

# ACP-Mxl Series AC Induction Gear Motor

## User's Guide



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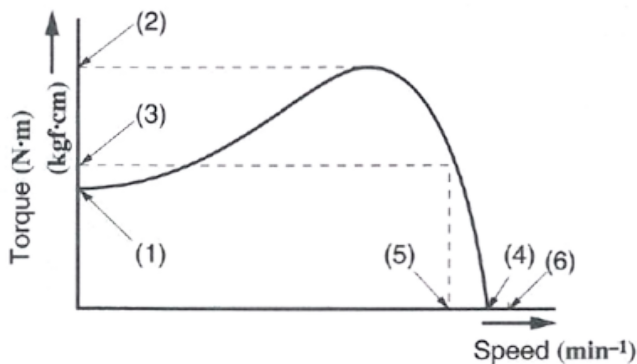
## ACP-Mxl AC Induction Gear Motor Features

- 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

## General Description

The ACP-Mxl Series provide are fractional horsepower induction motors available in several different sizes to accommodate a range of user requirements. These units operate at 120 or 220VAC, so there is no need for a transformer, just hook up and go!

ACP-Mxl series can be tailored with three phase AC input. Three phase AC induction motors provide the highest efficiency 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. ACP-Mxl motors mate with ACP-G-2N gearheads and are compatible with our ACP-US-2I6A-xL AC speed controllers. Customization such as lead wires, cables, connectors, and windings are available upon request.



### Speed-torque characteristics

- (1) Starting torque
- (2) Stalling torque
- (3) Rated torque
- (4) No load speed
- (5) Rated speed
- (6) Synchronous speed

## Wiring Diagram

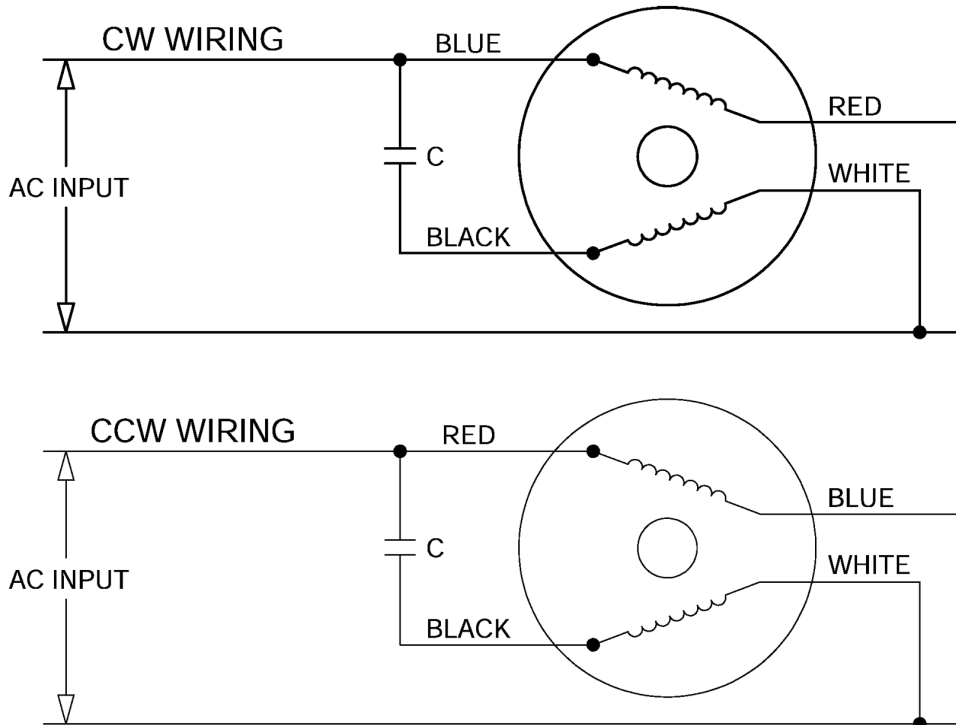


Figure 3: Induction Motor Hookup, Single Phase 110VAC/220VAC

### 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	0.8	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

## Power Supply Requirements

It is recommended that the ACP-Mxl Series be powered by 120 VAC for the ACP-M-xlxxx-Ax or 220 VAC for the ACP-M-xlxxx-Cx series.

