



WORLDWIDE CAPACITORS

CORPORATE PROFILE

1960 - CGE is established in Mexico City as an Electrical Component Manufacturer

1970 - CGE merges with CentraLab (NA Philips) and expand into electromechanical components

1986 - CGE is bought back from Philips

1999 - Aerovox merges with CGE to manufacture Motor Start Capacitors

2001- Aerovox enters in bankruptcy and CGE is bought back once more

2001 - CGE becomes "Nueva Generación Manufacturas" (NGM)

2004 - NGM buys Barker Microfarads

2005 - NGM buys assets, trademark and patents from Mallory

2006 - NGM buys assets of NORCAP and Commonwealth Sprague

2006 - NGM creates a Joint Venture with Shengda and establishes NGM Yangzhou

2008 - NGM buys assets of U.K. Cambridge Capacitors and Philips Advance

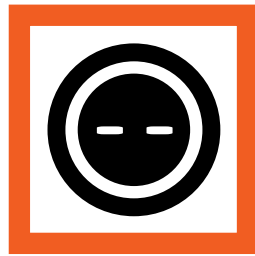
"Process innovation and customer satisfaction have driven the development of NGM operations."

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GENERAL INFORMATION

PURPOSE

This catalog's purpose is to provide a reference for all of NGM's standard AC motor run motor, start and power factor correction capacitor products. Please consult NGM Sales or Customer service for further information at sales@ngm.com.mx., Tel. (52) (55) 5352-5244.

INTRODUCTION

A motor capacitor, such as a start capacitor or run capacitor, is an electrical capacitor that boosts the current or reduce the power factor to an electric motor, such as air conditioners, water pumps, garage openers, or forced air heat furnaces. A round or oval dual run capacitor is used in some air conditioner compressor units to boost both the fan and compressor motors and reduce the power factor.

Motor Start Capacitors: are commonly used in single-phase motors to boost the value of their starting torque. It is necessary that the start should take in a small fraction of time (seconds) with the input of a high reactive power.

Due to its advantages like size and high capacitance value, the motor start capacitor is the best capacitor for this type of application. Once the motor has been started, the capacitor should be disconnected from the circuit. The capacitor elements are made out of aluminum foil separated by layers of impregnated paper.

Run capacitors: are designed for continuous duty and they are energized the entire time the motor is running. Run capacitors are rated in a range of 1-90 μ F with voltage classifications of 240V to 480V. They are manufactured with a dielectric material that consists of two sheets of polypropylene film. Each one with a thin layer of vacuum deposited metal on one side.

Power factor correction capacitors cells: they are used to reduce the power factor and harmonic filtration in industrial and commercial three-phase electrical installations also can be used in large motor machines that can affect the rest of the installation during its operation, the range is 1 to 27 Kvar, and in operating voltages from 250VA to 690VAC. The use of UGM power correction factor capacitors help in reducing substantially the electricity bill.

A.C. MOTOR START CAPACITORS

ELECTRICAL SPECIFICATIONS

Capacitance Range: 21 to 1410
Voltage Ratings: 110, 125, 165, 220, 250 and 330 VAC
Rated Frequency: 50/60 HZ
Operating Temperature: -40 + 65 °C max.
[-40 +149 °F max.] 70°C Upon request
Power Factor: 10% max. after applying working voltage for 4 sec.

MECHANICAL SPECIFICATIONS

Case: Phenolic or Thermoplastic case with a positive pressure safety vent.
Terminals: Designed to accept 1/4"; single, double and triple quick female connectors with solder lug option.
Marking: Manufacturer identification, capacitance range, rated voltage, working frequency, maximum operating temperature, manufacture week; year, and UL marking. (Special marking available on request).

AGENCY APPROVALS

- CQC. There are 7 certificates, in example : CQC09006034300, CQC09006034299, ETC
- UL File No. E348072 (certified under new standard UL 810 applicable to May 21st, 2012)
- VDE 220V Approval No: 40016549 and 40016550
260V Approval No: 40016554 and 40016561
250V Approval No: 40016560
330V Approval No: 40018822 and 40016556
- CSA LR 89486-1

NG capacitors meet the requirements of the following international standards:
IEC-60252-2 , EIA RS-463-B, UL 810, UL 310, directive RoHS

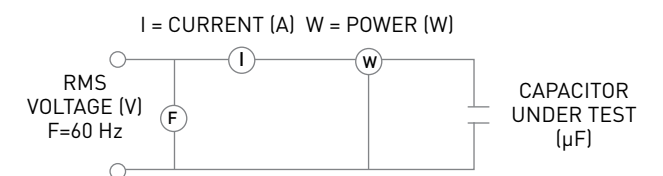


APPLICATIONS

These non-polarized capacitors are widely applicable to start small A.C. monophasic motors. More specifically, they are suitable for washing machines, refrigerators, air conditioning systems, fans, machine tools, garage door openers, etc. All designs meet the EIA dimensional standards.

PROCEDURE FOR CAPACITANCE AND POWER FACTOR MEASUREMENT

The capacitance and power factor of AC motor start capacitors are calculated by applying 60 Hz, rated voltage to the capacitor and recording, from the circuit below, the voltage within 2 seconds, the current within 3 seconds, and the wattage within 4 seconds.



CAPACITANCE AND POWER FACTOR ARE CALCULATED WITH THE BELOW EQUATIONS:

$$C = \frac{I \times 10^6}{2\pi fV}$$

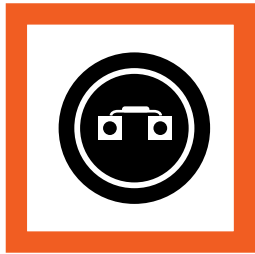
$$PF = \frac{W \times 100}{VI}$$

C = Capacitance
I = Corrent (A)
f = Frequency (Hz)
TT = 3.1416

V = Volts (Vac)
W = Power (W)
PF = Power Factor

VOLTAGE RATING

The rated voltage of the capacitor must be greater than or equal to the average voltage



across the capacitor terminals during the motor starting cycle. This is not necessarily the same as the motor line voltage. In addition, the cut-off voltage rating of the capacitor must be greater than or equal to the maximum voltage attained across the terminals of the capacitor in actual service. The maximum recommended cut-off voltages for the six standard voltage ratings are as follows:

Rated Voltage (RMS)	Maximum Voltage (RMS)
110	130
125	150
165	200
220	265
250	300
330	395

FREQUENCY

These capacitors are engineered for 60 Hz application but may be operated between 47 Hz and 66 Hz without damage provided that voltage limitations stated above are observed. (For other variations in frequency, contact NG).

CAPACITANCE RATING

The capacitance is chosen to give the necessary starting torque to the motor. The minimum capacitance value is the minimum designed capacitance. The maximum capacitance is defined by the tolerance chosen.

DUTY CYCLE

The duty cycle should be calculated for each application. It is the ratio of the time the capacitor

has applied voltage to the total time of one cycle. The duty cycles for the normal performance of Type I and Type II are in accordance with the standards in EIA RS-463-B.

SAFETY

Because the watt-second value of these capacitors is high, precautions should be taken during the testing and application of these devices. Discharge resistors should be specified when there is a possibility of a residual charge left on the capacitor or to protect contacts. Mis-application, such as exceeding design limits or applying continuous AC voltage, may result in destruction of capacitors.

CASE INSULATION TEST

The capacitors shall be capable of withstanding the application of 1500 volts AC RMS 60 Hz for 5 seconds between the terminals and a metal foil tightly surrounding the lateral surface of the plastic case or insulating sleeve without breakdown or flashover.

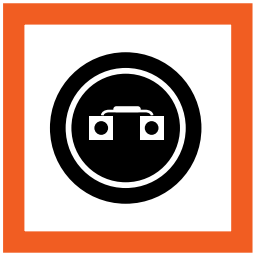
A.C. MOTOR START CAPACITORS

VENT TEST

Capacitors shall be capable of releasing any excessive internal pressure without violent expulsion of capacitor element or cover or emission of flame, when rated AC RMS voltage 60 Hz is applied continuously to a capacitor. Care should be taken to shield the capacitor from observers to prevent injury.

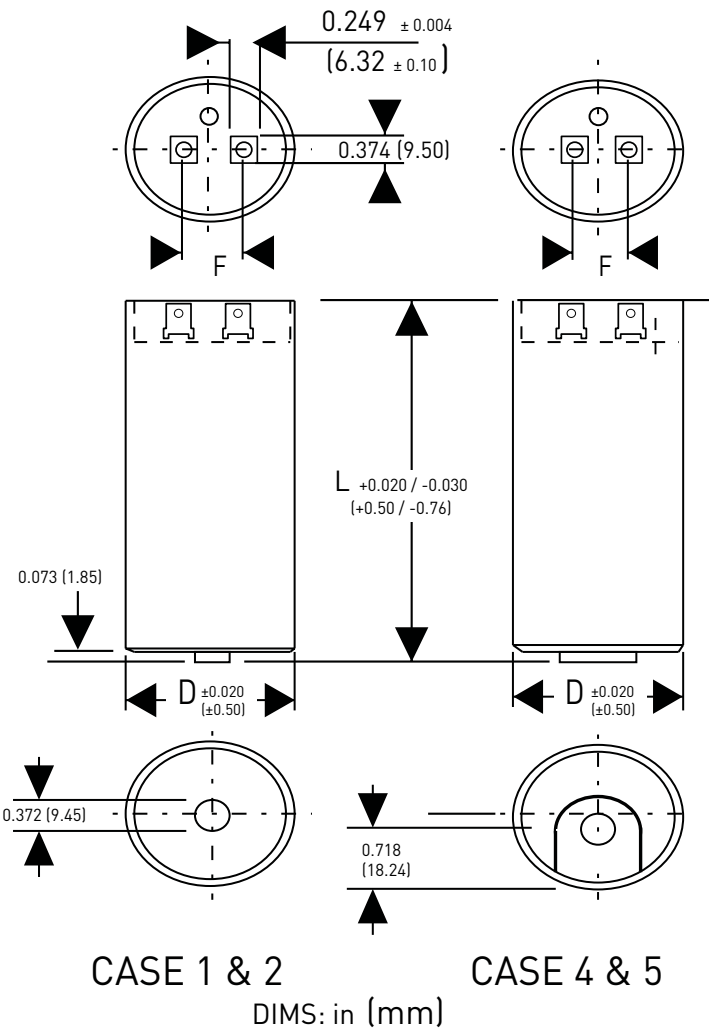
ACCELERATED LIFE TEST

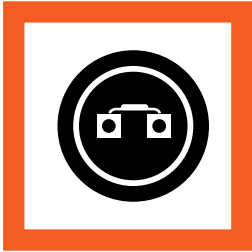
Capacitors shall be capable of withstanding life test conditions per EIA 463-B in a 65°C ±3°C ambient at rated sinusoidal voltage and frequency with current limiting and discharge resistors. A resistance equivalent to approximately 10% of the capacitor impedance shall be connected in series with each capacitor and a resistor of approximately 1000 ohms shall be connected in parallel with each capacitor. Life test shall be conducted in a test chamber with capacitors separated by at least 1 inch of air and with sufficient circulation so that the ambient temperature remains within the above temperature limits and does not vary more than 1°C. Also, capacitors shall not be exposed to direct radiation from heating elements. Test voltage is applied to the capacitor resistor combination. At the conclusion of the life test, at room temperature, the capacitance shall not differ from the initial measured value by more than ±25% and the power factor shall not exceed 20%.



