

## PG - LL9 Long Life Grade

-40°C +85°C



Capacitor Diameter (mm)	35	50	63	76	90	100	120
Max. Ripple Current (Amps)	20	20	40	40	72	72	72

### Application

Long Life Grade for High Voltage, Compact design, High Ripple Current Applications like PWM Inverters, High KVA On-Line UPS, Frequency Converters, AC Drives, Telecom SMPS. Static frequency inverters / servo-drives

### Capacitor mounting

Capacitors are available in screw terminals in three mounting styles

- AEST** - Screw terminals with plain insulated base. *see page 6,7*
- AEST-D** - Screw terminals with stud mounting. *see page 6,7*
- AEST-AL** - Capacitor with aluminium bottom disc. *see page 8*

### Capacitor Terminal Style


Capacitors are available in two different terminal style, round and across flat. Below table summarizes the available terminal styles in different capacitors diameter

Capacitors Diameter (mm)	35	50	63	76	90	100	120
Terminal Style - Round		○	○	○	○		
Terminal Style - Across Flat		○	○	○	○	○	○

*For details see pages 6, 7, 8*

### Marking on capacitors

Each capacitor will have the following information printed on it, sequentially:

- The Company's symbol  followed by the words ALCON ELECTROLYTIC
- The capacitor grade viz. PG-LL9
- The capacitance value \_\_ MFD, rated voltage \_\_VDC
- The surge voltage
- Capacity tolerance
- Climatic category
- Part number on non-standard capacitors
- CE marking

### Specifications

- **Voltage range** : 315 VDC to 450 VDC
- **Can size** : 50φ x 80mm to 120φ x 240mm
- **Operating Temperature range** : -40°C to +85°C
- **Capacitance** : 1000 MFD to 38000 MFD  
Tolerance ± 20%
- **Leakage current**: The max. leakage current (IL) is given by the formula:  

$$I_r = 0.003 CV \text{ (microamps)}$$
 C = capacitance in microfarads  
 V = DC rated voltage  
 Pre-conditioning of the capacitors prior to testing for leakage current is essential.
- **Ripple Current**: All capacitors withstand rms ripple current at 100 Hz at 85°C. When capacitors operate at temperatures other than 85°C, the permissible rms ripple current at 85°C should be multiplied by the factors given below :

+40°C	+45°C	+50°C	+65°C
2.2	2.1	1.9	1.6

Where capacitors are required to operate at frequencies other than 100 Hz, the multiplying factors given below, may be used to determine the ripple current capacity, at that frequency.

Frequency Hz	100	120	250	500	1k to10k	>10K
Multiplying Factor	1.0	1.02	1.05	1.20	1.32	1.35

### Notes :

1. Can is negative, However, it is isolated with a PVC insulating sleeve and mylar end-disc.
2. Maximum ripple current for each capacitor diameter .

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### Useful life

Useful life is a period of time which the capacitor takes to reach "end of life".

For PG-LL9 capacitors the useful life is estimated as 15000 hours at maximum rated temperature, ripple current and voltages.

End of the defined as follows :

1. Catastrophic failure : capacitor short or open circuit
2. Mechanical failure : operation of safety vent or sleeve damage
3. Parametric failure :
  - a. Capacitance change  $\pm 30\%$
  - b. ESR exceed three times specified value
  - c. Leakage current exceed specified value

The useful life for a known ripple current load and ambient temperature ( $T_a$ ) °C is determined on the basis of the "Life graph" shown below.