## Absolute Maximum Ratings

Input Voltage for ACP-M-xlxxx-Ax: 130 VAC  
 Input Voltage for ACP-M-xlxxx-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-2IK6N-AU	4	1800	1550	0.41	0.25	5.7	7.2	14.4
ACP-M-3IK15N-AU	4	1800	1600	0.59	0.34	12.5	12.5	25
ACP-M-4IK25N-AU	4	1800	1500	0.91	0.49	19.4	25	50
ACP-M-5IK40N-AU	4	1800	1575	1.5	0.74	33.3	37.5	75
ACP-M-5IK60U-AFU	4	1800	1550	2.2	1.06	62.5	52.7	105.4
ACP-M-5IK90U-AFU	4	1800	1625	3.1	1.7	66	73.6	147.2
ACP-M-5IK120U-AFU	4	1800	1610	2.85	1.65	107	101	202
ACP-M-5IK150U-AFU	4	1800	1512	3.3	2.61	126.4	137.5	275

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-2IK6N-CU	4	1800	1550	0.21	0.13	5.7	7.2	14.4
ACP-M-3IK15N-CU	4	1800	1600	0.3	0.17	12.5	12.5	25
ACP-M-4IK25N-CU	4	1800	1625	0.55	0.24	19.4	25	50
ACP-M-5IK40N-CU	4	1800	1590	0.75	0.31	33.3	37.5	75
ACP-M-5IK60U-CFU	4	1800	1550	1.1	0.54	62.5	52.7	105.4
ACP-M-5IK90U-CFU	4	1800	1625	1.6	0.85	66	73.6	147.2
ACP-M-5IK120U-CFU	4	1800	1615	1.52	0.92	119	104	208
ACP-M-5IK150U-CFU	4	1800	1560	1.7	1.07	130	130	260

Gear Head Part Number	Ratio	Maximum Torque (oz-in)
ACP-G-2N3.6-K	3.6	13.8
ACP-G-2N6-K	6	22
ACP-G-2N9-K	9	34
ACP-G-2N10-K	10	37
ACP-G-2N15-K	15	57
ACP-G-2N18-K	18	69
ACP-G-2N20-K	20	74
ACP-G-2N30-K	30	112
ACP-G-2N36-K	36	134
ACP-G-2N60-K	60	222
ACP-G-2N90-K	90	319
ACP-G-2N120-K	120	347
ACP-G-2N180-K	180	347
ACP-G-2N10X-K	10	347

Gear Head Part Number	Ratio	Maximum Torque (oz-in)
ACP-G-3N3.6-K	3.6	33
ACP-G-3N6-K	6	55
ACP-G-3N9-K	9	83
ACP-G-3N10-K	10	93
ACP-G-3N15-K	15	138
ACP-G-3N18-K	18	166
ACP-G-3N20-K	20	180
ACP-G-3N30-K	30	263
ACP-G-3N36-K	36	319
ACP-G-3N60-K	60	541
ACP-G-3N90-K	90	694
ACP-G-3N120-K	120	694
ACP-G-3N180-K	180	694
ACP-G-3N10X-K	10	694

Gear Head Part Number	Ratio	Maximum Torque (oz-in)
ACP-G-4N3.6-K	3.6	55
ACP-G-4N6-K	6	93
ACP-G-4N9-K	9	138
ACP-G-4N10-K	10	152
ACP-G-4N15-K	15	222
ACP-G-4N18-K	18	277
ACP-G-4N20-K	20	291
ACP-G-4N30-K	30	444
ACP-G-4N36-K	36	541
ACP-G-4N60-K	60	901
ACP-G-4N90-K	90	1110
ACP-G-4N120-K	120	1110
ACP-G-4N180-K	180	1110
ACP-G-4N10X-K	10	1110

Gear Head Part Number	Ratio	Maximum Torque (oz-in)
ACP-G-5U3.6K	3.6	194
ACP-G-5U6-K	6	319
ACP-G-5U9-K	9	486
ACP-G-5U10-K	10	527
ACP-G-5U15-K	15	805
ACP-G-5U18-K	18	958
ACP-G-5U20-K	20	1069
ACP-G-5U30-K	30	1541
ACP-G-5U36-K	36	1847
ACP-G-5U60-K	60	2777
ACP-G-5U90-K	90	2777
ACP-G-5U120-K	120	2777
ACP-G-5U180-K	180	2777
ACP-G-5U10X-K	10	2777

**Note:**

For higher gear ratios, please add the ACP-x(U/N)10(X/L)-K to multiply any of the gear ratio's by 10 up to a maximum ratio of 1800:1.