MECHANICAL CHARACTERISTICS
PLASTIC SIZE CHART

CASE SIZE	DØ	F	L
1	1.437 [36.50]	0.500 [12.70]	2.750 [69.85]
2	1.437 [36.50]	0.500 [12.70]	3.375 [85.72]
4	1.812 [46.02]	0.630 [16.00]	3.375 [85.72]
5	1.812 [46.02]	0.630 [16.00]	4.375 [111.12]



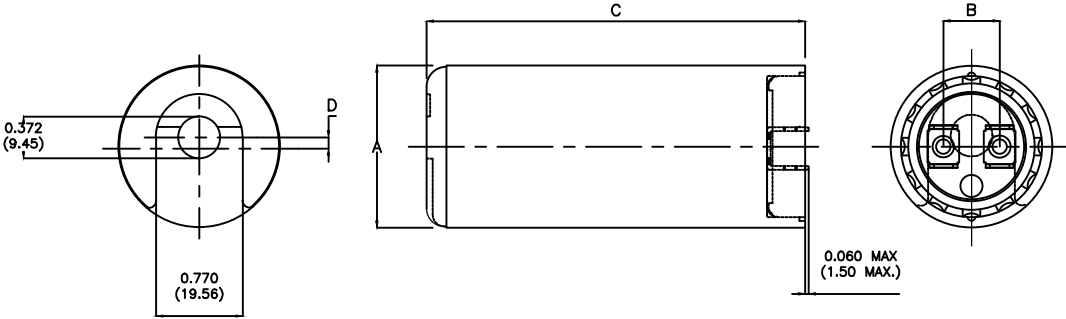


A.C. MOTOR START CAPACITORS

PHENOLIC SIZE CHART

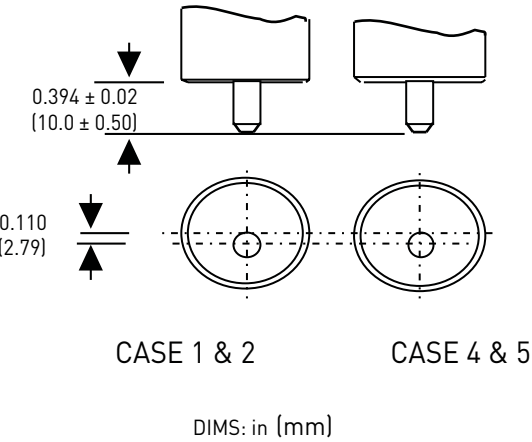
CASE SIZE	A	B	C	D
1	1.437 [36.50]	0.500 [12.70]	2.750 [69.85]	See NOTE
2	1.437 [36.50]	0.500 [12.70]	3.375 [85.72]	
4	1.812 [46.02]	0.630 [16.00]	3.375 [85.72]	0.110 [2.79]
5	1.812 [46.02]	0.630 [16.00]	4.375 [111.12]	0.110 [2.79]
6	2.062 [52.37]	0.881 [22.37]	3.375 [85.72]	0.235 [5.97]
7	2.062 [52.37]	0.881 [22.37]	4.375 [111.12]	0.235 [5.97]
8	2.562 [65.07]	0.881 [22.37]	4.375 [111.12]	0.485 [12.31]

DIM: in (mm)



- General notes:
- All capacitors are available larger case sizes than indicated in the chart.
 - NOTE: This dimension is 0.080 [2.03] but the center line of the 0.375 [9.52] diameter protection is on the opposite side of the center line of the case from what is shown.

PLASTIC CASE WITH MOUNTING STUD



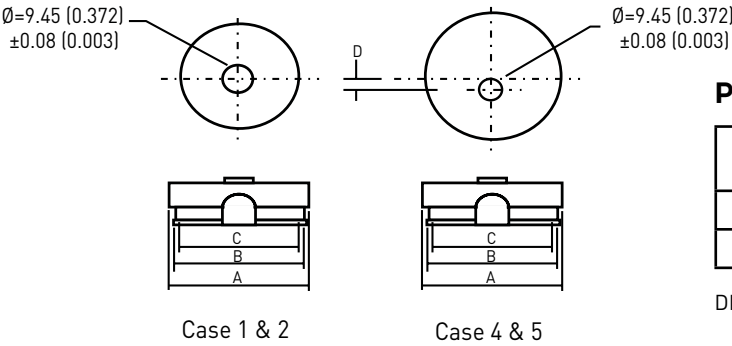
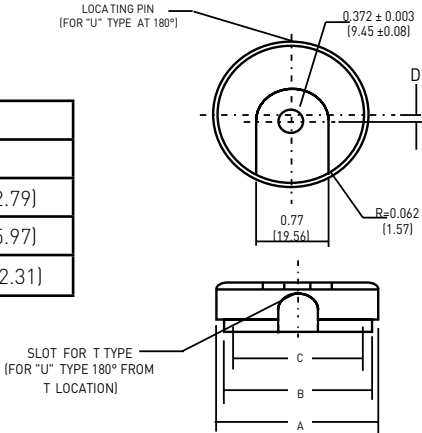
- General notes:
- All capacitors are available in larger case sizes than indicated in the chart.
 - All capacitors are available with M8-1.25 x 10.0mm mounting stud.
 - Standard sizes are 1, 4 and 5.

HARDWARE ACCESSORIES

PHENOLIC END CAP

FOR CASE	A	B	C	D
1, 2 & 3	1.437 [36.50]	1.241 [31.52]	1.093 [27.56]	
4 & 5	1.812 [46.02]	1.611 [40.92]	1.468 [37.25]	0.110 [2.79]
6 & 7	2.062 [52.37]	1.866 [47.40]	1.718 [43.64]	0.235 [5.97]
8	2.562 [65.07]	2.366 [60.09]	2.218 [56.33]	0.485 [12.31]

DIM: in (mm) TOL: 0.010 [0.25]



PLASTIC END CAP

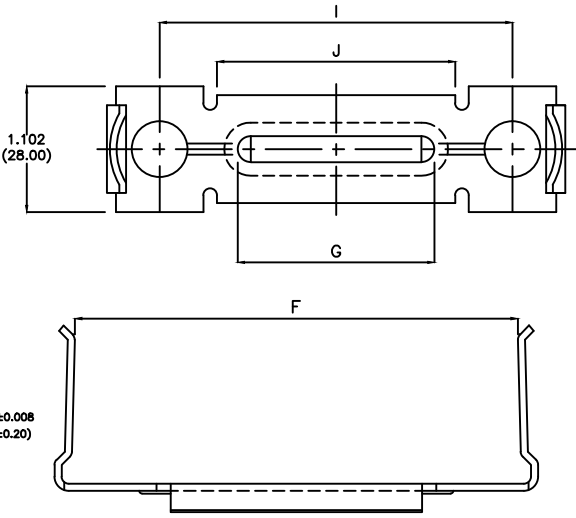
FOR CASE	A	B	C	D
1 & 2	1.437 [36.50]	1.348 [34.25]	1.0240 [31.50]	
4 & 5	1.812 [46.02]	1.710 [43.45]	1.594 [40.50]	0.110 [2.79]

DIM: in (mm) TOL: 0.010 [0.25]

MOUNTING BRACKET FOR PLASTIC & PHENOLIC

FOR CASE	F	G	I	J
1	3.015 [76.59]	1.110 [28.25]	2.570 [65.27]	1.444 [36.70]
2, 4 & 6	3.656 [92.86]	1.732 [44.00]	3.090 [78.70]	2.086 [53.00]
3, 5, 7 & 8	4.720 [119.80]	2.780 [70.54]	4.180 [106.04]	3.090 [78.34]

DIM: in (mm) TOL: 0.010 [0.38]



Mounting hardware, wire terminals, and discharge resistor available upon request.



A.C. MOTOR START
CAPACITORS



PLASTIC SIZE / RATING CHART

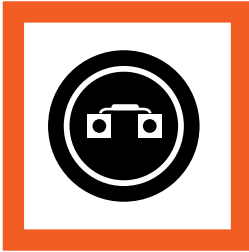
PLASTIC SIZE / RATING CHART

TYPE I MAX START CAPACITOR (EIA)

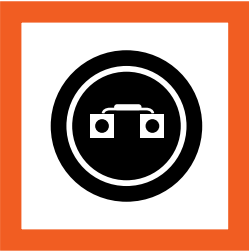
VOLTAGE	110	125	165	220	250	330
CAPACITANCE VALUE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE
21 - 25						1
25 - 30						1
30 - 36					1	1
36 - 43				1	1	1
43 -52				1	1	2
47 - 56			1	1	1	2
53 - 64			1	1	1	4
64 - 77		1	1	1	1	4
72 - 86	1	1	1	1	1	4
88 - 106	1	1	1	1	2	4
108 - 130	1	1	1	1	4	5
130 - 156	1	1	1	2	4	5
145 - 175	1	1	1	4	4	5
161 -193	1	1	1	4	4	5
189 -227	1	1	1	4	5	
216 - 259	1	1	1	5	5	
233 - 280	1	1	2	5	5	
243 - 292	1	1	2	5	5	
270 - 324	1	1	2	5	5	
324 - 389	1	1	2			
340 -389	1	1	2			
378 - 454	1	2	4			
400 -480	2	2	4			
430 - 516	2	4	4			
460 -552	2	4	4			
540 - 648	4	4	4			
590 - 708	4	4	4			
708 - 850	4	4	5			
829 - 995	4	5	5			
1000 - 1200	5	5				
1020 -1224	5	5				
1175 - 1410	5					

TYPE II MAX START CAPACITOR (EIA) SMALLEST CASE SIZE ACCORDING TO EIA RS-463-B

VOLTAGE	110	125	165	220	250	330
CAPACITANCE VALUE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE
21 - 25						
25 - 30						1
30 - 36						1
36 - 43					1	1
43 -52				1	1	1
47 - 56				1	1	1
53 - 64			1	1	1	2
64 - 77			1	1	1	2
72 - 86		1	1	1	1	4
88 - 106	1	1	1	4	4	4
108 - 130	1	1	1	4	4	4
130 - 156	1	1	1	4	4	4
145 - 175	1	1	1	4	4	5
161 -193	1	1	1	4	4	5
189 -227	1	1	1	4	4	5
216 - 259	1	1	1	4	5	5
233 - 280	1	1	1	5	5	
243 - 292	1	1	1	5	5	
270 - 324	1	1	2	5	5	
324 - 389	1	1	2	5		
340 -389	1	1	4	5		
378 - 454	1	1	4			
400 -480	1	2	4			
430 - 516	2	2	4			
460 -552	2	2	4			
540 - 648	4	4	4			
590 - 708	4	4	4			
708 - 850	4	4	5			
829 - 995	4	4	5			
1000 - 1200	5	5	5			
1020 -1224	5	5	5			
1175 - 1410	5	5				



A.C. MOTOR START
CAPACITORS



PHENOLIC SIZE / RATING CHART

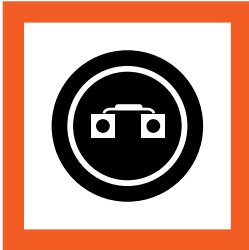
PHENOLIC SIZE / RATING CHART

TYPE I CAPACITOR (EIA)