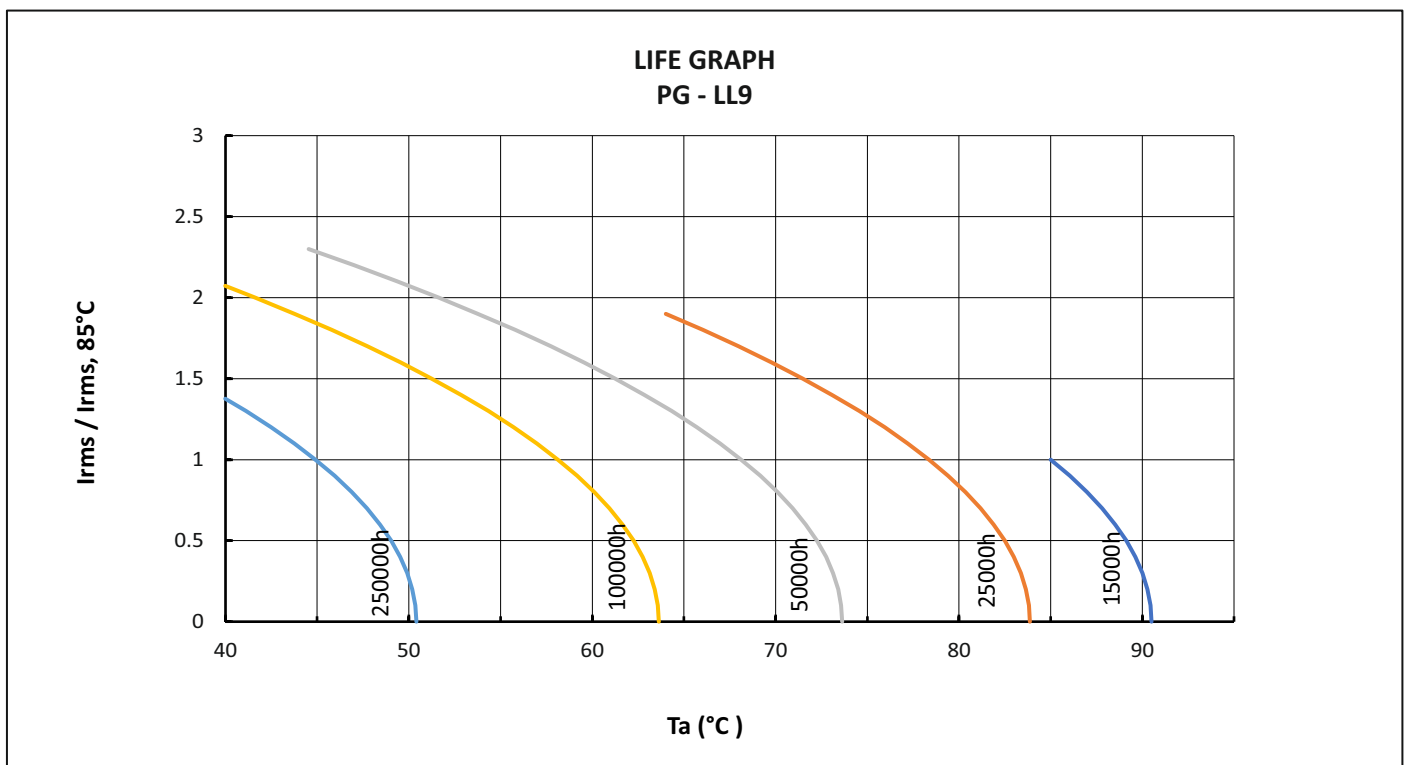
### Manufacturing Date Code Chart

The manufacturing code shall consists of four digits (alphanumeric). The first two shall denote the date (numeric). The third stands for the month (alpha-numeric). The fourth stands for the year (alphabet)

First two spaces DATE	Third space MONTH	Fourth space YEAR
01	1 = JANUARY	A = 2012
02	2 = FEBRUARY	B = 2013
03	3 = MARCH	C = 2014
.	4 = APRIL	D = 2015
.	5 = MAY	E = 2016
.	6 = JUNE	F = 2017
10	7 = JULY	G = 2018
11	8 = AUGUST	H = 2019
.	9 = SEPTEMBER	J = 2020
.	X = OCTOBER	K = 2021
.	Y = NOVEMBER	L = 2022
31	Z = DECEMBER	M = 2023

For example :

1. Manufacturing code 023A will mean 2<sup>nd</sup> March, 2012
2. Manufacturing code 10XA will mean 10<sup>th</sup> October, 2012



