# ACP-MxI Series, AC Induction Gear Motor

User's Manual

- ***Brushless design for long life and quiet operation***
- ***110/220 VAC input***
- ***Single or Three phase input available***
- ***Rated for Continuous operation***
- ***High power factor up to 0.8***
- ***Self starting***
- ***UL Certified***
- ***Output from 6 to 150 watts***
- ***High Starting torque for high inertial loads.***
- ***Reduction ratio's from 3.6 to 1800:1***
- ***Precise Helical gearsets***
- ***Gear boxes are hermetically sealed to ensure lubrication***
- ***Gears conform with JIS CLass-4 AGMA Class -8***
- ***Direct Replacement for some Panasonic AC induction motors***

***Figure 1: Gearbox and Fan attached***

The ACP-MxI Series are fractional horsepower induction motors.
ACP-MxI series provide users that need a simple solution. The ACP-MxI offers different sizes to accommodate your needs. These AC Induction motors can be customized to have a clutch and/or brake. ACP-MxI series operate at 120 or 220VAC, so there is no need for a transformer, just hook up and go! ACP-MxI series AC Induction motors can also be mated with other accessories, another reason to choose Anaheim Automation for your AC induction motor projects.
ACP-MxI series can be tailored with three phase AC Input.Three phase AC Induction motors are used when efficiency needs to be at its highest. A benefit of having a three phase AC induction motor is without the need of a starting capacitor. Our three phase AC induction motors offer great starting torque compared to other three phase AC induction motors.

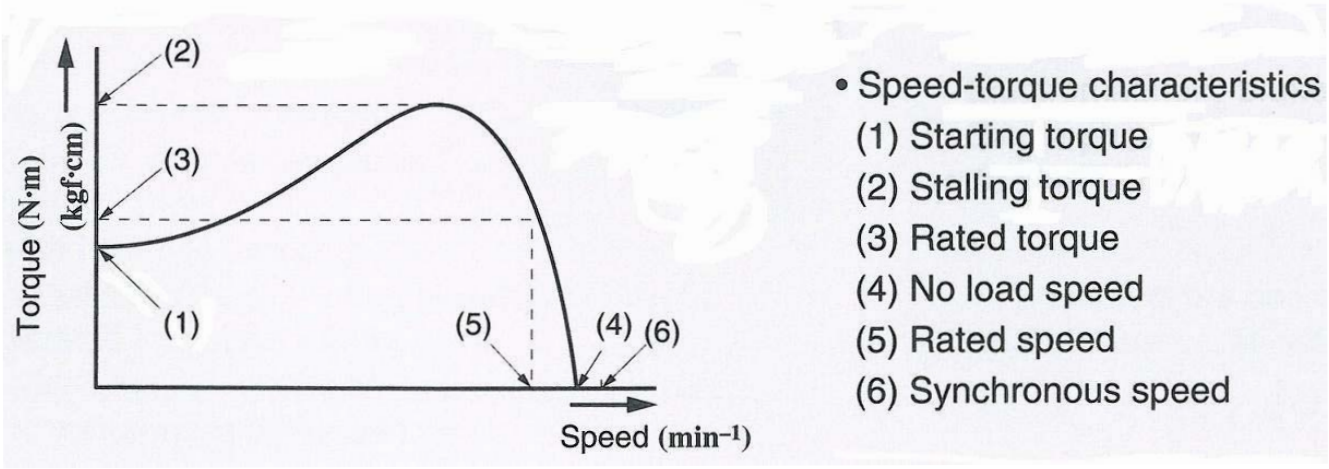



*Figure 2: ACP-MxI typical torque speed curve*

ANAHEIM AUTOMATION
910 East Orangefair Lane, Anaheim, CA 92801 (714) 992-6990 fax: (714) 992-0471
e-mail: info@anaheimautomation.com website: www.anaheimautomation.com