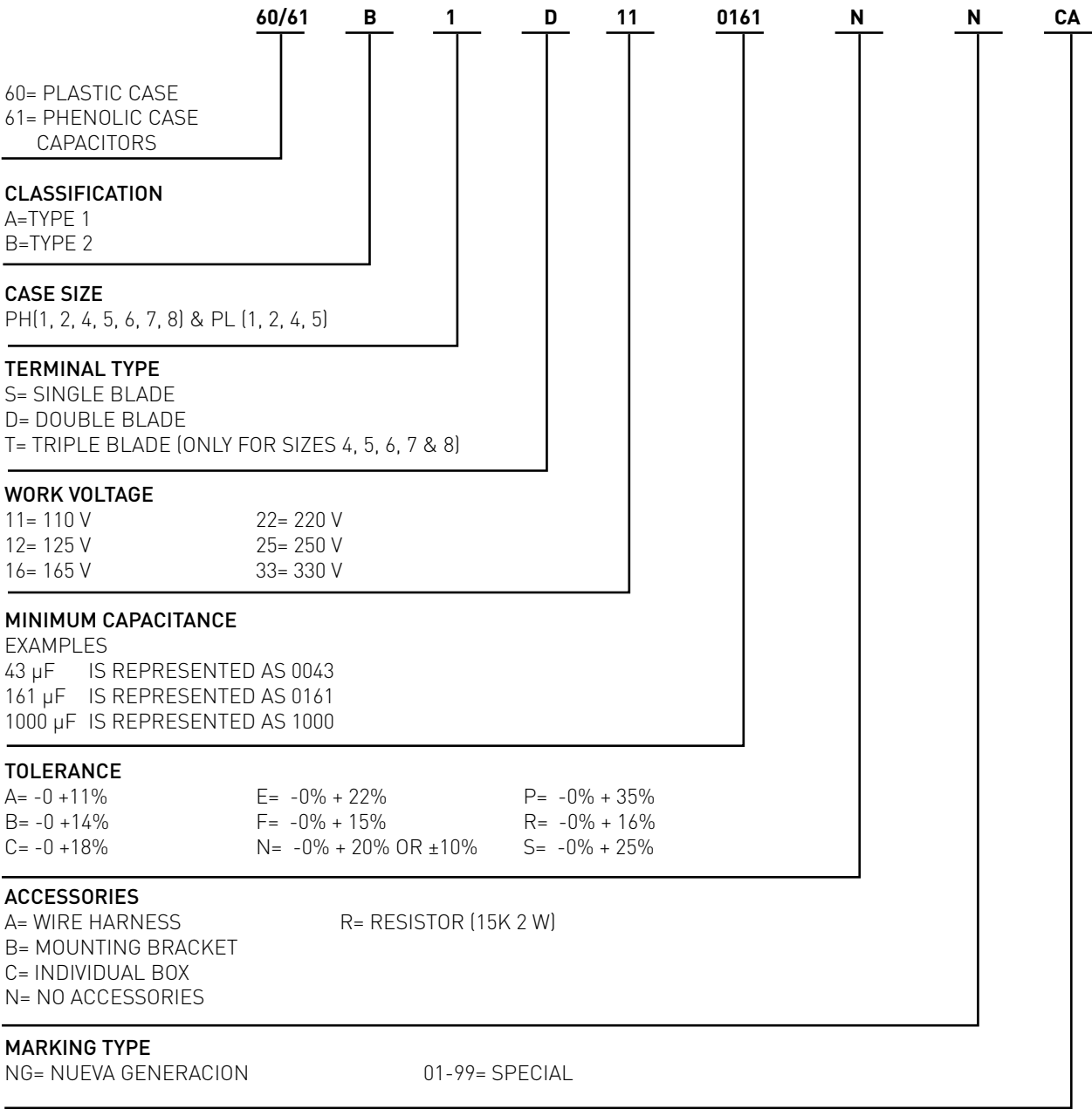
VOLTAGE	110	125	165	220	250	330
CAPACITANCE VALUE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE
21 - 25						
25 - 30						1
30 - 36				1	1	2
36 - 43				1	1	4
43 -52			1	1	1	4
47 - 56			1	1	2	4
53 - 64			1	1	2	4
64 - 77		1	1	2	2	4
72 - 86	1	1	1	2	4	4
88 - 106	1	1	1	2	4	5
108 - 130	1	1	1	4	4	5
130 - 156	1	1	1	4	4	7
145 - 175	1	1	2	5	5	7
161 -193	1	1	2	5	5	7
189 -227	1	1	4	5	5	8
216 - 259	1	1	4	5	5	8
233 - 280	1	1	4	5	7	8
243 - 292	1	2	4	7	7	8
270 - 324	1	2	4	7	7	8
324 - 389	2	4	4	7	8	8
340 -389	2	4	4	7	8	8
378 - 454	2	4	4	8	8	
400 -480	4	4	5	8	8	
430 - 516	4	4	5	8	8	
460 -552	4	4	5	8	8	
540 - 648	4	4	5	8	8	
590 - 708	4	4	5	8		
708 - 850	4	4	7			
829 - 995	4	5	7			
1000 - 1200	5	5	8			
1020 -1224	5	7	8			
1175 -1410	5	7	8			

TYPE II CAPACITOR (EIA)

VOLTAGE	110	125	165	220	250	330
CAPACITANCE VALUE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE	CASE SIZE
21 - 25						
25 - 30						1
30 - 36					1	1
36 - 43				1	1	1
43 -52				1	1	2
47 - 56				1	1	2
53 - 64				1	1	4
64 - 77			1	1	1	4
72 - 86		1	1	1	2	4
88 - 106	1	1	1	1	4	4
108 - 130	1	1	1	2	4	5
130 - 156	1	1	1	4	4	5
145 - 175	1	1	1	4	4	5
161 -193	1	1	1	4	5	5
189 -227	1	1	1	5	5	7
216 - 259	1	1	2	5	5	7
233 - 280	1	1	4	5	5	7
243 - 292	1	1	4	5	5	7
270 - 324	1	2	4	5	7	8
324 - 389	1	4	4	7	8	8
340 -389	1	4	4	7	8	8
378 - 454	2	4	4	7	8	8
400 -480	2	4	4	7	8	8
430 - 516	4	4	4	8	8	
460 -552	4	4	4	8	8	
540 - 648	4	4	5	8	8	
590 - 708	4	4	5	8	8	
708 - 850	4	5	5	8		
829 - 995	4	5	5			
1000 - 1200	5	5	7			
1020 -1224	5	5	7			
1175 - 1410	5	5	8			



PART NUMBERING SYSTEM

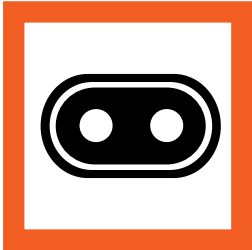


A.C. MOTOR RUN CAPACITORS

The A.C. MOTOR RUN CAPACITORS are manufactured with a dielectric material that consists of two sheets of polypropylene film. Each one with a thin layer of vacuum deposited metal on one side. Metals are selected according to final application and can be either aluminum/zinc or zinc. Both films are acting as electrodes in the capacitor but; because this metal is just a few hundred angstroms thick, it has a very limited current carrying capability at any single point in the dielectric. To compensate for this limitation, the entire edge of each electrode is bonded by a metallized endspray that has a relatively high current carrying capability. The endspray serves as the termination point for the internal connections of the capacitor. This construction minimizes the current at any single point of the electrode. The current capability is enhanced by soldered or welded end terminations.

These capacitors are self-healing, a property of the metallized film to restore itself to an operating condition when a dielectric breakdown occurs during operation.

The thin metal layer around the fault point will act like a low current carrying fuse. Under a fault condition the current will evaporate the metal around the fault point and clear the fault. This is accomplished by special frame work of the film with a specific ohmic resistivity and low melting point temperature the evaporation of the electrode will result in a capacitance loss that is virtually unmeasurable. All films for capacitors have particularly low dielectric losses, high level of insulation and dielectric strength.

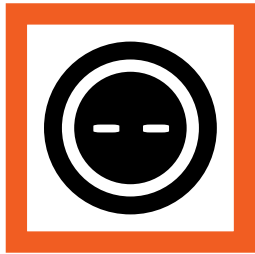


These capacitors are provided with an internal protective device to prevent case rupture under capacitor fault conditions at specified levels of voltage and fault current. The internal protector is a pressure sensitive interrupter and the dielectric medium is made of vegetable oil. The kind of enclosure can be oval or round.



Run capacitors: Run capacitors are designed for continuous duty, and they are energized the entire time the motor is running. Run capacitors are rated in a range of 1-99 µF with voltage classifications of 240VAV to 660VAC. Single phase electric motors need a capacitor to shift the current in the winding, to simulate the operation of a two-phase motor and compensate the inductance of the winding. If the wrong run capacitor is installed, the motor will not have an even magnetic field, and this will cause the rotor to hesitate at those spots that are uneven. This hesitation can cause the motor to become noisy, increase energy consumption, cause performance to drop, and cause the motor to overheat. However, a motor will not be ruined just because a run capacitor is faulty.

Dual run capacitors. A dual run capacitor supports two electric motors, such as in a large air conditioner unit with both a fan motor and a compressor motor in the outdoor heat pump. The dual capacitor has 3 terminals, labeled “C” or “FAN” or “HERM” for the common, fan, and hermetic (pressure/compressor) electric lines.



Dual run capacitors (shaped as round or oval) are commonly used for air conditioning, to help in the starting of the compressor and the condenser fan motor and compensate the inductance of the winding. Dual capacitors come in a variety of sizes, depending on microfarads (μF or MFD), such as 40 + 5 MFD, and also the voltage. A 440Volt capacitor can be used in place of a 370Volt but not a 370 in place of a 440Volt. The microfarads must stay the same within 5% of its original value. An oval dual run capacitor could be used instead of a round capacitor, but the mounting strap should be changed to better fit the oval shape.

SAFETY PROTECTION.

Degree of safety protection identified by one of three codes to be marked on the capacitor:

(P2) indicates that the capacitor type has been designed to fail in the open-circuit mode only and is protected against fire or shock hazard. Compliance is verified by the test.

(P1) indicates that the capacitor type may fail in the open-circuit or short-circuit mode and is protected against fire or shock hazard.

(P0) indicates that the capacitor type has no specific failure protection.

Internal Interrupters when the customer requires a protection system in the capacitors, NGM uses two different types of interrupters; a mechanical interrupter in metal case designs impregnated with oil and for dry capacitors NGM has an electrical interrupter using segmented film.

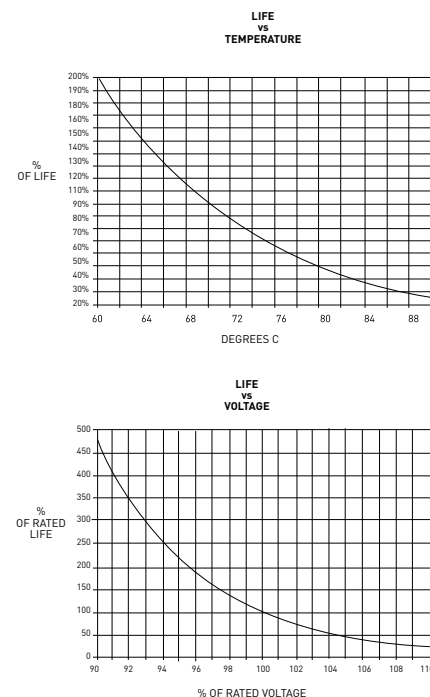
The mounting position of the capacitors will not affect the operation of the interrupter. To ensure proper operation, capacitors must be installed with a minimum of 0.5 inches (12.7 mm) of clearance between terminals or cover and any external restriction.

PERFORMANCE AND SERVICE LIFE

Rated Life. NGM Capacitors are designed to have a life expectancy of 60,000 hours with an estimated survival of better than 94%. Their first year survival under rated operating conditions is designed to be greater than 99.5%.

The useful life of a capacitor will be shortened by exceeding the rated voltage and temperature limits. Acceleration effects of temperature and voltage are now under extensive study.

