same as specified under Leakage Current
Capacitance	Within ±20% of initial measurements
Dissipation factor	150% less of values in Table 1.
Appearance	Free from leakage of electrolyte and/or other noticeable deformation

Shelf life test: Prior to testing, each capacitor in the test group is measured for capacitance, dissipation factor and DC leakage current.

The capacitors are then stored with no voltage applied at temperature of 85°C±2°C for 500 hours ±12 hours. Following this period the capacitors shall be removed from the test chamber and be allowed to stabilize at room temperature. Next they shall be connected to a series limiting resistor with DC rated voltage applied for 30 minutes after which the capacitors shall be discharged. After completion of these procedures, the capacitors shall meet each of the requirements as listed in Table 3.



BREL INTERNATIONAL COMPONENTS

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RIPPLE CURRENT in Amp-RMS (at 120Hz, +85°C) – peak voltage not to exceed rated DC voltage –
HL SERIES

Rated Voltage (V)	16	25	35	50	63	80	100
Surge Voltage (V)							
CAP. (μF)							
470	0.52	0.52	0.52	0.52	0.52	0.52	0.56
680	0.56	0.56	0.56	0.56	0.56	0.68	0.76
1000	0.68	0.68	0.68	0.68	0.73	0.93	1.00
2200	0.87	0.87	1.08	1.23	1.32	1.63	1.80
3300	1.07	1.15	1.51	1.62	1.78	2.21	
4700	1.38	1.56	1.93	2.13	2.36		
6800	1.87	2.01	2.56	2.84			
10000	2.44	2.69	3.44				
15000	3.65	3.65					
22000	4.30						

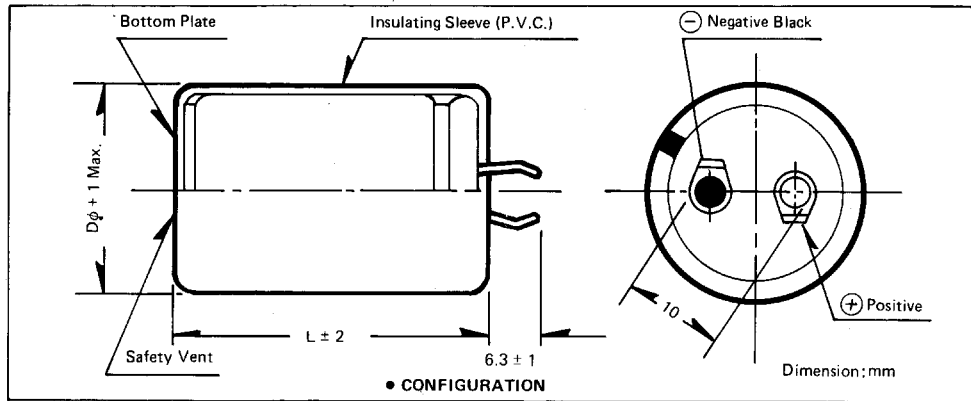
Rated Voltage (V)	160	180	200	250	350	400	450
Surge Voltage (V)							
CAP. (μF)							
22							0.15
33						0.19	0.20
47					0.24	0.25	0.26
68				0.34	0.35	0.35	0.35
100			0.47	0.49	0.49	0.50	0.51
220	0.78	0.81	0.87	0.89	0.90		
330	1.06	1.10	1.18				
470	1.40	1.45	1.55				
680	1.77	1.85					

LL SERIES

Rated Voltage (V)	16	25	35	50	63	80	100
Surge Voltage (V)							
CAP. (μF)							
1000	0.73	0.73	0.73	0.73	0.73	0.91	0.98
2200	1.08	1.08	1.08	1.21	1.30	1.60	
3300	1.15	1.15	1.48	1.59	1.75		
4700	1.37	1.54	1.90	2.09			
6800	1.85	1.98	2.51				
10000	2.40	2.64					
15000	3.23						

Rated Voltage (V)	160	180	200	250
Surge Voltage (V)				
CAP. (μF)				
220	0.72	0.80	0.85	0.89
330	0.98	1.05	1.10	1.18
470	1.25	1.40	1.45	1.52
680	1.68	1.78	1.83	2.01