### Standard Capacitor Values

Rated Voltage (VDC)	Surge Voltage (VDC)	Capacitance Nominal (MFD)	MAX ESR at 100 Hz, 25°C (miliohm)	Impedance at 100 Hz, 25°C (Ohms)	Ripple Current (Irms, 85°C) at 100 Hz, 85°C (Amps)	Can size Nominal D x L mm	Case code	Ordering code
315	362	2200	77.08	0.726	7	50x105	022	SA022000315AC022____M01
		3300	62.31	0.484	8.9	63x105	026	SA033000315AC026____M01
		3900	44.77	0.409	10.5	63x105	026	SA039000315AC026____M01
		4700	43.47	0.340	11.8	63x145	035	SA047000315AC035____M01
		4700	42.12	0.340	12.1	76x105	028	SA047000315AC028____M01
		5600	35.93	0.285	13.1	76x105	028	SA056000315AC028____M01
		6800	31.59	0.235	15.4	76x146	081	SA068000315AC081____M01
		8200	30.21	0.195	18.0	76x220	092	SA082000315AC092____M01
		8200	26.99	0.195	18.0	100X105	082	SA082000315AC082____M01
		10000	28.48	0.160	18.5	76x220	092	SA100000315AC092____M01
		10000	24.23	0.160	20.1	100X120	083	SA100000315AC083____M01
		12000	18.50	0.133	23	76x220	092	SA120000315AC092____M01
		12000	21.74	0.133	23	100X146	084	SA120000315AC084____M01
		12000	18.50	0.133	23	120X105	086	SA120000315AC086____M01
		15000	15.41	0.107	25.2	76x220	092	SA150000315AC092____M01
		15000	16.01	0.107	27.5	120X120	087	SA150000315AC087____M01
		18000	14.00	0.089	31	100X175	085	SA180000315AC085____M01
22000	12.68	0.073	36	100X220	099	SA220000315AC099____M01		
27000	11.46	0.059	38	120X175	042	SA270000315AC042____M01		
38000	10.25	0.042	46	120X240	044	SA380000315AC044____M01		
350	385	1500	92.64	1.063	5.8	50x80	020	SA015000350AC020____M01
		2200	72.85	0.725	7.2	50x105	022	SA022000350AC022____M01
		3300	58.31	0.484	9.2	63x105	026	SA033000350AC026____M01
		3900	48.38	0.410	10.1	63x105	026	SA039000350AC026____M01
		4700	37.53	0.340	12.7	63x145	035	SA047000350AC035____M01
		4700	37.64	0.340	12.8	76x105	028	SA047000350AC028____M01
		5600	33.34	0.285	13.6	76x105	028	SA056000350AC028____M01
		6800	29.27	0.235	16.0	76x145	081	SA068000350AC081____M01
		8200	27.11	0.195	19.0	76x220	092	SA082000350AC092____M01
		8200	26.99	0.195	18.0	100X105	082	SA082000350AC082____M01
		10000	18.66	0.160	22.9	76x220	092	SA100000350AC092____M01
		10000	18.58	0.160	22.9	100X120	083	SA100000350AC083____M01
		12000	16.85	0.133	24.1	76x220	092	SA120000350AC092____M01
		12000	17.01	0.133	26.0	100X145	084	SA120000350AC084____M01
		12000	16.99	0.133	24.0	120X120	087	SA120000350AC087____M01
		15000	13.62	0.107	29.2	90x220	094	SA150000350AC094____M01
		15000	14.00	0.107	31.0	100X175	085	SA150000350AC085____M01
18000	11.64	0.089	29.0	120X145	088	SA180000350AC088____M01		
22000	11.38	0.073	38.0	100X220	099	SA220000350AC099____M01		
27000	9.84	0.059	41.0	120X175	042	SA270000350AC042____M01		
33000	9.13	0.049	47.0	120X220	043	SA330000350AC043____M01		
38000	8.02	0.042	52.0	120X240	044	SA380000350AC044____M01		

Custom designed capacitors available

### Standard Capacitor Values

Rated Voltage (VDC)	Surge Voltage (VDC)	Capacitance Nominal (MFD)	MAX ESR at 100 Hz, 25°C (miliohm)	Impedance at 100 Hz, 25°C (Ohms)	Ripple Current (I <sub>rms</sub> , 85°C) at 100 Hz, 85°C (Amps)	Can size Nominal D x L mm	Case code	Ordering code
400	440	1500	89.53	1.063	5.9	50x105	022	SA015000400AC022___M01
		2200	70.87	0.725	7.3	63x105	026	SA022000400AC026___M01
		3300	54.69	0.484	9.5	63x105	026	SA033000400AC026___M01
		3900	44.28	0.409	11.8	76x105	028	SA039000400AC028___M01
		4700	35.39	0.340	13.2	76x105	028	SA047000400AC028___M01
		5600	33.30	0.285	15.0	76x145	081	SA056000400AC081___M01
		5600	32.12	0.285	16.5	100X105	082	SA056000400AC082___M01
		6800	25.62	0.235	17.1	76x146	081	SA068000400AC081___M01
		6800	25.63	0.235	19.5	100X120	083	SA068000400AC083___M01
		8200	20.62	0.195	19.0	90x145	095	SA082000400AC095___M01
		8200	20.93	0.195	22.0	100X145	084	SA082000400AC084___M01
		10000	17.72	0.160	23.5	76x220	092	SA100000400AC092___M01
		10000	17.91	0.160	26.0	120X120	087	SA100000400AC087___M01
		12000	15.25	0.133	27.6	90x220	094	SA120000400AC094___M01
		12000	14.94	0.133	30.0	100X175	085	SA120000400AC085___M01
		18000	13.02	0.089	37.0	100X240	045	SA180000400AC045___M01
		22000	11.82	0.073	32.0	120X220	043	SA220000400AC043___M01
27000	10.25	0.059	46.0	120X240	044	SA270000400AC044___M01		
415	456	1500	89.39	1.063	6.5	50x105	022	SA015000415AC022___M01
		2200	69.95	0.725	8.4	63x105	026	SA022000415AC026___M01
		3300	52.87	0.484	10.8	76x105	028	SA033000415AC028___M01
		3900	42.82	0.409	12.0	76x105	028	SA039000415AC028___M01
		4700	31.46	0.339	14.0	76x105	028	SA047000415AC028___M01
		5600	30.39	0.285	15.7	76x145	081	SA056000415AC081___M01
		5600	30.26	0.285	17.0	100X105	082	SA056000415AC082___M01
		6800	23.12	0.235	18.0	76x146	081	SA068000415AC081___M01
		6800	23.19	0.235	20.5	100X120	083	SA068000415AC083___M01
		8200	19.33	0.195	22.5	76x220	092	SA082000415AC092___M01
		8200	19.16	0.195	24.5	100X145	084	SA082000415AC084___M01
		8200	18.92	0.195	24.0	120X105	086	SA082000415AC086___M01
		10000	15.66	0.160	25.0	76x220	092	SA100000415AC092___M01
		10000	16.01	0.160	27.5	120X120	087	SA100000415AC087___M01
		12000	14.30	0.133	28.5	90x220	094	SA120000415AC094___M01
		12000	13.86	0.133	32.0	120X145	088	SA120000415AC088___M01
		12000	13.56	0.133	31.5	100X175	085	SA120000415AC085___M01
15000	32.45	0.108	22.5	100X220	099	SA150000415AC099___M01		
18000	29.76	0.091	27.0	100X240	045	SA180000415AC045___M01		
18000	31.28	0.091	23.0	120X175	042	SA180000415AC042___M01		
22000	28.73	0.075	26.5	120X220	043	SA220000415AC043___M01		
27000	25.80	0.061	29.0	120X240	044	SA270000415AC044___M01		

