

Aerovox Corp

Supermet™ Oil-Filled AC Film Capacitors for Motor Run Applications

Aerovox makes a complete line of oil impregnated, AC capacitors for use in motor, HVAC, and other general purpose applications. Constructed with specially formulated metallized polypropylene film and our patented ESO (Epoxidized Soybean Oil), these capacitors are designed to meet or exceed EIA-456-A performance standards.

Aerovox offers a complete line of motor run capacitors available in industry standard round and oval sizes for operating voltages to 660 VAC. Operating temperature ratings of 70°C are produced for 60,000 hour operation. Produced in single and dual ratings.



Oil Filled Supermet™ Capacitors

KEY FEATURES

- Manufactured to EIA-456-A
- Made with patented Epoxidized Soybean Oil
- Aluminum can construction
- UL-810 fault current protection
- RoHS Compliant
- Capacitance from 2 µF to 100 µF
- Voltage ranges from 240 VAC to 660 VAC
- Operating temperature to 70°C

CONSTRUCTION

Aerovox Supermet™ oil filled AC motor run capacitors are constructed using controlled manufacturing processes and high quality materials. The capacitor section is made with metallized polypropylene film, wound on a core with precision winding machines to a capacitance tolerance of $\pm 10\%$. The capacitor section is endsprayed with zinc, providing a connection to the film and a solid surface to connect the electrodes.

The capacitor section is then connected to a pressure sensitive interrupter plate on a cover assembly consisting of the cover, terminals and the interruptor plate.

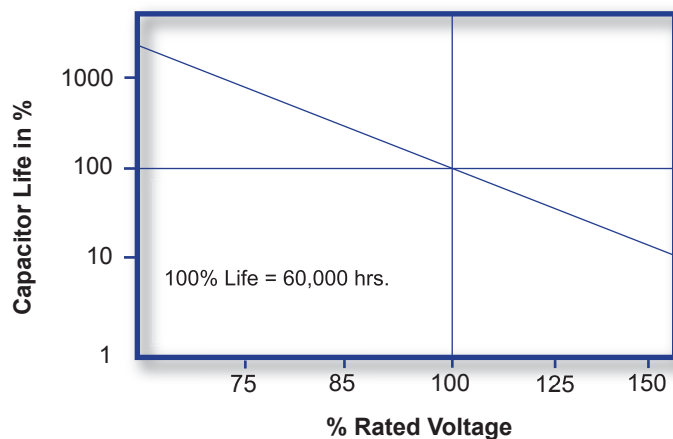
The interrupter is the safety device in the capacitor which results in an open circuit failure mode should the capacitor go into thermal overload. The can and cover are connected by a double roll seam, providing the seal necessary for proper operation. Aerovox uses our patented, environmentally friendly Epoxidized Soybean Oil (ESO) as the dielectric fluid for optimum heat transfer and corona suppression. Under proprietary vacuum impregnation and heating cycles, the ESO fills the final capacitor assembly and is then solder sealed. 100% of our capacitors undergo a rigorous 8 point final inspection to assure compliance with specifications.

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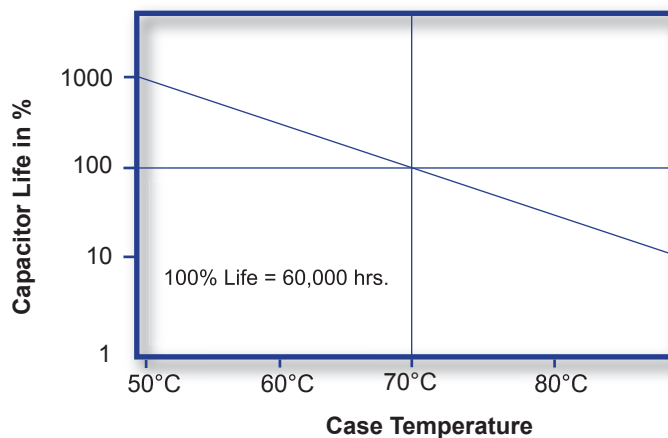
PERFORMANCE

Capacitors in this brochure are designed to meet performance testing outlined in Electrical Industry Association (EIA) standard #RS-456A. Test programs are run continuously at Aerovox to monitor production and for design improvements. Ongoing tests include: Accelerated Life Testing (ALT, for 2000 hours at 125% voltage rating and temperature rating +10°C), fault current, and mechanical testing. Aerovox testing programs accumulate over 500 million component hours each year.