## Hook-Up Drawing

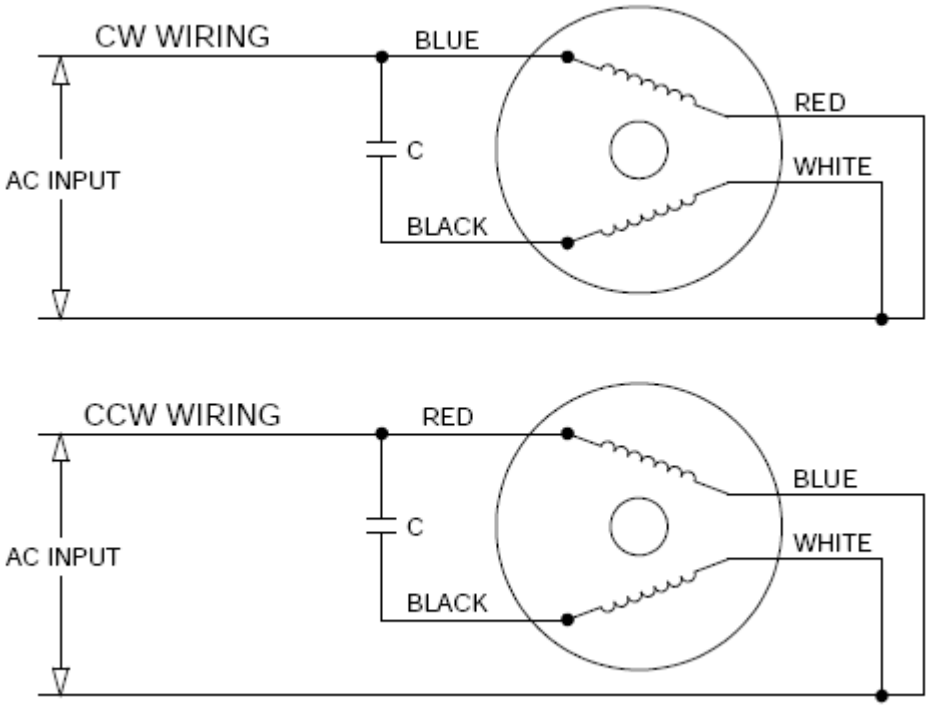



***Figure 3: Induction Motor Hookup, Single Phase 110VAC/220VAC***

### Recommended Capacitor Values

| Part Number | uF | Voltage |
|---|---|---|
| **ACP-M-2IK6A-AU** | 2.5 | 250 |
| **ACP-M-3IK15A-AU** | 4 | 250 |
| **ACP-M-4IK25A-AU** | 6 | 250 |
| **ACP-M-5IK40A-AU** | 8 | 250 |
| **ACP-M-5IK60A-AFU** | 16 | 250 |
| **ACP-M-5IK90A-AFU** | 20 | 250 |
| **ACP-M-5IK120A-AF** | 25 | 250 |
| **ACP-M-5IK150A-AF** | 36 | 250 |

| Part Number | uF | Voltage |
|---|---|---|
| **ACP-M-2IK6A-CU** | .8 | 450 |
| **ACP-M-3IK15A-CU** | 1 | 450 |
| **ACP-M-4IK25A-CU** | 1.5 | 450 |
| **ACP-M-5IK40A-CU** | 2 | 450 |
| **ACP-M-5IK60A-CFU** | 4 | 450 |
| **ACP-M-5IK90A-CFU** | 5 | 450 |
| **ACP-M-5IK120A-CF** | 7 | 450 |
| **ACP-M-5IK150A-CF** | 8 | 450 |

*Table 1: Capacitor Specifications*

## Power Supply Requirements

It is recommended that the ACP-MxI series be powered by 120 VAC for the ACP-M-xIxxx-Ax or 220 VAC for the ACP-M-xIxxx-Cx series

## Absolute Maximum Ratings

Input Voltage for ACP-M-xIxxx-Ax: 130 VAC
Input Voltage for ACP-M-xIxxx-Cx: 240 VAC
Max Case Temperature: 80° C
Storage Temperature: 0° to +50° C

Temperature consideration: Use additional airflow and/or heatsinking to keep motor temperature under 80° C.

# Motor Specifications

| Part Number | Poles | No Load Speed (RPM) | Rated Load Speed (RPM) | Starting Current (A) | Rated Current (A) | Starting Torque (oz-in) | Rated Torque (oz-in) | Maximum Torque (oz-in) |
|---|---|---|---|---|---|---|---|---|
| ACP-M-2IK6A-AU | 4 | 1800 | 1550 | 0.41 | 0.25 | 5.7 | 7.2 | 14.4 |
| ACP-M-3IK15A-AU | 4 | 1800 | 1600 | 0.59 | 0.34 | 12.5 | 12.5 | 25 |
| ACP-M-4IK25A-AU | 4 | 1800 | 1500 | 0.91 | 0.49 | 19.4 | 25 | 50 |
| ACP-M-5IK40A-AU | 4 | 1800 | 1575 | 1.5 | 0.74 | 33.3 | 37.5 | 75 |
| ACP-M-5IK60A-AFU | 4 | 1800 | 1550 | 2.2 | 1.06 | 62.5 | 52.7 | 105.4 |
| ACP-M-5IK90A-AFU | 4 | 1800 | 1625 | 3.1 | 1.7 | 66 | 73.6 | 147.2 |
| ACP-M-5IK120A-AFU | 4 | 1800 | 1610 | 2.85 | 1.65 | 107 | 101 | 202 |
| ACP-M-5IK150A-AFU | 4 | 1800 | 1512 | 3.3 | 2.61 | 126.4 | 137.5 | 275 |
| | | | | | | | | |
| ACP-M-2IK6A-CU | 4 | 1800 | 1550 | 0.21 | 0.13 | 5.7 | 7.2 | 14.4 |
| ACP-M-3IK15A-CU | 4 | 1800 | 1600 | 0.3 | 0.17 | 12.5 | 12.5 | 25 |
| ACP-M-4IK25A-CU | 4 | 1800 | 1625 | 0.55 | 0.24 | 19.4 | 25 | 50 |
| ACP-M-5IK40A-CU | 4 | 1800 | 1590 | 0.75 | 0.31 | 33.3 | 37.5 | 75 |
| ACP-M-5IK60A-CFU | 4 | 1800 | 1550 | 1.1 | 0.54 | 62.5 | 52.7 | 105.4 |
| ACP-M-5IK90A-CFU | 4 | 1800 | 1625 | 1.6 | 0.85 | 66 | 73.6 | 147.2 |
| ACP-M-5IK120A-CFU | 4 | 1800 | 1615 | 1.52 | 0.92 | 119 | 104 | 208 |
| ACP-M-5IK150A-CFU | 4 | 1800 | 1560 | 1.7 | 1.07 | 130 | 130 | 260 |
| | | | | | | | | |
| ACP-M-4IK25A-SU | 4 | 1800 | 1650 | 0.52 | 0.19 | 54 | 20 | 60 |
| ACP-M-5IK40A-SU | 4 | 1800 | 1675 | 1 | 0.27 | 91 | 32 | 96 |
| ACP-M-5IK60A-SFU | 4 | 1800 | 1675 | 1.4 | 0.4 | 119 | 48.6 | 145.8 |
| ACP-M-5IK90A-SFU | 4 | 1800 | 1675 | 2.1 | 0.56 | 208 | 73.6 | 220.8 |
| ACP-M-5IK120A-SFU | 4 | 1800 | 1600 | 2.6 | 0.8 | 312 | 104 | 312 |
| ACP-M-5IK150A-SFU | 4 | 1800 | 1570 | 3.1 | 1 | 336 | 132 | 396 |

