# MONARCH

## Single Phase Induction Motors
### 0.18 kW to 3 kW

TECO

**TECO Australia Pty. Ltd.**

MON SP Mk II-042004

## 1. HANDLING AND STORAGE

Motors should be preferably stored in their normal operating positions. They should be stored in surroundings as clean and dry and free from vibration as possible.

If motors have been exposed to moisture during long periods of storage then the insulation resistance of the windings against the frame (earth) should be checked with the aid of a megger (max. d.c. voltage 500V) prior to installation.

If any motor damage is to be claimed as “warranty”, TECO Australia must be consulted prior to any work being carried out on motor.

## 2. INSTALLATION AND OPERATION

Motors should be installed to the requirements of AS3000:2000 SAA Wiring Rules

The installation of the equipment shall be carried out in a manner that does not reduce the protection afforded by the equipment design.

When installing the motor the following points should be carefully checked:

- rated voltage and frequency
- ambient temperature should not exceed 40°C, unless confirmed with TECO sales office
- altitude does not exceed 1000 meters above sea level
- correct connection of motor (see below)

The use of the motor should conform to the specified degree of protection in accordance with AS1939.

Care must be taken to ensure that the cooling air can flow in and out unhindered. The space between the air intake and the nearest wall should be approximately equal to the shaft height of the motor. Foundations must be designed in such a way that vibration is avoided when the motor and the driven machine are running coupled.

Care should be taken to ensure that any condensate drain plugs are located at the lowest point of motor casing. Before mounting the transmission parts, the motor shaft should be cleaned with a solvent.

Secure motor to a level surface. Unevenness leads to mechanical deformation of the motor. The motor should be used only with coupling systems, which are elastic with respect to centre offset, angular displacement, longitudinal shift and torsional strain. Rigid coupling systems are not permissible (unless previously agreed).

If direct coupling is employed check centre offset and angular offset with screwed on test arm and dial gauge. The following deviations should not be exceeded:

- Centre offset (radial measurement) 0.03 mm in 2 pole motors. 0.05 mm in motors with more than 2 poles. (the dial shows twice the value of the deviation).
- Angular offset (axial measurement) 0.10 mm.

Check alignment at normal operating temperature.

With applications involving belt transmission, unnecessary axial forces on the bearings can be avoided by positioning the shafts parallel to each other and keeping the pulleys perfectly aligned. The belt tension should be just sufficiently stretched to prevent slipping in service. If the pulleys are too small the motor shaft is likely to bend and this must be avoided.

