

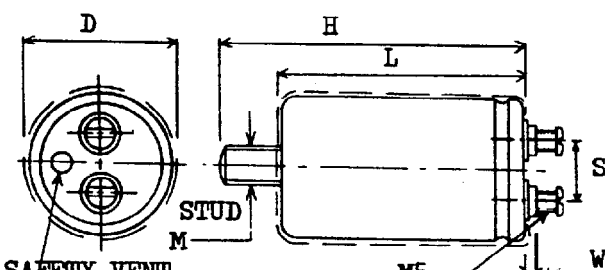
BRITISH STANDARD INSTITUTION 2 PARK STREET, LONDON, W1A 2BS	BS CECC 30301-026 Issue: 3 FEBRUARY 1988
Specification available from:- As shown in PD9002 and CECC 00200 and BH COMPONENTS (WEYMOUTH) LIMITED 20-21 CUMBERLAND DRIVE, GRANBY INDUSTRIAL ESTATE, WEYMOUTH, DORSET, DT4 9TE	Page 1 of 25
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BSE 9070 (CECC 30000) 1975 BS CECC 30300 (CECC 30000) 1978	MANUFACTURER'S TYPE NUMBER ALS20A/21A and ALS20B/21B See CECC 00200, PD 9002 For ordering information see Clause 6
Outline and dimensions First angle projection  See TABLE 1 and Appendix C for detailed dimensions. Marking information - See clause 5	Aluminium electrolytic Type J with non-solid electrolyte, cylindrical insulated case. Screw Terminations. Plain can - ALS20A/ALS20B Studded can - ALS21A/ALS21B Style I and Style II Long Life grade Assessment Level: E +

TABLE 1 DIMENSIONS (mm) FOR STYLE I

CASE SIZE	D +2 -1	L +/- 2	H MAXIMUM	S +/- 0,1	M	W +/- 0,8*
A	35	52	L MAX + 12	13	M8	6,4 OR 1,6
B	35	62	12	13	M8	6,4 OR 1,6
C	35	75	12	13	M8	6,4 OR 1,6
D	35	105	12	13	M8	6,4 OR 1,6
E	50	62	16	22	M12	6,4 OR 1,6
F	50	75	16	22	M12	6,4 OR 1,6
G	50	105	16	22	M12	6,4 OR 1,6
H	50	115	16	22	M12	6,4 OR 1,6
I	65	105	16	28	M12	6,4 OR 1,6
J	65	115	16	28	M12	6,4 OR 1,6
K	76	105	16	32	NOT AVAILABLE	6,4 OR 1,6
L	76	115	16	32	NOT AVAILABLE	6,4 OR 1,6
M	76	140 +/- 3	16	32	NOT AVAILABLE	6,4 OR 1,6

Refer to Qualified Products List PD9002 and/or CECC 00200 for details of Manufacturers approved to this specification.

* The letters A and B in the type number indicate the dimension W of the screw terminations. A = 6,4 mm and B = 1,8 mm

2. SPECIFIED METHOD OF MOUNTING FOR VIBRATION AND BUMP TESTING



- ALS20A/B - by the body (clamped)
ALS21A/B - by the stud (case sizes A-J only)

3 RATINGS AND CHARACTERISTICS

Grade	- Long Life
Capacitance Range	- See Table 2 A
Capacitance Tolerance	- -10% +50%
Rated Voltage U _R	- See Table 2 A
Category Temperature Range	- -55° C TO 85° C
Rated Temperature	- 85° C
Insulation Resistance	- > 100MΩ
Climatic Category	- 55/85/56
Leakage Current	- $\leq (0.003 C U + 4) \mu A$ (See Note 2) R R
Bump Test Severity	- 390 m/s ² 4000 ±10 Bumps
Vibration Test Severity	- 10 to 55 Hz 0.75 mm or 98 m/s ² (10g)
Low Air Pressure	- 8.5 kPa (85 mbar)
Max. Ripple Current at 100 Hz	- See Table 2 B
Tangent of Loss Angle	- See Table 2 B2
Voltage Proof	- 1000V for 1 min
Max. H.F. Impedance at 10 kHz and 20° C (Milliohms)	- See Table 2 B1
Max. ESR @ 20° C 100Hz (Milliohms)	- See Table 3