## Gear Head Specifications

| Gear Head Part Number | Ratio | Maximum Torque (Oz-In) | Gear Head Part Number | Ratio | Maximum Torque (Oz-In) | Gear Head Part Number | Ratio | Maximum Torque (Oz-In) |
|---|---|---|---|---|---|---|---|---|
| ACP-G-2N3.6-K | 3.6 | 13.8 | ACP-G-3N3.6-K | 3.6 | 33 | ACP-G-4N3.6-K | 3.6 | 55 |
| ACP-G-2N6-K | 6 | 22 | ACP-G-3N6-K | 6 | 55 | ACP-G-4N6-K | 6 | 93 |
| ACP-G-2N9-K | 9 | 34 | ACP-G-3N9-K | 9 | 83 | ACP-G-4N9-K | 9 | 138 |
| ACP-G-2N10-K | 10 | 37 | ACP-G-3N10-K | 10 | 93 | ACP-G-4N10-K | 10 | 152 |
| ACP-G-2N15-K | 15 | 57 | ACP-G-3N15-K | 15 | 138 | ACP-G-4N15-K | 15 | 222 |
| ACP-G-2N18-K | 18 | 69 | ACP-G-3N18-K | 18 | 166 | ACP-G-4N18-K | 18 | 277 |
| ACP-G-2N20-K | 20 | 74 | ACP-G-3N20-K | 20 | 180 | ACP-G-4N20-K | 20 | 291 |
| ACP-G-2N30-K | 30 | 112 | ACP-G-3N30-K | 30 | 263 | ACP-G-4N30-K | 30 | 444 |
| ACP-G-2N36-K | 36 | 134 | ACP-G-3N36-K | 36 | 319 | ACP-G-4N36-K | 36 | 541 |
| ACP-G-2N60-K | 60 | 222 | ACP-G-3N60-K | 60 | 541 | ACP-G-4N60-K | 60 | 901 |
| ACP-G-2N90-K | 90 | 319 | ACP-G-3N90-K | 90 | 694 | ACP-G-4N90-K | 90 | 1110 |
| ACP-G-2N120-K | 120 | 347 | ACP-G-3N120-K | 120 | 694 | ACP-G-4N120-K | 120 | 1110 |
| ACP-G-2N180-K | 180 | 347 | ACP-G-3N180-K | 180 | 694 | ACP-G-4N180-K | 180 | 1110 |
| ACP-G-2N200-K | 200 | 347 | ACP-G-3N200-K | 200 | 694 | ACP-G-4N200-K | 200 | 1110 |
| ACP-G-2N300-K | 300 | 347 | ACP-G-3N300-K | 300 | 694 | ACP-G-4N300-K | 300 | 1110 |
| ACP-G-2N360-K | 360 | 347 | ACP-G-3N360-K | 360 | 694 | ACP-G-4N360-K | 360 | 1110 |
| ACP-G-2N600-K | 600 | 347 | ACP-G-3N600-K | 600 | 694 | ACP-G-4N600-K | 600 | 1110 |
| ACP-G-2N900-K | 900 | 347 | ACP-G-3N900-K | 900 | 694 | ACP-G-4N900-K | 900 | 1110 |
| ACP-G-2N1200-K | 1200 | 347 | ACP-G-3N1200-K | 1200 | 694 | ACP-G-4N1200-K | 1200 | 1110 |
| ACP-G-2N1800-K | 1800 | 347 | ACP-G-3N1800-K | 1800 | 694 | ACP-G-4N1800-K | 1800 | 1110 |

