

# AR- / AR- HG SERIES

## ALUMINIUM ELECTROLYTIC CAPACITORS GENERAL PURPOSE

Series	Capacitance range	Voltage Range	Temperature range	Case $\Phi \times H$	Applications
AR / ARU	100 - 470000	25 – 450	-40 °C , +85°C	35 x 59	High capacitance, reduced volume, long life, industrial applications
AR-HG ARU-HG				76 x 147	High CV product for applications where dimensions are very important

### 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: <ul style="list-style-type: none"> <li>• standard tolerance -10% +30%</li> <li>• or available on request -20% +20%</li> </ul>

### 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

- 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

<b>Working Voltage</b>	25	40	50	63	75	100	160	200	250	350	400	420	450
<b>Surge Voltage</b>	29	46	58	73	86	115	185	230	290	385	440	460	495

**RIPPLE CURRENT:**

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

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

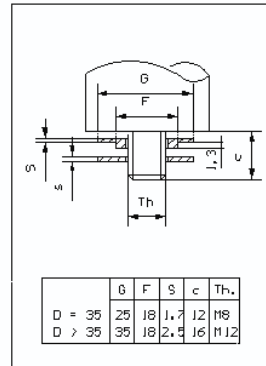
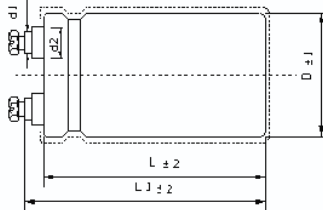
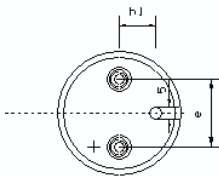
where  $I_{r85}$  is the limit given by tables, referred to a temperature of 85 °C and to a frequency of 100 HZ and  $K_t$  or  $K_f$  are values here below tabulated:

**Note . Ripple current is function of the capacitance tolerance**

°C	40	55	65	75	85
$K_t$	2.1	1.8	1.6	1.3	1.0

$V_n$ Hz	$K_f$					
	V=50	50<V=300	V>300	V=50	50<V=300	V>300
	Code Diameter A,B			Code Diameter C,D		
50	0.82	0.79	0.76	0.86	0.78	0.72
100	1	1	1	1	1	1
120	1.03	1.04	1.04	1.01	1.02	1.03
300	1.12	1.16	1.28	1.03	1.08	1.24
500	1.15	1.22	1.39	1.03	1.09	1.32
>1000	1.18	1.25	1.45	1.03	1.09	1.37

