YORK®

ANBI

# AC Motor Run Capacitors – Oil Filled

The power behind **your mission**

Johnson Controls

CBB65

# Perfect for continuous AC applications

## Product description

YR and YO AC Motor Run units from YORK® are nonpolarized, oil-filled metallized polypropylene film capacitors designed for continuous air conditioning (AC) applications. These capacitors are used in split phase motor, compressor, filter, and other AC applications. The capacitors are housed in aluminum cases with steel covers. Different terminal configurations are available for various wiring options. Hardware and brackets are available to facilitate mounting. Units can be supplied with bleeder resistors should they be required.



## Features

- Self-healing, metallized polypropylene film
- Oil-filled
- Metal case that is moisture- and oil-resistant
- Voltages from 240 - 660 VAC
- Single (YR) and dual (YO) capacitance values
- Meets EIA 456 specifications
- UL recognized capacitors
- RoHS Compliant

| General Specifications | |
|---|---|
| Operating Temperature | -40 to +70°C (std.) - higher temps available upon request |
| Voltage Range | 240 - 660 VAC |
| Capacitance Range | 3 - 120µF |
| Capacitance Tolerance | ±5% (std.) - others available |
| Operating Frequency | 50 - 60Hz |
| Case Size | Round and oval sizes |
| Termination | 1/4" quick disconnect terminal (Std.) |
| Performance Specifications | Meets requirements of EIA-456 UL3 IO and UL 810, C22.2 No. 190 RoHS Compliant |

## CBB65

### YR single-part number breakdown

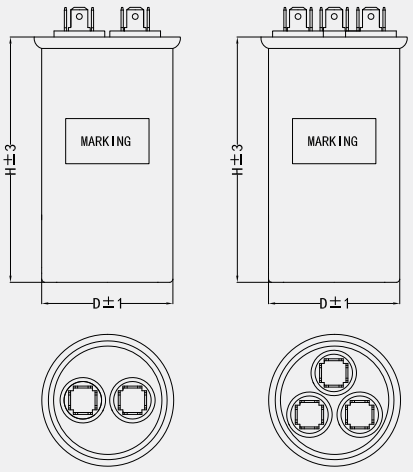
**YR-CAP-30/44R**

| YORK Round | Capacitor | 30 μ F | Rated:440VAC |
|---|---|---|---|

**YR-CAP-3505/44R**

| YORK Round | Capacitor | 35+5 μ F | Rated:440VAC |
|---|---|---|---|

### YR round capacitor dimensions




### YR - maximum capacitance by case size

| Code | Capacitance (uF) | Voltage | Size (mm) | Type |
|---|---|---|---|---|
| YR-CAP-05/440R | 5.00 | 440 VAC | 40*55 | Round |
| YR-CAP-075/440R | 7.50 | 440 VAC | 40*65 | Round |
| YR-CAP-10/440R | 10.00 | 440 VAC | 40*75 | Round |
| YR-CAP-0125/440R | 12.50 | 440 VAC | 40*75 | Round |
| YR-CAP-15/440R | 15.00 | 440 VAC | 40*75 | Round |
| YR-CAP-0175/440R | 17.50 | 440 VAC | 40*75 | Round |
| YR-CAP-20/440R | 20.00 | 440 VAC | 40*75 | Round |
| YR-CAP-25/440R | 25.00 | 440 VAC | 45*75 | Round |
| YR-CAP-30/440R | 30.00 | 440 VAC | 50*85 | Round |
| YR-CAP-35/440R | 35.00 | 440 VAC | 50*85 | Round |
| YR-CAP-40/440R | 40.00 | 440 VAC | 50*100 | Round |
| YR-CAP-45/440R | 45.00 | 440 VAC | 50*100 | Round |
| YR-CAP-50/440R | 50.00 | 440 VAC | 50*125 | Round |
| YR-CAP-55/440R | 55.00 | 440 VAC | 50*125 | Round |
| YR-CAP-60/440R | 60.00 | 440 VAC | 50*125 | Round |
| YR-CAP-3505/440R | 35+5.00 | 440 VAC | 50*125 | Round |
| YR-CAP-3575/440R | 35+7.50 | 440 VAC | 50*100 | Round |
| YR-CAP-4003/440R | 40+3.00R | 440 VAC | 50*100 | Round |
| YR-CAP-4005/440R | 40+5.00 | 440 VAC | 50*100 | Round |
| YR-CAP-4010/440R | 40+10.0 | 440 VAC | 50*100 | Round |
| YR-CAP-4505/440R | 45+5.00 | 440 VAC | 50*125 | Round |
| YR-CAP-4575/440R | 45+7.50 | 440 VAC | 50*125 | Round |
| YR-CAP-5005/440R | 50+5.00 | 440 VAC | 50*125 | Round |
| YR-CAP-6005/440R | 60+5.00 | 440 VAC | 55*125 | Round |
| YR-CAP-6075/440R | 60+7.50 | 440 VAC | 55*125 | Round |

