

Series	Capacitance range	Voltage range	Temperature range	Case $\Phi \times H$	Applications
FY-FYX	1000-1000000	16-500	-40°C +85°C	51x105 90x222	High ripple current High reliability Long life

**MECHANICAL OUTLINES:**

CASE: aluminium made

TERMINALS: screw

SEALING: hermetic by beading on an EPR gasket, housed on a resin cover

PRESSURE RELEASE VENT: made in silicone-rubber

SLEEVE: self-extinguishing thermoshrinkable sleeve

SIZE: see enclosed drawings

MOUNTING HARDWARE: see hardware section

SPECIFICATIONS	TEMPERATURE RANGE	CAPACITANCE
CECC 30300 IEC 384-4 ("long life grade") MIL C62D DIN 41240 / DIN 45910	Operating: -40°C / +85°C Climatic Category: 40/85/56	Tolerance shall be within the following limits: · standard tolerance -10%+30% · or available on request -20%+20%

**LEAKAGE CURRENT:**

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be:

Maximum limit	at 25°C	$I_f \leq 0.004 * C * V$
Operating limit	at 25°C	$I_f \leq 0.001 * C * V$

Where  $I_f$  = leakage current ( $\mu A$ )

C= capacitance ( $\mu F$ )

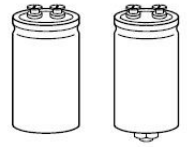
V= rated voltage(V)

**IMPORTANT**

1) When using high-capacitance and high-voltage electrolytic capacitors it is important to remember that the inner part (the rolled section) is not insulated from can: between the negative pole and the aluminium can there is a variable and not defined resistance essentially due to the electrolyte used in capacitor manufacture.

**SURGE VOLTAGE**

Working Voltage	16	25	40	50	63	75	100	160	200	250	350	400	420	450	500
Surge Voltage	18	29	46	58	73	86	115	185	230	290	385	440	460	495	525



**RIPPLE CURRENT:**

The allowable values of ripple current in amperes, are related to temperature and frequency by the formula:

$$I_{rip} = K_t * K_f * I_{r85}$$

Where  $I_{r85}$  is the limit given by tables, referred to a temperature of 85°C and to a frequency of 100 HZ and  $K_t$  or  $K_f$  are values here

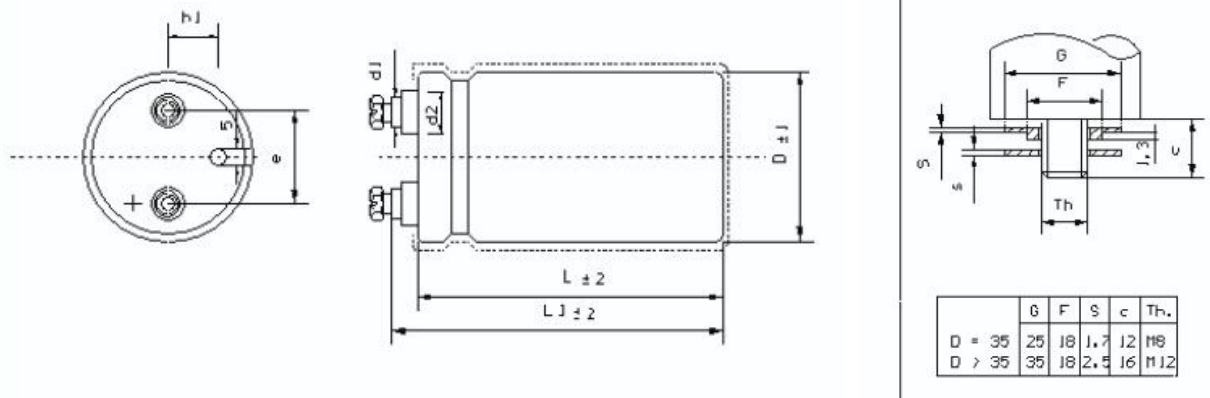
Below tabulated:

°C	40	55	65	75	80	85
$K_t$	1.65	1.5	1.4	1.2	1.1	1.0

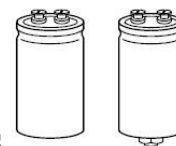
Vn	Kf			
	50<V=300	V>300	50<V=300	V>300
Hz	Code Diameter A,B		Code Diameter C ,D	
50	0.79	0.76	0.78	0.72
100	1	1	1	1
120	1.04	1.04	1.02	1.03
200	1.12	1.17	1.06	1.14
300	1.16	1.28	1.08	1.24
400	1.20	1.35	1.09	1.29
500	1.22	1.39	1.09	1.32
>1000	1.25	1.45	1.09	1.37

Note: Ripple current is function of the capacitance tolerance.