TABLE 2A VALUES OF CAPACITANCE AND OF VOLTAGE RELATED
TO CASE SIZE (SEE NOTE 1)

Capacitance uF (C_R)	RATED VOLTAGE (U_R) d.c.													
	6,3	10	16	25	40	63	100	160	200	250	315	350	400	450
68														A
100												A	A	A
150										A	A	A	B	C
220									A	A	B	B	C	D
330								A	B	B	C	C	E	F
470								A	C	C	E	E	F	G
680							A	C	E	E	F	F	H	H
1 000							A	C	F	F	G	G	J	I
1 500						A	C	E	G	G	I	I	K	K
2 200					A	A	C	G	I	I	K	K	M	M
3 300				A	A	C	E	I	K	K	M	M	M	
4 700			A	A	B	C	G	K	M	M				
6 800		A	A	B	C	E	I	K	M	M				
10 000	A	A	B	C	D	G	I	M						
15 000	A	B	C	D	F	I	K							
22 000	B	C	D	F	G	K	M							
33 000	C	D	F	G	I	K	M							
47 000	D	F	G	I	K	M								
68 000	F	G	I	K	M									
100 000	G	H	J	L	M									
150 000	I	J	L	M										
220 000	I	L	M											
330 000	M													

TABLE 28 MAX. RIPPLE CURRENT (AMPS) AT
100 Hz. AND 85°C
(SEE NOTE 3)

Capacitance uF (C _R)	RATED VOLTAGE (U _R) d.c.													
	6,3	10	16	25	40	63	100	160	200	250	315	350	400	450
68														0,76
100												0,86	0,77	0,75
150										1,00	1,00	1,05	1,0	1,06
220									1,2	1,18	1,3 1,4	1,3 1,5	1,3	1,8
330								1,5	1,6	1,54	1,7 2,0	1,8 2,1	1,8	2,4
470								1,8	2,1	2,1	2,3 2,6	2,4 3,2	2,3	3,1
680							2,2	2,5 2,1	3,4 3,7	2,7 3,0	3,0 2,1	3,2 3,1	3,4	3,3
1000							2,2	2,9 3,6	3,7	3,1	4,0 4,4	4,1 4,6	5,8	4,4
1500						2,9	3,3 2,9	4,1 4,5	4,9 6,4	4,7 5,2	5,9 6,1	6,1 6,3	5,9 7,4	5,8
2200					3,4	2,9	3,8 4,6	6,0 5,0	8,2 8,6	6,8 7,1	7,5 7,9	7,7 8,1	6,9 8,1	7,8
3300				3,9	3,8	5,4 4,3	5,1 5,7	9,3 7,7	8,2 10,6	8,1 8,6 9,0	10,2	10,5	9,5	
4700			4,0	4,0	5,1	5,4 7,5	8,4 6,5	10,4 10,0	10,0 12,5	9,7 11,5				
68 00		4,7	4,1	5,1	6,2	7,2 8,8	11,3 9,4	11,1 13,7 12,9	13,1	12,9				
10 000	4,6	5,0	5,2	7,0	8,8 8,3	11,4	11,4 12,0	14,6						
15 000	4,4	6,3	7,2	9,7 9,1	9,9	13,0 14,4	13,0 16,9 13,8							
22 000	5,6	6,8	10,0 9,3	11,0	12,8 14,6	15,5 15,2	16,9							
33 000	7,9	9,6 9,9	11,3	14,0 15,6	15,7 16,7	15,2 19,8 16,3								
47 000	10,9 10,2	11,9	14,3 16,0	17,3 18,3	16,2 17,4	19,5								
68 000	12,1	14,6 16,3	17,4 18,5	18,3 19,5	20,6									
100 000	15,2 17,1	14,3 18,6	18,2 19,5	23,0										
150 000	18,1 19,3	16,4 19,8	22,7											
220 000	16,9 19,7	22,5												
330 000	23,0													

TABLE 2B1 MAX. IMPEDANCE @ 20°C 10 KHZ. (MILLIOHMS)

