

Protected, for heavy-duty, Oil-impregnated, round Aluminum case, metallized polypropylene AC film capacitors for electrical appliances

[1] Features

- ① The highest safety level :protected by double safety(self-healing + PSI)
- ② For heavy-duty conditions(high ambient temperature or humid climatic)
- ③ Low loss.
- ④ High operating temperature.
- ⑤ Environmentally safe and compatible by use of nontoxic(no PCB's)dielectric oil.
- ⑥ Minimize space requirement :by combining both a "Fan" and a "Compressor"capacitor in a single package.

[2] Typical applications

In a typical air conditioning system,2 motor run capacitors are required.
1 capacitor is used for the fan motor(Fan),the other for the compressor(Herm).

[3] Construction



① **Winding** :actually contains 2 independent capacitors of non-inductively wound self-healing metallized polypropylene film. These windings are packaged with a common terminal for ground.

② **Style** :Dielectric oil impregnated winding is encapsulated in an aluminum case with aluminum cover to provide a leak proof seal.
*Impregnation:For a self-healing dielectric,impregnation is basically not required.

However,our capacitors,the windings are vacuum-impregnated with dielectric oil(non PCB) to eliminate air and moisture then protect metallized film from corrosion and improve "self-healing".

The dielectric oil

- ① suppresses the degrading effects of corona at the edge of the metallized film to attain a high life expectancy.
- ② eliminates environmental influences and improves heat transfer as coolant then reduces thermal resistance and provides excellent heat dissipation.
- ③ resulting in superior capacitance stability and guarantee reliable,long-term operation.

The winding is firmly located by inbuilt securing device,make the capacitor safe from earthing insulation and resistance to vibration.

③ **Terminal** :Common-4 tine,Compressor(Herm)section or High capacitance-3 tine,and Fan section or Low capacitance-2 tine AMP 250 quick disconnect terminals surrounded by terminal insulator meeting UL minimum spacing requirements standard.

④ **PSI(UL recognized,rated for 10,000AFC)** :This device is designed to sense the build-up of pressure within the capacitor, to disconnect the capacitor winding,then interrupt the internal electrical connection before the case can rupture,if excessive pressure should develop inside the case from misapplication or a fault occurs.

⑤ **Options** :Also,available with a discharge resistor,ground lugs,special terminals,mounting bracket, upon request.

[4] Specifications

① General data

Applicable standard	IEC60252,JIS C4908	
Rated voltage(URAC)	250VAC,330VAC,400VAC,450VAC	
Capacitance range	7.0/1.5uF~50.0/15.0uF	
Capacitance tolerance	+ 10~ -5%(U),±10%(K),±5%(J),±3%(W)	
Max. permissible temperature	+85℃	
Min. ambient temperature	-25℃	
Life expectancy	40D(40,000h)	

② Electrical data

AC withstand voltage	between	terminals	1.75URAC for 10sec.
		the collected terminals and case	2,000 VAC for 60sec.
Dissipation factor(DF)	0.10% max. at 20℃,50/60hz,URAC		
Rated frequency	50/60hz.		
Insulation resistance	≥ 2,000MΩ at 20℃,between the collected terminals and the case. 500VDC,1 min.		
Max. permissible voltage	1.1 URAC		
Max. permissible current	1.3 rated current		
Max. permissible VA	1.35 rated VA		

*rated current(A)= $2\pi f(\text{hz})C(\text{uF})URAC(\text{VAC}) \times 10^{-6}$

*rated VA(Var)= $2\pi f(\text{hz})C(\text{uF})URAC^2(\text{VAC}) \times 10^{-6}$

3] Environmental test data

Item	Test conditions	Test criteria
Sealing and heating test	+90±3°C for 1~3 hours	No leakage of dielectric fluid.
Damp heat test	5 cycles of; ① 8 hours at 40±3°C, R.H.:90~95% ② 16 hours under normal ambient temperature (5~35°C) and normal humidity(R.H.:45~85%)	① Rins: ≥0.5 x specified value in ② Electrical data. ② Increase in DF at 90±3°C: ≤0.05% ③ $\frac{C}{C_0}$: ≤±5% of initial value
Endurance test	85±3°C applying 1.25URAC for 800 hours	① Increase in DF at 90±3°C: ≤0.05% ② $\frac{C}{C_0}$: ≤±5% of initial value
Destruction test	85±3°C, repeatedly applying ① 1.3URAC, then ② DC voltage of 10URAC, until the capacitor current becomes zero.	The capacitor shall withstand the Withstand voltage test in ② Electrical data, without drops of liquid fall, rupture the case, smoke appear.