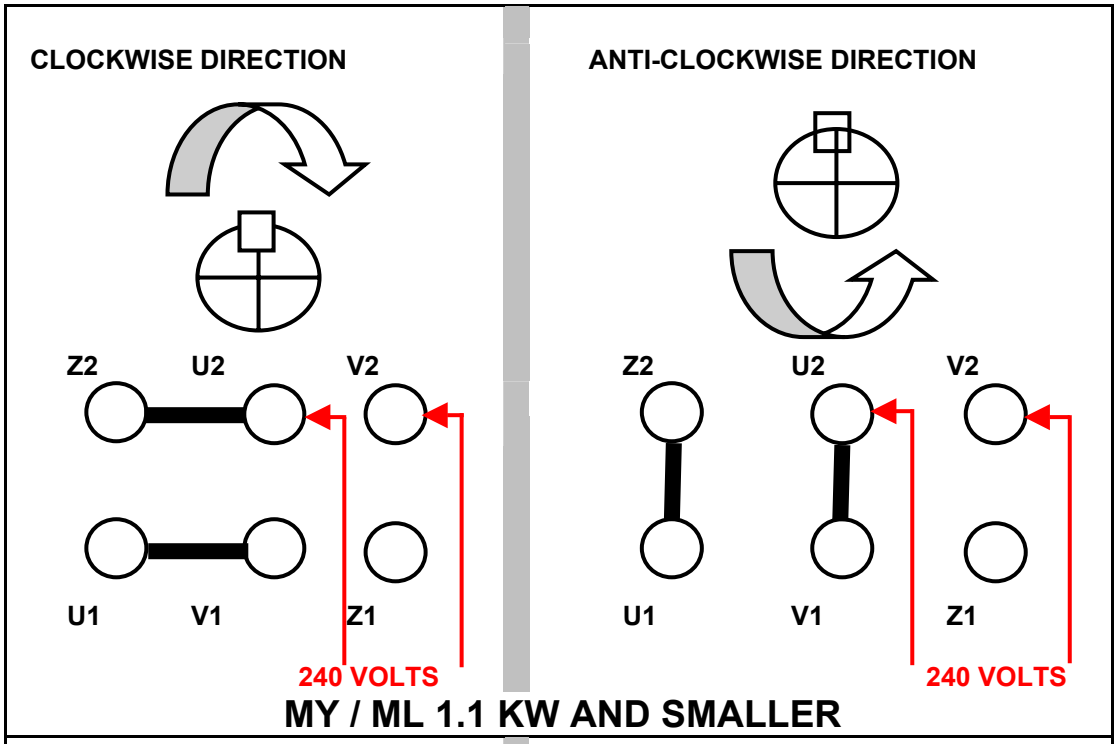
## 2) CONNECTION DIAGRAMS

This connection is indicated on the connection diagram inside terminal box lid and as shown on page3.

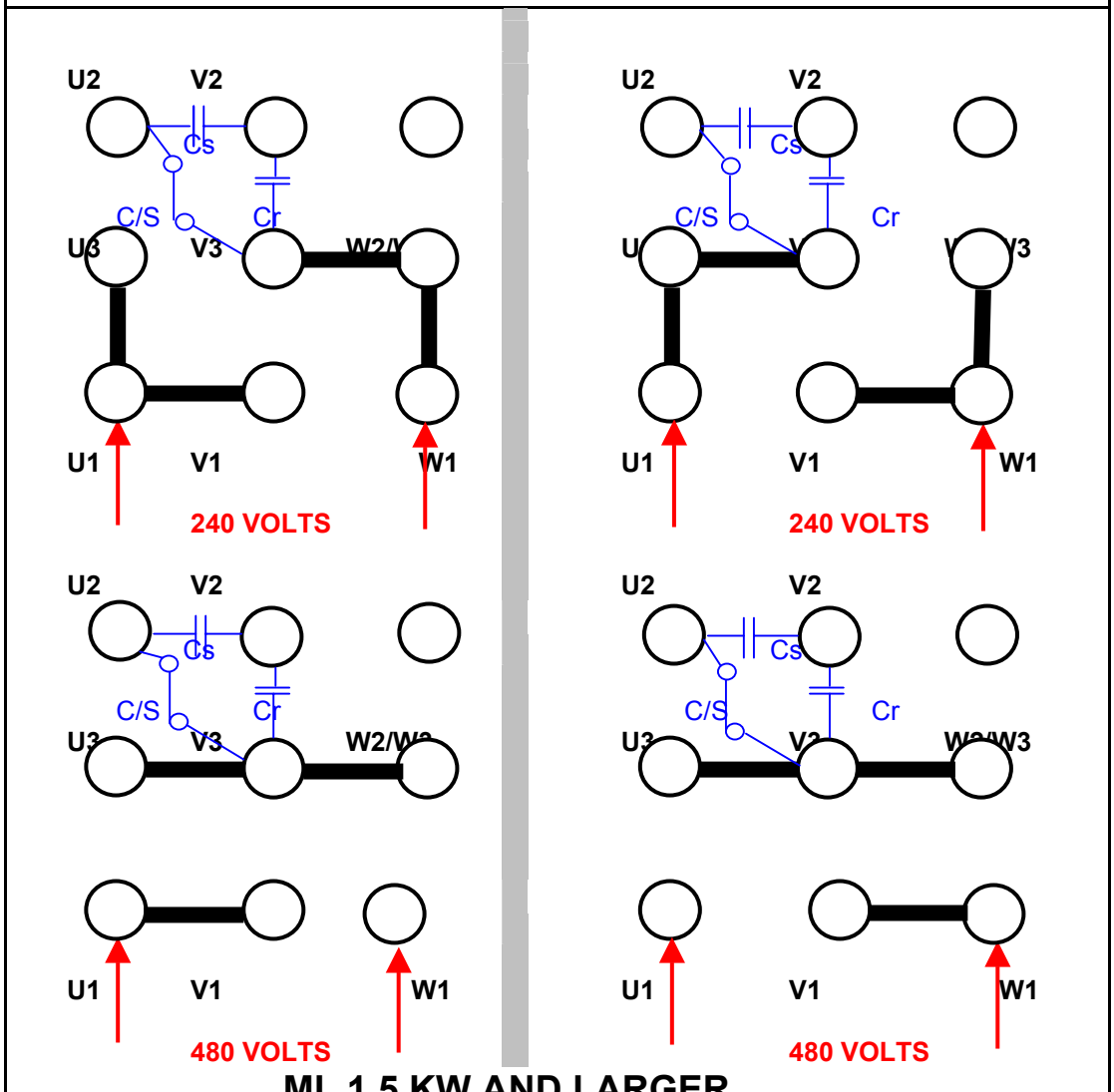
For special voltages and the like, different connections will be noted on the motor nameplate beside voltage.

