Operating Instructions

ECR01 and ECR82P/92P

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1. Safety Notes

Please read the following safety precautions before installation:

1.1. General Safety during Installation, Maintenance and Operation

- Only suitably qualified and trained personnel shall install or maintain electric motors and fans. Suitable safety clothing and equipment should be worn to avoid injury.
- Before installation of the motor, the housing and other mechanical parts as well as all cables and connections must be inspected for damage or defect. Do not install the motor if it is damaged or if it has been dropped.
- Electrical cables and connections must be checked for damage at regular intervals and defective motors should be removed.
- Do not install cables in a way that will allow them to come into contact with a fan.
- The motor does not contain any serviceable parts; damaged or malfunctioning motors shall be returned or disposed of. (See information regarding Disposal, Section 3.3)
- After a fan has been assembled to the motor, care should be taken to avoid injury from spinning fan blades. Loose clothing and jewellery must not be worn and the use of a hair net is advised. Do not work on the machine while the fan is still spinning.
- A suitable guard shall be installed over the fan to avoid accidental contact with spinning fan blades.
- **IMPORTANT** : **The motor may start automatically and unexpectedly when power is applied. Do not assume that a non-rotating motor is not powered! Ensure power is disconnected before any work is performed on the motor or fan.**
- After a period of operation, some motor surfaces may be hot. Ensure that there is protection from accidental contact to avoid burn injuries.

1.2. Safety in Zone 2 Flammable Gas Environments

- Before installation of the motor in a zone 2 flammable gas environment, please ensure that it is suitably certified. Only motors carrying the Ex mark are certified for use in zone 2 flammable gas environments.
- All electrical connections to the motor and electrical cable must be made to conform to the ATEX Directive 94/9/EC or IEC 60079-0.
- Any fan that is assembled to the motor shall be enclosed by a fan hood or enclosure which will provide IP20 on the air inlet side and IP10 at the air outlet side.
- The clearances between the fan and its hood or walls of the enclosure shall be at least 1/100 of the maximum diameter of the fan or 1mm whichever is greater. Clearances need not exceed 5 mm.
- If the installed fan is made of light alloy, the content of Mg and Ti must be less than 7.5%.
- The fan must comply with EN 14986 for the EC market and installation should comply IEC 60079-0 and IEC 60079-15.

2. Proper Use

- The ECR motor range is designed to be used exclusively as fan motors in commercial refrigeration applications.
- Motors must be properly matched to the required fan load. See Catalogue for performance data. The rated load of the motor shall not be exceeded.
- Motors must only be used in environments that are within the specified permitted temperature limits.
- Motors must only be used within the limits of their respective IP ratings. Motors shall not be used in situations where they will be partially or wholly submerged in water.

3. Transport and Handling

3.1. Storage

Motors must be stored in clean, dry conditions.

3.2. Motor handling

Care must be taken to protect the motor from damage from impact or dropping during transport.

3.3. Disposal

The regulations for disposal of electrical equipment in the country of use must be followed.

4. Motor and Fan Installation

The following general requirements must be met for any installation of the motor:

- The Motor must be installed in such a way as to protect it from any sources of impact.
- Nuts on motor through bolts must not be removed or loosened. Removal of the nuts or bolts can damage the seal between the motor housings. Additional spring washers and nuts should be used to fasten the motor to its mounting.
- Cables and wiring must be secured to avoid contact with moving parts and fan blades.
- Cables shall not be installed in a way that puts excessive strain on the cable gland.
- Motors shall be mounted in an orientation that allows cable entry from below. If cable orientation is from the side of the motor, a downward bend should be applied to the cable as close to the cable gland as possible, to avoid water tracking into the motor. Cable entry from above is not recommended.

4.1. Motor mounting

Motors can be mounted in the following ways:

a) Basket or Ring Mounting

Figure 1 (below) shows the correct installation of the motor into a fan basket or ring mount. The motor shall be secured to the fan basket with four flanged nuts or nuts and spring washers with a required torque setting of 1.0 - 1.5Nm.