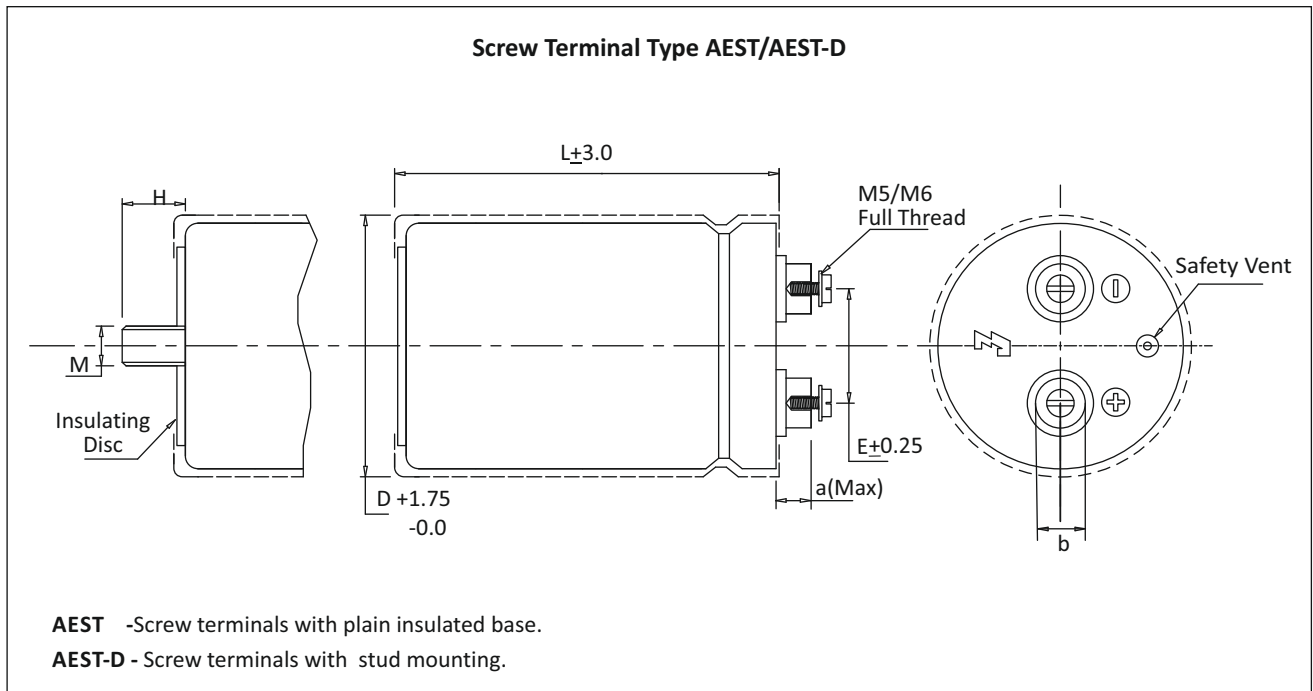
Custom designed capacitors available

### Standard Capacitor Values

Rated Voltage (VDC)	Surge Voltage (VDC)	Capacitance Nominal (MFD)	MAX ESR at 100 Hz, 25°C (miliohm)	Impedance at 100 Hz, 25°C (Ohms)	Ripple Current (Irms, 85°C) at 100 Hz, 85°C (Amps)	Can size Nominal D x L mm	Case code	Ordering code
450	495	1000	141.08	1.595	4.7	50x80	020	SA010000450AC020____M01
		1500	86.70	1.063	6.6	50x105	022	SA015000450AC022____M01
		2200	65.21	0.725	8.7	63x105	026	SA022000450AC026____M01
		3300	48.25	0.484	11.2	63x145	035	SA033000450AC035____M01
		3300	48.29	0.484	11.3	76x105	028	SA033000450AC028____M01
		4700	32.43	0.339	15.2	76x146	081	SA047000450AC081____M01
		4700	32.12	0.339	16.5	100X105	082	SA047000450AC082____M01
		5600	29.27	0.285	16.0	76x146	081	SA056000450AC081____M01
		5600	29.42	0.285	18.2	100X120	083	SA056000450AC083____M01
		6800	24.23	0.235	20.1	76x220	092	SA068000450AC092____M01
		6800	23.58	0.235	21.5	120X105	086	SA068000450AC086____M01
		8200	17.72	0.195	23.5	76x220	092	SA082000450AC092____M01
		8200	17.91	0.195	26.0	120X120	087	SA082000450AC087____M01
		10000	16.54	0.160	26.5	90x220	094	SA100000450AC094____M01
		10000	17.16	0.160	28.0	100X175	085	SA100000450AC085____M01
		12000	16.88	0.133	29.0	120X145	088	SA120000450AC088____M01
		15000	15.42	0.107	34.0	100X240	045	SA150000450AC045____M01
		18000	13.97	0.089	38.0	120X220	043	SA180000450AC043____M01
		22000	12.30	0.073	42.0	120X240	044	SA220000450AC044____M01