**DIMENSIONS**

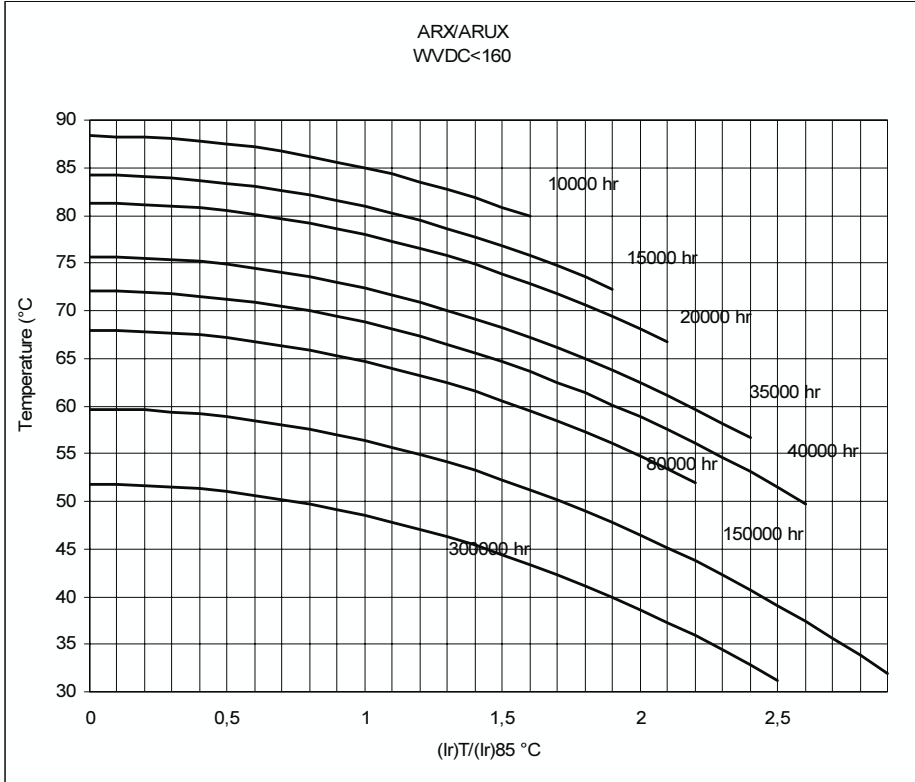


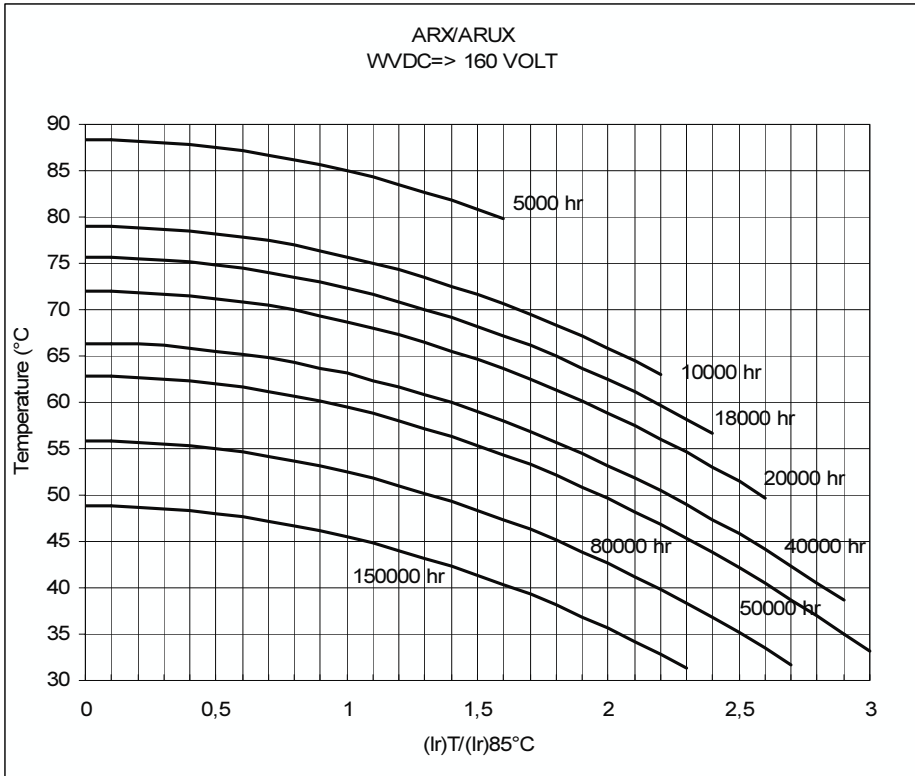
Insert screw thread = m5	Screw torque for hex nuts m8 = 4 Nm.
Insert screw torque max. (m5) = 2 Nm.	Screw torque for hex nuts m12 = 10 Nm
Insert screw length (terminal code "-x") = 10 mm.	