All Motors are suitable for operation in both directions.

## CONNECTION DIAGRAMS




MY / ML 1.1 KW AND SMALLER




ML 1.5 KW AND LARGER

## 3. CLEANING, LUBRICATION AND MAINTENANCE

*Periodical checking of the magnetic starter (where used) is recommended, in order to prevent serious problems developing such as oxidation and poor electrical contact.*

The intake and outlet openings as well as the channels between the cooling fins must be kept clean and protected against clogging to prevent motor overheating.
Bearings are greased for life and need no further maintenance. This means that greasing can only be carried out during general overhauls when the motor is disassembled.

## 4. PROTECTION DEVICES

**Thermal Reset Overloads** are fitted to motors up to and including 1.1 kW. If overload should trip motor should be allowed to cool before the overload is reset. To reset the overload press the red button mounted on the motor terminal box. Supply to the motor should be disconnected before restart is attempted and cause for the overload should be investigated.

## 5. FAULT FINDING & RECOGNITION

| Kind of Fault | Symptom | Cause | Remedy |
|---|---|---|---|
| Fail to Start without Load | Motionless And soundless | Power-off | Consult power company |
| | | Switch-off | Switch-on |
| | | No fuse | Install fuse |
| | | Broken wires | Check wires and repair |
| | | Broken lead | Check leads and repair |
| | | Faulty winding | Check winding and repair |
| | | Overload tripped | Reset overload |
| | Fuse blowing – (Circuit Breaker trips off, slow start with electromagnetic noise | Short circuit | Check circuit |
| | | Incorrect wiring | Check wiring |
| | | Poor contact in circuit switches | Check and repair |
| | | Broken wiring | Check and repair |
| | | Poor contact of starting switch | Check and repair |
| | | Incorrect connection of starting switch | Check and repair |
| Overload after start | Fuse blowing – Fail to restart due to circuit breaker tripping | Insufficient capacity of fuse or breaker | Replace fuse or breaker |
| | | Overload | Lighten load |
| | | High load at low voltage | Check circuit capacity and reduce load |
| | | Faulty internal centrifugal switchgear | Send for repair |
| Overload after Start | Overheating of Motor | Overload or Intermittent Overload | Lighten Load |
| | | Under-voltage | Check circuit capacity and power source |
| | | Over-voltage | Check power source |
| | | Fuse blowing (Single phase rotating) | Install the specified fuse |
| | | Poor contact of circuit switches | Check and repair |
| | | Poor contact of starting switch | Check and repair |
| | Speed falls sharply | Voltage drop | Check circuit and power source |
| | | Sudden overload | Check machine |