Custom designed capacitors available

### Terminal Style And Dimension With Round Insert

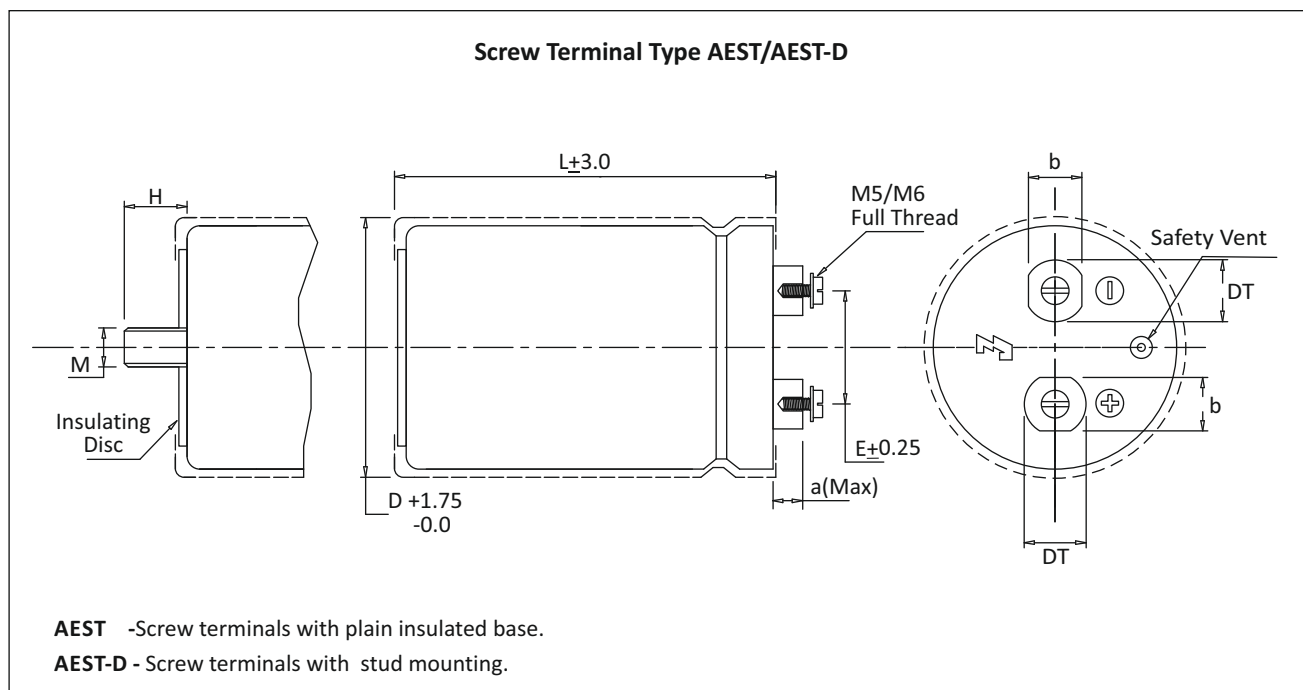


**Dimension in mm.**

Terminal	D	E	L	a (Max)	b±0.1	M	H±1.0
M5	35	12.6	62	7.8	9.5	---	---
M5	35	12.6	80	7.8	9.5	---	---
M5	35	12.6	105	7.8	9.5	---	---
M5	50	22.1	80	7.8	9.5	M 12	17.0
M5	50	22.1	105	7.8	9.5	M 12	17.0
M5	50	22.1	120	7.8	9.5	M 12	17.0
M5	63	28.5	105	7.8	12.0	M 12	17.0
M5	63	28.5	120	7.8	12.0	M 12	17.0
M5	63	28.5	146	7.8	12.0	M 12	17.0
M5	76	31.6	105	7.8	12.0	M 12	17.0
M5	76	31.6	120	7.8	12.0	M 12	17.0
M5	76	31.6	146	7.8	12.0	M 12	17.0