| Gear Head Part Number | Ratio | Maximum Torque (Oz-In) | Gear Head Part Number | Ratio | Maximum Torque (Oz-In) |
|---|---|---|---|---|---|
| ACP-G-5N3.6-K | 3.6 | 93 | ACP-G-5U3.6-K | 3.6 | 194 |
| ACP-G-5N6-K | 6 | 152 | ACP-G-5U6-K | 6 | 319 |
| ACP-G-5N9-K | 9 | 222 | ACP-G-5U9-K | 9 | 486 |
| ACP-G-5N10-K | 10 | 249 | ACP-G-5U10-K | 10 | 527 |
| ACP-G-5N15-K | 15 | 388 | ACP-G-5U15-K | 15 | 805 |
| ACP-G-5N18-K | 18 | 458 | ACP-G-5U18-K | 18 | 958 |
| ACP-G-5N20-K | 20 | 500 | ACP-G-5U20-K | 20 | 1069 |
| ACP-G-5N30-K | 30 | 750 | ACP-G-5U30-K | 30 | 1541 |
| ACP-G-5N36-K | 36 | 902 | ACP-G-5U36-K | 36 | 1847 |
| ACP-G-5N60-K | 60 | 1388 | ACP-G-5U60-K | 60 | 2777 |
| ACP-G-5N90-K | 90 | 1388 | ACP-G-5U90-K | 90 | 2777 |
| ACP-G-5N120-K | 120 | 1388 | ACP-G-5U120-K | 120 | 2777 |
| ACP-G-5N180-K | 180 | 1388 | ACP-G-5U180-K | 180 | 2777 |
| ACP-G-5N200-K | 200 | 1388 | ACP-G-5U200-K | 200 | 2777 |
| ACP-G-5N300-K | 300 | 1388 | ACP-G-5U300-K | 300 | 2777 |
| ACP-G-5N360-K | 360 | 1388 | ACP-G-5U360-K | 360 | 2777 |
| ACP-G-5N600-K | 600 | 1388 | ACP-G-5U600-K | 600 | 2777 |
| ACP-G-5N900-K | 900 | 1388 | ACP-G-5U900-K | 900 | 2777 |
| ACP-G-5N1200-K | 1200 | 1388 | ACP-G-5U1200-K | 1200 | 2777 |
| ACP-G-5N1800-K | 1800 | 1388 | ACP-G-5U1800-K | 1800 | 2777 |

# Dimensions

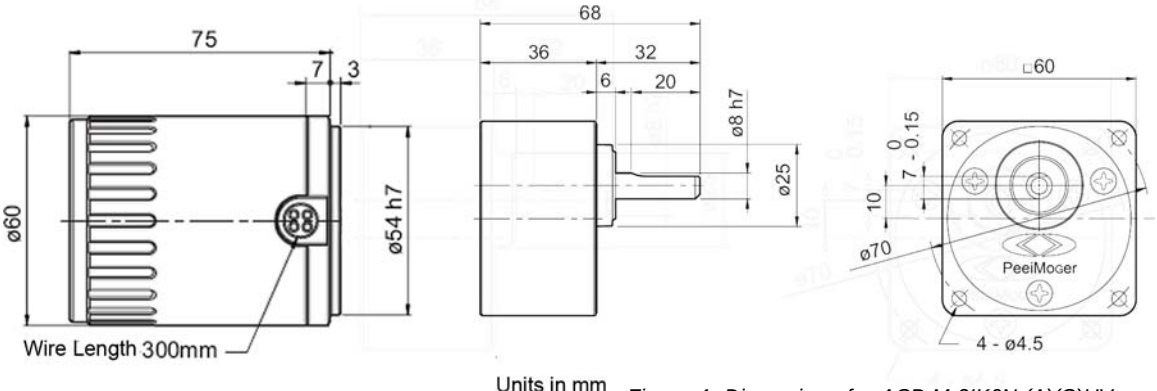
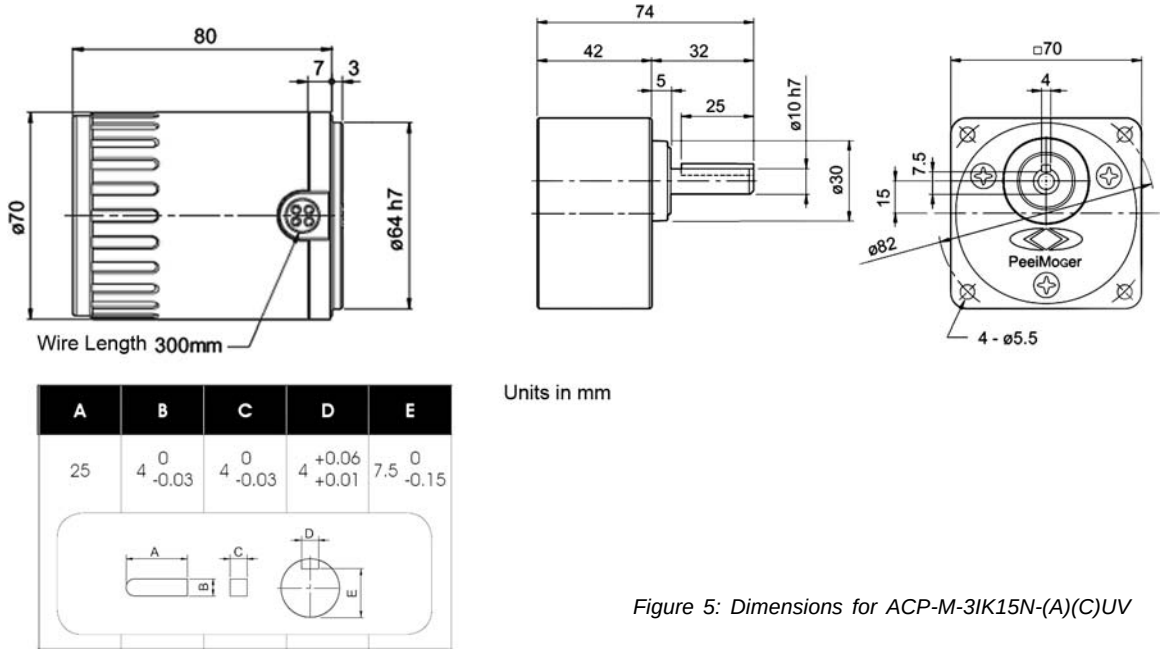