**Example:**

A ratio of 200:1 is needed with the following motor: ACP-M-3IK15N-xx. The required part numbers are: **ACP-G-3N20-K** and **ACP-G-3N10X-K**

# Dimensions

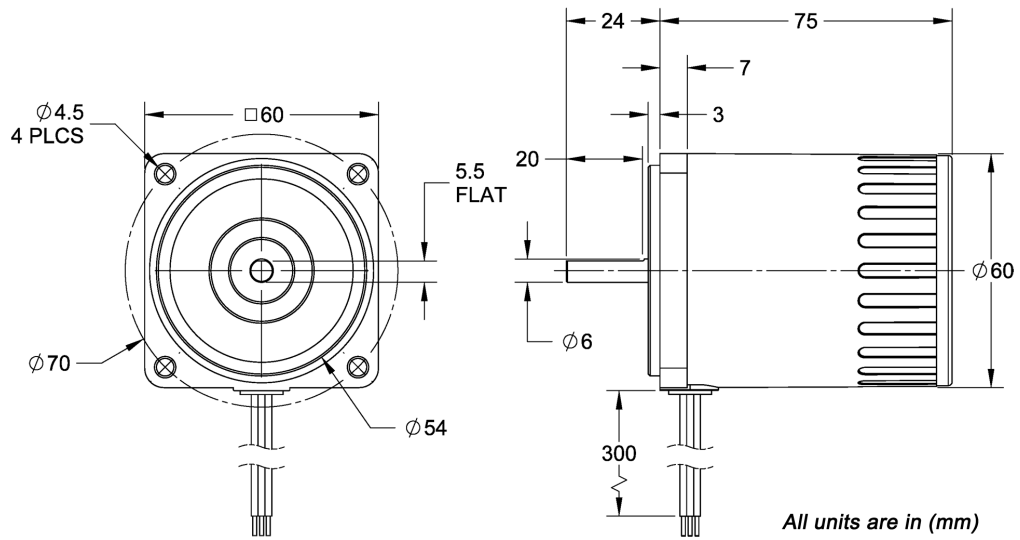
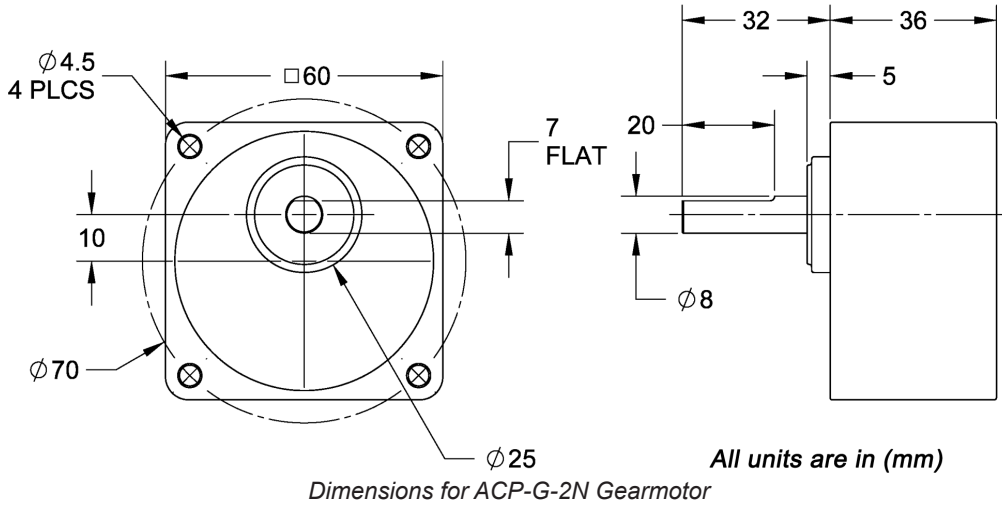