Capacitance uF (C _R)	RATED VOLTAGE (U _R) d.c.													
	6,3	10	16	25	40	63	100	160	200	250	315	350	400	450
68														1100
100												400	1200	1100
150										400	310	300	800	800
220									185	280	210 200	200 200	550	350
330								100	125	200	140 135	125 120	370	230
470								80	85	85	100 100	85 60	260	160
680							90	45 50	45 42	90 86	70 68	60 40	180	160
1 000							80	58 32	41	85	50 50	41 41	90	115
1 500						50	50 50	25 22	30 22	45 45	35 35	30 30	90 60	80
2 200					40	45	40 35	17 28	18 17	32 32	27 27	24 24	62 60	55
33 000				40	32	16 20	28 23	13 14	17 17	18 24	19 24	18 24	43	
4 700			34	35	20	16 12	15 20	13 12	16 14	17 18				
6 800		32	34	25	17	13 11	13 14	13 10 12	12	13				
10 000	34	27	25	15	12 13	9	12 12	10						
15 000	32	20	15	12 12	11	8 8	12 10 11							
22 000	22	18	11 12	11	9 8	9 9	9							
33 000	14	13 13	10	8 8	8 8	10 8 9								
47 000	10 12	10	8 8	8 8	9 9	8								
68 000	9,5	8 8	8 8	8 8	8									
100 000	8 7	8 8	8 8	7										
150 000	7 7	8 9	7											
220 000	7,5 7	7												
330 000	6,5													

[illegible]

TABLE 3 MAX. ESR @ 20°C 100Hz. MILLIOHMS

Capacitance uF (C _R)	RATED VOLTAGE (U _R) d.c.													
	6,3	10	16	25	40	63	100	160	200	250	315	350	400	450
68														1856
100												1089	1750	1915
150										870	770	710	1313	1100
220									530	608	545 520	502 480	896	572
330								259	356	405	361 350	291 320	600	382
470								213	246	237	254 252	235 158	380	269
680							168	152 158	115 113	195 194	177 175	160 110	260	260
1 000							163	132 105	117	140	120 120	110 110	130	180
1 500						76	103 107	74 71	79 54	90 90	83 83	77 76	120 90	120
2 200					55	74	75 71	49 63	40 39	64 64	60 59	55 55	96 94	80
3 300				47	48	32 42	51 49	27 36	40 40 30	40 46 46	41	38	65	
4 700			43	46	31	32 22	27 37	28 27	32 29	33 32				
6 800		38	43	32	26	23 18	21 26	23 20 22	23	23				
10 000	34	34	30	21	16 18	13	21 20	17						
15 000	33	24	19	15 17	15	12 12	17 13 17							
22 000	26	20	14 15	13	11 10	11 11	13							
33 000	16	15 15	12	10 9	9 9	11 11 9								
47 000	12 13	11	9 9	8,5 8,5	10 9,5	9								
68 000	11	9 8,5	8 8	8,5 8	9									
100 000	8 8	8,5 8	8,5 8	7,5										
150 000	7,5 7,5	8 9	7,5											
220 000	8 7,5	7,5												
330 000	7,5													

- NOTE 1: The letters indicate case size (see Table 1 and Appendix C).
The capacitors may be used for any lower voltage rating.
- NOTE 2: Leakage current maximum permissible values are derived from the empirical term $(0,003 \frac{C}{R} U + 4) \mu A$ where $\frac{C}{R}$ is the rated capacitance of the capacitor in μF and $\frac{U}{R}$ is the rated voltage of the capacitor in V. The dimensions of $\frac{C}{R}$ and $\frac{U}{R}$ are not required in this derivation.
- NOTE 3: The ripple currents are the maximum permissible values at a frequency of 100Hz and U.C.T.
To obtain the ripple current rating at 50Hz, the figure for 100Hz must be multiplied by $1/\sqrt{2}$.
It should be noted that the life of capacitor is extended by operating at lower ripple currents and low ambient temperatures. (See Table 2 B).
- NOTE 4: Mounting - A capacitor may be mounted in any position, but preferably with vent uppermost. The capacitors are not intended to be mounted by their terminations alone.

4. RELATED DOCUMENTS

BSE 9070:1975 CECC 30000	Generic specification for fixed capacitors.
BS CECC 30300:1978	Sectional specification Aluminium electrolytic capacitors
BS CECC 30301:1978	Blank detail specification Aluminium electrolytic capacitors with non-solid electrolyte.