M5	76	31.6	175	7.8	12.0	M 12	17.0
M5	76	31.6	220	7.8	12.0	M 12	17.0
M5	76	31.6	240	7.8	12.0	M 12	17.0
M6	76	31.6	105	5.3*	16.0	M 12	17.0
M6	76	31.6	120	5.3*	16.0	M 12	17.0
M6	76	31.6	146	5.3*	16.0	M 12	17.0
M6	76	31.6	175	5.3*	16.0	M 12	17.0
M6	76	31.6	220	5.3*	16.0	M 12	17.0
M6	76	31.6	240	5.3*	16.0	M 12	17.0
M6	90	32	105	5.3*	16.0	M 12	17.0
M6	90	32	146	5.3*	16.0	M 12	17.0
M6	90	32	175	5.3*	16.0	M 12	17.0
M6	90	32	220	5.3*	16.0	M 12	17.0
M6	90	32	240	5.3*	16.0	M 12	17.0

\* Low Post Design

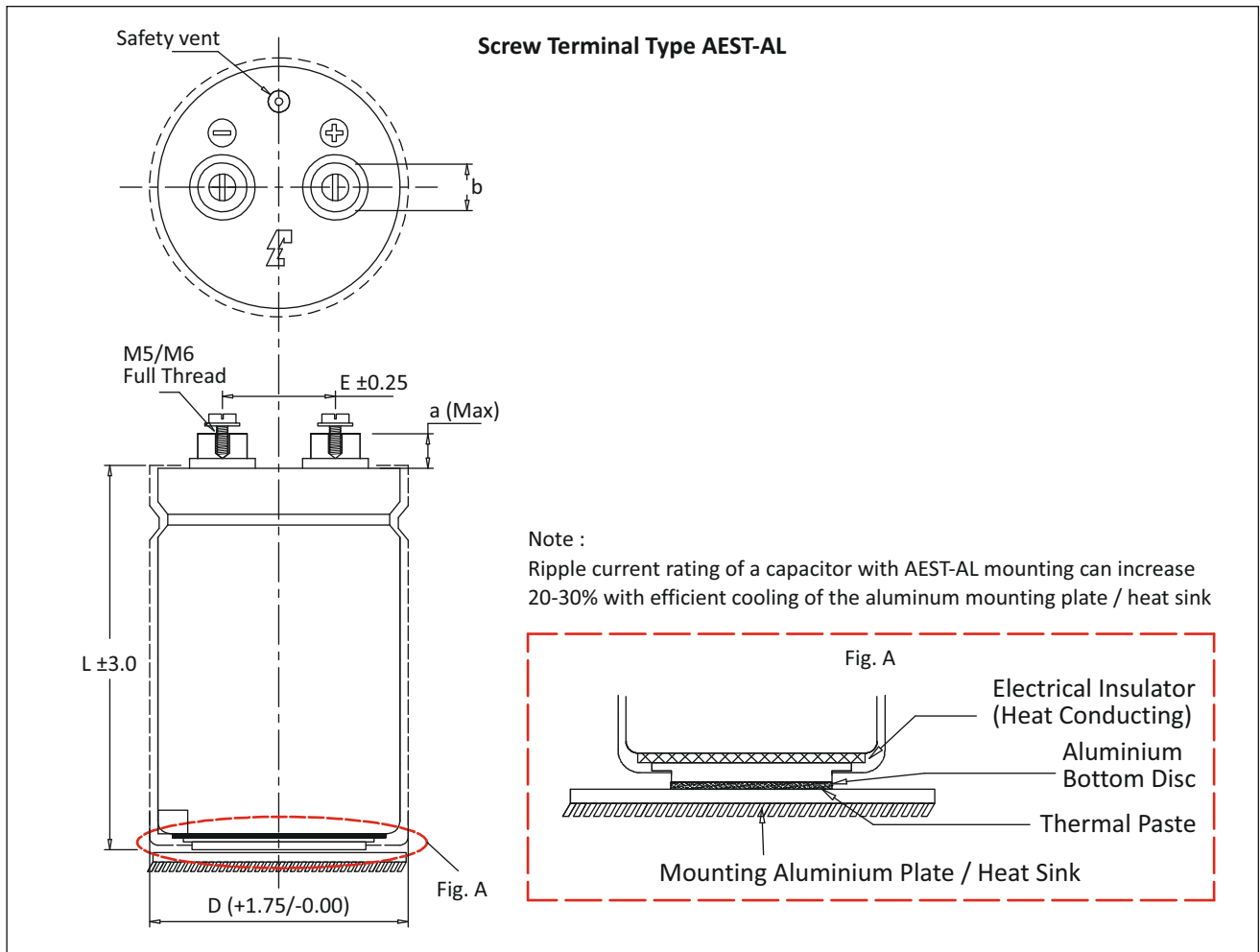
### Terminal Style And Dimension With A/F Insert