Figure 4: Dimensions for ACP-M-2IK6A-(A)(C)UV



Dimensions for ACP-G-2N Gearmotor

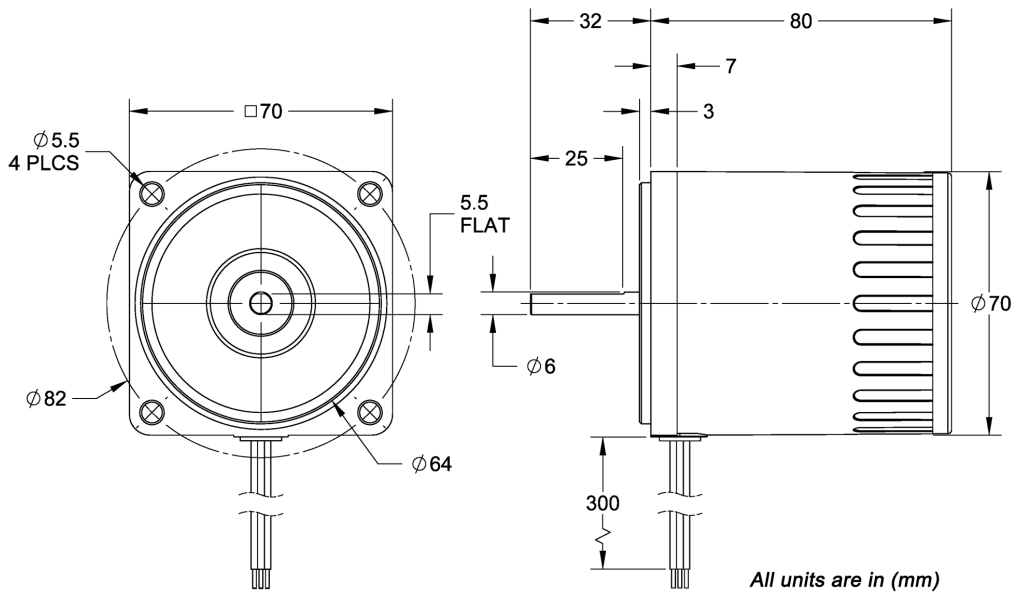
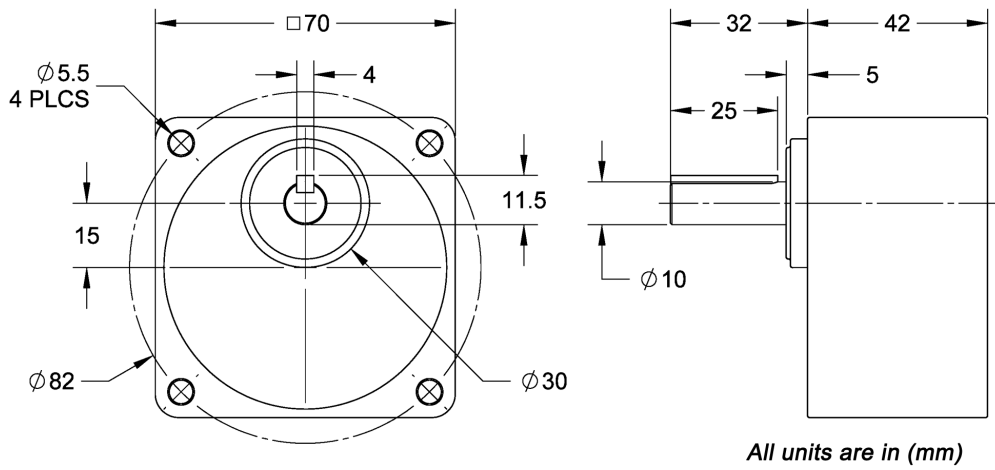