| Kind of Fault | Symptom | Cause | Remedy |
|---|---|---|---|
| Overload after Start | Switch overheat | Insufficient capacity of switch | Replace switch |
| | | High load | Lighten load |
| | Bearing Overheat | Misalignment between motor and load | Re-align |
| | | High bearing noise | Replace damaged bearing |
| Motor does not start | Motors hums and / or does not accelerate | Load too great<br>Power supply is not sufficient<br>Extension lead used | Reduce load<br>Increase power supply |
| | | | Decrease extension lead length |
| | | | Increase current carrying capacity of extension lead |
| | | | Move power supply towards motor. |
| Noise | Electro-magnetic noise induced by electricity | Occurrence from first operation | Check noise not normal |
| | | Sudden sharp noise and smoking | Short circuit of windings. Repair. |
| | Bearing noise | Excessive noise | Replace the damaged bearing |
| | Mechanical noise caused by machinery | Loose belt sheaf | Adjust key and lock the screw |
| | | Loose coupling | Adjust the position of couplings and tighten |
| | | Loose screw | Tighten screw |
| | | Fan rubbing | Adjust fan position |
| | Mechanical noise caused by machinery | Rubbing as a result of ingress of foreign matter | Clean motor interior and ventilation ducts |
| | | Wind noise | Noise induced by air flowing through ventilation ducts |
| | | Induced by conveyance machine | Repair machine |
| Vibration | Electro-magnetic vibration | Short circuit of windings | Repair |
| | | Open circuit of rotor | Repair |
| | Vibration | Unbalanced rotor | Repair |
| | | Unbalanced fan | Repair |
| | Mechanical vibration | Broken fan blade | Replace fan |
| | | Un-symmetrical centres between belt sheaf | Align central points |
| | | Central points of couplings do not lie on the same level | Adjust the central points of couplings on the same level |
| | | Improper mounting installation | Lock the mounting screw |
| | | Motor mounting bed is not strong | Reinforce mounting bed |

## Performance Data 240 Volt, 50 Hz, Capacitor Start, Capacitor Run (ML series)

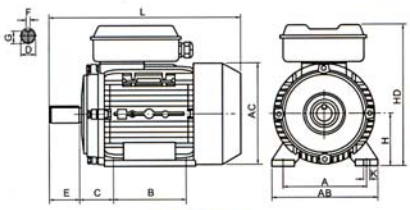
### 2 Pole – 3000 RPM

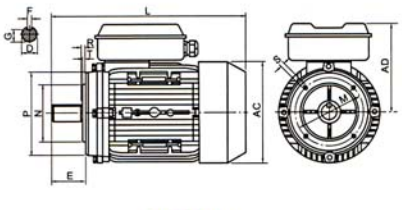
| Rated Power (kW) | Frame Size | Current (Amps) $I_N$ | Speed (RPM) | Efficiency (%) | Power Factor (p.u.) | Starting Torque $\frac{T_{st}}{T_N}$ | Break-down Torque $\frac{T_b}{T_N}$ | Starting Current $\frac{I_{st}}{I_N}$ | Approx net Weight IM1001 Kg |
|---|---|---|---|---|---|---|---|---|---|
| 0.37 | 71 | 2.5 | 2800 | 67 | 0.92 | 2.3 | 1.8 | 5.9 | 7 |
| 0.55 | 71 | 3.6 | 2800 | 70 | 0.92 | 2.5 | 1.8 | 5.4 | 8 |
| 0.75 | 80 | 4.7 | 2800 | 72 | 0.92 | 2.5 | 1.8 | 5.8 | 8.5 |
| 1.1 | 80 | 6.5 | 2800 | 75 | 0.95 | 2.5 | 1.8 | 5.7 | 9.5 |
| 1.5 | 90S | 8.7 | 2800 | 76 | 0.95 | 2.5 | 1.8 | 5.8 | 12.5 |
| 2.2 | 90L | 12.5 | 2800 | 77 | 0.95 | 2.5 | 1.8 | 5.8 | 14 |
| 3 | 100L | 16.7 | 2800 | 79 | 0.95 | 2.5 | 1.7 | 6.0 | 20.5 |