**DIMENSIONS**



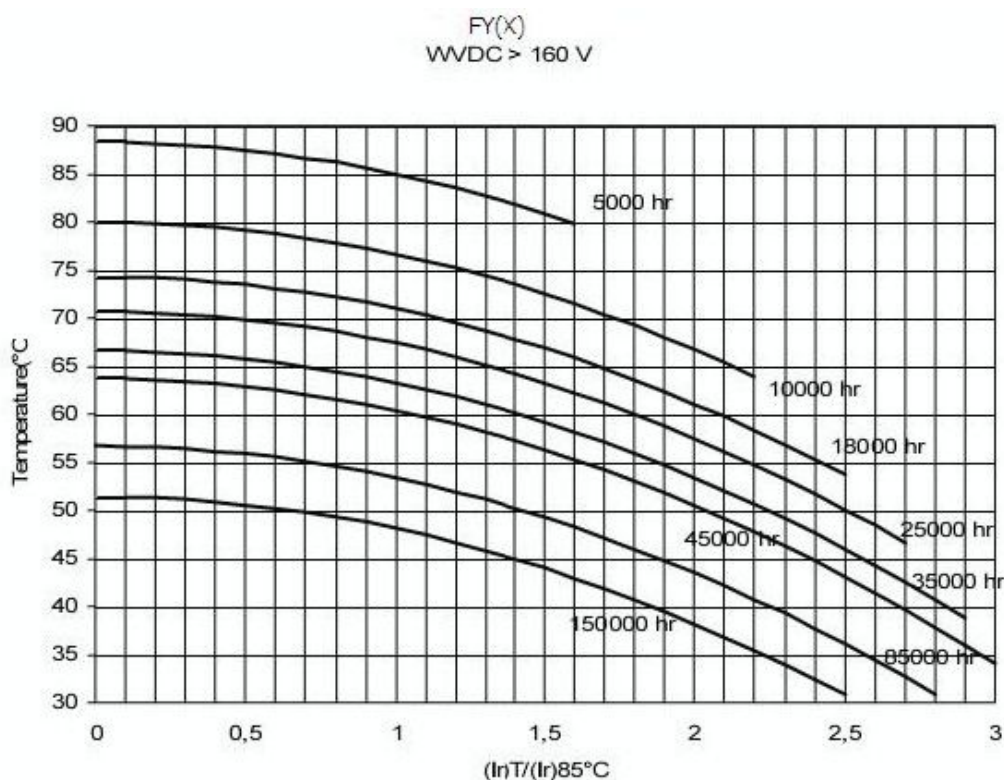
Insert Screw Thread ( D=51,63 ) =M5	Insert Screw Thread ( D =76, 90) = M6
Insert Screw Length = 10 mm.	Insert Screw Torque Max. (M5) = 2Nm .
Insert Screw Torque Max.(M6) =2.5Nm	Screw Torque For Hex Nuts M12= 10Nm .



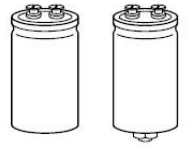
CASE CODE	D*L (mm)	L1	d1 +,-0.5	d2 +,-0.5	h1	e	CASE CODE	D*L (mm)	L1	d1 +,-0.5	d2 +,-0.5	h1	e
BC	51x105	109	13	18	13	22.2	DK	76x165	173	13	18	19	31.8
CC	63x105	111	13	18	16	28.6	DJ	76x220	222	13	18	19	31.8
DC	76x105	111	13	18	19	31.8	EC	90x105	110	17	23	19	31.8
DX	76x115	120	13	18	19	31.8	EF	90x150	155	17	23	19	31.8
DB	76x130	135	13	18	19	31.8	EG	90x185	190	17	23	19	31.8
DF	76x145	151	13	18	19	31.8	EJ	90x220	227	17	23	19	31.8

STANDARD MOUNTING STUD HARDWARE \_ INSULATING PLASTIC WASHERS AND METALLIC NUT  
 \_ PLASTIC NUTS ON REQUEST.