CBB65

## YO single-part number breakdown

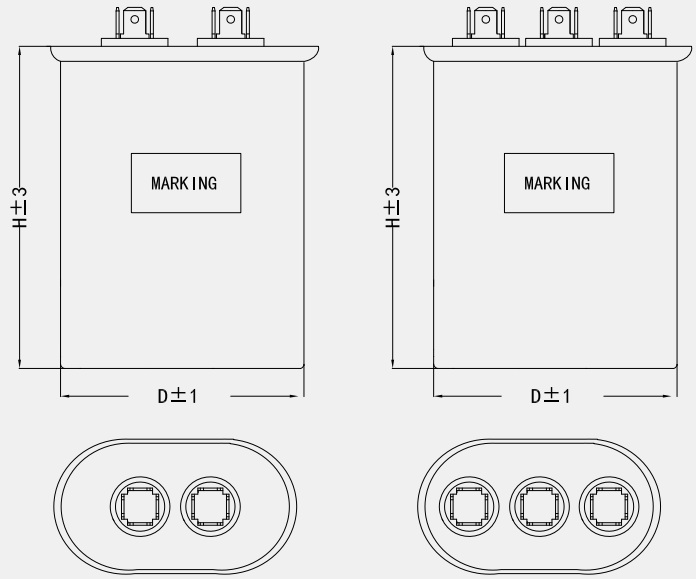
YO-CAP-30/37R

YORK Oval | Capacitor | 30 μ F | Rated:370VAC

YO-CAP-3505/37R

YORK Oval | Capacitor | 35+5 μ F | Rated:370VAC

## YO - oval capacitor dimensions




## YO – maximum capacitance by case size

| Code | Capacitance (uF) | Voltage | Size (mm) | Type |
|---|---|---|---|---|
| YO-CAP-05/370R | 5.00 | 370 VAC | 31.5*51.5*55 | Round |
| YO-CAP-075/370R | 7.50 | 370 VAC | 31.5*51.5*55 | Round |
| YO-CAP-10/370R | 10.00 | 370 VAC | 31.5*51.5*65 | Round |
| YO-CAP-0125/370R | 12.50 | 370 VAC | 31.5*51.5*75 | Round |
| YO-CAP-15/370R | 15.00 | 370 VAC | 31.5*51.5*75 | Round |
| YO-CAP-0175/370R | 17.50 | 370 VAC | 31.5*51.5*85 | Round |
| YO-CAP-20/370R | 20.00 | 370 VAC | 45*71*65 | Round |
| YO-CAP-25/370R | 25.00 | 370 VAC | 45*71*75 | Round |
| YO-CAP-30/370R | 30.00 | 370 VAC | 45*71*75 | Round |
| YO-CAP-35/370R | 35.00 | 370 VAC | 45*71*75 | Round |
| YO-CAP-40/370R | 40.00 | 370 VAC | 45*71*80 | Round |
| YO-CAP-45/370R | 45.00 | 370 VAC | 45*71*90 | Round |
| YO-CAP-3505/440R | 35+5.00 | 370 VAC | 45*71*90 | Round |
| YO-CAP-3510/370R | 35+10.0 | 370 VAC | 45*71*100 | Round |
| YO-CAP-4005/370R | 40+5.00 | 370 VAC | 45*71*100 | Round |
| YO-CAP-4010/370R | 40+10.0 | 370 VAC | 45*71*110 | Round |
| YO-CAP-4505/370R | 45+5.00 | 370 VAC | 45*71*110 | Round |
| YO-CAP-4510/370R | 45+10.00 | 370 VAC | 45*71*120 | Round |

