EXTERNAL ROTOR MOTORS

INTRODUCTION

The external rotor motor offers many attractive features such as space saving, compact design, optimum cooling, full speed controllability and low starting currents.

Single and three-phase motors are produced to the highest International Quality Assurance Standards.

Sealed-for-life ball bearings are fitted throughout the range with an L_{10} life expectancy of approximately 40,000 hours depending upon conditions of operation.

TEMPERATURE RANGE

The motors are designed to operate in the ambient temperature range of -15°C to +40°C, but external rotor motors are often capable of operating in higher ambient temperatures. Should you have such a need, refer your enquiry to one of our sales offices.

ENCLOSURE STANDARD

The minimum is IP44 in accordance with DIN40050 and AS 60529: 2004.

SPECIAL FEATURES

Speed Control
External rotor motors are inherently suited to speed control using either electronic or auto-transformer controllers. Refer to page *M-1* for details of the range of controllers available.

Three phase external rotor motors can be speed controlled using Inverters with the following restrictions:

1. Inverter output frequency must not be set over 50Hz. External rotor motors are sized to suit the fan impeller at the maximum synchronous speed and do not have the reserve capacity to provide the extra power required for faster speeds.
2. All frequency Inverters must include "all pole effective sinusoidal filters"
3. DV/DT filters are not a suitable replacement for "all pole sinusoidal filters"

Note that warranty is void if an all pole sinusoidal filter is not used when speed controlling an external rotor with a frequency inverter.

Care must be taken when selecting speed controllers as the amperage drawn by some motors when being speed-controlled, can exceed the rated full load amps. This characteristic is more apparent at approximately 70% of full speed and must be considered when selecting the controller to ensure the controller rating is sufficient for all conditions.

Whilst the drawn amps may exceed the nominal nameplate amps, there is little likelihood of damage being done to the motor. The overload should be sized to accommodate the excess amperage.

A number of identical fans can be controlled from a single controller but the total amps of all the motors must not exceed 85% of the controller rating.

STAR/DELTA MOTORS

Most three-phase external rotor motors used with backward-curved centrifugal fans are fitted with 2-speed star/delta motors as standard.

These motors enable full speed to be obtained when connected in delta and a reduced speed when connected in star. The ratio of the speeds obtained is approximately 1.3:1 (reduced speed in slip) which approximates to a slightly higher speed than the next synchronous speed down.

These speeds can be obtained by connecting directly to either delta or star. Alternatively, by using a star/delta switch, either speed can be obtained at will. Details of this product is given on page *M-7*.

THERMAL CONTACTS

Thermal contacts are fitted as standard to all external rotor motors.

Embedded deep in the windings of the motors, the contacts are bi-metal cutout design which are temperature-dependent. Should the temperature of the motor rise to the limit, the bi-metal cutouts activate and cut off the power, thereby providing full protection to the motor.

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Re-starting the motors is achieved by two methods:-

- auto-reset
- manual-reset

The 'auto-reset' will permit the fan motor to automatically re-start when the windings cool down. It is recommended they be connected to a current control relay.

The 'manual-reset' type requires the thermal contacts to be wired to a remote trip contactor which has to be reset manually.

SUPPLY VOLTAGE

As the speed of external rotor motors can be controlled by varying the applied voltage, they can be used where the voltage varies from the standard of 240V/1ph/50Hz or 415V/3ph/50Hz without detrimental effect to the motor. Indeed, on voltages as low as 200 volt on single-phase, or 346 volt on three-phase supply, only a slight reduction of the motor speed would be detected.

TROPIC-PROOFING

Tropic-proofing consists of an anti-fungal treatment of the windings. Further modifications may be necessary for high humidity applications.

WARRANTY

Note that warranty is void if the thermal contacts are not used.

AS/NZS3000:2007 wiring rules state that motors required to run unattended shall be fitted with over-temperature devices such as thermal overload relays. If this is not complied with warranty will be void.

A licensed electrical contractor or engineer, experienced in motor protection, should be engaged to assess the motors and specific requirements of the installation.

STANDARD MOTORS

INTRODUCTION

Constructed to appropriate Australian, European and International Standards, standard motors are used to drive a range of fans extending from window and wall units to large industrial axial flow and centrifugal fans.

STANDARDS

The standard motors used are foot, flange or pad mounted, metric type and totally enclosed as produced by most of the world's major manufacturers. They will run continuously with the minimum of attention and have been selected for their universal interchangeability and availability in countries throughout the world. The motors comply with the appropriate British, Australian and International Standards as far as:-

- output
- performance
- dimensions
- minimum energy performance standard (MEPS) to AS/NZS1359.5:2004

are concerned.

TEMPERATURE RANGE AND ALTITUDE

In general the motors can operate in ambients from -20°C to +40°C at altitudes up to 1000 metres above sea level. Motors to operate outside this range can be supplied if required.

ENCLOSURE STANDARD

The minimum is IP54 in accordance with the appropriate standards. IP55 enclosure can be supplied for fully weatherproof applications.

FINISH

Standard finish is enamel paint top coat on suitable primer to give good appearance and protection for general usage. Alternative finishes such as epoxy coating can also be provided.

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