CASE CODE	Φ X L (mm)	l1	d1 ±0.5	d2 ±0.5	h1	e	CASE CODE	Φ X L (mm)	l1	d1 ±0.5	d2 ±0.5	h1	e
AA	35 x 59	65	8	12	8	12.7	CC	63 x 107	111	13	18	16	28.6
AB	35 X 83	89	8	12	8	12.7							
AC	35 X 105	109	8	12	8	12.7	DC	76 x 107	111	13	18	19	31.8
BB	51 x 83	89	13	18	13	22.2							
BC	51 x 105	109	13	18	13	22.2	DF	76 x 147	151	13	18	19	31.8

STANDARD MOUNTING STUD HARDWARE - INSULATING PLASTIC WASHER AND METALLIC NUT

EXPECTED LIFE VS. TEMPERATURE AND RIPPLE CURRENT





Expected life criteria: see introduction

# **ARX / ARUX**

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
10000	25	AA	35 x 59	0,27	39	31	27	8,4	4,6	ARX103X025AA1	ARUX103X025AA1
15000		AB	35 x 79	0,30	29	23	21	11,9	6,6	ARX153X025AB1	ARUX153X025AB1
22000		AC	35 x 105	0,33	21	17	16	15,6	8,7	ARX223X025AC1	ARUX223X025AC1
33000		BB	51 x 83	0,47	20	16	16	17,3	9,6	ARX333X025BB1	ARUX333X025BB1
47000		BC	51 x 105	0,68	21	17	14	19,5	10,8	ARX473X025BC1	ARUX473X025BC1
68000		CC	63 x 107	0,70	15	12	12	26	14,5	ARX683X025CC1	ARUX683X025CC1
100000		CC	63 x 107	0,70	10	8	10	31,5	17,5	ARX104X025CC1	ARUX104X025CC1
150000		DC	76 x 107	0,98	9	7	8	36,3	20,2	ARX154X025DC1	ARUX154X025DC1
220000		DF	76 x 147	1,26	8	7	7	44,4	24,6	ARX224X025DF1	ARUX224X025DF1

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
6800	40	AA	35 x 59	0,22	46	37	33	7,3	4,2	ARX682X040AA1	ARUX682X040AA1
10000		AB	35 x 79	0,22	32	25	22	10,8	6,3	ARX103X040AB1	ARUX103X040AB1
15000		AC	35 x 105	0,28	27	21	15	13,3	7,8	ARX153X040AC1	ARUX153X040AC1
22000		BB	51 x 83	0,36	23	19	16	15,4	9	ARX223X040BB1	ARUX223X040BB1
33000		BC	51 x 105	0,36	16	13	12	21,4	12,5	ARX333X040BC1	ARUX333X040BC1
47000		CC	63 x 107	0,33	10	8	8	30	17,5	ARX473X040CC1	ARUX473X040CC1
68000		CC	63 x 107	0,39	8	7	7	33,2	19,4	ARX683X040CC1	ARUX683X040CC1
100000		DC	76 x 107	0,56	8	6	7	37,4	21,8	ARX104X040DC1	ARUX104X040DC1
150000		DF	76 x 147	0,75	7	6	7	45,2	26,4	ARX154X040DF1	ARUX154X040DF1

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
4700	50	AA	35 x 59	0,18	55	44	39	6,7	3,9	ARX472X050AA1	ARUX472X050AA1
6800		AB	35 x 79	0,21	44	35	29	9,1	5,3	ARX682X050AB1	ARUX682X050AB1
10000		AC	35 x 105	0,25	36	29	25	11,5	6,7	ARX103X050AC1	ARUX103X050AC1
15000		BB	51 x 83	0,27	26	21	17	14,7	8,6	ARX153X050BB1	ARUX153X050BB1
22000		BC	51 x 105	0,33	21	17	14	18,2	10,6	ARX223X050BC1	ARUX223X050BC1
33000		CC	63 x 107	0,35	15	12	10	24,4	14,2	ARX333X050CC1	ARUX333X050CC1
47000		CC	63 x 107	0,37	11	9	9	28,3	16,5	ARX473X050CC1	ARUX473X050CC1
68000		DC	76 x 107	0,42	9	7	8	35,6	20,8	ARX683X050DC1	ARUX683X050DC1
100000		DF	76 x 147	0,49	7	6	6	45,7	26,6	ARX104X050DF1	ARUX104X050DF1

CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
3300	63	AA	35 x 59	0,13	56	45	44	6,6	3,8	ARX332X063AA1	ARUX332X063AA1
4700		AB	35 x 79	0,14	43	34	33	9,3	5,4	ARX472X063AB1	ARUX472X063AB1
6800		AB	35 x 79	0,15	32	25	24	10,8	6,3	ARX682X063AB1	ARUX682X063AB1
10000		AC	35 x 105	0,16	23	18	15	14,4	8,4	ARX103X063AC1	ARUX103X063AC1
10000		BB	51 x 83	0,18	26	21	17	14,7	8,6	ARX103X063BB1	ARUX103X063BB1
15000		BB	51 x 83	0,22	21	17	16	16,3	9,5	ARX153X063BB1	ARUX153X063BB1
22000		BC	51 x 105	0,25	16	13	12	21,0	12,2	ARX223X063BC1	ARUX223X063BC1
33000		CC	63 x 107	0,20	9	7	8	32,3	18,8	ARX333X063CC1	ARUX333X063CC1
47000		DC	76 x 107	0,25	8	6	7	38,4	22,4	ARX473X063DC1	ARUX473X063DC1
68000		DF	76 x 147	0,30	6	5	6	48,1	28,1	ARX683X063DF1	ARUX683X063DF1

CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
3300	75	AA	35 x 59	0,12	52	42	34	6,9	4,0	ARX332X075AA1	ARUX332X075AA1
4700		AB	35 x 79	0,12	37	29	25	10,0	5,8	ARX472X075AB1	ARUX472X075AB1
6800		AC	35 x 105	0,12	25	20	18	13,7	8,0	ARX682X075AC1	ARUX682X075AC1
10000		BB	51 x 83	0,16	23	18	16	15,6	9,1	ARX103X075BB1	ARUX103X075BB1
15000		BC	51 x 105	0,16	15	12	12	21,6	12,6	ARX153X075BC1	ARUX153X075BC1
22000		CC	63 x 107	0,12	8	6	7	34,0	19,0	ARX223X075CC1	ARUX223X075CC1
33000		CC	63 x 107	0,12	5	4	7	36,4	21,4	ARX333X075CC1	ARUX333X075CC1
33000		DC	76 x 107	0,16	7	6	7	40,2	23,4	ARX333X075DC1	ARUX333X075DC1
47000		DC	76 x 107	0,18	5	4	5	45,2	26,4	ARX473X075DC1	ARUX473X075DC1
68000		DF	76 x 147	0,22	5	4	6	56,2	32,8	ARX683X075DF1	ARUX683X075DF1

CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
2200	100	AA	35 x 59	0,10	65	52	42	6,2	3,6	ARX222X100AA1	ARUX222X100AA1
3300		AB	35 x 79	0,10	43	35	30	9,2	5,4	ARX332X100AB1	ARUX332X100AB1
4700		AC	35 x 105	0,08	24	20	20	13,9	8,1	ARX472X100AC1	ARUX472X100AC1
4700		BB	51 x 83	0,10	30	24	21	13,5	7,9	ARX472X100BB1	ARUX472X100BB1
6800		BC	51 x 105	0,12	25	20	20	16,8	9,8	ARX682X100BC1	ARUX682X100BC1
10000		BC	51 x 105	0,10	14	11	10	22,3	13,0	ARX103X100BC1	ARUX103X100BC1
10000		CC	63 x 107	0,10	14	11	10	25,1	14,7	ARX103X100CC1	ARUX103X100CC1
15000		CC	63 x 107	0,11	11	8	7	29,4	17,1	ARX153X100CC1	ARUX153X100CC1
22000		CD	63 x 118	0,13	8	7	6	34,4	20,2	ARX223X100CD1	ARUX223X100CD1
22000		DC	76 x 107	0,14	9	7	6	35,1	20,5	ARX223X100DC1	ARUX223X100DC1
33000	DF	76 x 147	0,16	7	6	5	45,9	26,8	ARX333X100DF1	ARUX333X100DF1	