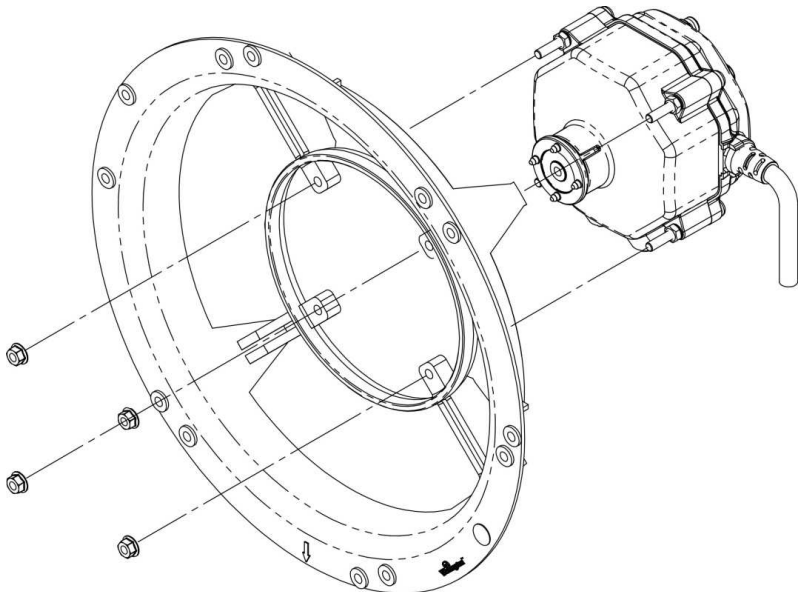


Figure 1. – Basket Mounting

b) Bracket Mount

The motor shall be secured to the bracket with two screws which are part of the Foot Mount Kit. Figure 2 shows the correct insertion of the rectangular washers and screws into the foot mount feature on the housing. The screws should be pushed all the way to the end of the groove. Figure 3 shows the correct assembly of the motor to a foot mount bracket. The required torque setting for the two hex nuts is 2.0 – 2.2Nm.