Figure 5: Dimensions for ACP-M-3IK15A-(A)(C)UV



Dimensions for ACP-G-3N Gearmotor

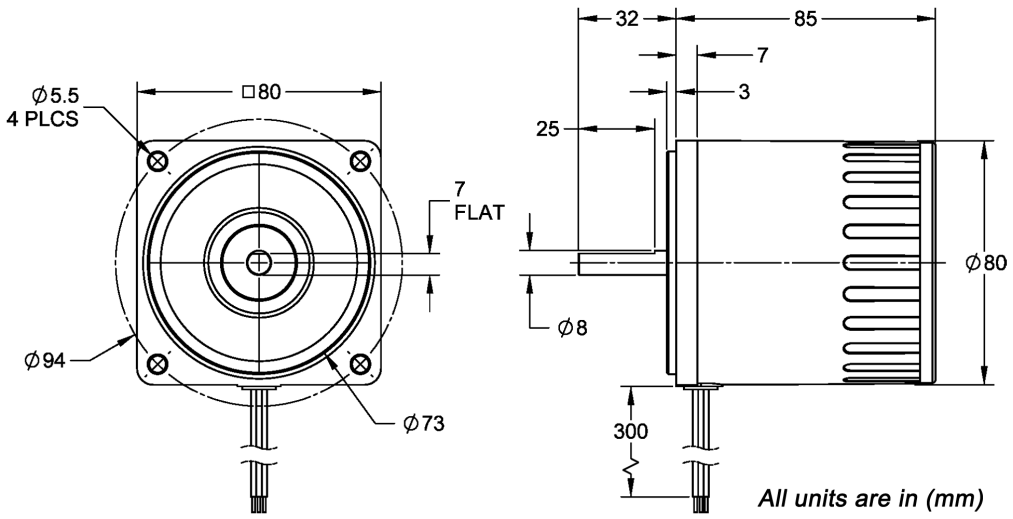
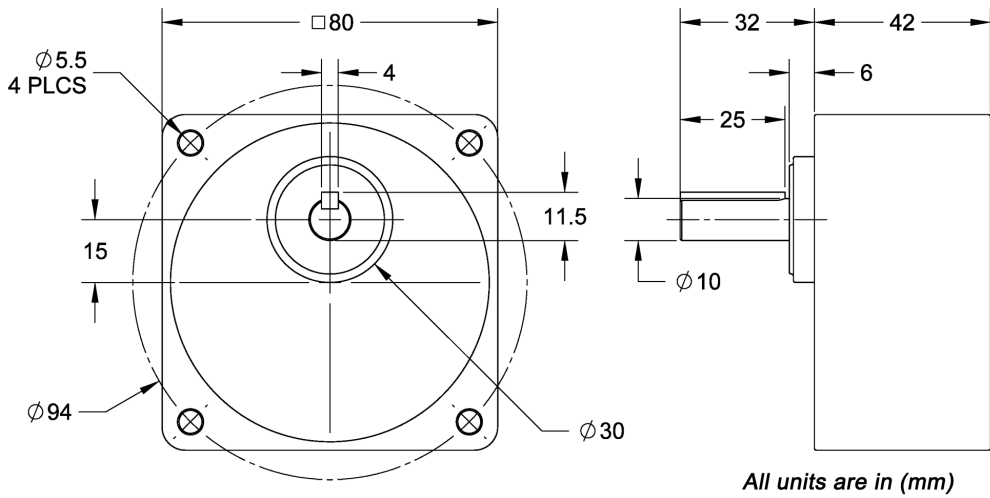