### Expected life as a function of temperature and ripple current



Expected life criteria: see introduction



CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
150000	25	DF	76x145	0.8	9	7	13	24.2	18.9	FY(X)154P025DF2
470000		DJ	76x220	1.7	7	6	11	27.3	15.4	FY(X)474P025DJ2
680000		EJ	89x220	2.0	6	5	9	34.4	12.4	FY(X)684P025EJ2
1000000		EJ	89x220	2.2	4	3	8	39.2	10.3	FY(X)105P025EJ2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
47000	40	BC	51x105	0.32	11	8	8	25.2	18	FY(X)473P040BC2
68000		CC	63x105	0.38	9	7	7	31.3	22.4	FY(X)683P040CC2
100000		DC	76x105	0.46	7	5	6	38.4	27.4	FY(X)104P040DC2
150000		DF	76x145	0.65	7	5	6	45.2	32.3	FY(X)154P040DF2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
22000	63	BC	51x105	0.24	17	13	12	19.9	14.2	FY(X)223P063BC2
33000		BC	51x105	0.28	14	10	11	22.6	16.1	FY(X)333P063BC2
47000		CC	63x105	0.30	10	8	8	29.3	20.9	FY(X)473P063CC2
68000		DC	76x105	0.36	8	6	7	34.5	25.6	FY(X)683P063DC2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
10000	100	BB	51x85	0.12	19	14	17	15.6	9	FY(X)103P100BB2
10000		BC	51x105	0.10	16	12	9	20.8	14.9	FY(X)103P100BC2
15000		BC	51x105	0.11	12	9	8	24	17.3	FY(X)153P100BC2
22000		CC	63x105	0.15	11	8	7	29.3	20.2	FY(X)223P100CC2
33000		DC	76x105	0.18	9	7	7	35.3	25.2	FY(X)333P100DC2
33000		DF	76x145	0.16	8	6	7	42.8	30.5	FY(X)333P100DF2
47000		DF	76x145	0.18	6	5	5	48.1	34.4	FY(X)473P100DF2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
4700	160	BC	51x105	0.10	34	25	21	14.3	10.2	FY(X)472P160BC2
4700		CC	63x107	0.09	30	23	20	16.9	12.1	FY(X)472P160CC2
6800		DC	76x105	0.10	23	18	16	21.5	15.3	FY(X)682P160DC2
10000		DC	76x105	0.11	18	13	13	24.8	17.7	FY(X)103P160DC2
15000		DF	76x145	0.12	13	10	11	33.3	23.8	FY(X)153P160DF2
22000		DJ	76x220	0.14	10	8	8	45.1	32.2	FY(X)223P160DJ2
15000		EC	90x105	0.15	16	12	11	29.3	20.9	FY(X)153P160EC2
22000		EF	90x145	0.15	11	8	8	40.3	28.8	FY(X)223P160EF2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
3300	200	BC	51x105	0.10	48	36	30	12.5	8.9	FY(X)332P200BC2
4700		CC	63x105	0.10	34	25	21	16.8	12	FY(X)472P200CC2
4700		DC	76x105	0.09	30	23	21	19.7	14.1	FY(X)472P200DC2
6800		DC	76x105	0.10	23	18	16	22.5	16.1	FY(X)682P200DC2
10000		DF	76x145	0.11	18	13	13	29.7	21.2	FY(X)103P200DF2
15000		DF	76x145	0.12	13	10	10	34.9	24.9	FY(X)153P200DF2
22000		DF	76x145	0.13	9	7	7	40.6	29	FY(X)223P200DF2
22000		DK	76x165	0.12	9	7	7	45.1	32.2	FY(X)223P200DK2
33000		DK	76x165	0.12	6	4	7	55.3	39.5	FY(X)333P200DK2
15000		EC	90x105	0.14	15	11	12	31.8	22.7	FY(X)153P200EC2