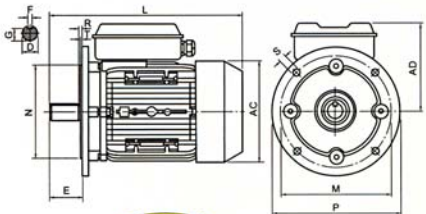
### 4 Pole – 1500 RPM

| Rated Power (kW) | Frame Size | Current (Amps) $I_N$ | Speed (RPM) | Efficiency (%) | Power Factor (p.u.) | Starting Torque $\frac{T_{st}}{T_N}$ | Break-down Torque $\frac{T_b}{I_N}$ | Starting Current $\frac{I_{st}}{I_N}$ | Approx net Weight IM1001 Kg |
|---|---|---|---|---|---|---|---|---|---|
| 0.18 | 63 | 1.4 | 1400 | 60 | 0.92 | 2.3 | 1.7 | 5.9 | 5 |
| 0.37 | 71 | 2.6 | 1400 | 65 | 0.92 | 2.3 | 1.7 | 6.6 | 8.1 |
| 0.55 | 80 | 3.7 | 1400 | 68 | 0.92 | 2.5 | 1.7 | 5.3 | 8.9 |
| 0.75 | 80 | 4.8 | 1400 | 71 | 0.92 | 2.5 | 1.7 | 5.8 | 9.6 |
| 1.1 | 90S | 6.6 | 1400 | 73 | 0.95 | 2.5 | 1.7 | 5.6 | 13 |
| 1.5 | 90L | 8.8 | 1400 | 75 | 0.95 | 2.5 | 1.7 | 5.8 | 16 |
| 2.2 | 100L | 12.8 | 1400 | 76 | 0.95 | 2.5 | 1.7 | 5.8 | 23 |
| 3 | 100L | 17.1 | 1400 | 77 | 0.95 | 2.5 | 1.7 | 5.9 | 27 |

## Dimensions: Capacitor Start, Capacitor Run (ML series)




| Frame Size | Mounting Dimensions (mm) | | | | | | | | | | | | | | | | | | | | | Frame Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | IMB14 | | | | | | IMB5 | | | | | | | | | | |
| | A | B | C | D | E | F | G | H | K | M | N | P | R | S | T | M | N | P | R | S | T | AB | AC | AD | HD | L |
| 71 | 112 | 90 | 45 | 14 | 30 | 5 | 11 | 71 | 7 | 85 | 70 | 105 | 0 | M6 | 2.5 | 130 | 110 | 160 | 0 | 10 | 3.5 | 145 | 145 | 125 | 210 | 255 |
| 80 | 125 | 100 | 50 | 19 | 40 | 6 | 15.5 | 80 | 10 | 100 | 80 | 120 | 0 | M6 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 160 | 165 | 135 | 240 | 295 |
| 90S | 140 | 100 | 56 | 24 | 50 | 8 | 20 | 90 | 10 | 115 | 95 | 140 | 0 | M8 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 180 | 185 | 145 | 270 | 335 |
| 90L | 140 | 125 | 56 | 24 | 50 | 8 | 20 | 90 | 10 | 115 | 95 | 140 | 0 | M8 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 180 | 185 | 145 | 270 | 360 |
| 100L | 160 | 140 | 63 | 28 | 60 | 8 | 24 | 100 | 12 | - | - | - | - | - | - | 215 | 180 | 250 | 0 | 15 | 4.0 | 205 | 215 | 170 | 280 | 380 |