**Dimension in mm.**

Terminal	D	E	L	a (Max)	b(-0.2/+0.1)	DT (±0.1)	M	H±1.0
M6	63	28.5	105	6.5	13	15	12	17
M6	63	28.5	120	6.5	13	15	12	17
M6	63	28.5	146	6.5	13	15	12	17
M6	76	31.6	105	6.5	13	15	12	17
M6	76	31.6	120	6.5	13	15	12	17
M6	76	31.6	146	6.5	13	15	12	17
M6	76	31.6	175	6.5	13	15	12	17
M6	76	31.6	220	6.5	13	15	12	17
M6	76	31.6	240	6.5	13	15	12	17
M6	90	32	105	6.5	13	15	12	17
M6	90	32	120	6.5	13	15	12	17
M6	90	32	146	6.5	13	15	12	17
M6	90	32	175	6.5	13	15	12	17
M6	90	32	220	6.5	13	15	12	17
M6	90	32	240	6.5	13	15	12	17
M6	100	32	105	6.5	13	15	12	17
M6	100	32	120	6.5	13	15	12	17
M6	100	32	146	6.5	13	15	12	17
M6	120	41.50	105	6.5	13	15	12	17
M6	120	41.50	120	6.5	13	15	12	17
M6	120	41.50	146	6.5	13	15	12	17

### Terminal Style And Dimension



Dimension in mm.

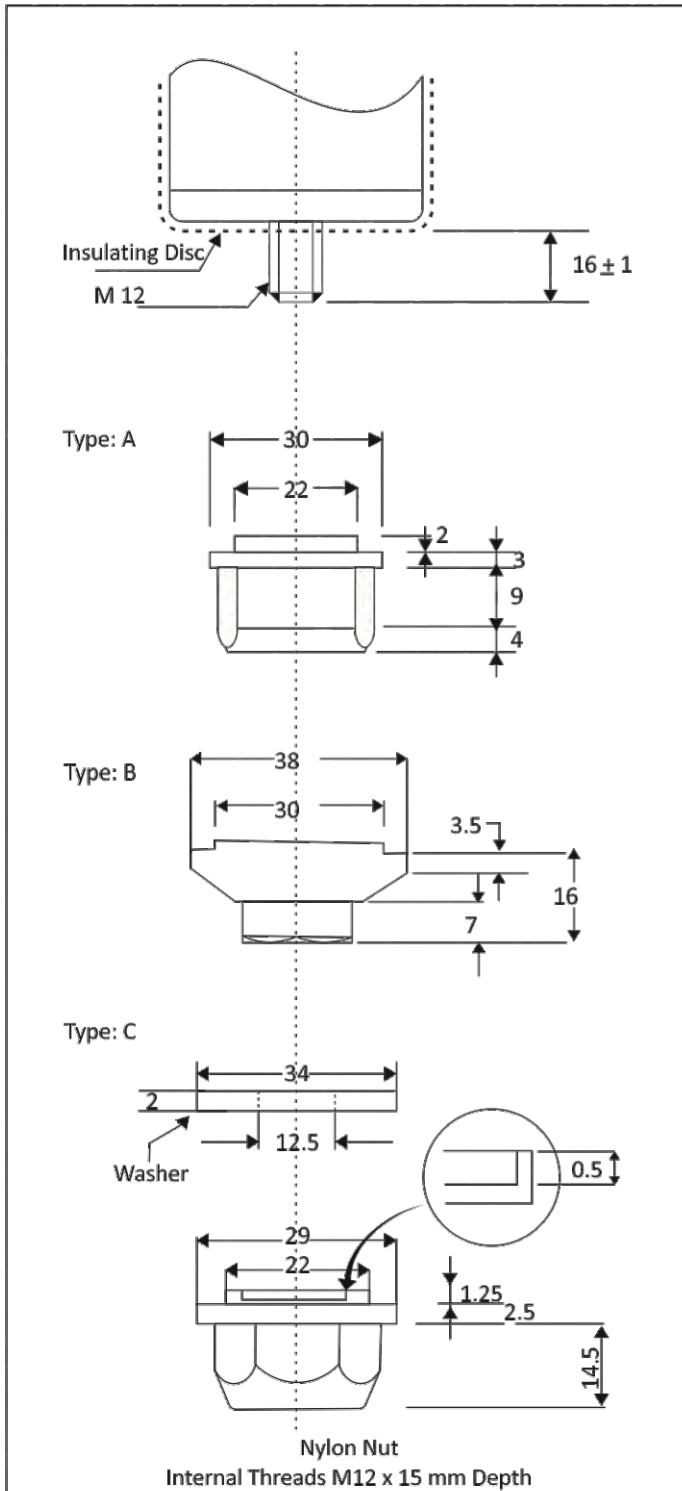
Terminal	D	E	L	a (Max)	b±0.1
M5	63	28.5	105	7.8	12
M5	63	28.5	120	7.8	12
M5	63	28.5	146	7.8	12
M5	76	31.6	105	7.8	12
M5	76	31.6	120	7.8	12
M5	76	31.6	146	7.8	12
M5	76	31.6	175	7.8	12
M5	76	31.6	220	7.8	12
M5	76	31.6	240	7.8	12
M6	76	31.6	105	5.3 *	16
M6	76	31.6	120	5.3 *	16
M6	76	31.6	146	5.3 *	16
M6	76	31.6	175	5.3 *	16
M6	76	31.6	220	5.3 *	16
M6	76	31.6	240	5.3 *	16
M6	90	32	105	5.3 *	16
M6	90	32	146	5.3 *	16
M6	90	32	175	5.3 *	16
M6	90	32	220	5.3 *	16
M6	90	32	240	5.3 *	16