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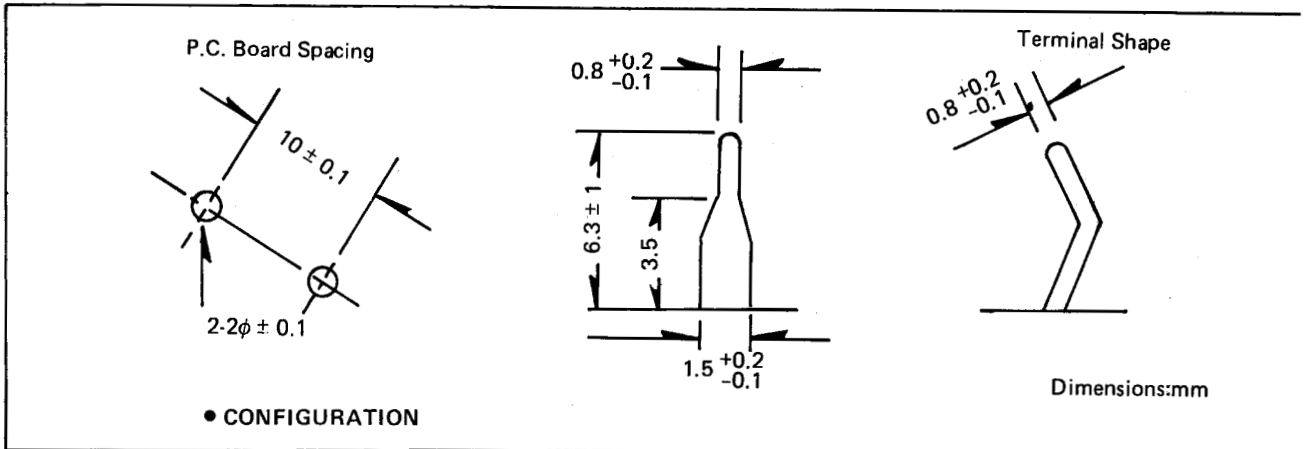
HL DIMENSIONAL TABLE

DIMENSIONS: Diameter (Dφ) x Length (L): mm

Rated Voltage (V)	16	25	35	50	63	80	100
Surge Voltage (V)	20	32	44	63	79	100	125
CAP. (μF)							
470	22x25	22x25	22x25	22x25	22x25	22x25	22x30
680	22x25	22x25	22x25	22x25	22x25	22x30	22x40
1000	22x25	22x25	22x25	22x25	22x30	22x40	25x40
2200	22x25	22x25	22x30	22x40	25x40	25x52	30x52
3300	22x25	22x30	22x40	25x40	25x52	30x52	
4700	22x30	22x40	25x40	25x52	30x52		
6800	22x40	25x40	25x52	30x52			
10000	25x40	25x52	30x52				
15000	30x52	30x52					
22000	30x52						

Rated Voltage (V)	160	180	200	250	350	400	450
Surge Voltage (V)	200	225	250	300	400	450	500
CAP. (μF)							
22							22x25
33						22x25	22x30
47					22x25	22x30	22x40
68				22x25	22x40	22x40	25x40
100			22x30	22x40	25x40	25x40	30x52
220	22x40	22x40	25x40	25x52	30x52		
330	25x40	25x40	25x52				
470	25x52	25x52	30x52				
680	30x52	30x52					

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LL DIMENSIONAL TABLE

DIMENSIONS: Diameter (Dφ) x Length (L): mm

Rated Voltage (V)	16	25	35	50	63	80	100
Surge Voltage (V)	20	32	44	63	79	100	125
CAP. (μF)							
1000	25x25	25x25	25x25	25x25	25x25	30x25	30x30
2200	25x25	25x25	25x25	30x25	30x30	35x30	
3300	25x25	25x25	30x25	30x30	35x30		
4700	25x25	30x25	30x30	35x30			
6800	30x25	30x30	35x30				
10000	30x30	35x30					
15000	35x30						

Rated Voltage (V)	160	180	200	250
Surge Voltage (V)	200	225	250	300
CAP. (μF)				
220	25x25	30x25	30x25	30x30
330	30x25	30x30	30x30	35x30
470	30x30	35x30	35x30	35x40
680	35x30	35x40	35x40	35x52