Figure 6: Dimensions for ACP-M-4IK25A-(A)(C)UV



Dimensions for ACP-G-4N Gearmotor

# Dimensions

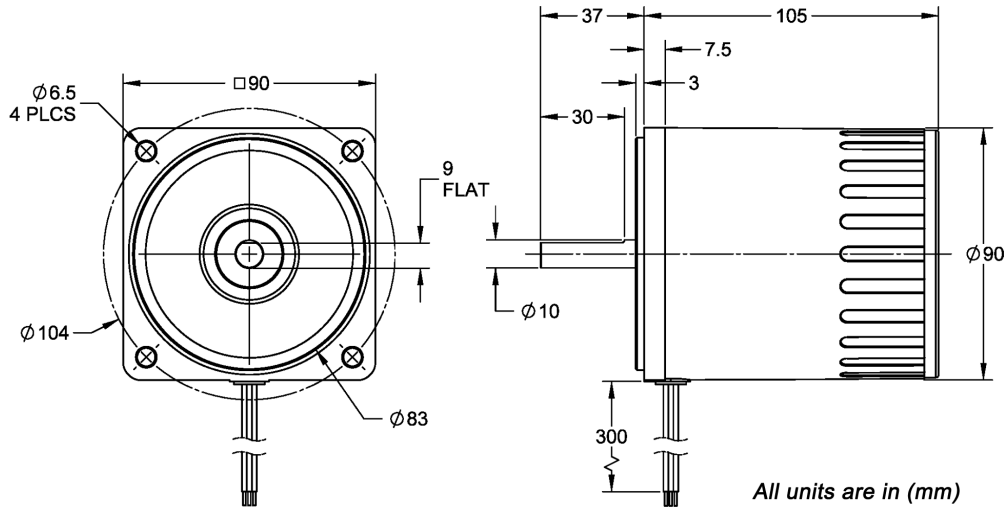


Figure 7: Dimensions for ACP-M-5IK40A-(A)(C)UV

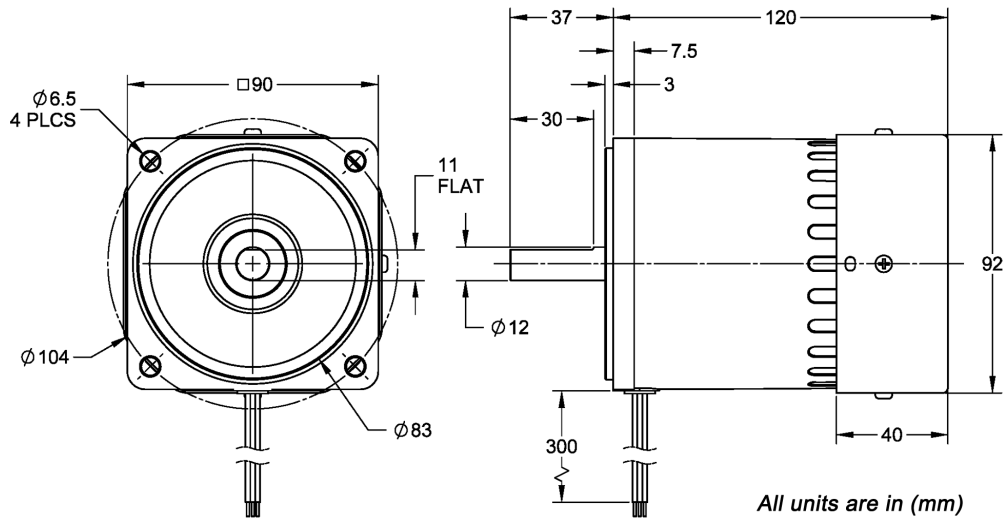
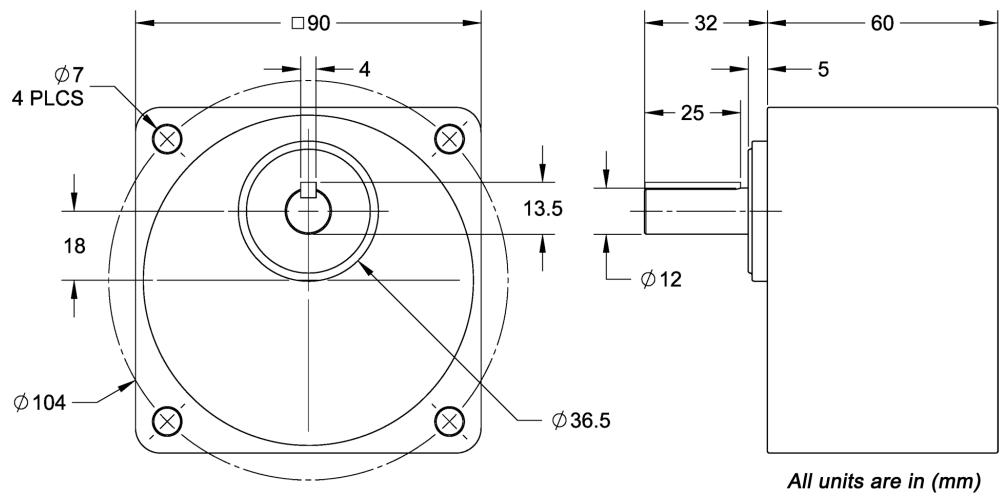


Figure 8: Dimensions for ACP-M-5IK60A-(A)(C)UV



Dimensions for ACP-G-5N Gearmotor





# Gearhead Installation Instructions

## Assembly

1. Remove the seal cap and clean the grease on the end of the surface. (Figure 13)
2. Remove 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 remove the shaft-sheath. (Figure 14)
4. Proper alignment is necessary when assembling gearhead with motor. (Figure 15)
5. After assembling, fasten the 4 exclusive bolts diagonally (Figure 16) making sure to fasten bolts to the required torque specifications. (Table 2)

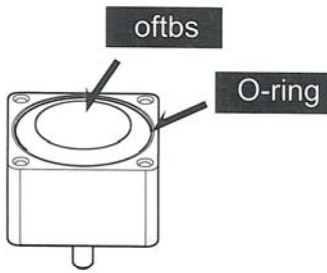


Figure 13.