22000		EC	90x105	0.14	10	8	8	43.7	31.2	FY(X)223P200EC2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
2200	250	BC	51x105	0.09	65	49	38	10.8	7.7	FY(X)222P250BC2
3300		DC	76x105	0.10	48	36	29	14.1	10.1	FY(X)332P250DC2
4700		DC	76x105	0.10	34	25	22	18.7	13.4	FY(X)472P250DC2
6800		DC	76x105	0.10	23	18	16	22.5	16.1	FY(X)682P250DC2
10000		DF	76x145	0.10	16	12	12	31.2	22.3	FY(X)103P250DF2
15000		DJ	76x220	0.12	13	10	10	42.1	30.1	FY(X)153P250DJ2
22000		DJ	76x220	0.12	9	7	10	42.1	30.1	FY(X)223P250DJ2
10000		EC	90x105	0.13	21	16	14	26.9	19.2	FY(X)103P250EC2
15000		EF	90x145	0.13	14	10	10	37.4	26.7	FY(X)153P250EF2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1500	350	BC	51x105	0.08	85	64	51	9.4	6.7	FY(X)152P350BC2
2200		CC	63x105	0.08	58	43	35	12.9	9.2	FY(X)222P350CC2
3300		DC	76x105	0.08	39	29	24	17.5	12.5	FY(X)332P350DC2
4700		DC	76x105	0.10	34	25	24	18.7	13.4	FY(X)472P350DC2
4700		DF	76x145	0.08	27	20	17	23.9	17.1	FY(X)472P350DF2
6800		DF	76x145	0.08	19	14	13	28.8	20.5	FY(X)682P350DF2
6800		DJ	76x220	0.08	19	14	11	34.7	24.8	FY(X)682P350DJ2
10000		DF	76x220	0.11	17	13	10	30	21.4	FY(X)103P350DF2
16000		DG	76x160	0.12	13	10	10	34.9	24.9	FY(X)153P350DG2
18000		DF	76x145	0.12	11	8	9	38.2	37.3	FY(X)183P350DF2
10000		DJ	76x220	0.10	16	12	10	37.7	26.9	FY(X)103P350DJ2
15000		DJ	76x220	0.10	11	8	10	46.1	32.9	FY(X)153P350DJ2
18000		DF	76x145	0.10	9	7	10	46.1	32.8	FY(X)183P350DJ2
10000		EF	90x145	0.11	18	13	12	33.2	23.7	FY(X)103P350EF2
18000		EF	90x145	0.12	11	8	8	46.7	33.6	FY(X)183P350EF2
15000		EJ	90x220	0.11	12	9	7	48.2	34.4	FY(X)153P350EJ2
27000		EJ	90x220	0.11	6	5	5	58.4	41.7	FY(X)273P350EJ2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1000	400	BC	51x105	0.08	127	96	78	7.7	5.5	FY(X)102P400BC2
1500		BC	51x105	0.08	85	64	50	9.4	6.7	FY(X)152P400BC2
2200		BC	51x105	0.09	65	49	46	10.2	7.3	FY(X)222P400BC2
2200		CC	63x105	0.09	65	49	43	12.1	8.7	FY(X)222P400CC2
2200		DC	76x105	0.08	58	43	34	14.3	10.2	FY(X)222P400DC2
3300		CC	63x105	0.09	43	33	29	14.1	10.1	FY(X)332P400CC2
3300		DC	76x105	0.09	43	33	27	16.5	11.8	FY(X)332P400DC2
3300		DF	76x145	0.09	43	33	27	18.9	13.5	FY(X)332P400DF2
4700		DC	76x105	0.10	34	25	21	17.7	12.7	FY(X)472P400DC2
4700		DF	76x145	0.09	30	23	18	22.5	16.1	FY(X)472P400DF2
6800		DF	76x145	0.07	16	12	16	24.4	17.4	FY(X)682P400DF2
8200		DF	76x145	0.08	16	12	16	26.3	18.8	FY(X)822P400DF2
6800		DJ	76x220	0.08	19	14	12	32.7	23.4	FY(X)682P400DJ2
10000		DJ	76x220	0.11	18	13	11	35.9	25.6	FY(X)103P400DJ2
4700		EN	90x65	0.11	37	28	25	20.1	14.3	FY(X)472P400EC2
4700		EC	90x105	0.11	37	28	23	30.1	21.5	FY(X)472P400EF2