Typical Life vs. Operating Voltage



Typical Life vs. Case Temperature



Capacitor life is impacted by operating temperature and voltage as illustrated in the associated charts. A standard guide to the effect of temperature on capacitor life is that for every 6.5°C rise in temperature, there will be a 50% reduction in operating life. Aerovox Supermet™ capacitors are rated for 70°C. For higher temperature operation, please see our product bulletin for HID capacitors rated up to 100°C.

SAFETY FEATURES

Aerovox protected capacitors are designed to operate in environments where there is a requirement for an internal protective device. Protective devices cause open circuits at the end of capacitor life, versus short circuits that can be caused by capacitors without protective devices. The pressure sensitive interrupter provides this protection, and has been approved by UL. Testing includes fault-current requirements on interrupter mechanisms per UL specification 810.

Installation guidelines for use of these capacitors requires that there be 0.5 inches of free space above the capacitor terminals to allow the cover of the capacitor to bow upward in case of failure, allowing the interrupter mechanism to function properly.

Agency Listings of Aerovox Capacitors:

- U.L. File E303347 (Includes Canadian designation)

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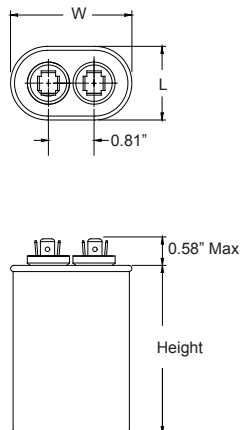
PART NUMBERING SYSTEM

The Aerovox Supermet™ part numbering system is a descriptive part number made of several different components such as can size, voltage rating, etc. The descriptors are explained below:

| Z | 23 | S | 37 | 50 | M | 00 | N |
|--------------|--|--------------------------|------------------------------|-----------------------------------|---|---------------------------|---------------|
| Type | Can Size | Impregnant | Voltage Rating | Capacitance Code | Section Type | Dual Capacitor Descriptor | Aerovox China |
| Z = MPP Film | 23 = 1.75" Rd 24 = 2.00" Rd 26 = 2.50" Rd 50 = 1.25" Oval 64 = 1.75" Oval 62 = 2.00" Oval | S=Epoxidized Soybean Oil | 37 = 370 VAC 44 = 440 VAC | 05 = 5 μ F 50 = 50 μ F | M = As Indicated N = Odd Rating W = Dual Rating | | |

OVAL OIL-FILLED CASE SIZES

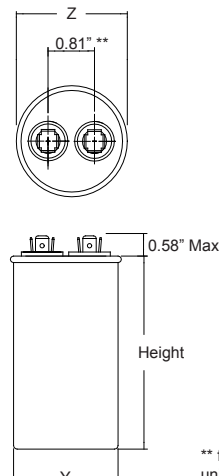
| Base Size | Description | L inches | W inches |
|-----------|-------------|----------|----------|
| A | 1 1/4" Oval | 1.31 | 2.16 |
| C | 1 3/4" Oval | 1.91 | 2.91 |
| D | 2" Oval | 1.97 | 3.66 |



Tolerance on all case dimensions is ± 0.06 "

ROUND OIL-FILLED CASE SIZES

| Base Size | Description | Y inches | Z inches |
|-----------|--------------|----------|----------|
| P | 1 3/4" Round | 1.75 | 1.87 |
| S | 2" Round | 2.00 | 2.12 |
| T | 2 1/2" Round | 2.50 | 2.62 |



