

## PG - LL9 Long Life Grade

-40°C +85°C



Capacitor Diameter (mm)	50	63	76	90	100	120
Max. Ripple Current (Amps)	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)	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 ELECTRONICS
- 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:  
IL = 0.003 CV (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. The base stud is also negative and can be insulated with a nylon nut. Please see the page regarding mounting accessories for details.
3. Maximum ripple current for each capacitor diameter .

### 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.

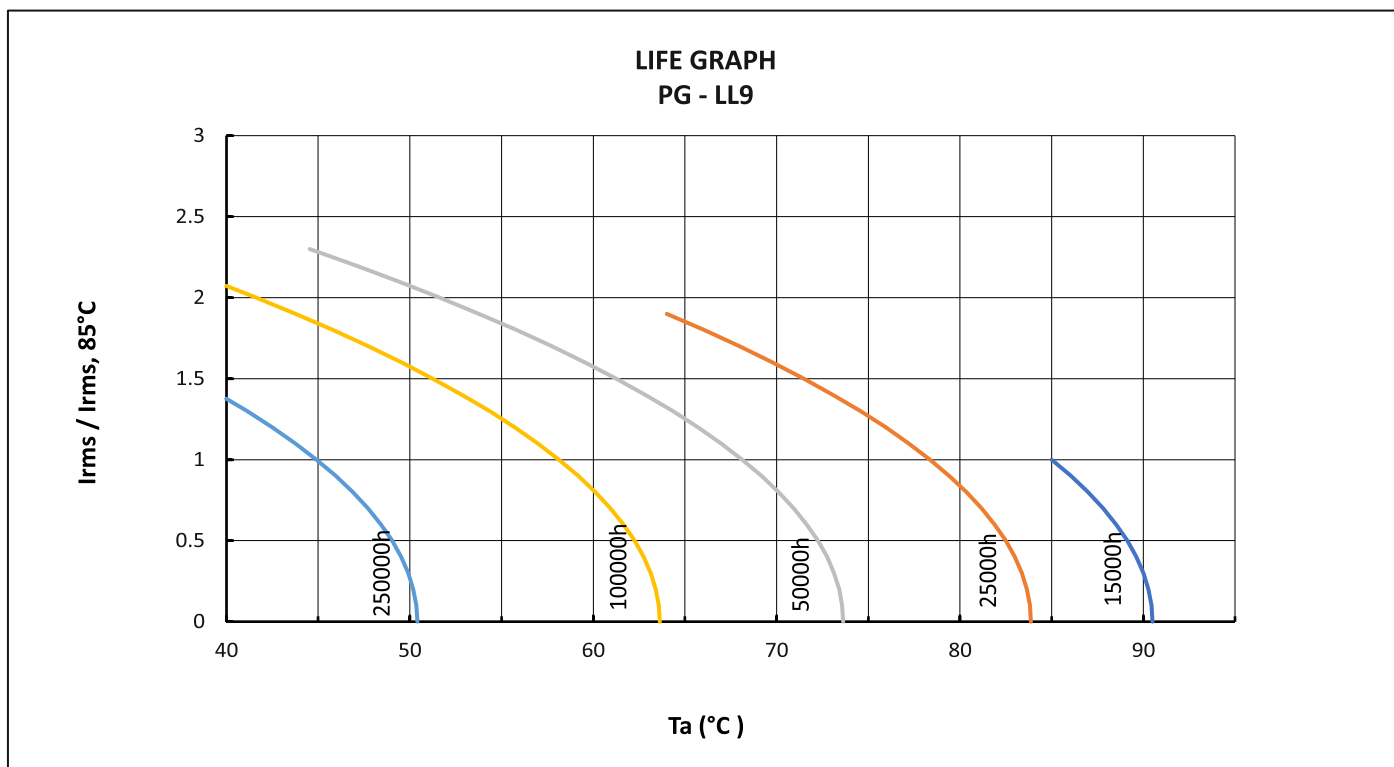
### Manufacturing Date Code Chart

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)	Ripple Current (Irms) at 100 Hz, 85°C (Amps)	Can size Nominal D x L mm	Case code	Ordering code
315	362	2200	77.08	7	50x105	022	SA022000315AC022_ _ _ _ M01
		3300	62.31	8.9	63x105	026	SA033000315AC026_ _ _ _ M01
		3900	44.77	10.5	63x105	026	SA039000315AC026_ _ _ _ M01
		4700	43.47	11.8	63x145	035	SA047000315AC035_ _ _ _ M01
		4700	42.12	12.1	76x105	028	SA047000315AC028_ _ _ _ M01
		5600	35.93	13.1	76x105	028	SA056000315AC028_ _ _ _ M01
		6800	31.59	15.4	76x146	081	SA068000315AC081_ _ _ _ M01
		8200	30.21	18.0	76x220	092	SA082000315AC092_ _ _ _ M01
		8200	26.99	18.0	100X105	082	SA082000315AC082_ _ _ _ M01
		10000	28.48	18.5	76x220	092	SA100000315AC092_ _ _ _ M01
		10000	24.23	20.1	100X120	083	SA100000315AC083_ _ _ _ M01
		12000	18.50	23	76x220	092	SA120000315AC092_ _ _ _ M01
		12000	21.74	23	100X146	084	SA120000315AC084_ _ _ _ M01
		12000	18.50	23	120X105	086	SA120000315AC086_ _ _ _ M01
		15000	15.41	25.2	76x220	092	SA150000315AC092_ _ _ _ M01
		15000	16.01	27.5	120X120	087	SA150000315AC087_ _ _ _ M01
		18000	14.00	31	100X175	085	SA180000315AC085_ _ _ _ M01
22000	12.68	36	100X220	099	SA220000315AC099_ _ _ _ M01		
27000	11.46	38	120X175	042	SA270000315AC042_ _ _ _ M01		
38000	10.25	46	120X240	044	SA380000315AC044_ _ _ _ M01		
350	385	1500	92.64	5.8	50x80	020	SA015000350AC020_ _ _ _ M01
		2200	72.85	7.2	50x105	022	SA022000350AC022_ _ _ _ M01
		3300	58.31	9.2	63x105	026	SA033000350AC026_ _ _ _ M01
		3900	48.38	10.1	63x105	026	SA039000350AC026_ _ _ _ M01
		4700	37.53	12.7	63x145	035	SA047000350AC035_ _ _ _ M01
		4700	37.64	12.8	76x105	028	SA047000350AC028_ _ _ _ M01
		5600	33.34	13.6	76x105	028	SA056000350AC028_ _ _ _ M01
		6800	29.27	16.0	76x145	081	SA068000350AC081_ _ _ _ M01
		8200	27.11	19.0	76x220	092	SA082000350AC092_ _ _ _ M01
		8200	26.99	18.0	100X105	082	SA082000350AC082_ _ _ _ M01
		10000	18.66	22.9	76x220	092	SA100000350AC092_ _ _ _ M01
		10000	18.58	22.9	100X120	083	SA100000350AC083_ _ _ _ M01
		12000	16.85	24.1	76x220	092	SA120000350AC092_ _ _ _ M01