The next graphics show the variation of the life regarding to the voltage and the temperature.



A.C. MOTOR RUN CAPACITORS

NGM Capacitors shall be capable of stable operation with decreased life at 110% of rated voltage at frequencies up to 66 Hz (Sinusoidal) provided the case temperature does not exceeded the maximum rated case temperature.

NGM Capacitors shall have rated life performance when operated within case temperature range specified. Operation at higher case temperature will result in reduced life.

NGM Capacitors shall be capable of operating at a volt-ampere loading resulting from the combined effects of capacitance tolerance, frequency variations, voltage and harmonics not exceeding 130% of the volt-ampere loading calculated at rated capacitance and at rated 60 Hz (sinusoidal) voltage in an instantaneous event provided rated case temperature is not exceeded.

High transients of voltage, frequency, temperature, or any combination of the three may be encountered in some applications. Therefore, complete information pertaining to their magnitude, duration and frequency should be supplied to NGM for our recommendations as to the proper capacitor for the particular application.

NGM Capacitors shall be capable of being mounted in any position under any of the rated conditions, electrical and environmental.

Capacitance and Tolerance. The capacitance of all capacitors is within the specified tolerance limits of the nominal rating when measured at a temperature of +25°C. When measured at the operating case temperature limits, the capacitance of these capacitors will not

change by more than -5% to +2% of the +25°C capacitance value. Capacitance measurements shall be made on an AC bridge at a frequency of 60 Hz.

Dissipation Factor The dissipation factor does not exceed 0.1% when measured at a frequency of 60 Hz and a case temperature of +25°C.

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

NOMINAL CAPACITANCE (μF)	LEAKAGE CURRENT (μA)
0 - 14	60
14.1 - 20	70
20.1 - 35	100
35.1 - up	150

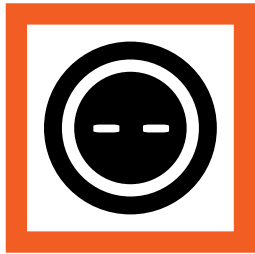
VOLTAGE TEST

Between Terminals. Capacitors are capable of withstanding the applications of 1.75 times rated alternating voltage for a period of 1 second at +25°C. Capacitors can be discharged through a 10,000 ohm resistor to limit the current.

Terminals to Case. Capacitors are capable of withstanding the application of two times the rated alternating voltage plus 1000 volts for a period of 1 second at +25°C. Alternate tests to those outlined above may be conducted at direct voltage equal to the peak alternating voltage.

Surge Voltage. The maximum peak transient surge voltage will not exceed 315% of the nominal 60 Hz rms voltage.

Accelerated Life Test. The accelerated life test



may be performed by capacitor users to confirm life expectancy of the units. The following procedure details this specific test:

- 1. Capacitance and dissipation factor are measured prior to life testing.
- 2. Capacitors will withstand a test of 1.25 times the rated voltage at 60Hz between the terminals for a period of 2,000 hours at 80°C.
- 3. Upon completion of the test, the capacitance and dissipation factor will be measured at a temperature of +25°C. The capacitors shall be considered to have passed the life test if none of the following has occurred:

- A. Permanent short circuit between terminals or between terminals and case.
- B. Continuous or intermittent open circuit.
- C. Change in capacitance of greater than 3%.
- D. An dissipation factor bigger than 0.15%.

Not more than 1 failure in 25 units will be permitted. This life test will be conducted in a test chamber with capacitors separated by at least 1 inch of air and with sufficient circulation so that the ambient temperature does not vary by more than ±3°C. The power supply shall be 60 Hz and should be free of distortion (5% maximum).

Room Temperature Accelerated Life Test. A similar test can be performed at room temperature. The capacitors are operated at 135% of rated voltage for a period of 120 hours instead of the 2,000 prescribed above. Passing criteria will be same as in the accelerated life test.

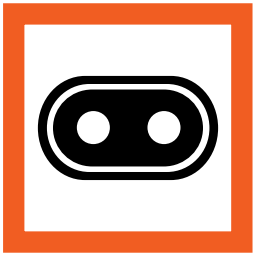
CERTIFICATIONS AND APPROVALS

SERIES	AGENCY APPROVALS	VOLTAGE [VAC]	No FILE
325P	UL and CUL	To 660	E229850
	VDE	370	E229850
		440	E229850
		480	E229850
328P	CE	180 TO 660	N/A
	UL and CUL	To 600	E229850
329P	CE	To 600	N/A
	UL	To 660	E229850
315P y 319P	CE	To 660	N/A
	UL	To 480	E229850
33 (PCEM cells)	CE	To 480	N/A
	UL and CUL	180 To 600	E229850
	CSA	180 To 600	89486
28P (segmented film)	CE	180 To 600	N/A
	UL and CUL	To 440	E229850
27	CE	To 440	N/A
	UL	To 480	E130758
28	CE	To 480	N/A
	UL	150 a 450	E130758
	VDE and CE	220	HA104813

- Technical standards of reference to design and evaluate the performance of the NGM AC Capacitors: EIA-456, IEC 60252, UL 310, UL 810, C22.2 No.190 and IEC 60831
- NGM Capacitors are RoHS compliant. Reference to the Directive 2002/95/EC
- NGM Capacitors are REACH compliant.

WET METAL CASE FEATURES

- Maximum Fault current 10,000 [A]
- Internally Protected (Pressure Interrupter)
- Meets all EIA standards and UL810
- Integral mounting options available for easy installation
- 60,000 hours of operational life



A.C. MOTOR RUN CAPACITORS

- Self-clearing metallized polypropylene film
- 100% end of line tested
- 100% serialized and end of line data captured
- 96% reliability at 60,000 hours of equivalent run time

WET METAL CASE APPLICATIONS

The WET METAL CASE A.C. MOTOR RUN CAPACITORS are designed to be used in various types of applications like electric motors and HID ballasts. They are used as part of the current limiting circuit for power factor correction, refrigeration equipment, etc.

The A.C. capacitors provide direction by shifting the current in the windings so that the motor simulates the operation of a two-phase motor. These motor run capacitors are designed specifically to be used with permanent split-phase capacitor motors in swimming pool, whirlpool and spa applications where strict form and fit restrictions are required.

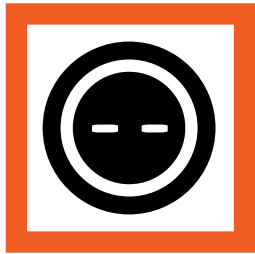


ELECTRICAL TESTING

These capacitors are designed to meet performance testing outlined in EIA-456 standard and UL810. Test programs are run continuously at NG and at third party laboratories to monitor production and for design improvements. These tests confirm reliable performance of NG capacitors used within rated conditions. Ongoing tests include: accelerated life, over voltage, mechanical, terminal to terminal voltage, and terminal to case voltage tests.

MARKING

- Manufacturer’s name, trade name, trademark or file number
- The date or other dating period of manufacture
- A distinctive catalog number or the equivalent
- The capacitance in microfarads
- The voltage rating
- The frequency in Hertz
- The temperature rating when the capacitor is rated over 70°C (158 F)
- The maximum fault current
- The capacitor shall be additionally marked Internally Protected or Protected
- Recognition Component Marking
- Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program



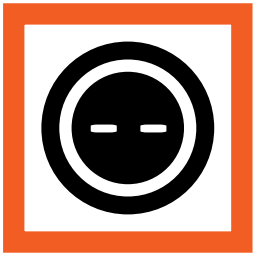
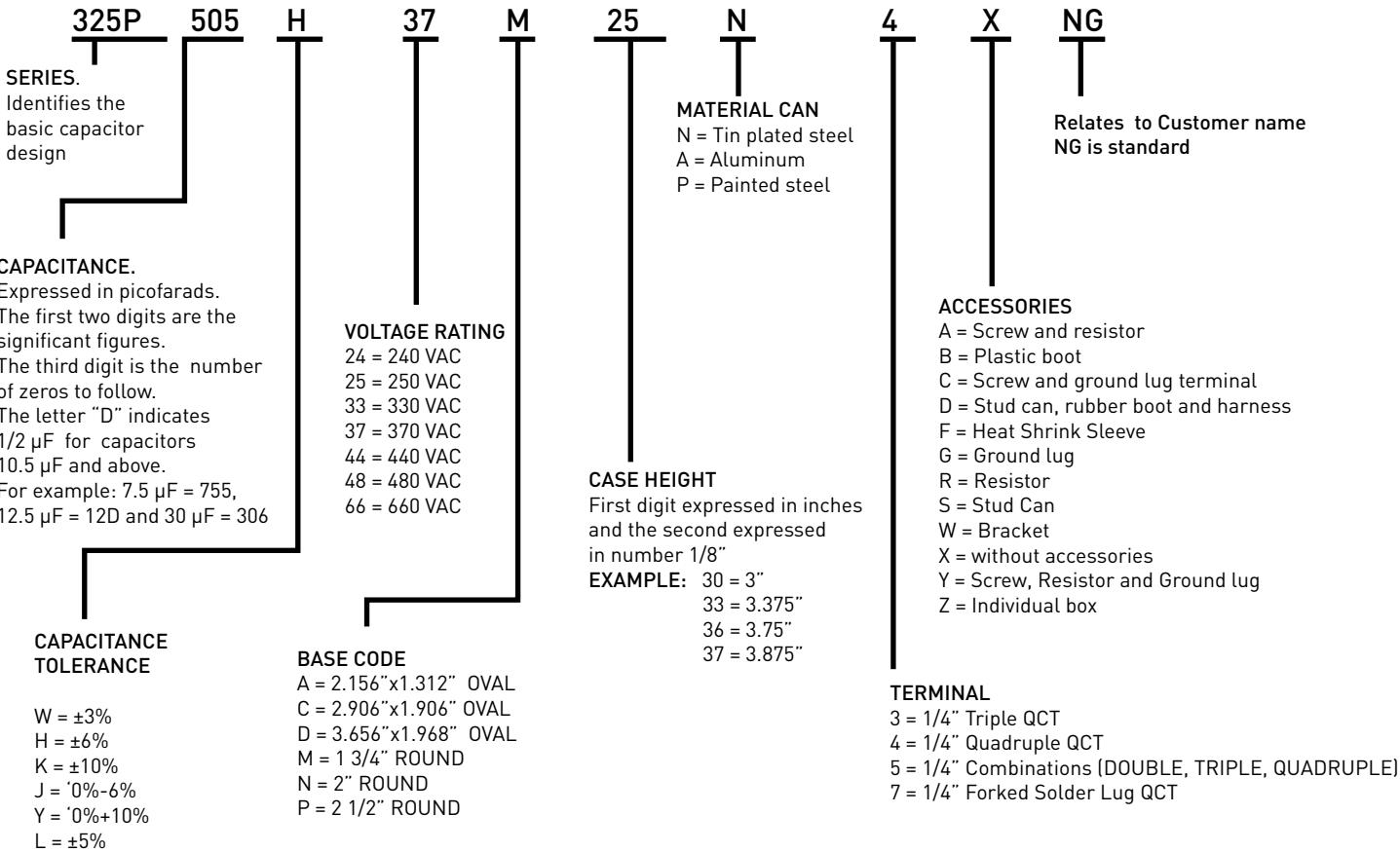
WET METAL CASE CAPACITORS