# Typical data and performance characteristics for AC Motor Run Capacitors

## 1. Operating temperature
These capacitors are designed to operate within the ambient temperature range of -40°C to +70°C.

## 2. Frequency
Standard operating frequency range is 50Hz to 60Hz.

## 3. Voltage rating
The rated voltage is the rms value of AC voltage at which the capacitor may be operated at maximum ambient temperature.

## 4. Capacitance
The capacitance shall be measured on an AC bridge at a frequency of 60Hz at standard test conditions. When measured at the operational limits, the capacitance will not change by more than -5% to +2% of the +25°C capacitance value.

## 5. Single and dual value capacitors
YORK® capacitors are available in both single and dual types. Single value capacitors are one capacitor value in one case with two quick-connect terminals. Dual value capacitors are designed to house two separate valued capacitors in the same housing. The dual capacitor has three terminals labeled "C". "Fan", and "Herm" for the common, fan, and hermetic (pressure/compressor) electric lines that support the two electric motors.

## 6. Self-healing capability
The metallized capacitor element self-heals itself by automatically "clearing " any defects within microseconds - the capacitor continues to function at full efficiency. The metallized electrode evaporates around the defect to allow full functionality of the element with negligible capacitance loss.

## 7. Dissipation factor
The dissipation factor (DF) shall not exceed 0.1 percent when measured at a frequency of 60Hz and +25°C - it's 1 percent at 1kHz and +25°C.

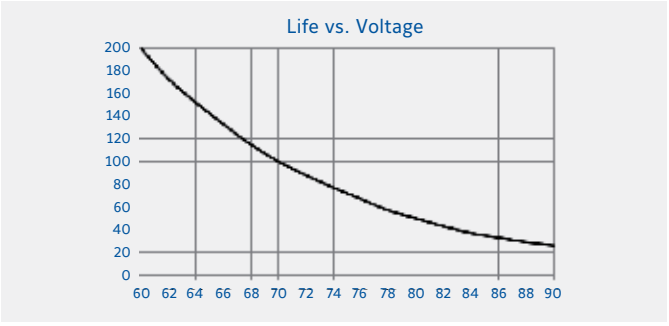
## 8. Leakage current
When 115VAC (60Hz) is applied between the shorted capacitor terminals and the bare case, the leakage current will not exceed the values shown on the following table:

| Capacitance (µF) | Leakage Current (µA) |
|---|---|
| 0-14 | 60 |
| 14.1-20 | 70 |
| 20.1-35 | 100 |
| 35.1 - up | 150 |

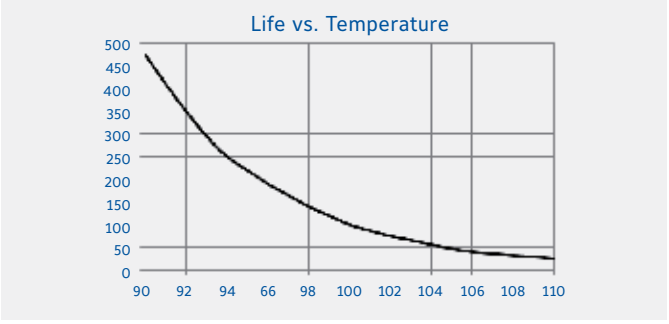
## 9. Life expectancy
The Barker Microfarads AC electrolytic motor run capacitors are designed to have a life expectancy of 60,000 hours with an estimated survival of better than 94 percent. Their first year survival under rated operating conditions is designed to be greater than 99.5 percent.