** for 1.75" and 2.00" OD units, spacing is 0.78"

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Supermet™ Oval Oil Filled Metal Case Capacitors - Single Value

Rated for 60,000 hour duty @ 70 °C

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|----------|-------------|-----------|------------------------|
|----------|-------------|-----------|------------------------|

370 VAC, 70°C Case Temperature

| | | | |
|------|------------|---|--------------|
| 3 | Z50S3703MN | A | 1.56 (39.6) |
| 4 | Z50S3704MN | A | 1.56 (39.6) |
| 5 | Z50S3705MN | A | 1.56 (39.6) |
| 6 | Z50S3706MN | A | 2.38 (60.5) |
| 7.5 | Z50S3707NN | A | 2.38 (60.5) |
| 10 | Z50S3710MN | A | 2.75 (69.9) |
| 12.5 | Z50S3712NN | A | 3.25 (82.6) |
| 15 | Z50S3715MN | A | 3.94 (100.1) |
| 20 | Z64S3720MN | C | 2.38 (60.5) |
| 25 | Z64S3725MN | C | 2.75 (69.9) |

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|----------|-------------|-----------|------------------------|
|----------|-------------|-----------|------------------------|

440 VAC, 70°C Case Temperature

| | | | |
|-----|------------|---|--------------|
| 3 | Z50S4403MN | A | 1.56 (39.6) |
| 5 | Z50S4405MN | A | 2.12 (53.8) |
| 7.5 | Z50S4407NN | A | 3.15 (80.0) |
| 10 | Z50S4410MN | A | 3.25 (82.6) |
| 15 | Z50S4415MN | A | 4.13 (104.9) |
| 25 | Z64S4425MN | C | 3.25 (82.6) |

Supermet™ Round Oil Filled Metal Case Capacitors - Single Value

Rated for 60,000 hour duty @ 70 °C

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|----------|-------------|-----------|------------------------|
|----------|-------------|-----------|------------------------|

370 VAC, 70°C Case Temperature

| | | | |
|------|------------|---|--------------|
| 5 | Z23S3705MN | P | 2.16 (54.9) |
| 7.5 | Z23S3707NN | P | 2.16 (54.9) |
| 10 | Z23S3710MN | P | 2.36 (59.9) |
| 12.5 | Z23S3712NN | P | 2.36 (59.9) |
| 15 | Z23S3715MN | P | 2.56 (65.0) |
| 20 | Z23S3720MN | P | 2.75 (69.9) |
| 25 | Z23S3725MN | P | 3.15 (80.0) |
| 30 | Z23S3730MN | P | 3.15 (80.0) |
| 35 | Z23S3735MN | P | 3.75 (95.3) |
| 40 | Z24S3740MN | S | 3.55 (90.2) |
| 45 | Z24S3745MN | S | 3.95 (100.3) |
| 50 | Z24S3750MN | S | 3.88 (98.6) |

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|----------|-------------|-----------|------------------------|
|----------|-------------|-----------|------------------------|

440 VAC, 70°C Case Temperature

| | | | |
|----|------------|---|--------------|
| 15 | Z23S4415MN | P | 3.25 (82.6) |
| 20 | Z23S4420MN | P | 3.15 (80.0) |
| 25 | Z23S4425MN | P | 3.54 (89.9) |
| 30 | Z24S4430MN | S | 3.75 (95.3) |
| 35 | Z24S4435MN | S | 3.94 (100.1) |
| 40 | Z24S4440MN | S | 4.33 (110.0) |
| 45 | Z26S4445MN | T | 3.35 (85.1) |
| 50 | Z26S4450MN | T | 3.25 (82.6) |
| 55 | Z26S4455MN | T | 3.25 (82.6) |
| 60 | Z26S4460MN | T | 3.75 (95.3) |

For additional ratings, contact the factory

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Supermet™ Round Oil Filled Metal Case Capacitors - Dual Value

Rated for 60,000 hour duty @ 70 °C

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|-------------|-------------|--------------|---------------------------|
|-------------|-------------|--------------|---------------------------|