ELECTRICAL SPECIFICATIONS

Capacitance Range	From 1 to 99 µF
Voltage Range	250, 370 ,440, 480 and 660 Vac. Other voltages upon request
Capacitor Tolerance:	6% Standard. Other tolerances upon request
Dissipation Factor:	0.1% at 60 Hz and 25 C, 1% at 1,000 Hz and 25 C
Operating Temperature:	-40°C +70°C. Other temperatures upon request.
Insulation Resistance	500 M Ohms per µF.
100% end of line tested:	Terminal to Terminal = 1.41x[1.75 x VAC (rated)] as a DC voltage Terminal to Case = 1.41x[2 x VAC (rated) + 1 KVAC] as a DC voltage Capacitance measured at 1 KHz and 25°C ± 5°C D.F. measured at 1 KHz and 25° ± 5°C
100% serialized and 100% end of line data capture:	Capacitance measured at 1 KHz and 25°C ±5°C D.F. measured at 1 KHz and 25° ± 5°C Capacitance end of life is = -3% loss of capacitance

PART NUMBERING SYSTEM

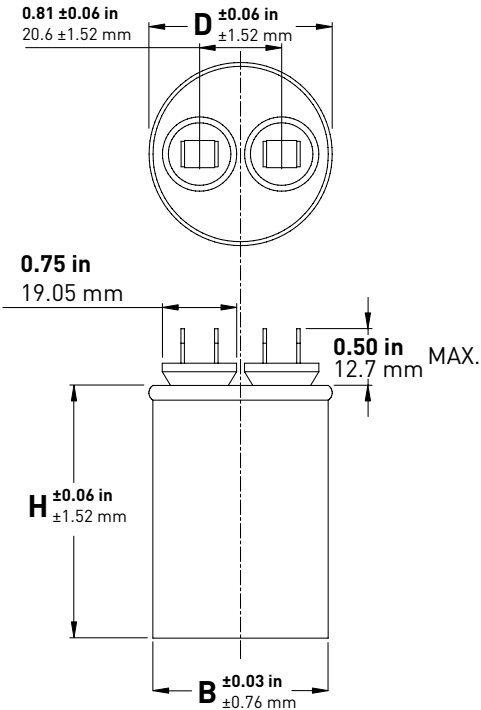
NOMENCLATURE BREAKDOWN

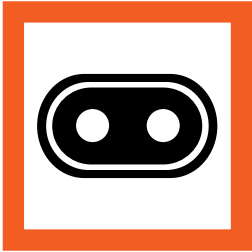


WET METAL CASE CAPACITORS

MECHANICAL ESPECIFICATIONS / MAXIMUM CAPACITANCE PER ROUND CAN

MAXIMUM CAPACITANCE PER CAN [µf]							
Diameter Can	Can Height		240 Vac	300	370	440	480
	in	mm	[Vac]	[Vac]	[Vac]	[Vac]	[Vac]
Ø 1 3/4" [44.5mm] (M)	2.000	50.8	31	20	13	9.5	7.5
	2 375	60.32	43	28	19	13.5	10.5
	2.625	66.67	50	32	21.5	16	12
	2.75	69.85	56	36	24.5	18	13.5
	3	76.2	62	40	27	20	15
	3.375	85.72	75	48	33	24	18.5
	3.75	95.25	87	56	38.5	28	21.5
	4	101.6	94	60	41	30	23
	4.25	107.95		68	47	35	26
	4.75	120.65		76	52	38	29
Ø 2.0" [50.8mm] (N)	2 3/8"	60.32	61	39	26	19.5	15
	2 5/8"	66.67	70	45	30	22	17
	3	76.2	87	56	38	28	21.5
	3 3/8"	85.72	99	67	46	33	26
	3 3/4"	95.25		78	55	39	30
	4.0"	101.6		84	58	42	32
	4 1/4"	107.95		95	65	48	37
	4 3/4"	120.65		99	73	54	41
Ø 2.5" [63.5mm] (P)	2 5/8"	66.67	99	69	50	36	28
	3	76.2		87	63	46	35
	3 3/8"	85.72		99	75	55	42
	3 3/4"	95.25			88	61	50
	4.0"	101.6			95	70	53
	4 1/4"	107.95			99	79	60
	4 3/4"	120.65				89	68
	5 1/8"	130.18				99	75



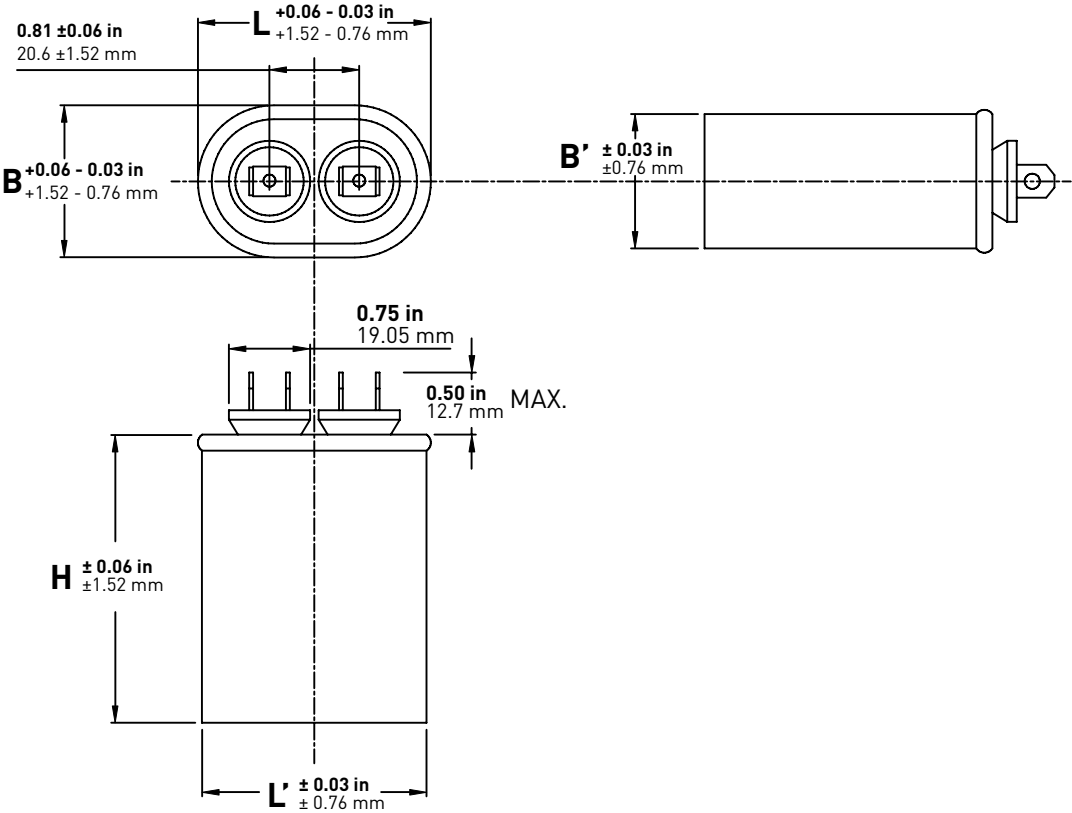


WET METAL CASE OVAL CAPACITORS

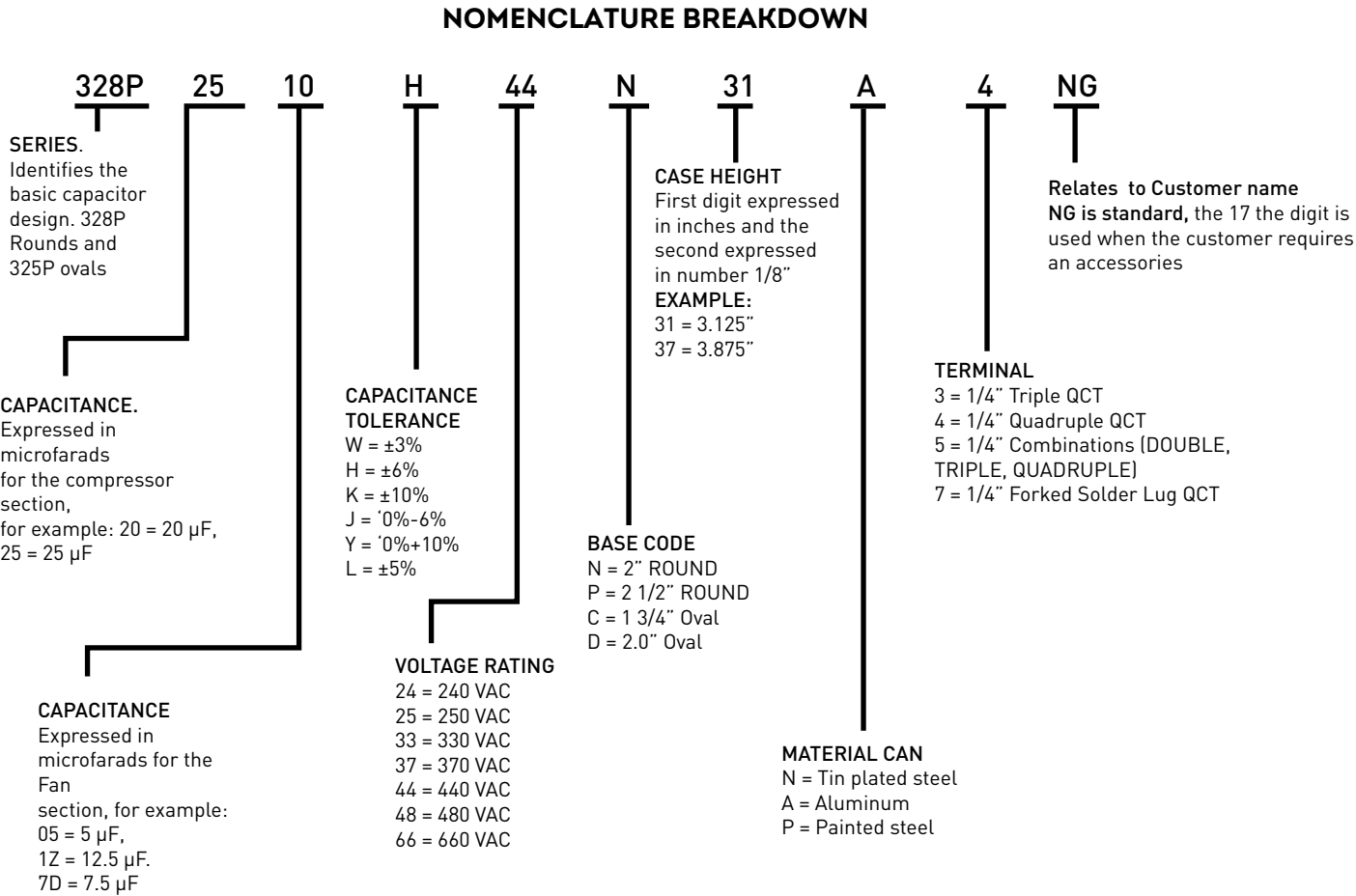


MECHANICAL ESPECIFICATIONS / MAXIMUM CAPACITANCE PER OVAL CAN

MAXIMUM CAPACITANCE PER CAN						
Commercial Size	Can Height		300 [Vac]	370 [Vac]	440 Vac	480 Vac
	in	mm				
1 ¼" [31.75 mm] [30.28 x 52.22] (1.212 x 2.056) [A]	1.625	41.275	10	6	4	3
	2.000	50.800	9	6	4.5	3.5
	2.375	60.325	13	8.5	6.5	5
	2.750	69.850	17	11.5	8	6
	3.000	76.200	18.5	12.5	9	7
	3.375	85.725	22.5	15	11	8.5
	3.750	95.250	26	17.5	13	10
	4.000	101.600	28	19	14	10.5
	4.250	107.950	32	21.5	16	12
	4.750	120.650	35	23	18	13
1 ¾" [44.45 mm] [45.87 x 71.27] (1.806 x 2.806) [C]	2.625	66.675	42	28	20	16
	3.000	76.200	52	36	26	20
	3.375	85.725	62	44	32	24
	3.750	95.250	72	50	36	28
	4.000	101.600	76	52	40	30
	4.250	107.950	86	58	44	34
	4.750	120.650	99	68	50	38
2" [50.8 mm] [47.75 x 90.42] (1.88 x 3.56) [D]	2.625	66.675	76	50	34	28
	3.000	76.200	94	60	46	36
	3.375	85.725	99	74	54	42
	3.750	95.250		88	62	48
	4.000	101.600		92	68	52
	4.250	107.950		99	76	60
	4.750	120.650			86	66
	5.125	130.175			96	72