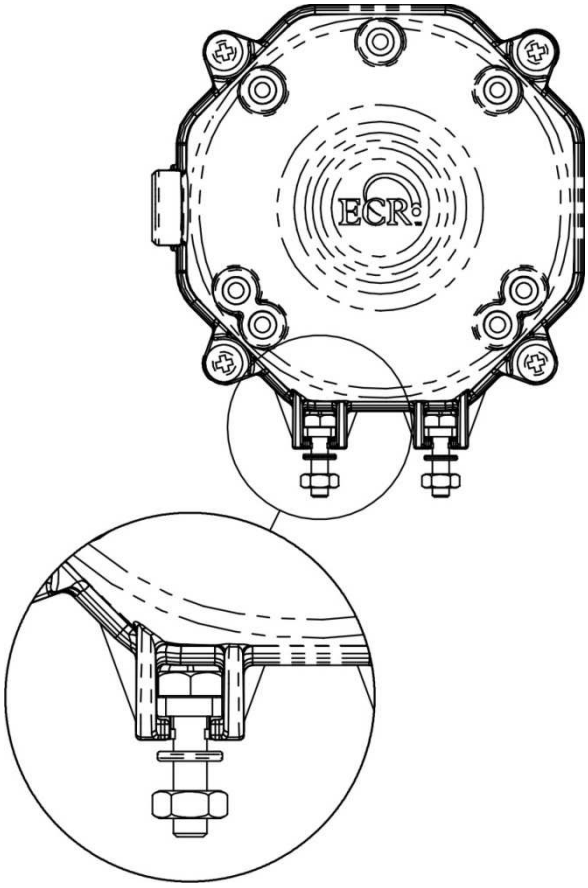


Figure 2. – Foot Mount Kit insertion

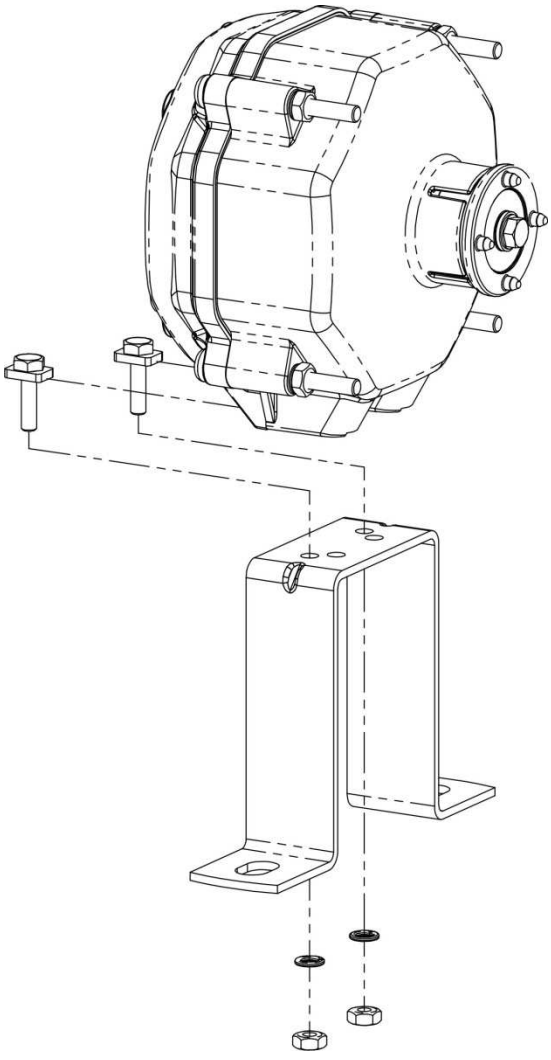


Figure 3. – Bracket assembly

c) Rear Mounting

Motors with threaded inserts can be mounted to bulkheads or sheet metal brackets by securing them with either 3 or 4 screws. As shown in Figure 4, below, screws may not have a penetration of more than 6mm. The required torque setting for the rear mount screws is 2.0 – 2.2Nm.

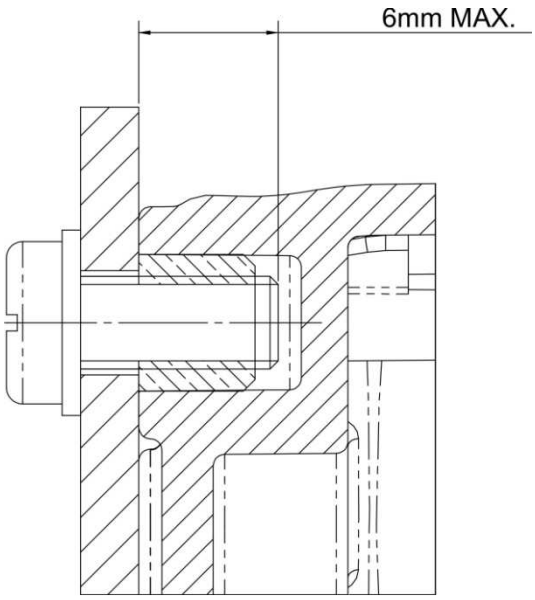


Figure 4. – Rear Mounting Screw

4.2. Fan Installation

Figure 5 shows the correct assembly of a fan to the motor. A flat washer or conical washer is recommended between the fan and the serrated flange screw. The required torque setting for the screw is 2.0 – 2.2Nm.

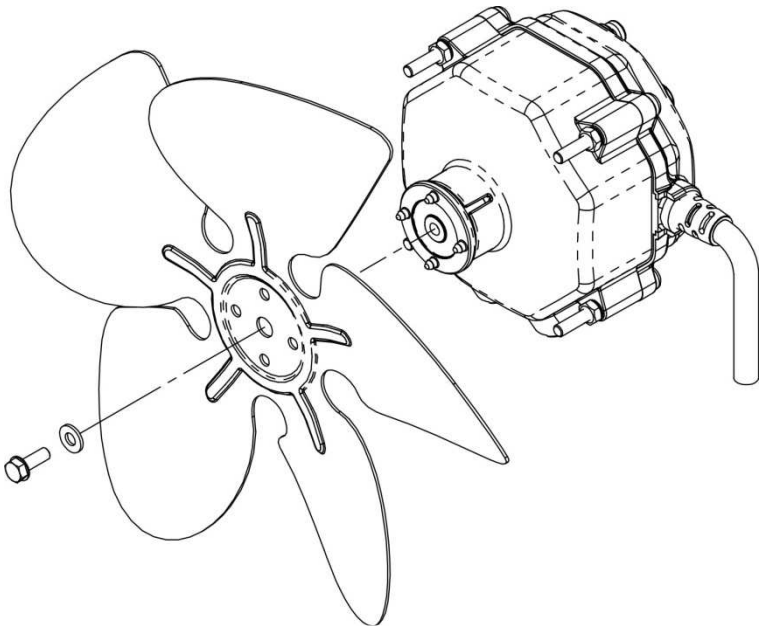


Figure 5. – Fan Assembly

4.3. Electrical Connections

To connect the motor to an electrical circuit, the conductors need to be connected in the following way:

Brown – Phase (Live)

Blue – Neutral

Black – (Optional) Used for speed and direction control. See Firmware Operation, below.

- Cable must be secured to ensure it does not make contact with the fan or any other moving parts.
- If the motor is being used in a potentially explosive environment, electrical connections must be made and protected in accordance with relevant ATEX/IECEx standards.
- Cable must be free from any excessive strain after connection has been made.

5. Firmware Operation

Motors with three core cables have the ability to be speed or direction controlled. The direction of rotation, clockwise (CW) or counter-clockwise (CCW), is referenced with respect to the shaft end of the motor. It can be changed by connecting the black control wire to either phase (live), neutral or left unconnected. Leaving the control wire unconnected will give the same operation as connecting it to neutral.

Alternative configurations are possible with different, pre-programmed firmware, the most common being:

- Continuous CCW and CW operation.
- Timed reverse; continuous CCW and time limited CW operation. (described below)

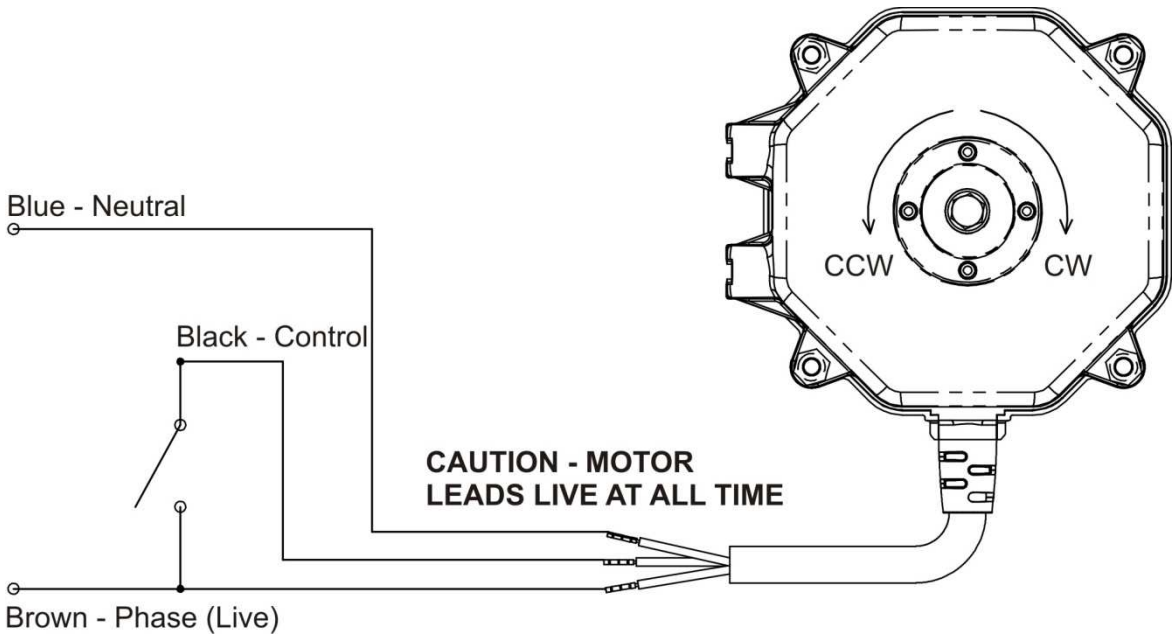


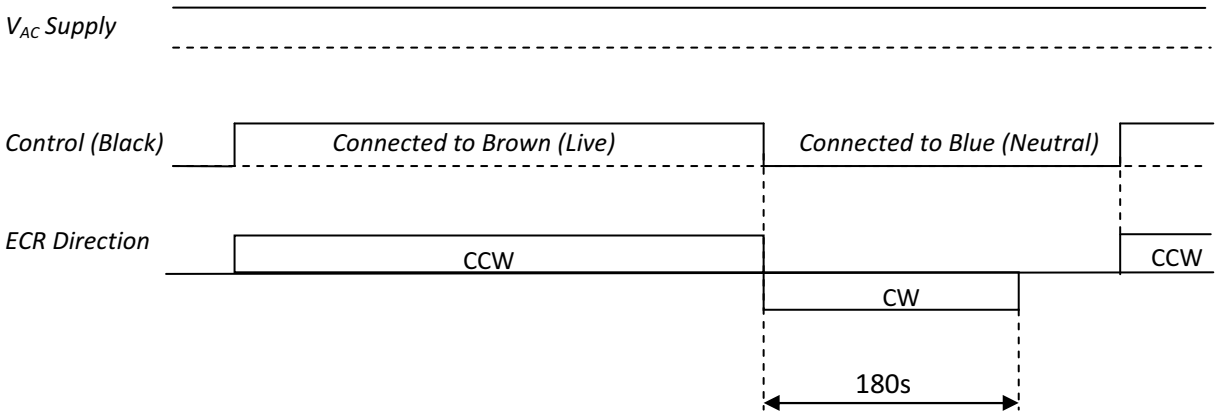
Figure 6. – Electrical Connection for Direction Control

5.1. Timed Reverse Operation

If the motor is programmed with Timed Reverse Code, the motor will behave in the following way:

- Brown connected to Phase (Live), Blue connected to Neutral, Black connected to Phase (Live) – The motor spins continuously in CCW direction
- If Black is then disconnected or connected to Neutral – The motor will change direction to CW for 180 seconds, then stop.

If the power is turned off and on again, the timer is restarted and the motor will operate in the CW direction for 180 seconds. The motor will not restart in the CCW direction, until the black wire is reconnected to Phase (Live).



6. Specifications

6.1. Environment

Motor	Operating Temperature Range @ Max load
ECR01*****	-30 to +50°C, -22 to +122°F
ECR82P****	-30 to +50°C, -22 to +122°F