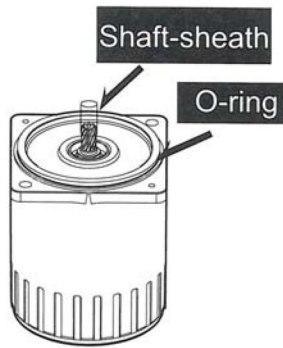


Figure 14.

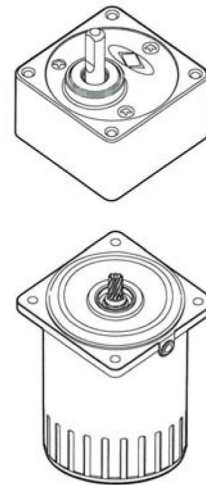


Figure 15.

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

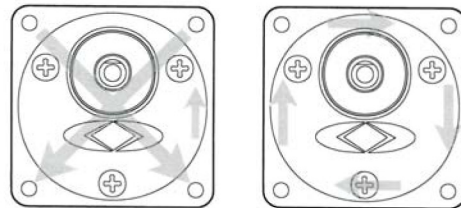


Figure 16.

## 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.

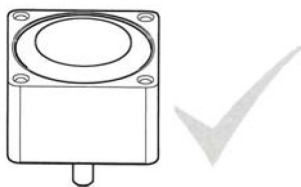


Figure 17.

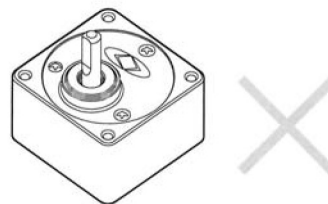


Figure 18.

## AC Induction Motor FAQ

**Q: 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?**

**A:** An AC reversible motor is an AC induction motor with coils wound specifically for the application of a quick reversal movement. Moreover, the capacitor has also been altered to increase the starting torque. Removing just the internal brake mechanism will not make the reversible motor run continuously.

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

**A:** Due to the construction and the intended purpose of the AC reversible motor, a higher input power than that of a standard AC induction motor. The higher input power is used for the increased starting torque and instant reversing characteristics. There are higher losses in a 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.

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

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

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

**A:** You can increase the running time of the motor if heating conditions are taken into consideration. The motor casing should be below 80°C.

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

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

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

**A:** The capacitor that comes with the motor has been chosen for optimum stability and performance. If using another capacitor, be sure to use the recommended capacitance and voltage values. Only non-polarized capacitors should be used. Electrolytic capacitors should not be used.

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

**A:** 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.

**Q: How does power supply fluctuation affect AC Induction motor?**

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

For example:

Rated Voltage: 100VAC

Stall Torque,  $T_m$ : .5 Nm

Starting Torque,  $T_s$ : .25Nm

The voltage is then reduced to 75VAC:

New  $T_m$ :  $[.5*(75/100)^2]=.375$  Nm

New  $T_s$ :  $[.25*(75/100)^2]=.1875$  Nm

If the motor will be experiencing power fluctuations, please take it into account when choosing an AC induction motor.

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All Anaheim Automation products are warranted against defects in workmanship, materials and construction, when used under Normal Operating Conditions and when used in accordance with specifications. This warranty shall be in effect for a period of twelve months from the date of purchase or eighteen months from the date of manufacture, whichever comes first. **Warranty provisions may be voided if products are subjected to physical modifications, damage, abuse, or misuse.**

Anaheim Automation will repair or replace at its' option, any product which has been found to be defective and is within the warranty period, provided that the item is shipped freight prepaid, with previous authorization (RMA#) to Anaheim Automation's plant in Anaheim, California.

## **TECHNICAL SUPPORT**

If you should require technical support or if you have problems using any of the equipment covered by this manual, please read the manual completely to see if it will answer the questions you have. If you need assistance beyond what this manual can provide, contact your Local Distributor where you purchased the unit, or contact the factory direct.

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