PART NUMBERING SYSTEM



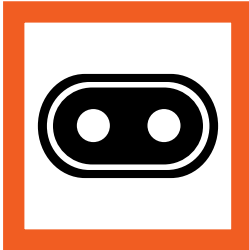
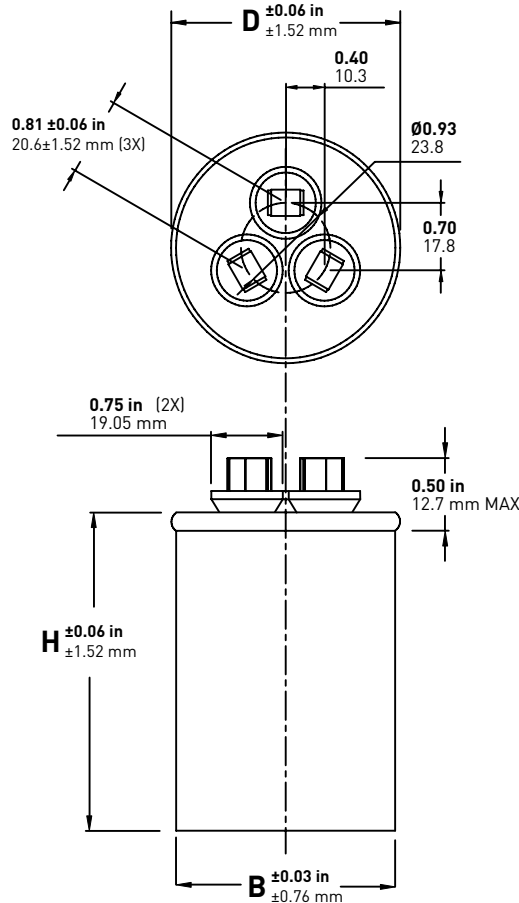


WET METAL CASE DUAL
CAPACITORS

MAXIMUM CAPACITANCE PER ROUND CAN / MECHANICAL SPECIFICATIONS

MAXIMUM CAPACITANCE PER CAN [µF]							
Diameter Can	Can Height		240 Vac	300	370	440	480
	in	mm	[Vac]	[Vac]	[Vac]	[Vac]	[Vac]
2.0" [50.08 mm]	3 1/8"	79.375	87	56	38	28	21.5
	3 7/8"	98.425	99	78	55	39	30
	4 3/4"	120.65		99	73	54	41
2.5" [63.5 mm]	3 1/8"	79.375	99	87	63	46	35
	3 7/8"	98.425			88	61	50
	4 3/4"	120.65				89	68

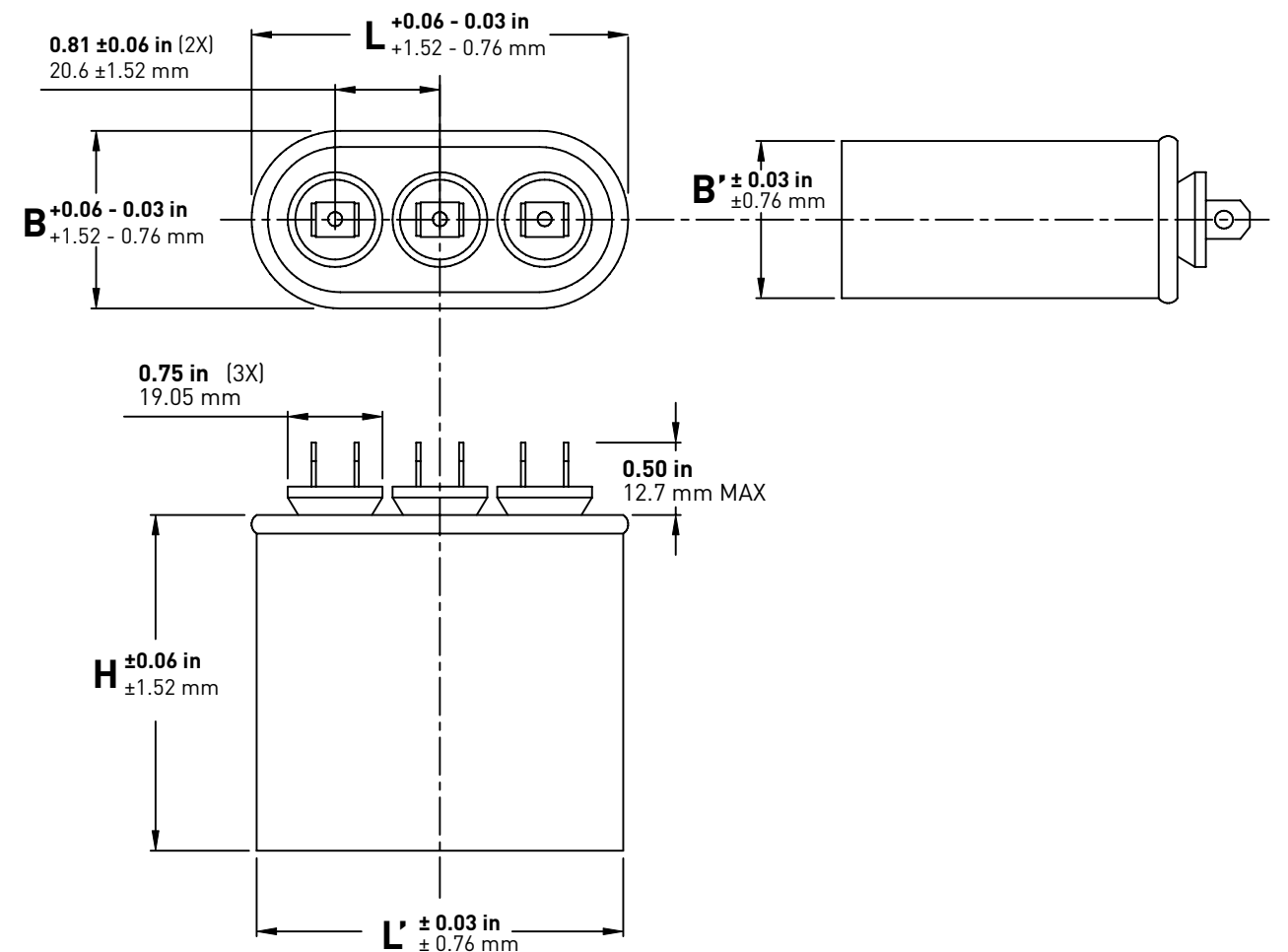
To determinate the size of the round can, add both capacitances (Capacitance Herm + Capacitance Fan).
For example a dual capacitor rated at 50+10µF/440 Vac = 60µF/440 Vac and it can use the can P37 (Ø2.5" x 3.875 height).



WET METAL CASE DUAL
CAPACITORS

MAXIMUM CAPACITANCE PER OVAL CAN / MECHANICAL SPECIFICATIONS

MAXIMUM CAPACITANCE PER CAN										
Commercial Size	Can Height		300 [Vac]		370 [Vac]		440 Vac		480 Vac	
	in	mm	Herm [µF]	Fan [µF]	Herm [µF]	Fan [µF]	Herm [µF]	Fan [µF]	Herm [µF]	Fan [µF]
1 3/4" [44.45 mm] (45.87 x 71.27) (1.806 x 2.806)	2.625	66.675	32	20	21	15	15.5	10	12	8
	3.000	76.200	40	20	27	20	20	15	15	10
	3.750	95.250	56	20	40	20	28	20	21.5	15
	4.750	120.650			52	20	40	20	29	20
2" [50.8 mm] (47.75 x 90.42) (1.88 x 3.56)	3.000	76.200			30	20	23	20	18	18
	3.750	95.250			44	20	31	20	24	20
	4.750	120.650					45	20	33	20





DRY CAPACITORS



APPLICATIONS

NG dry A.C. motor run capacitors are designed to be used in various types of applications like electric motors and HID ballasts. They are used as part of the current limiting circuit for power factor correction. The A.C. capacitors provide direction by shifting the current in the windings so that the motor simulates the operation of a two-phase motor. These motor run capacitors are designed specifically to be used with permanent split-phase capacitor motors in swimming pool, whirlpool, and spa applications where strict form and fit restrictions are required.

ELECTRICAL TESTING

NG dry motor run capacitors are designed to meet performance testing outlined in the EIA-456 standard. Test programs are run continuously at NG and at third party laboratories to monitor production and for design improvements. These tests confirm reliable performance of NG capacitors used within rated conditions. Ongoing tests include: accelerated life, over voltage, mechanical, terminal to terminal voltage, and terminal to case voltage tests.

FEATURES

- Non-corrosive, flame-retardant UL 94V-2
- Meets all EIA standards
- Integral mounting options available for easy installation
- 60,000 hours operational life
- Self-clearing metallized polypropylene film
- Automated assembly for consistent results
- Light weight and cost effective

MARKING

- Manufacturer's name, file number, authorized trade name, or trademark
- The catalog number or the equivalent
- The capacitance in microfarads (uF)
- Voltage rating
- The frequency in HERTZ
- Temperature rating
- Date

ELECTRICAL SPECIFICATIONS (for Round Phenolic and Plastic Cans)

Capacitance Range:	1 to 130 µF
Capacitance Tolerance:	± 3%, ±5%, -5% + 10%, ±10 %
Voltage Range:	180 VAC to 480 VAC
Operating Temperature: (under special requests)	-40° ~ + 70° C [-40° ~ 158° F] (Standard)
	-40° ~ + 85° C [-40° ~ 185° F]
	-40° ~ + 90° C [-40° ~ 194° F]
Dissipation Factor:	0.1% maximum at 25° C, 60 Hz
Rated Frequency:	50, 60 HZ
Dielectric Strength:	Terminals to case: Capacitors shall be capable of withstanding the application of 2 x rated ac voltage plus 1,000 volts for one second. Between terminals: Capacitors shall be capable of withstanding the application of 1.75 x rated ac voltage for one second.

ELECTRICAL SPECIFICATIONS (for Plastic Boxes)

Capacitance Range:	1 to 25 µF (Up to 32 µF under 250 VAC)
Capacitance Tolerance:	± 3%, ±5%, -5% + 10%, ±10 %
Voltage Range:	Higher voltages without UL recognition 180 VAC to 450 VAC
Operating Temperature: (under special requests)	-40° ~ + 70° C [-40° ~ 158° F] (Standard)
	-40° ~ + 85° C [-40° ~ 185° F]
	-40° ~ + 90° C [-40° ~ 194° F]
Dissipation Factor:	0.1% maximum at 25° C, 60 Hz
Rated Frequency:	50, 60 HZ
Dielectric Strength:	Terminals to case: Capacitors shall be capable of withstanding the application of 2 x rated ac voltage plus 1,000 volts for one second. Between terminals: Capacitors shall be capable of withstanding the application of 1.75 x rated ac voltage for one second.