370 VAC, 70°C Case Temperature

| | | | |
|-------|--------------|---|--------------|
| 25+5 | Z24S3730W05N | S | 3.00 (72.2) |
| 30+5 | Z24S3735W05N | S | 3.54 (89.9) |
| 35+5 | Z24S3740W05N | S | 3.94 (100.1) |
| 40+5 | Z24S3745W05N | S | 4.13 (104.9) |
| 45+5 | Z24S3750W05N | S | 4.33 (110.0) |
| 50+5 | Z26S3755W05N | T | 3.54 (89.9) |
| 50+10 | Z26S3760W01N | T | 3.54 (89.9) |
| 55+10 | Z26S3765W01N | T | 3.75 (95.3) |
| 60+5 | Z26S3765W05N | T | 3.75 (95.3) |
| 60+10 | Z26S3770W01N | T | 4.13 (104.9) |
| 70+10 | Z26S3780W01N | T | 4.33 (110.0) |
| 80+5 | Z26S3785W05N | T | 4.33 (110.0) |
| 80+10 | Z26S3790W01N | T | 4.73 (95.3) |

| Cap (μF) | Aerovox P/N | Base Size | Can Height Inches (mm) |
|-------------|-------------|--------------|---------------------------|
|-------------|-------------|--------------|---------------------------|

440 VAC, 70°C Case Temperature

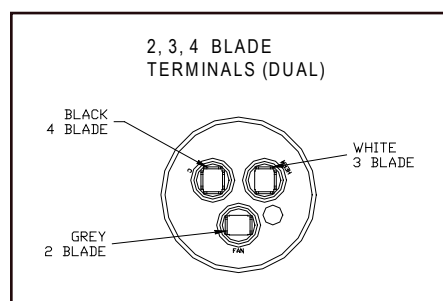
| | | | |
|--------|--------------|---|--------------|
| 35+5 | Z26S4440W05N | T | 3.15 (80.0) |
| 40+5 | Z26S4445W05N | T | 3.54 (89.9) |
| 40+10 | Z26S4450W01N | T | 3.54 (89.9) |
| 50+5 | Z26S4455W05N | T | 3.75 (95.3) |
| 60+5 | Z26S4465W05N | T | 4.13 (104.9) |
| 60+7.5 | Z26S4467W01N | T | 4.13 (104.9) |
| 60+10 | Z26S4470W01N | T | 4.33 (110.0) |
| 80+7.5 | Z26S4487W01N | T | 4.92 (125.0) |

DUAL CAPACITORS

Aerovox dual, protected capacitors are designed for optimum performance in HVAC applications such as unitary and window air conditioners. By winding two capacitors on one core, Aerovox is able to provide both capacitor values an efficient size and cost effective 3-terminal package. These capacitors are available in 370 and 440 VAC, with typical fan ratings of 3, 5, 7.5, and 10 μF. Compressor (Herm) cap ratings are available in ratings of 15 to 80 μF.

The most popular ratings are shown above, and Aerovox maintains the designs for hundreds of different combinations that are also available.

Unlike a single value capacitor, the dual units have a three terminal cover - a connection for the fan, the herm, and common. The diagram below shows the number of spades per terminal.



For additional ratings, contact the factory

WARRANTY

Aerovox Corp. (hereafter called Company), warrants to the Purchaser that capacitors manufactured by the Company are free from defects in materials, workmanship, and title for one-year from date of shipment; and this warranty is conditional based on proper installation, use and maintenance.

NO OTHER WARRANTIES ARE MADE, EITHER EXPRESSED OR IMPLIED (INCLUDING, WITHOUT LIMITATION WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE).

PURCHASER RETAINS RESPONSIBILITY FOR THE APPLICATION AND FUNCTIONAL ADEQUACY OF THE CAPACITOR.

LIMITS OF LIABILITY. Under no circumstances will the Company be liable for consequential, incidental, or exemplary damages; and the Company liability for any claim shall not exceed Purchaser's cost from the Company of specific capacitor(s) that generates such claim.