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
680	160	AA	35 x 59	0,10	211	169	127	3,4	2,0	ARX681X160AA1	ARUX681X160AA1
1000		AB	35 x 79	0,10	143	115	89	5,1	2,9	ARX102X160AB1	ARUX102X160AB1
1500		AC	35 x 105	0,10	96	76	62	7,0	4,1	ARX152X160AC1	ARUX152X160AC1
2200		BB	51 x 83	0,10	65	52	42	9,2	5,4	ARX222X160BB1	ARUX222X160BB1
3300		BC	51 x 105	0,12	52	42	36	11,7	6,8	ARX332X160BC1	ARUX332X160BC1
4700		CC	63 x 107	0,12	37	29	25	15,7	9,2	ARX472X160CC1	ARUX472X160CC1
6800		DC	76 x 107	0,12	25	20	18	21,1	12,3	ARX682X160DC1	ARUX682X160DC1
10000		DC	76 x 107	0,12	17	14	12	25,5	14,9	ARX103X160DC1	ARUX103X160DC1
15000		DF	76 x 147	0,13	12	10	9	34,4	20,0	ARX153X160DF1	ARUX153X160DF1

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
470	200	AA	35 x 59	0,09	274	220	178	3,0	1,8	ARX471X200AA1	ARUX471X200AA1
680		AB	35 x 79	0,09	190	152	123	4,4	2,7	ARX681X200AB1	ARUX681X200AB1
1000		AC	35 x 105	0,09	129	103	85	6,1	3,7	ARX102X200AC1	ARUX102X200AC1
1500		BB	51 x 83	0,10	96	76	63	7,6	4,7	ARX152X200BB1	ARUX152X200BB1
2200		BC	51 x 105	0,10	65	52	43	10,5	6,4	ARX222X200BC1	ARUX222X200BC1
3300		CC	63 x 107	0,10	43	35	29	14,4	8,8	ARX332X200CC1	ARUX332X200CC1
4700		DC	76 x 107	0,12	37	29	27	17,5	10,7	ARX472X200DC1	ARUX472X200DC1
6800		DF	76 x 147	0,12	25	20	18	24,1	14,7	ARX682X200DF1	ARUX682X200DF1
10000		DF	76 x 147	0,12	17	14	12	29,2	17,8	ARX103X200DF1	ARUX103X200DF1

CAP ( $\mu\text{F}$ )	Rated Voltage (Vn)	Case Code	$\Phi \times h$ (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
330	250	AA	35 x 59	0,08	347	278	215	2,7	1,6	ARX331X250AA1	ARUX331X250AA1
470		AB	35 x 79	0,08	244	195	157	3,9	2,3	ARX471X250AB1	ARUX471X250AB1
680		AC	35 x 105	0,08	169	135	108	5,3	3,2	ARX681X250AC1	ARUX681X250AC1
1000		BB	51 x 83	0,08	115	92	73	7,0	4,3	ARX102X250BB1	ARUX102X250BB1
1500		BC	51 x 105	0,08	76	61	51	9,7	5,9	ARX152X250BC1	ARUX152X250BC1
2200		CC	63 x 107	0,08	52	42	35	13,2	8,1	ARX222X250CC1	ARUX222X250CC1
3300		CC	63 x 107	0,09	39	31	27	15,2	9,3	ARX332X250CC1	ARUX332X250CC1
4700		DC	76 x 107	0,10	30	24	21	19,2	11,7	ARX472X250DC1	ARUX472X250DC1
6800		DF	76 x 147	0,10	21	17	14	26,4	16,1	ARX682X250DF1	ARUX682X250DF1



CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
220	350	AA	35 x 59	0,07	456	365	280	2,3	1,4	ARX221X350AA1	ARUX221X350AA1
330		AB	35 x 79	0,08	347	278	186	3,2	2,0	ARX331X350AB1	ARUX331X350AB1
470		AC	35 x 105	0,08	244	195	140	4,4	2,7	ARX471X350AC1	ARUX471X350AC1
470		BB	51 x 83	0,08	244	195	143	4,8	2,9	ARX471X350BB1	ARUX471X350BB1
680		BB	51 x 83	0,08	169	135	107	5,7	3,5	ARX681X350BB1	ARUX681X350BB1
1000		BB	51 x 83	0,08	115	92	73	7,0	4,3	ARX102X350BB1	ARUX102X350BB1
1500		BC	51 x 105	0,08	76	61	50	9,7	5,9	ARX152X350BC1	ARUX152X350BC1
2200		CC	63 x 107	0,09	59	47	39	12,4	7,6	ARX222X350CC1	ARUX222X350CC1
2200		CD	63 x 118	0,09	59	47	38	13,5	8,0	ARX222X350CD1	ARUX222X350CD1
3300		DC	76 x 107	0,10	43	35	29	16,1	9,8	ARX332X350DC1	ARUX332X350DC1
3300		DF	76 x 147	0,09	39	31	27	19,2	11,8	ARX332X350DF1	ARUX332X350DF1

CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
220	400	AA	35 x 59	0,07	456	365	411	2,3	1,4	ARX221X400AA1	ARUX221X400AA1
330		AB	35 x 79	0,07	304	243	280	3,5	2,1	ARX331X400AB1	ARUX331X400AB1
470		AC	35 x 105	0,08	244	195	215	4,4	2,7	ARX471X400AC1	ARUX471X400AC1
680		BB	51 x 83	0,08	169	135	156	5,7	3,5	ARX681X400BB1	ARUX681X400BB1
1000		BC	51 x 105	0,08	115	92	73	7,9	4,8	ARX102X400BC1	ARUX102X400BC1
2200		BC	51 x 105	0,09	59	47	44	11,9	7,3	ARX222X400BC1	ARUX222X400BC1
1500		CC	63 x 107	0,09	86	69	57	10,3	6,3	ARX152X400CC1	ARUX152X400CC1
2200		DC	76 x 107	0,10	65	52	44	13,1	8,0	ARX222X400DC1	ARUX222X400DC1
3300		DF	76 x 147	0,10	43	35	30	18,4	11,2	ARX332X400DF1	ARUX332X400DF1

CAP ( $\mu$ F)	Rated Voltage (Vn)	Case Code	$\Phi$ x h (mm)	TG $\delta$ 100Hz	ESR	ESR	Z	I ripple	I ripple	CATALOGUE NUMBER	
					max 100Hz (mOhm)	typ 100Hz (mOhm)	max 10KHz (mOhm)	55°C 100Hz (A)	85°C 100Hz (A)	Flat bottom	Mounting stud
150	450	AA	35 x 59	0,08	764	611	702	1,8	1,1	ARX151X450AA1	ARUX151X450AA1
220		AB	35 x 79	0,08	521	417	320	2,6	1,6	ARX221X450AB1	ARUX221X450AB1
330		AC	35 x 105	0,08	347	278	213	3,7	2,3	ARX331X450AC1	ARUX331X450AC1
470		BB	51 x 83	0,10	305	244	190	4,3	2,6	ARX471X450BB1	ARUX471X450BB1
680		BC	51 x 105	0,10	211	169	131	5,8	3,6	ARX681X450BC1	ARUX681X450BC1
1000		CC	63 x 107	0,10	143	115	91	7,9	4,9	ARX102X450CC1	ARUX102X450CC1
1500		CD	63 x 118	0,10	96	76	62	10,2	6,3	ARX152X450CD1	ARUX152X450CD1
1500		DC	76 x 107	0,10	96	76	62	10,8	6,6	ARX152X450DC1	ARUX152X450DC1
2200		DF	76 x 147	0,10	65	52	44	15,0	9,2	ARX222X450DF1	ARUX222X450DF1
3300		DF	76 x 147	0,10	43	35	30	18,4	11,2	ARX332X450DF1	ARUX332X450DF1