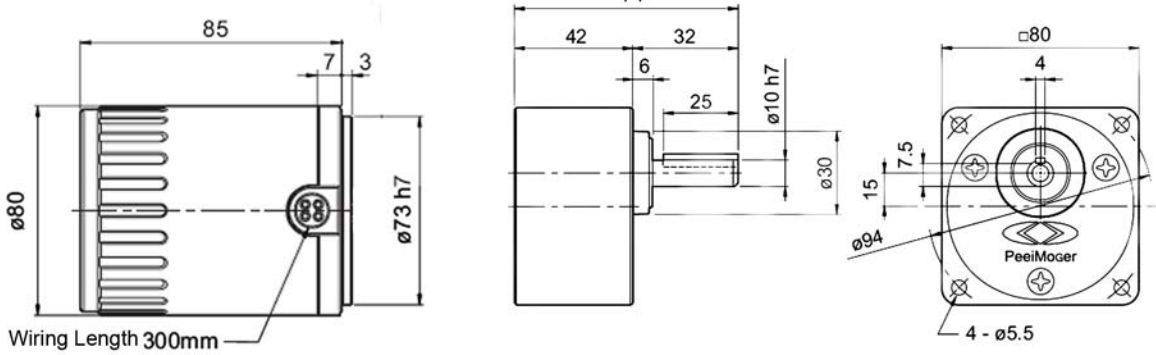

*Figure 4: Dimensions for ACP-M-2IK6N-(A)(C)UV*




| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 4 $^{0}_{-0.03}$ | 4 $^{0}_{-0.03}$ | 4 $^{+0.06}_{+0.01}$ | 7.5 $^{0}_{-0.15}$ |




*Figure 5: Dimensions for ACP-M-3IK15N-(A)(C)UV*




| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 4 $^{0}_{-0.03}$ | 4 $^{0}_{-0.03}$ | 4 $^{+0.06}_{+0.01}$ | 7.5 $^{0}_{-0.15}$ |

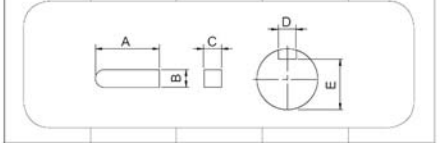
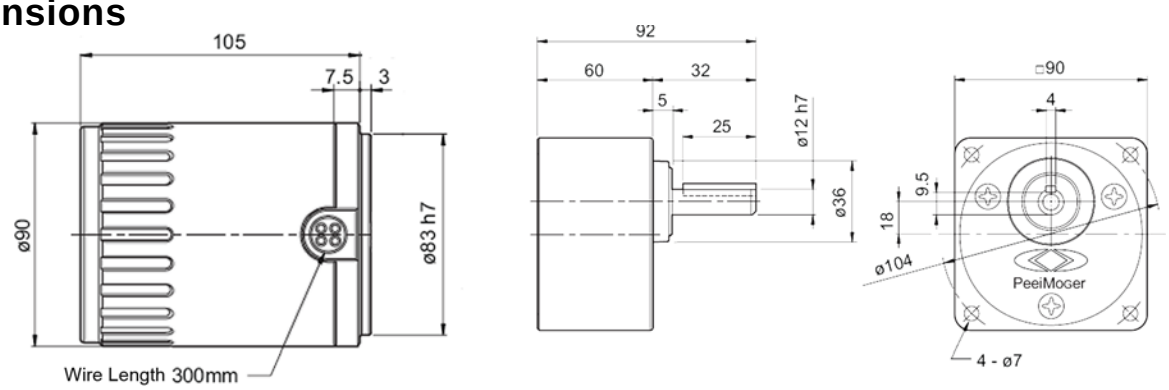



*Figure 6: Dimensions for ACP-M-4IK25N-(A)(C)(S)UV*

# Dimensions




Units in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 4 0 -0.03 | 4 0 -0.03 | 4 +0.06 +0.01 | 9.5 0 -0.15 |