8200		EF	90x145	0.11	21	16	14	33.2	23.7	FY(X)822P400EF2
10000		EF	90x145	0.11	18	13	14	46.1	33	FY(X)103P400EF2
15000		EJ	90x220	0.08	8	6	12	49.8	36	FY(X)153P400EJ2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10KHz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1000	420	BC	51x105	0.08	127	96	78	7.7	5.5	FY(X)102P420BC2
1500		BC	51x105	0.08	85	64	50	9.4	6.7	FY(X)152P420BC2
1500		CC	63x105	0.08	85	64	50	10.6	7.6	FY(X)152P420CC2
2200		CC	63x105	0.10	72	54	43	11.5	8.2	FY(X)222P420CC2
2200		DC	76x105	0.08	58	43	34	14.3	10.2	FY(X)222P420DC2
3300		DC	76x105	0.09	43	33	28	16.5	11.8	FY(X)332P420DC2
3300		DF	76x145	0.09	43	33	27	18.9	13.5	FY(X)332P420DF2
4700		DF	76x145	0.09	30	23	18	22.5	16.1	FY(X)472P420DF2
6800		DF	76x145	0.07	16	12	12	24.4	17.5	FY(X)682P420DF2
6800		DJ	76x220	0.09	21	16	12	32.7	23.4	FY(X)682P420DJ2
10000		DJ	76x220	0.09	14	11	11	39.4	28.1	FY(X)103P420DJ2
6800		EF	90x145	0.11	26	19	11	27.4	19.6	FY(X)682P420EF2
15000		EJ	90x220	0.11	12	9	11	46.5	35.1	FY(X)153P420EJ2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10KHz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1000	450	BC	51x105	0.10	159	119	136	6.9	4.9	FY(X)102P450BC2
1500		BC	51x105	0.10	118	88	136	8.0	5.7	FY(X)152P450BC2
1500		CC	63x105	0.10	106	80	92	9.5	6.8	FY(X)152P450CC2
2200		CC	63x105	0.12	87	65	75	10.5	7.5	FY(X)222P450CC2
2200		DC	76x105	0.10	72	54	66	12.8	9.1	FY(X)222P450DC2
3300		DC	76x105	0.12	58	43	56	14.3	10.2	FY(X)332P450DC2
3300		DF	76x145	0.10	48	36	43	17.9	12.8	FY(X)332P450DF2
4700		DF	76x145	0.12	41	30	37	19.5	13.9	FY(X)472P450DF2
6800		DF	76x145	0.12	38	28	31	20.2	14.4	FY(X)682P450DF2
6800		DJ	76x220	0.12	28	21	26	28.3	20.2	FY(X)682P450DJ2
4700		EC	90x110	0.12	41	30	39	21.8	15.6	FY(X)472P450EC2
6800		EF	90x145	0.12	28	21	26	26.2	18.7	FY(X)682P450EF2
10000		EJ	90x220	0.12	19	14	18	37.7	26.9	FY(X)103P450EJ2
12000		EJ	90x220	0.12	19	14	18	40.5	26.9	FY(X)123P450EJ2

CAP (uF)	Rated Voltage (V n)	Case Code	D*L (mm)	TGδ 100Hz	ESR Max 100Hz (mΩ)	ESR typ 100Hz (mΩ)	Z max 10Khz (mΩ)	I ripple 55°C 100Hz (A)	I ripple 85°C 100Hz (A)	CATALOGUE NUMBER
1000	500	BC	51x105	0.13	207	155	190	6.0	4.3	FY(X)102P500BC2
1500		CC	63x105	0.15	159	119	146	7.8	5.5	FY(X)152P500CC2
2200		DC	76x105	0.18	130	98	120	9.5	6.8	FY(X)222P500DC2
2200		DF	76x145	0.15	109	81	100	11.9	8.5	FY(X)222P500DF2
3300		DF	76x145	0.18	87	65	80	13.4	9.5	FY(X)332P500DF2
4700		DF	76x145	0.19	80	62	71	15.5	10.2	FY(X)472P500DF2

Change the 2 symbol with the needed capacitance tolerance code: 5=±5%, 1=±10%,2=±20%