		12000	17.01	26.0	100X145	084	SA120000350AC084_ _ _ _ M01
		12000	16.99	24.0	120X120	087	SA120000350AC087_ _ _ _ M01
		15000	13.62	29.2	90x220	094	SA150000350AC094_ _ _ _ M01
		15000	14.00	31.0	100X175	085	SA150000350AC085_ _ _ _ M01
18000	11.64	29.0	120X145	088	SA180000350AC088_ _ _ _ M01		
22000	11.38	38.0	100X220	099	SA220000350AC099_ _ _ _ M01		
27000	9.84	41.0	120X175	042	SA270000350AC042_ _ _ _ M01		
33000	9.13	47.0	120X220	043	SA330000350AC043_ _ _ _ M01		
38000	8.02	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)	Ripple Current (Irms) at 100 Hz, 85°C (Amps)	Can size Nominal D x L mm	Case code	Ordering code
400	440	1500	89.53	5.9	50x105	022	SA015000400AC022____M01
		2200	70.87	7.3	63x105	026	SA022000400AC026____M01
		3300	54.69	9.5	63x105	026	SA033000400AC026____M01
		3900	44.28	11.8	76x105	028	SA039000400AC028____M01
		4700	35.39	13.2	76x105	028	SA047000400AC028____M01
		5600	33.30	15.0	76x145	081	SA056000400AC081____M01
		5600	32.12	16.5	100X105	082	SA056000400AC082____M01
		6800	25.62	17.1	76x146	081	SA068000400AC081____M01
		6800	25.63	19.5	100X120	083	SA068000400AC083____M01
		8200	20.62	19.0	90x145	095	SA082000400AC095____M01
		8200	20.93	22.0	100X145	084	SA082000400AC084____M01
		10000	17.72	23.5	76x220	092	SA100000400AC092____M01
		10000	17.91	26.0	120X120	087	SA100000400AC087____M01
		12000	15.25	27.6	90x220	094	SA120000400AC094____M01
		12000	14.94	30.0	100X175	085	SA120000400AC085____M01
		18000	13.02	37.0	100X240	045	SA180000400AC045____M01
22000	11.82	32.0	120X220	043	SA220000400AC043____M01		
27000	10.25	46.0	120X240	044	SA270000400AC044____M01		
415	456	1500	89.39	6.5	50x105	022	SA015000415AC022____M01
		2200	69.95	8.4	63x105	026	SA022000415AC026____M01
		3300	52.87	10.8	76x105	028	SA033000415AC028____M01
		3900	42.82	12.0	76x105	028	SA039000415AC028____M01
		4700	31.46	14.0	76x105	028	SA047000415AC028____M01
		5600	30.39	15.7	76x145	081	SA056000415AC081____M01
		5600	30.26	17.0	100X105	082	SA056000415AC082____M01
		6800	23.12	18.0	76x146	081	SA068000415AC081____M01
		6800	23.19	20.5	100X120	083	SA068000415AC083____M01
		8200	19.33	22.5	76x220	092	SA082000415AC092____M01
		8200	19.16	24.5	100X145	084	SA082000415AC084____M01
		8200	18.92	24.0	120X105	086	SA082000415AC086____M01
		10000	15.66	25.0	76x220	092	SA100000415AC092____M01
		10000	16.01	27.5	120X120	087	SA100000415AC087____M01
		12000	14.30	28.5	90x220	094	SA120000415AC094____M01
		12000	13.86	32.0	120X145	088	SA120000415AC088____M01
12000	13.56	31.5	100X175	085	SA120000415AC085____M01		
15000	32.45	22.5	100X220	099	SA150000415AC099____M01		
18000	29.76	27.0	100X240	045	SA180000415AC045____M01		
18000	31.28	23.0	120X175	042	SA180000415AC042____M01		
22000	28.73	26.5	120X220	043	SA220000415AC043____M01		
27000	25.80	29.0	120X240	044	SA270000415AC044____M01		