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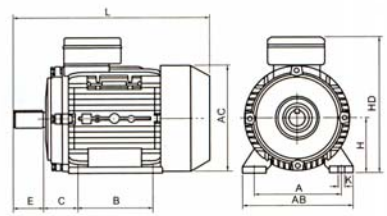
**NOTES:**

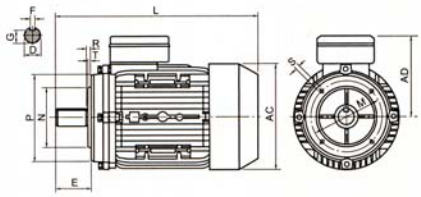
## Performance Data 240 Volt, 50 Hz, Capacitor Start Run (MY series)
## 4 Pole – 1500 RPM

| Rated Power (kW) | Frame Size | Current (Amps) $I_N$ | Speed (RPM) | Efficiency (%) | Power Factor (p.u.) | Starting Torque $\frac{T_{st}}{T_N}$ | Break-down Torque $\frac{T_b}{T_N}$ | Starting Current $\frac{I_{st}}{I_N}$ | Approx net Weight IM1001 Kg |
|---|---|---|---|---|---|---|---|---|---|
| 0.37 | 71 | 2.7 | 1400 | 62 | 0.92 | 0.35 | 1.7 | 3.4 | 7 |
| 0.55 | 80 | 3.9 | 1400 | 64 | 0.92 | 0.35 | 1.7 | 3.5 | 9.5 |
| 0.75 | 80 | 5.0 | 1400 | 68 | 0.92 | 0.32 | 1.7 | 3.7 | 10 |
| 1.1 | 90S | 6.8 | 1400 | 71 | 0.95 | 0.32 | 1.7 | 4.0 | 13 |
| 1.5 | 90L | 9.0 | 1400 | 73 | 0.95 | 0.3 | 1.7 | 4.6 | 16 |

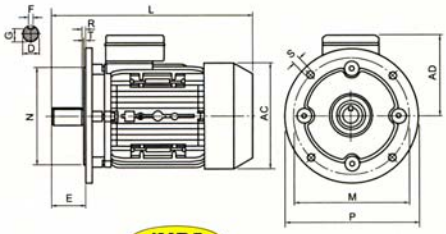
## Dimensions: Capacitor Start Run (MY series)




IMB3




IMB14




IMB5

| Frame Size | Mounting Dimensions (mm) | | | | | | | | | | | | | | | | | | | | Frame Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | IMB14 | | | | | | IMB5 | | | | | | | | | |
| | A | B | C | D | E | F | G | H | K | M | N | P | R | S | T | M | N | P | R | S | T | AB | AC | AD | HD | L |
| 63 | 100 | 80 | 40 | 11 | 23 | 4 | 8.5 | 63 | 7 | 75 | 60 | 90 | 0 | M5 | 2.5 | 115 | 95 | 140 | 0 | 10 | 3.0 | 130 | 130 | 115 | 185 | 230 |
| 71 | 112 | 90 | 45 | 14 | 30 | 5 | 11 | 71 | 7 | 85 | 70 | 105 | 0 | M6 | 2.5 | 130 | 110 | 160 | 0 | 10 | 3.5 | 145 | 145 | 125 | 205 | 255 |
| 80 | 125 | 100 | 50 | 19 | 40 | 6 | 15.5 | 80 | 10 | 100 | 80 | 120 | 0 | M6 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 160 | 165 | 135 | 235 | 295 |
| 90S | 140 | 100 | 56 | 24 | 50 | 8 | 20 | 90 | 10 | 115 | 95 | 140 | 0 | M8 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 180 | 185 | 145 | 265 | 335 |
| 90L | 140 | 125 | 56 | 24 | 50 | 8 | 20 | 90 | 10 | 115 | 95 | 140 | 0 | M8 | 3.0 | 165 | 130 | 200 | 0 | 12 | 3.5 | 180 | 185 | 145 | 265 | 360 |

## Bolt on feet – Multi-mount construction

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