5] Marking

URAC, Capacitance & tolerance are marked on the capacitor.

6] Ordering/part number information

MLC	62	P1	Z	45	456/156	K	3	G	R	W
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

- (1) AC capacitor for electrical appliance
- (2) Shape of capacitor (cylindrical, aluminum case)
- (3) Safety class: with PSI
- (4) Operating temperature: -25~+85°C
- (5) URAC: expressed in tens of volts of AC, for example 45=450VAC
- (6) Capacitance in pF (High/Low capacitance): first 2 figures indicating the pF, last figure indicating numbers of zeros to be added to the pF.

The letter D indicates 1/2 uF for capacitors 10.5uF and above.

For example: 45,000,000pF = 45,000nF = 45uF = 456

15,000,000pF = 15,000nF = 15uF = 156

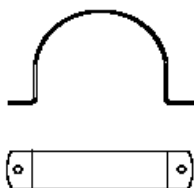
- (7) Capacitance tolerance: ±10%
- (8) Option (Terminal style): 3 or 4 tine AMP 250 quick disconnect terminals available.
3 tine AMP 250 quick disconnect terminals: 3
4 tine AMP 250 quick disconnect terminals: 4

(9) Option (Ground lug): G

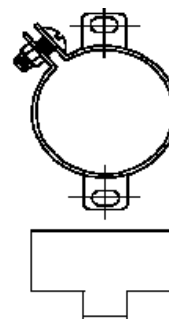
(10) Option (Discharge resistor): R

(11) Option (Mounting brackets): W (wrap around)

[Mounting brackets]

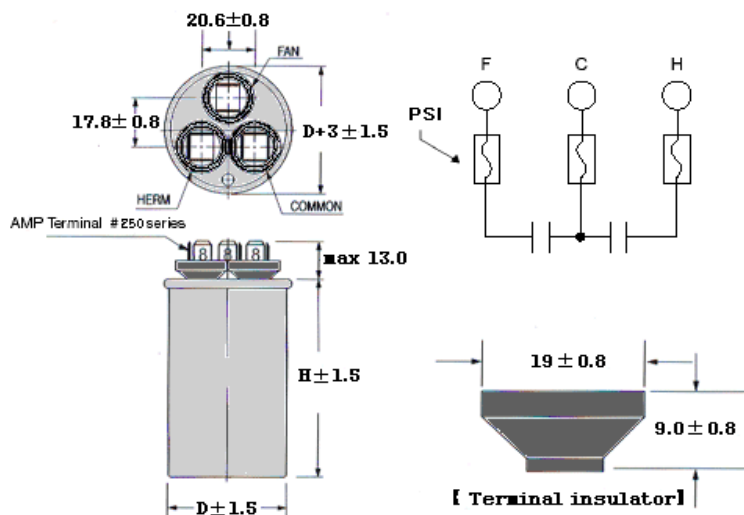


<Wrap around> :W



<2 footed> :F

7] Dimensions in mm



URAC:250Vrms(50/60Hz)

uF(High/Low capacitance)	D	H
7.0/ 1.5	50.0	70.0
7.0/ 3.0	50.0	70.0
8.0/ 1.5	50.0	70.0
8.0/ 3.0	50.0	70.0
10.0/ 1.5	50.0	70.0
10.0/ 3.0	50.0	70.0
10.0/ 5.0	50.0	70.0
15.0/ 1.5	50.0	70.0
15.0/ 2.5	50.0	70.0
15.0/ 4.0	50.0	70.0
15.0/ 6.0	50.0	70.0
15.0/10.0	50.0	70.0
15.0/12.5	50.0	70.0
17.5/ 1.5	50.0	70.0
17.5/ 2.5	50.0	70.0
17.5/ 4.0	50.0	70.0
17.5/ 6.0	50.0	70.0
17.5/10.0	50.0	70.0
17.5/15.0	50.0	70.0
20.0/ 1.5	50.0	70.0
20.0/ 2.5	50.0	70.0
20.0/ 4.0	50.0	70.0
20.0/ 6.0	50.0	70.0
20.0/10.0	50.0	70.0
20.0/15.0	50.0	70.0
25.0/ 1.5	50.0	70.0
25.0/ 2.5	50.0	70.0
25.0/ 5.0	50.0	70.0
25.0/ 7.5	50.0	70.0
25.0/10.0	50.0	70.0
25.0/15.0	50.0	80.0
30.0/ 1.5	50.0	80.0
30.0/ 2.5	50.0	80.0
30.0/ 4.0	50.0	80.0
30.0/ 6.0	50.0	80.0
30.0/10.0	50.0	80.0
30.0/15.0	50.0	80.0
35.0/ 1.5	50.0	80.0
35.0/ 2.5	50.0	80.0
35.0/ 5.0	50.0	80.0
35.0/ 7.5	50.0	80.0
35.0/10.0	50.0	90.0
35.0/15.0	50.0	90.0
40.0/ 1.5	50.0	90.0
40.0/ 2.5	50.0	90.0
40.0/ 4.0	50.0	90.0
40.0/ 6.0	50.0	90.0
40.0/10.0	50.0	90.0
40.0/15.0	50.0	90.0
45.0/ 1.5	50.0	90.0
45.0/ 2.5	50.0	90.0
45.0/ 4.0	50.0	90.0
45.0/ 6.0	50.0	90.0
45.0/10.0	50.0	90.0
45.0/15.0	50.0	90.0
50.0/ 1.5	50.0	90.0
50.0/ 2.5	50.0	90.0
50.0/ 6.0	50.0	90.0
50.0/10.0	50.0	100.0
50.0/15.0	50.0	100.0