9 .1. The useful life of a motor run capacitor is affected by operating temperature and voltage compared to the capacitor rating. For example:

Effects of application temperature vs. rated temperature




Effects of application voltage vs. rated voltage



## 10. Accelerated life test (elevated temperature)

To confirm life expectations, the following accelerated test conditions may be applied:

**10.1.** Measure the capacitance and DF at standard conditions.

**10.2.** Apply a test voltage of 1.25 times rated voltage at 60Hz for a period of 2,000 hours at 80°C in a chamber with capacitors separated by at least 1 inch of air. There should be sufficient air circulation so that the ambient temperature does not vary by ±3°C.

**10.3.** Upon completion of the test, the capacitance and DF will be measured at a temperature of +25°C. None of the following must happen to pass the test.

- Permanent short circuit
- Continuous or intermittent open circuit
- Change of capacitance by more than ±3%.
- An increase in DF by more than 0.1%

## 11. Accelerated life test (room temperature)

To confirm life expectations, the following accelerated test conditions may also be applied:

**11.1.** Measure the capacitance and DF at standard conditions. Apply a test voltage of 1.35 times rated voltage at 60Hz for a period of 120 hours at +25°C.

**11.2.** Upon completion of the test, the capacitance and DF will be measured at a temperature of +25°C.

**11.3.** The same pass conditions must be fulfilled as in the elevated temperature test.

## 12. Surge voltage

Standard maximum peak transient surge voltage rating must not exceed 315 percent of rated voltage AC (rms).

## 13. Overvoltage test

Standard maximum overvoltages are 140 percent of standard rated voltages AC (rms) for a duration of one second at the room temperature measurement condition. This is used for quality testing only.

## 14. Voltage tests

**14.1.** Terminal to Terminal – Capacitors are capable of withstanding the applications of 1.75 times rated voltagefor a period of 1 second at +25°C.

**14.2.** Terminal to Case – Capacitors are capable of withstanding the application of two times the rated voltage + 1,000 VAC for a period of 1 second at +25°C.

## 15. Storage life

With no voltage applied, the capacitors shall be capable of being exposed to temperatures of – 40°C to +90°C without permanent damage. The time of exposure in the -40°C to +40°C range without permanent damage is 10 years.

## 16. Terminal strength.

The capacitor terminals shall be capable of withstanding a steady push or pull of 220N (50 $lb_f$). There should be no loosening of the terminals or damage to the terminals or seal. A torque of 0.34 N·m (3.00 $lb_f$ -in) applied to the terminals shall not cause them to rotate.

## 17. Internal pressure interrupter.

The motor run capacitor is equipped with an internal protective mechanical device to prevent case rupture under capacitor fault conditions at specified levels of voltage and fault current causing an open circuit failure (P2).

### Failure modes:

P2 – The capacitor is designed to fail in Open circuit mode only and is protected against fire and shock hazard.
P1 – The capacitor is designed to fail in either open circuit or short-circuit mode and is protected against fire and shock hazard.
PO – The capacitor has no specific failure protection.

**18. Fault current** – YORK® AC motor run capacitors are rated to a fault current up to 10,000 Amps (AFC).

**About Johnson Controls**

At Johnson Controls, we transform the environments where people live, work, learn and play. From optimizing building performance to improving safety and enhancing comfort, we drive the outcomes that matter most. We deliver our promise in industries such ashealthcare, education, data centers and manufacturing. With a global team of 100,000 experts in more than 150 countries and over 130 years of innovation, we are the power behind our customers' mission. Our leading portfolio of building technology and solutions includes some of the most trusted names in the industry, such as Tyco®, YORK®, Metasys®, Ruskin®, Titus®, Frick®, Penn®, Sabroe®, Simplex®, ANSUL® and Grinnell®.

The power behind **your mission**