\* Low Post Design

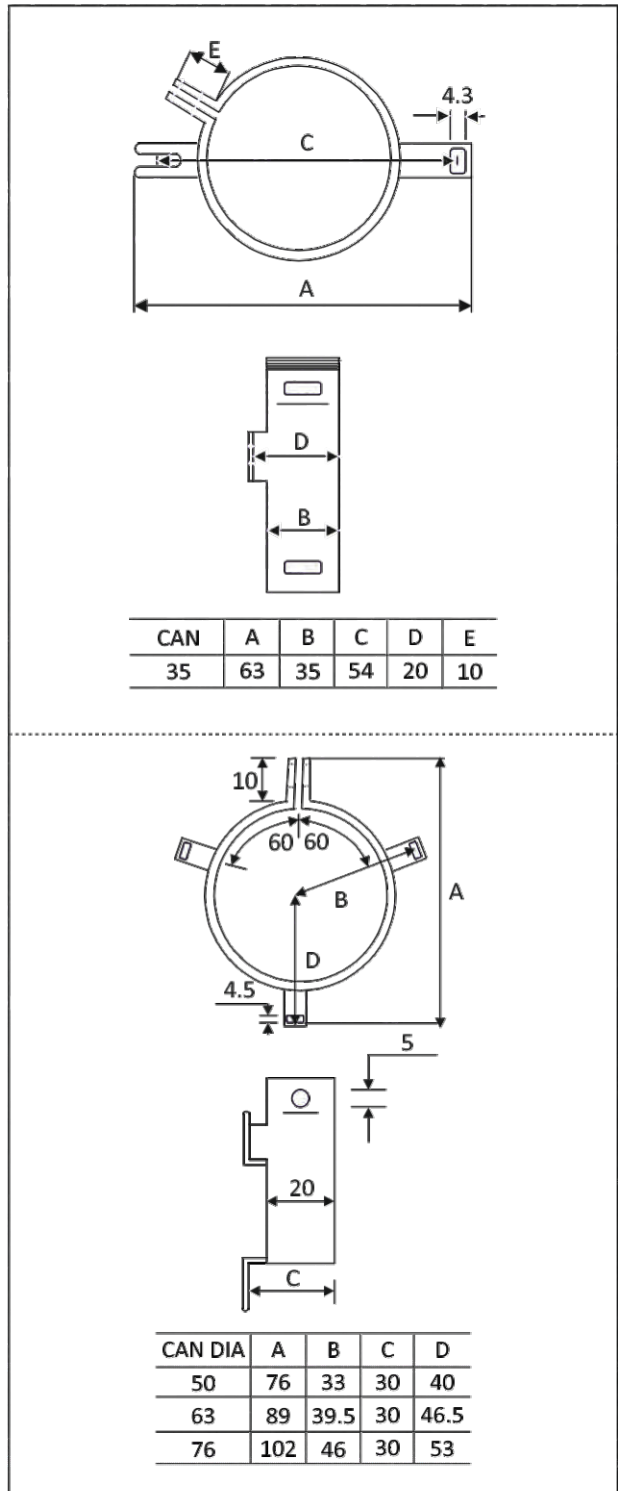


### Mounting Accessories

#### ▪ Mounting Nut and Washers for Cans with Bottom Stud



#### ▪ Vertical Mounting Clamps



Dimension in mm.