URAC:330Vrms(50/60Hz)

uF(High/Low capacitance)	D	H
7.0/ 1.5	50.0	70.0
7.0/ 3.0	50.0	70.0
8.0/ 1.5	50.0	70.0
8.0/ 3.0	50.0	70.0
10.0/ 1.5	50.0	70.0
10.0/ 3.0	50.0	70.0
10.0/ 5.0	50.0	70.0
15.0/ 1.5	50.0	70.0
15.0/ 2.5	50.0	70.0
15.0/ 4.0	50.0	70.0
15.0/ 6.0	50.0	70.0
15.0/10.0	50.0	70.0
15.0/12.5	50.0	80.0
17.5/ 1.5	50.0	70.0
17.5/ 2.5	50.0	70.0
17.5/ 4.0	50.0	70.0
17.5/ 6.0	50.0	70.0
17.5/10.0	50.0	80.0
17.5/15.0	50.0	80.0
20.0/ 1.5	50.0	70.0
20.0/ 2.5	50.0	70.0
20.0/ 4.0	50.0	70.0
20.0/ 6.0	50.0	70.0
20.0/10.0	50.0	80.0
20.0/15.0	50.0	90.0
25.0/ 1.5	50.0	80.0
25.0/ 2.5	50.0	80.0
25.0/ 5.0	50.0	80.0
25.0/ 7.5	50.0	80.0
25.0/10.0	50.0	90.0
25.0/15.0	50.0	90.0
30.0/ 1.5	50.0	90.0
30.0/ 2.5	50.0	90.0
30.0/ 4.0	50.0	90.0
30.0/ 6.0	50.0	90.0
30.0/10.0	50.0	90.0
30.0/15.0	50.0	100.0
35.0/ 1.5	50.0	90.0
35.0/ 2.5	50.0	90.0
35.0/ 5.0	50.0	90.0
35.0/ 7.5	50.0	90.0
35.0/10.0	50.0	100.0
35.0/15.0	50.0	110.0
40.0/ 1.5	50.0	100.0
40.0/ 2.5	50.0	100.0
40.0/ 4.0	50.0	100.0
40.0/ 6.0	50.0	100.0
40.0/10.0	50.0	110.0
40.0/15.0	50.0	110.0
45.0/ 1.5	50.0	100.0
45.0/ 2.5	50.0	100.0
45.0/ 4.0	50.0	110.0
45.0/ 6.0	50.0	110.0
45.0/ 10.0	50.0	120.0
45.0/ 15.0	50.0	120.0
50.0/ 1.5	50.0	110.0
50.0/ 2.5	50.0	110.0
50.0/ 6.0	50.0	120.0
50.0/10.0	50.0	130.0
50.0/15.0	50.0	130.0



URAC:400Vrms(50/60Hz)