ECR92P****	-30 to +50°C, -22 to +122°F

6.2. General Ratings

	ECR01A	ECR01B
Supply Voltage	115VAC	230VAC
Frequency	60 Hz	50/60 Hz
Rated Output Options	7W, 9W, 12W, 16W	7W (9W), 12W, 16W, 20W, 25W
Speed range	1300-1800 RPM	1250-2300 RPM

	ECR92P	ECR82P***1	ECR82P***2
Supply Voltage	115VAC	230VAC	230VAC
Frequency	60 Hz	50 Hz	60 Hz
Rated Output	16W	12W	16W
Speed (fixed)	1800 SRPM	1500 SRPM	1800 SRPM

7. Maintenance

7.1. Regular Inspections

The following items need to be included in a regular maintenance schedule for the machine (at least every 6 months):

- Check cable for signs of breakage or wear.
- Check for loose or damaged fan.
- Check that fan guard is still in place.
- Check that motor is still securely mounted.

7.2. Troubleshooting

NOTE: Motor Starting Behaviour

Motors may pause momentarily during starting and may reverse a number of times before a stable operating speed and direction is achieved. This is normal behaviour for this type of motor and is not a fault condition.

Problem	Possible Cause	Action
Motor does not turn	No mains power	Check mains power supply
	Faulty connection	Check power cable connection
	Reverse function timed out	Allow motor to reset to CCW mode
	Thermal protection activated	Allow motor to cool down and Thermal Protector to reset
Motor fails to start after multiple attempts or stops and starts often.	Fan diameter or pitch too large	Reduce load on motor
Motor runs in wrong or opposite direction	Black control wire not connected properly	Check the connection of the black control wire connection

7.3. Motor Maintenance

The motor does not contain any user serviceable parts and cannot be repaired. The motor bearings are selected for the rated duty of the motor and are expected to last for the life of the motor.

If the motors ceased to function properly, it should be disposed of as per section 3.3, above.

8. Service / Technical Support

For Service or Technical Support queries, please contact your local Wellington Sales Office or find your nearest contact by visiting www.wdtl.com .