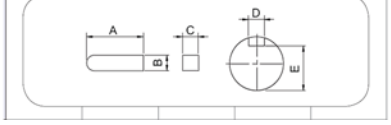
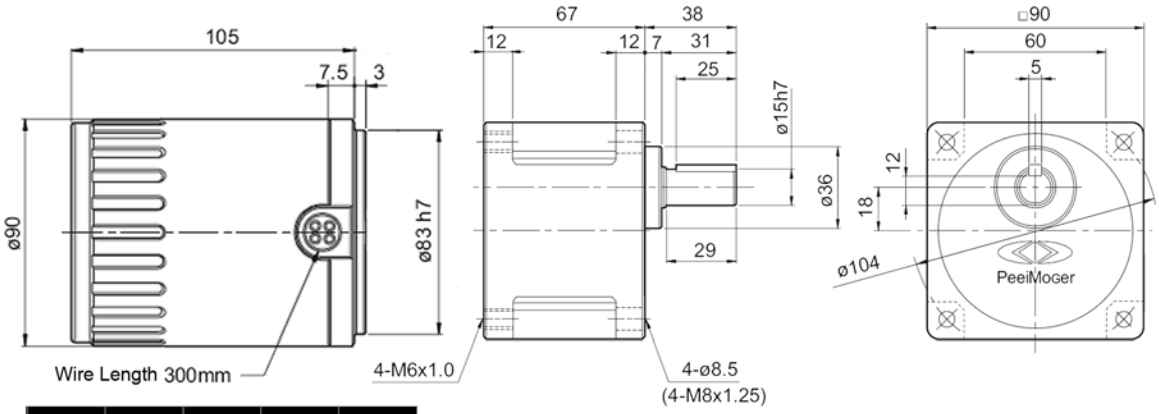



*Figure 7: Dimensions for ACP-M-5IK40N-(A)(C)(S)UV*




Units in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 5 0 -0.03 | 5 0 -0.03 | 5 +0.05 +0 | 12 0 -0.15 |

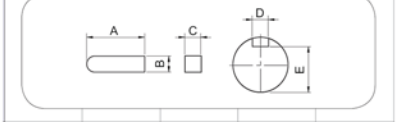
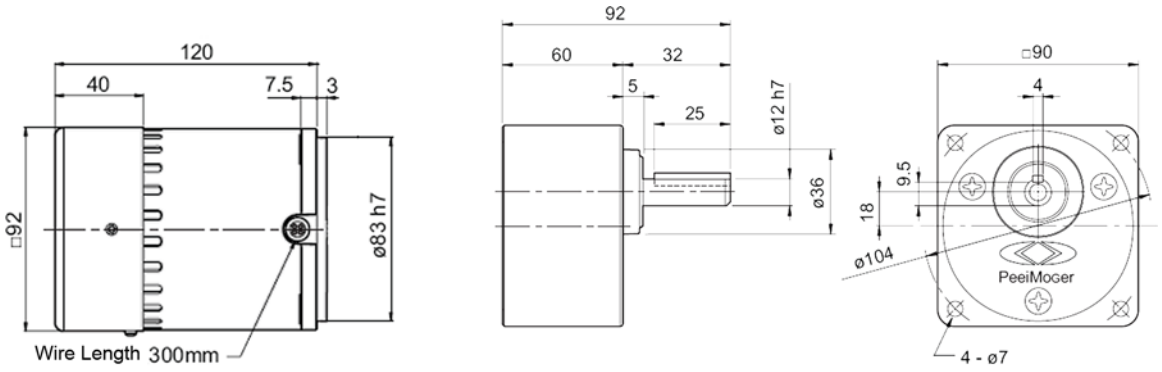



*Figure 8: Dimensions for ACP-M-5IK40U -(A)(C)(S)UV*

# Dimensions




Units in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 4 $^{0}_{-0.03}$ | 4 $^{0}_{-0.03}$ | 4 $^{+0.06}_{+0.01}$ | 9.5 $^{0}_{-0.15}$ |

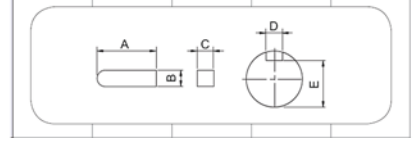
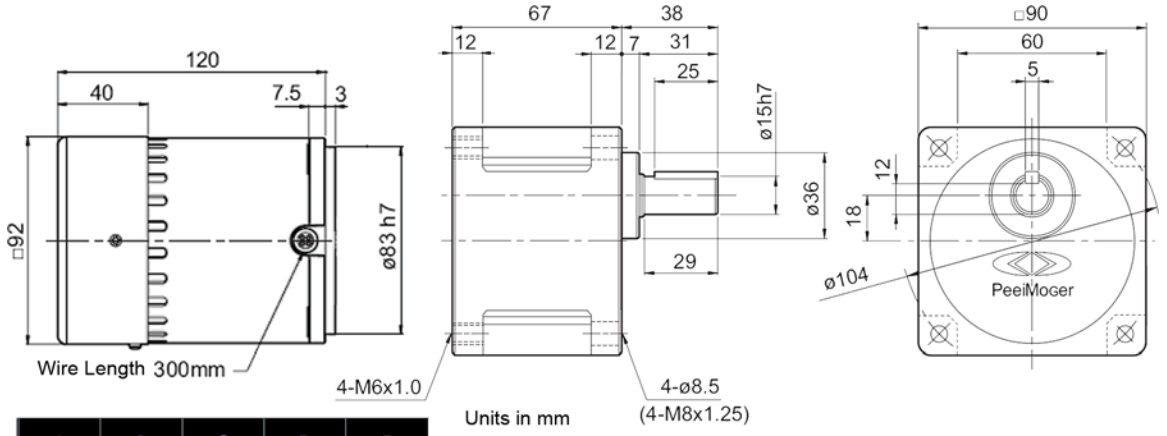