Custom designed capacitors available

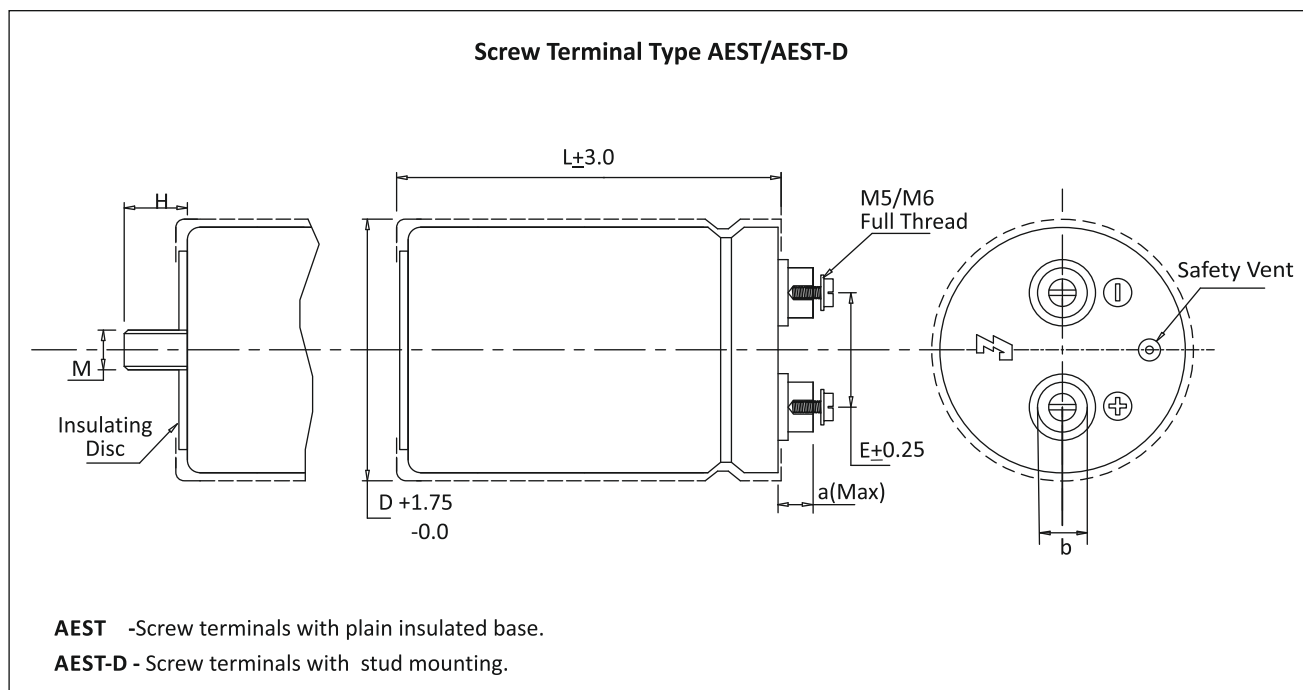


### Standard Capacitor Values

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

Custom designed capacitors available

### Terminal Style And Dimension With Round Insert

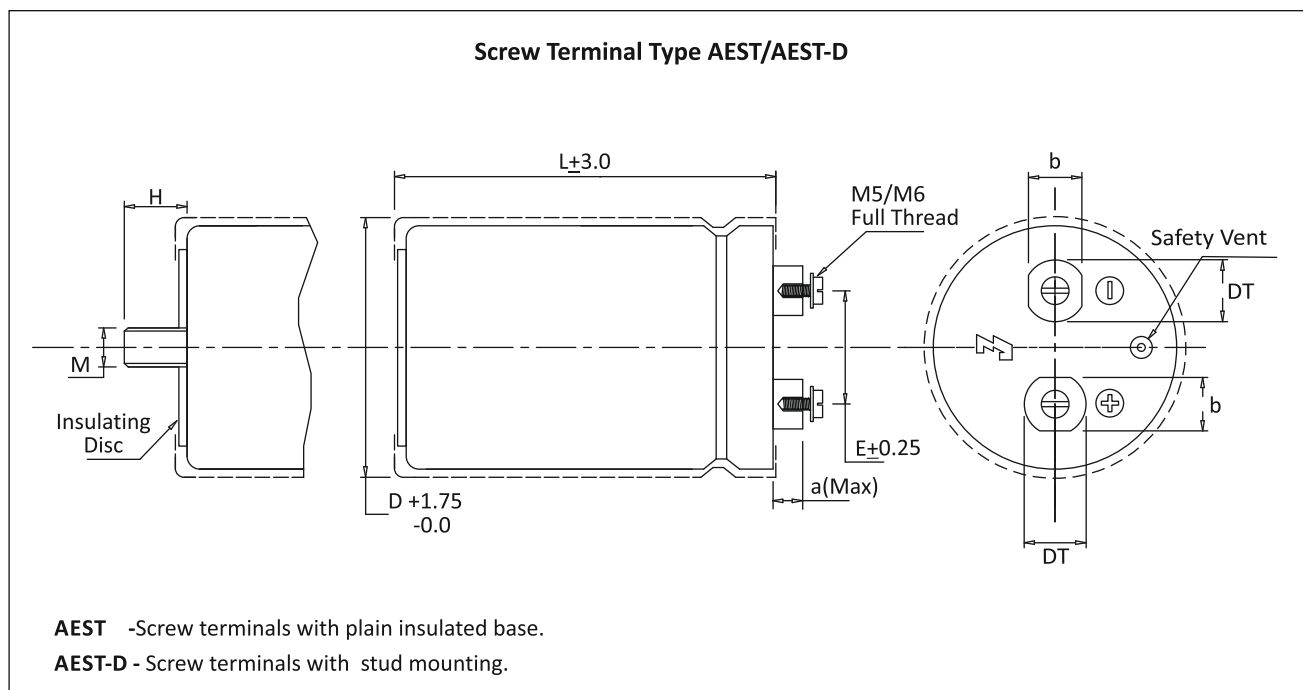


#### Dimension in mm.

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

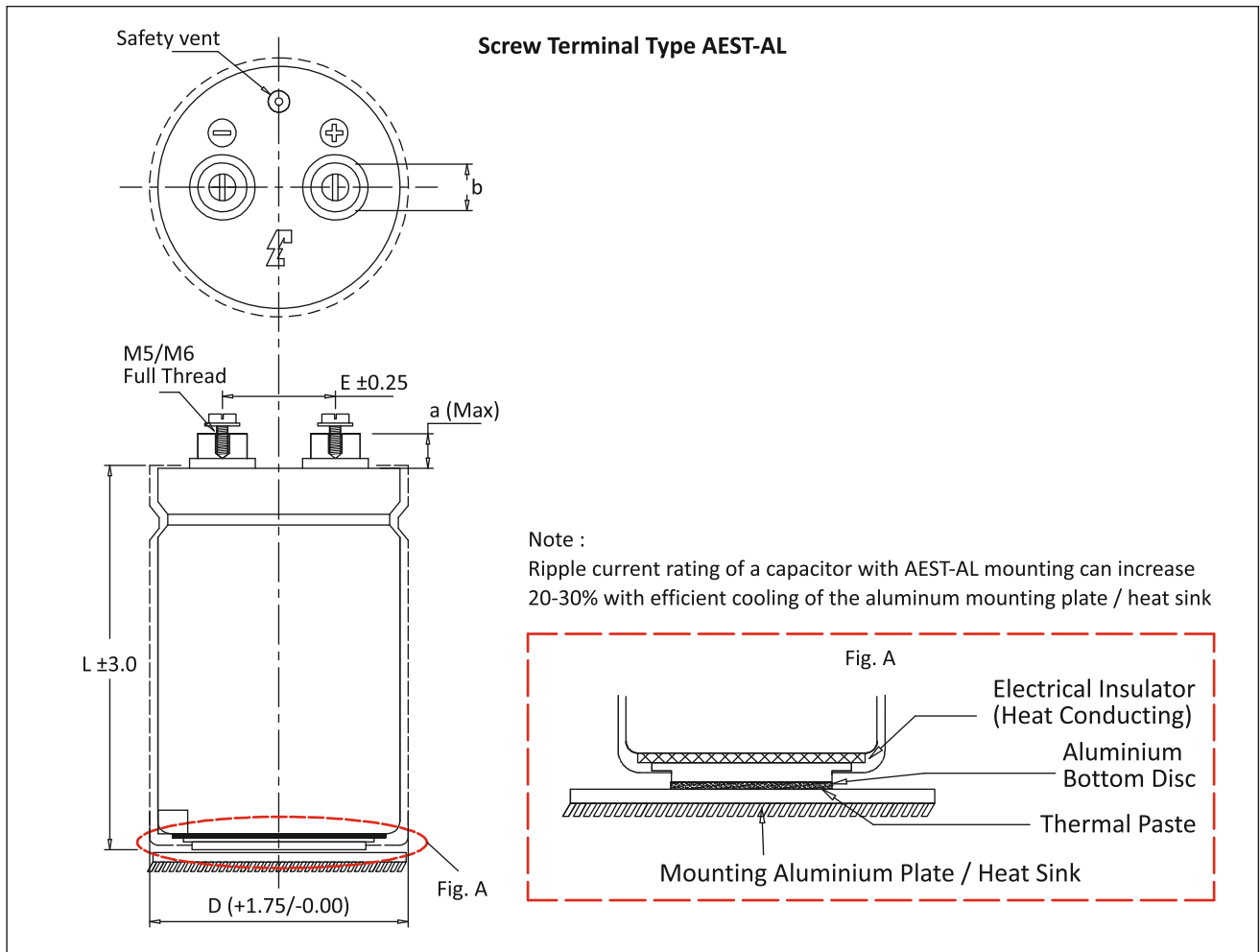
### Terminal Style And Dimension With Across Flat Insert



#### Dimension in mm.

Terminal	D	E	L	a (Max)	b	DT	M	H±1.0
M5	50	22.1	80	5.5	10	13	12	17
M5	50	22.1	105	5.5	10	13	12	17
M5	50	22.1	120	5.5	10	13	12	17
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	100	32	175	6.5	13	15	12	17
M6	100	32	220	6.5	13	15	12	17
M6	100	32	240	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
M6	120	41.50	175	6.5	13	15	12	17
M6	120	41.50	220	6.5	13	15	12	17
M6	120	41.50	240	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

#### Insulating Nylon Nut and Washers for Cans with Bottom Stud

Type : AL-01

Type : AL-02

Type : AL-03

Type : AL-04

Type : AL-05

#### Vertical Mounting Clamps

CAN	A	B	C	D	E
35	63	15	54	20	10

CAN DIA	A	B	C	D
50	76	33	30	40
63	89	39.5	30	46.5
76	102	46	30	53
90	116	53	30	60

Dimension in mm.

Catalogue No. AEPL PG-LL9-JULY-2020 (Rev01)

The specification shown herein ( page 1 to 9 ) pertain to the current manufacturing range of the Company. The Company reserves the right to change and /or modify any part of or whole of the specifications as a result of research and development and as may be necessary, without prior notice.