ROUND PLASTIC SIZES

VOLTAGE			240, 250 & 300 Vac	330 & 370 Vac	400, 440 & 450 Vac	480 Vac
Commercial Size	Capacitor Height		C. Max. (µF)	C. Max. (µF)	C. Max. (µF)	C. Max. (µF)
	in	mm				
1.18" [30mm]	[0] 2.535	65	13	8.5	6.5	4.5
1.437" [36.50mm]	[1N] 2.75	69.85	22	15	11	8.5
	[2N] 3.365	85.72	29	19.5	14.5	11
1.812" [46.02mm]	[4N] 3.365	85.72	55	37.5	27.5	21
	[5N] 4.365	111.12	63.5	43.5	32	24.5

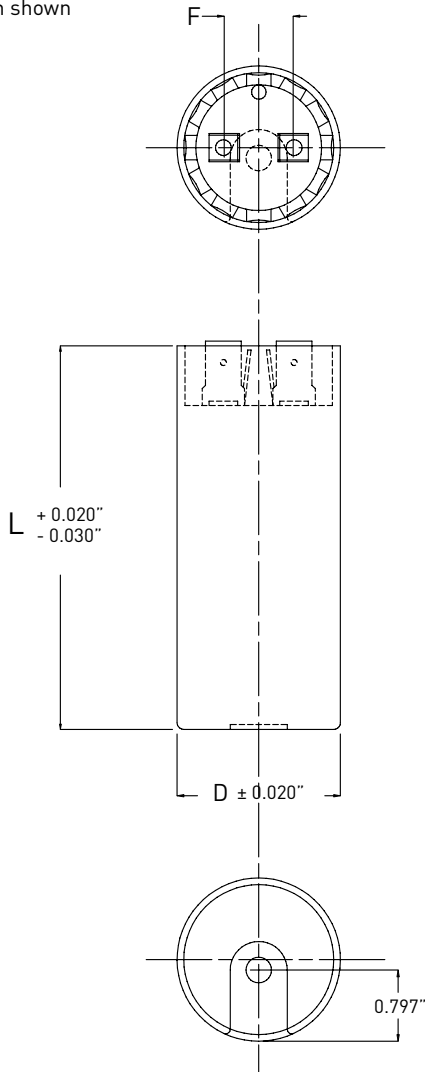
*The above table is based on operating temperatures of 70C.
*Higher temperatures will require larger case sizes than shown



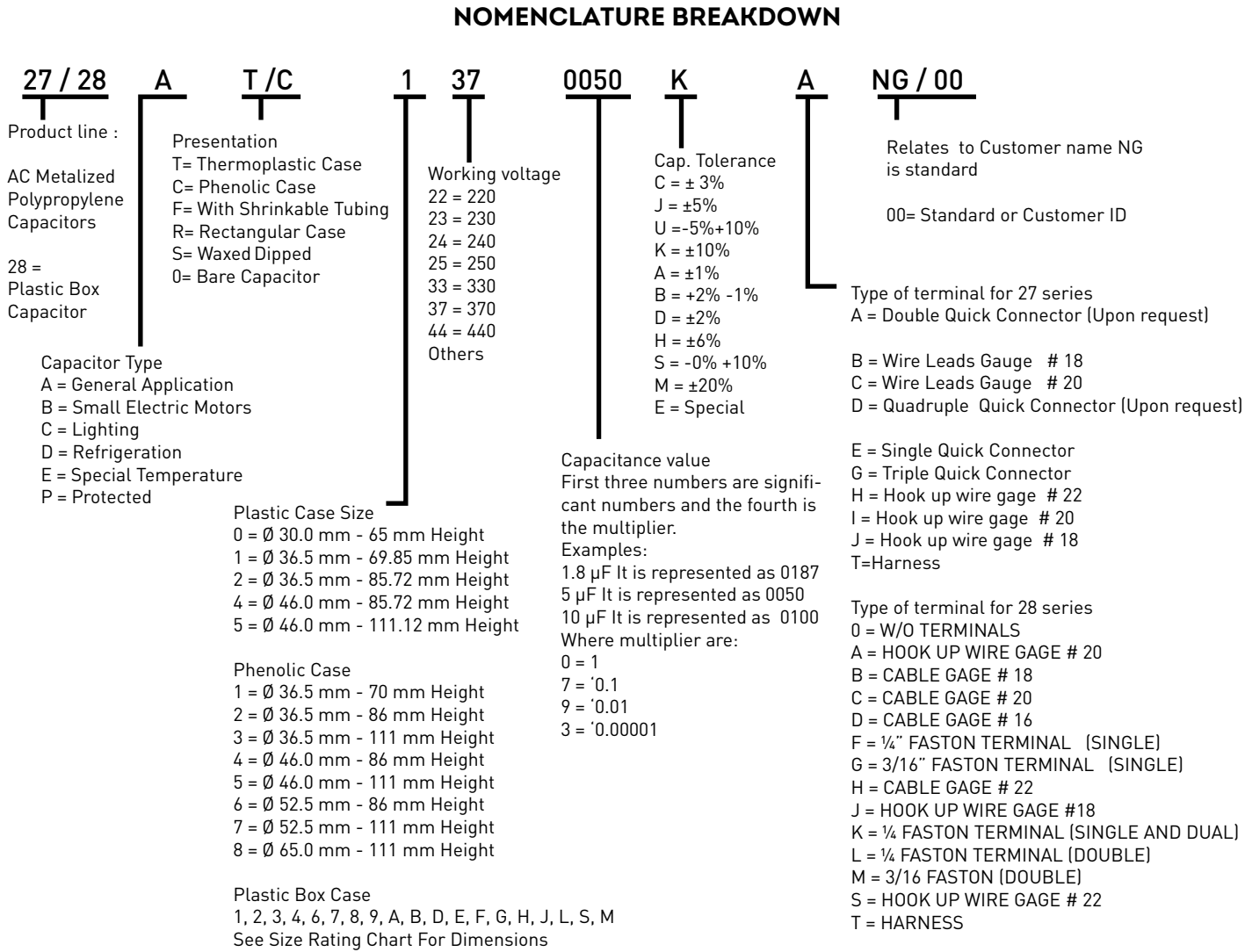
ROUND PHENOLIC SIZES

VOLTAGE						240, 250 & 300 Vac	330 & 370 Vac	400, 440 & 450 Vac	480 Vac
Commercial Size	code	DIAMETER		HEIGHT		C. Max. (µF)	C. Max. (µF)	C. Max. (µF)	C. Max. (µF)
		in	mm	in	mm				
1.437" [36.5]	74037	[1R] 2.75	69.85	[1R] 2.75	69.85	16	11	8	6
	74008	[2R] 3.317	85.07	[2R] 3.365	85.72	22	15	11	8.5
	74007	[3R] 4.334	111.13	[3R] 4.365	111.12	25.5	18	13	10
1.812" [46.02]	74001	[4R] 3.343	85.72	[4R] 3.365	85.72	39	26.5	19.5	15
	74033	[5R] 4.334	111.13	[5R] 4.365	111.12	53.5	36.5	27	20
2.062" [52.37]	74034	[6R] 3.343	85.73	[6R] 3.365	85.72	55	37	28	21
	74035	[7R] 4.323	110.87	[7R] 4.365	111.12	82	56	41	31.5
2.562" [65.07]	74006	[8R] 4.333	111.12	[8R] 4.365	111.12	130	90	67	51

Potting: Polyurethane Resin
*The above table is based on operating temperaturas of 70C.
*Higher temperatures will require larger case sizes than shown



PART NUMBERING SYSTEM



PLASTIC BOX SIZE / MECHANICAL SPECIFICATIONS

VOLTAGE					240 ,250 & 300 Vac	330 & 370 Vac	400 ,440 & 450 Vac	480 Vac	Description
Commercial Size	MECHANICAL DIMENSIONS FOR PLASTIC BOXES				C. Max. [μF]	C. Max. [μF]	C. Max. [μF]	C. Max. [μF]	
	L	H	W	F					
# 1	1.449 [36.8]	0.984 [25]	0.472 [12]	0.398 [10.1]	3	1.5	1	1	Mounting Ear
# 1	1.449 [36.8]	0.984 [25]	0.472 [12]	0.39 [10]	3	1.5	1	1	Mounting Ear
# 2	1.441 [36.6]	1.024 [26]	0.575 [14.6]	N/A	3.5	2.5	1.5	1	No Mounting Ear
# 3	1.445 [36.75]	1.029 [26.15]	0.575 [14.6]	0.236 [6]	4	2.5	1.5	1.5	Mounting Ear
# 4	1.606 [40.80]	1.075 [27.3]	0.874 [22.2]	N/A	5	2.5	2	1.5	No Mounting Ear
# 6	2.106 [53.50]	1.258 [31.95]	0.878 [22.3]	N/A	11	7.5	5	4	No Mounting Ear
# 6	2.106 [53.50]	1.258 [31.95]	0.878 [22.3]	N/A	11	7.5	5	4	No Mounting Ear
# 7	2.229 [58.40]	1.366 [34.70]	0.936 [23.78]	0.232 [5.9]	15	11	8	6	Mounting Ear
# 7	2.229 [58.40]	1.366 [34.72]	0.936 [23.78]	0.232 [5.9]	15	11	8	6	Mounting Ear
# 7	2.278 [57.85]	1.366 [34.70]	0.911 [23.15]	0.232 [5.9]	15	11	8	6	Mounting Ear
# 8	2.229 [58.40]	1.634 [41.5]	1.150 [29.20]	0.232 [5.9]	25	17	12	9.5	Mounting Ear
# 8	2.229 [58.40]	1.610 [40.9]	1.150 [29.20]	0.228 [5.8]	25	17	12	9.5	Mounting Ear
# 8	2.229 [58.40]	1.610 [40.9]	1.150 [29.20]	0.228 [5.8]	25	17	12	9.5	Mounting Ear
# 9	1.539 [39.1]	1.189 [30.2]	0.862 [21.9]	0.187 [4.75]	6	3.5	2.5	2	Mounting Ear
# 9	1.531 [38.9]	1.185 [30.1]	0.854 [21.7]	0.189 [4.8]	6	3.5	2.5	2	Mounting Ear
"A"	1.449 [36.80]	1.075 [27.3]	0.575 [14.6]	0.183 [4.65]	3.5	2	1.5	1	Mounting Ear
"B"	1.775 [45.09]	1.133 [28.78]	0.833 [21.16]	0.177 [4.5]	5.5	3.5	2.5	2	Mounting Ear
"D"	2.102 [53.40]	1.260 [32]	0.870 [22.10]	0.230 [5.845]	10	6.5	5	3.5	Mounting Ear
"D"	2.102 [53.40]	1.190 [30.24]	0.870 [22.10]	0.230 [5.845]	10	6.5	5	3.5	Mounting Ear
"E"	2.291 [58.2]	1.340 [35.5]	0.929 [23.6]	N/A	15	11	7.5	6	No Mounting Ear
"F"	2.102 [53.40]	1.632 [41.15]	1.150 [29.2]	N/A	25	16.5	12.5	9.5	No Mounting Ear
"G"	1.457 [37]	1.150 [29.2]	0.748 [19]	N/A	6	4	3	2	No Mounting Ear
"H"	1.957 [49.7]	1.358 [34.5]	0.882 [22.4]	0.216 [5.5]	5	3.5	2.5	2	Mounting Ear
"H"	1.957 [49.7]	1.358 [34.5]	0.882 [22.4]	0.221 [5.62]	5	3.5	2.5	2	Mounting Ear
"J"	2.229 [58.40]	1.366 [34.7]	0.936 [23.78]	0.230 [5.845]	3.5	2	1.5	1	Mounting Ear
"J"	2.229 [58.40]	1.366 [34.7]	0.936 [23.78]	0.230 [5.845]	3.5	2	1.5	1	Mounting Ear
"L"	1.535 [39]	1.201 [30.5]	0.858 [21.8]	0.2 [5.07]	6.5	4	3	2	Mounting Ear
"L"	1.535 [39]	1.201 [30.5]	0.858 [21.8]	0.2 [5.07]	6.5	4	3	2	Noryl Mounting Ear
"M"	1.539 [39.1]	1.339 [34]	0.862 [21.9]	0.258 [6.55]	8	5.5	4	3	Mounting Ear
"S"	2.303 [58.5]	0.626[15.9]	0.929 [23.6]	0.510[12.95]					NA
"7" P/2μF/ 230V	2.299 [58.4]	1.366[34.72]	0.936[23.78]	0.232 [5.9]	6.5	5	3.5	2.5	Mounting Ear
"8"valox ref	2.299 [58.4]	1.610 [40.9]	1.150 [29.2]	0.228 [5.8]	25	16.5	12.5	9.5	Mounting Ear

CONSTRUCTION

Metalized polypropylene capacitors manufactured by Nueva Generacion Manufacturas (NGM) offer improved performance and proven reliability in applications requiring power factor correction or harmonic filtering.