*Figure 9: Dimensions for ACP-M-5IK60N-(A)(C)(S)FUV*




Units in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 5 $^{0}_{-0.03}$ | 5 $^{0}_{-0.03}$ | 5 $^{+0.05}_{+0}$ | 12 $^{0}_{-0.15}$ |

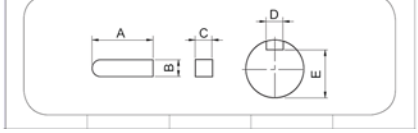
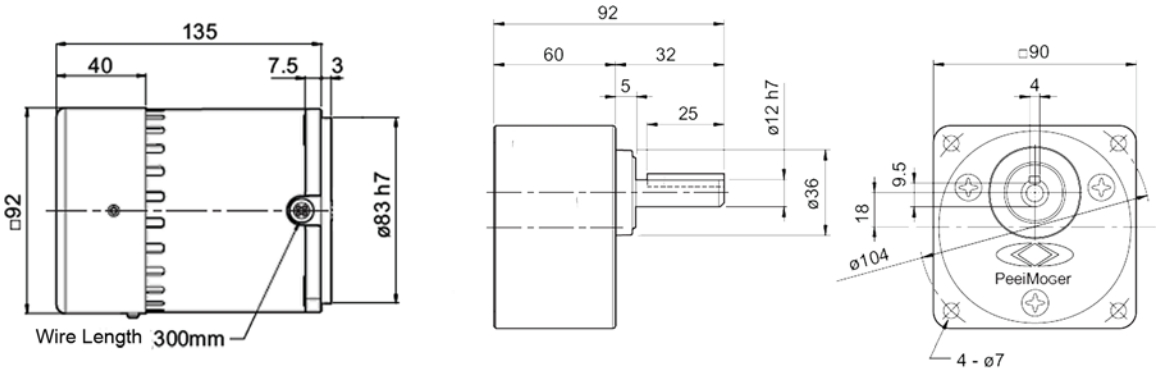
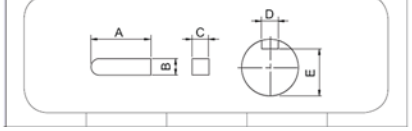



*Figure 10: Dimensions for ACP-M-5IK60U-(A)(C)(S)FUV*

# Dimensions

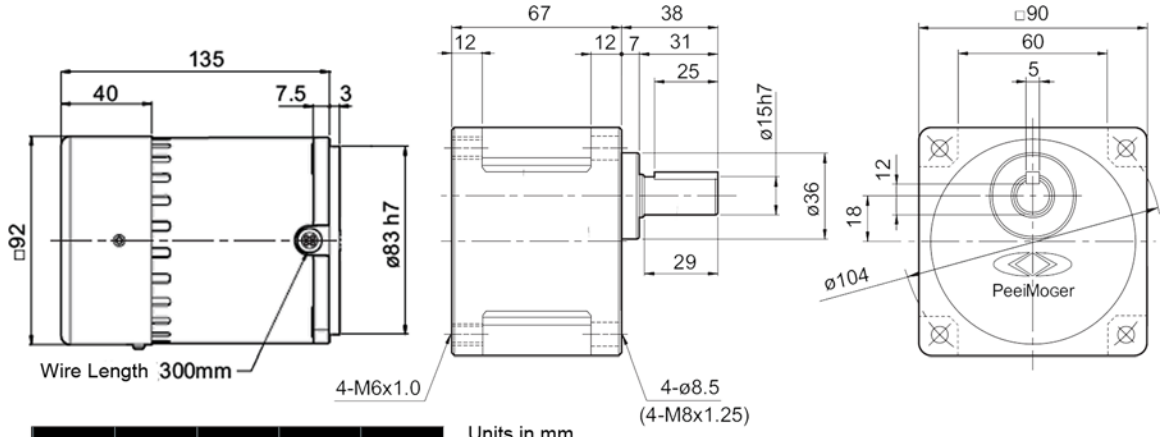



| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 4 0 -0.03 | 4 0 -0.03 | 4 +0.06 +0.01 | 9.5 0 -0.15 |

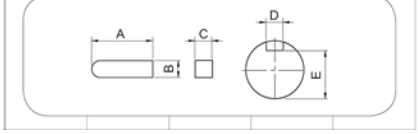



Units in mm

*Figure 11: Dimensions for ACP-M-5IK90N-(A)(C)(S)FUV, ACP-M-5IK120N-(A)(C)(S)FV, ACP-M-5IK150N-(A)(C)(S)FV*




| A | B | C | D | E |
|---|---|---|---|---|
| 25 | 5 0 -0.03 | 5 0 -0.03 | 5 +0.05 +0 | 12 0 -0.15 |




Units in mm

*Figure 12: Dimensions for ACP-M-5IK90U-(A)(C)(S)FUV,ACP-M-5IK120U-(A)(C)(S)FV, ACP-M-5IK150U-(A)(C)(S)FV*

# Gearhead Installation Instructions

## Assembly

1. Take off the seal cap and clean the grease on the end of the surface. (Figure 13)
2. Take off the O-Ring from the seal cap, and loop it flatly around the flange or motor bracket. (Figure 14)
3. Turn the motor upwards and take off the shaft-sheath as Figure 14.
4. Please refer to figure 15. Proper alignment is necessary when assembling gearhead with motor.
5. After assembling, please fasten the 4 exclusive bolts diagonally (Figure 16). Please fasten bolts to the required torque specifications. Table 2

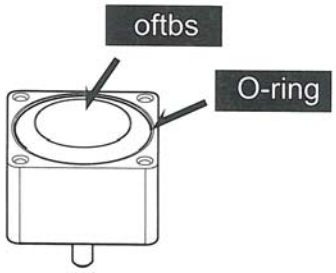



Figure 13.