uF(High/Low capacitance)	D	H
7.0/ 1.5	50.0	70.0
7.0/ 3.0	50.0	70.0
8.0/ 1.5	50.0	70.0
8.0/ 3.0	50.0	70.0
10.0/ 1.5	50.0	70.0
10.0/ 3.0	50.0	70.0
10.0/ 5.0	50.0	80.0
15.0/ 1.5	50.0	80.0
15.0/ 2.5	50.0	80.0
15.0/ 4.0	50.0	80.0
15.0/ 6.0	50.0	80.0
15.0/10.0	50.0	100.0
15.0/12.5	50.0	100.0
17.5/ 1.5	50.0	80.0
17.5/ 2.5	50.0	80.0
17.5/ 4.0	50.0	80.0
17.5/ 6.0	50.0	90.0
17.5/10.0	50.0	100.0
17.5/15.0	50.0	110.0
20.0/ 1.5	50.0	90.0
20.0/ 2.5	50.0	90.0
20.0/ 4.0	50.0	90.0
20.0/ 6.0	50.0	100.0
20.0/10.0	50.0	110.0
20.0/15.0	50.0	110.0
25.0/ 1.5	50.0	110.0
25.0/ 2.5	50.0	110.0
25.0/ 5.0	50.0	110.0
25.0/ 7.5	50.0	110.0
25.0/10.0	50.0	120.0
25.0/15.0	50.0	120.0
30.0/ 1.5	50.0	110.0
30.0/ 2.5	50.0	120.0
30.0/ 4.0	50.0	120.0
30.0/ 6.0	50.0	120.0
30.0/10.0	50.0	130.0
30.0/15.0	50.0	130.0
35.0/ 1.5	50.0	130.0
35.0/ 2.5	50.0	130.0
35.0/ 5.0	50.0	130.0
35.0/ 7.5	50.0	130.0
35.0/10.0	50.0	140.0
35.0/15.0	50.0	140.0
40.0/ 1.5	50.0	140.0
40.0/ 2.5	50.0	140.0
40.0/ 4.0	50.0	140.0
40.0/ 6.0	50.0	140.0
40.0/10.0	50.0	150.0
40.0/15.0	50.0	150.0
45.0/ 1.5	50.0	150.0
45.0/ 2.5	50.0	150.0
45.0/ 4.0	50.0	150.0
45.0/ 6.0	50.0	150.0
45.0/10.0	50.0	150.0
45.0/15.0	50.0	150.0
50.0/ 1.5	50.0	150.0
50.0/ 2.5	50.0	150.0
50.0/ 6.0	50.0	150.0
50.0/10.0	63.0	150.0
50.0/15.0	63.0	150.0

URAC:450Vrms(50/60Hz)

uF(High/Low capacitance)	D	H
7.0/ 1.5	50.0	70.0
7.0/ 3.0	50.0	80.0
8.0/ 1.5	50.0	70.0
8.0/ 3.0	50.0	80.0
10.0/ 1.5	50.0	70.0
10.0/ 3.0	50.0	80.0
10.0/ 5.0	50.0	80.0
15.0/ 1.5	50.0	90.0
15.0/ 2.5	50.0	90.0
15.0/ 4.0	50.0	90.0
15.0/ 6.0	50.0	90.0
15.0/10.0	50.0	100.0
15.0/12.5	50.0	100.0
17.5/ 1.5	50.0	90.0
17.5/ 2.5	50.0	100.0
17.5/ 4.0	50.0	100.0
17.5/ 6.0	50.0	100.0
17.5/10.0	50.0	110.0
17.5/15.0	50.0	120.0
20.0/ 1.5	50.0	100.0
20.0/ 2.5	50.0	100.0
20.0/ 4.0	50.0	100.0
20.0/ 6.0	50.0	110.0
20.0/10.0	50.0	110.0
20.0/15.0	50.0	130.0
25.0/ 1.5	50.0	100.0
25.0/ 2.5	50.0	110.0
25.0/ 5.0	50.0	110.0
25.0/ 7.5	50.0	120.0
25.0/10.0	50.0	130.0
25.0/15.0	50.0	150.0
30.0/ 1.5	50.0	120.0
30.0/ 2.5	50.0	130.0
30.0/ 4.0	50.0	130.0
30.0/ 6.0	50.0	140.0
30.0/10.0	50.0	150.0
30.0/15.0	50.0	150.0
35.0/ 1.5	50.0	140.0
35.0/ 2.5	50.0	140.0
35.0/ 5.0	50.0	150.0
35.0/ 7.5	50.0	150.0
35.0/10.0	50.0	150.0
35.0/15.0	63.0	150.0
40.0/ 1.5	50.0	140.0
40.0/ 2.5	50.0	150.0
40.0/ 4.0	50.0	150.0
40.0/ 6.0	50.0	150.0
40.0/10.0	63.0	150.0
40.0/15.0	63.0	150.0
45.0/ 1.5	63.0	150.0
45.0/ 2.5	63.0	150.0
45.0/ 4.0	63.0	150.0
45.0/ 6.0	63.0	150.0
45.0/10.0	63.0	150.0
45.0/15.0	63.0	150.0
50.0/ 1.5	63.0	150.0
50.0/ 2.5	63.0	150.0
50.0/ 6.0	63.0	150.0
50.0/10.0	63.0	150.0
50.0/15.0	63.0	150.0

*For further details, refer to  [General technical information of AC film capacitors for electrical appliances](#)