Metallized polypropylene film is used for its ability to operate at low temperatures and minimal loss of capacitance over the life of the cell. Encapsulated by a thermal setting polymer resin, excellent heat dissipation is achieved. In the event of a fault, three-phase pressure sensitive interrupters disconnect all three phases effectively taking the capacitor out of the circuit.

FEATURES



Individual capacitors are self-healing. Vacuum deposited conductors on a polypropylene dielectric act as electrodes in this process.

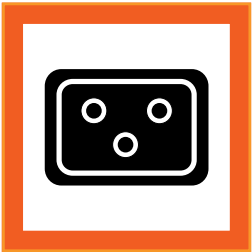
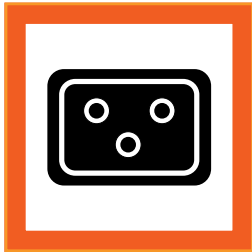
- Each three-phase capacitor is furnished with a U.L. recognized, pressure sensitive interrupter. The interrupter will disconnect all three phases at the same time to maintain a balanced circuit
- Capacitors are contained in hermetically sealed metal cans to prevent atmospheric contaminants from reducing the useful life
- The dielectric material exhibits a loss of less than 0.5 Watts per KVAR
- Encapsulation medium shall be a thermosetting polymer resin, which allows out gassing to engage the pressure interrupter.
- Nominal design life is 20 years
- Individual capacitor cells are covered by a 2-year limited warranty
- All capacitor cell terminations are threaded terminals for wire connection
- All three-phase capacitors are listed as cUL Recognized, C.S.A., and CE

CONSTRUCTION FEATURES

Termination
12-24 NC-2A threaded studs to ensure superior contact through compression. See figures 2-1 and 2-2.

Cell Housing
Constructed from a plated steel, the cell is hermetically sealed to prevent contamination.

Dielectric / Electrode
Constructed of metallized polypropylene film - a self healing, low loss material. Results in low operating temperature and minimal loss of capacitance over the life of the cell.



POWER FACTOR CORRECTION
CAPACITOR CELLS

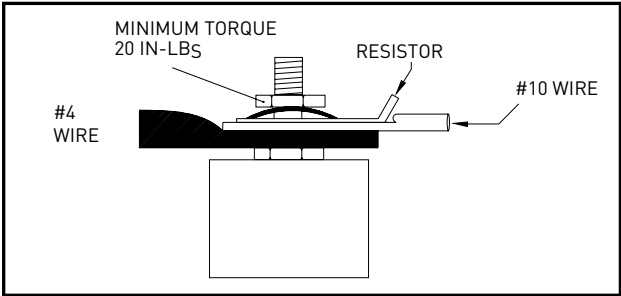


Figure 2-1: Cell Termination Connection 1

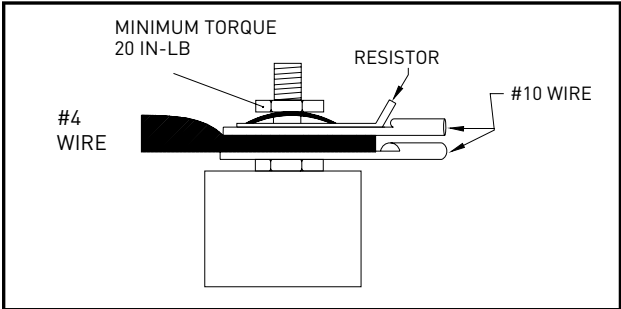


Figure 2-2: Cell Termination Connection 2

Note: Wire size shown is for example only.
Wire should be sized according to each application.

Three-Phase Construction

Internally connected in a three-phase delta connection to ensure three-phase operation under all conditions and minimize external wiring.

Three-Phase Pressure Interrupters

U.L. Recognized device (10,000 amps fault current) to disconnect all three phases if a fault occurs thus preventing single phase operation.

PERFORMANCE CHARACTERISTICS

Ambient Temperature Range

- -40°F to 115°F (- 40°C to 46°C)

Operating Temperature Range

- -40°F to 158°F (- 40°C to 70°C)

Design Life

Life expectancy of capacitor cells is 20 years within operating specifications.

Continuous Operation

Up to 135% rated (nameplate) KVAR, including the effects of 110% rated voltage (121% KVAR), 15% capacitance tolerance and harmonic voltages over the fundamental frequency (60 Hz).

Tolerance

Capacitor cell KVAR tolerance is 0% to +5%.

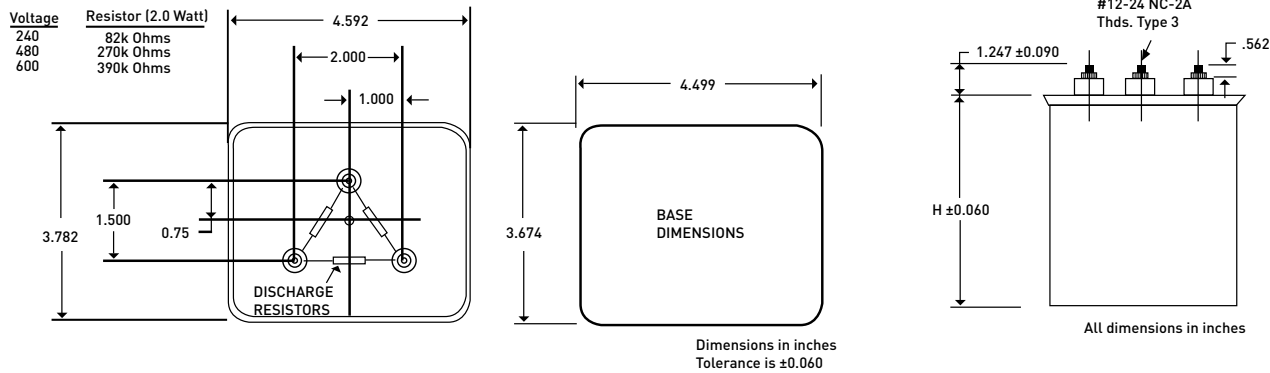
Model Selection

Tables 1 & 2 provide a listing of our most commonly used capacitor cell ratings. Other rating available upon request.

Table 1 should be used to select capacitors for applications requiring “hardened” cells where harmonics are expected. Using these capacitors assures maximum life.

Table 2 offers a wide array of standard capacitor cells for most Power Factor Correction applications.

DIMENSIONS



MECHANICAL SPECIFICATIONS

CAN SIZES AVAILABLE - POWER FACTOR CORRECTION CELLS										
CAN DIMENSIONS				230 Vac	240 Vac	440 Vac	480 Vac	600 Vac	660 Vac	690 Vac
Lenght	Width	Height (in)	Height (mm)	(KVar) Max.	(KVar) Max.	(KVar) Max.	(KVar) Max.	(KVar) Max.	(KVar) Max.	(KVar) Max.
4.59 116.58mm	3.78 69 mm	4.0 (A)	101.6	1.3 - 2.3	1.5 -2.5	2.4 - 4.3	2.2 - 3.8	2.2 - 3.8	2.2 - 3.8	2.0 - 3.5
				2.5 - 4.4	2.7 - 4.8	4.6 - 8.2	4.2 - 7.5	4.2 - 7.5	4.2 - 7.5	3.9 - 6.9
		5.0 (A)	127	2.5 - 5.8	2.7 - 6.5	8.7 - 11	8.0 - 10.0	8.0 - 10.0	8.0 - 10.0	4.0 - 9.2
				5.0 - 6.9	5.5 - 7.5	9.3 - 12.8	8.5 - 11.6	8.5 - 11.6	8.5 - 11.6	9.3 - 10.7
		5.5 (C)	139.7	7.0 - 8.9	7.6 - 9.7	12.9 - 16.5	11.7 - 15	11.7 - 15	11.7 - 15	10.8 - 13.8
		6.0 (D)	152.4	9.0 - 11.2	9.8 - 12.2	16.6 - 20.7	15.1 - 18.9	15.1 - 18.9	15.1 - 18.9	13.9 - 17.3
		7.0 (E)	177.8	11.3 - 11.9	12.3 - 13	20.8 - 22	19 - 20	19 - 20	19 - 20	17.4 - 18.5
		8.75 (F)	222.2	12.0 - 14.4	13.1 - 15.7	22.1 - 26.5	20.1 - 24.2	20.1 - 24.2	20.1 - 24.2	18.6 - 22.2
		9.63 (G)	244.6	14.5 - 17.9	15.8 - 19.5	26.6 - 33.1	24.3 - 30.1	24.3 - 30.1	24.3 - 30.1	22.3 - 27.6
CAN SIZES AVAILABLE - HARMONIC FILTERING CELLS										
4.59 116.58mm	3.78 69mm	4.0 (A)	101.6	0.7 - 1.1	0.8 - 1.2	1.5 - 2.6	1.4 - 2.5	1.5 - 2.7		
				1.3 - 2.2	1.4 - 2.4	2.8 - 5.0	2.7 - 4.8	2.9 - 5.2		
		5.0 (A)	127	2.3 - 3.0	2.5 - 3.2	5.1 - 6.6	4.9 - 6.4	5.3 - 7.0		
				3.1 - 3.5	3.3 - 3.8	6.7 - 7.6	6.5 - 7.4	7.1 - 8.1		
		5.5 (C)	139.7	3.6 - 4.5	3.9 - 4.9	7.8 - 10.0	7.5 - 9.6	8.2 - 10.4		
		6.0 (D)	152.4	4.6 - 5.6	5.0 - 6.1	10.1 - 12.5	9.7 - 12.0	10.5 - 13.0		
		7.0 (E)	177.8	5.7 - 6.0	6.2 - 6.5	12.6 - 13.3	12.1 - 12.8	13.1 - 14.0		
		8.75 (F)	222.2	6.1 - 7.2	6.6 - 7.9	13.4 - 16.1	12.9 - 15.5	14.1 - 16.8		
		9.63 (G)	244.6	7.3 - 9.0	8.0 - 9.8	16.2 - 20.0	15.6 - 19.3	16.9 - 21.0		

Case : Steel
See mechanical dimensions in this table:



NOMENCLATURE BREAKDOWN



NGM (hereafter called Company), warrants to the purchaser that capacitors manufactured by the Company are free from defects in materials, workmanship and title from 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.

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