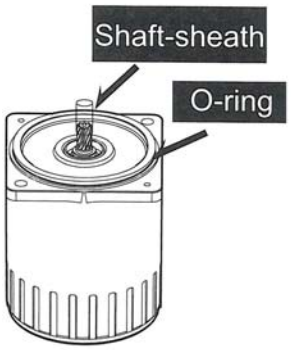



Figure 14.

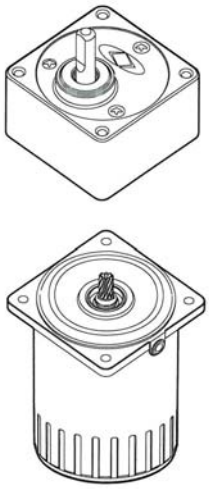


Figure 15.

Table 2.

| Frame size (mm) | Bolt size | Torque (ft-lb) |
|---|---|---|
| **60** | M4 | 1.4 |
| **70** | M5 | 1.8 |
| **80** | M5 | 1.8 |
| **90** | M6 | 2.2 |

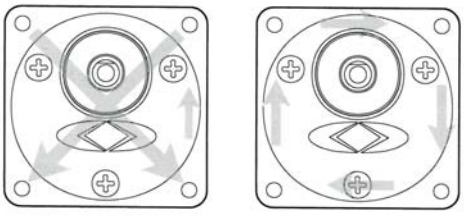


Figure 16.

## Storage

1. Keep the output shaft downwards when storing the gearhead. (Figure 17)
2. Reserve the gearhead with O-Ring and seal-cap to prevent grease from escaping the Gearhead. (Figure 18)
3. Improper assembly of the motor and/or gearhead can cause noise and diminish the lifetime.

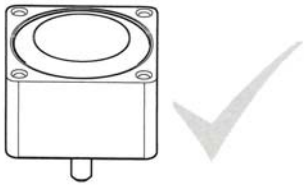


Figure 17.

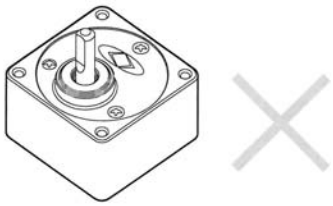


Figure 18.

# *AC Induction Motor FAQ*

***What happens if I remove the internal brake mechanism of an AC induction reversible motor? Can I then use it as a regular AC induction motor?***

An AC reversible motor is an AC induction motor, but is made different. An AC reversible motor has its coils wound specifically for the application of a quick reversal movement. The AC reversible motor has its primary and secondary coils altered. Having a different ratio between the primary and secondary coils, its starting torque characteristics will be changed. This change makes it have the instant reversing characteristics. Moreover, the capacitor has been changed also to increase the starting torque. Therefore, removing just the internal brake mechanism won't help make the reversible motor run continuously.

***Why do AC induction reversible motors have a 30 minute rating?***

Due to the construction and the purpose of the AC reversible motor, it won't allow running more than 30 minutes. The reason being is that a reversible motor requires a higher input power than an AC induction motor. The higher input power is used for the increased starting torque and instant reversing characteristics. There are higher losses in an reversible motor than a regular AC induction motor. Running the motor for more than 30 minutes can cause the motor to burn up. Therefore, for maximum performance, it is recommended for 30 minutes of use at a time.

***Can I run an AC induction reversible motor longer than 30 minutes?***

You can increase the running time of the motor if heating considerations are taken care of. The motor casing should be below 80 degrees Centigrade.

***Can I run an AC induction reversible motor 30 minutes in one direction then 30 minutes in the other?***

The 30 minute rating is for the total time that the motor is on, regardless of direction.

***Can I use a solid state relay (SSR) to switch the direction?***

When using a SSR to switch direction, please allow at minimum of 100ms before switching to the other direction.

***Can I use a capacitor other than the one it came with?***

The capacitor that came with the motor was chosen for optimum stability and performance. When using another capacitor, use the recommended capacitance and voltage values when obtaining another capacitor. The use of non polarized capacitors should be used. For example, Electrolytic capacitors should not be used.

***What happens if I use a different capacitor value other what has been given?***

When using a different capacitor value, the AC induction motor may or may not start up. Erratic startup can also occur when using different capacitor values.

***How does power supply fluctuation affect AC induction motor?***

The fluctuations of voltage will affect the torque output of the motor. The torque developed by an AC induction motor is proportional to the square of the applied voltage.

For example:
Rated voltage:100VAC
Stall Torque,Tm: .5 N·m
Starting Torque,Ts: .25 N·m
The voltage is then reduced to 75VAC:
New Tm:[.5*(75/100)^2 ]=.375 N·m
New Ts:[.25*(75/100)^2 ]=.1875 N·m

If the motor is going to experience power fluctuations, please take it into account when choosing an AC induction motor.



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