ECODESIGN REGULATIONS FOR ELECTRIC MOTORS

ON JULY 1, 2021, UPDATED REGULATIONS GOVERNING THE ENERGY EFFICIENCY REQUIREMENTS OF NEW ELECTRIC MOTORS WERE PUBLISHED. THIS GUIDE EXPLAINS THE CHANGES AND THE IMPLICATIONS FOR USERS OF ELECTRIC MOTORS

Across the European Union and the United Kingdom, it is estimated that some eight billion motors are in use. Together, they are believed to use around 50% of all the electricity generated in the two regions.

The amount of energy consumed by motor-driven systems represents a significant opportunity to contribute to global targets for reductions in CO2 emissions. In 2009, this was recognised by the European Commission with the introduction of new regulations under the Ecodesign Directive governing the minimum efficiency requirements for low-voltage motors newly placed on the market.

The UK has followed the regulation on ecodesign for electric motors during its time as a member state and continues to do so following Brexit. This means that all motors within the regulation's scope which are sold in the UK must meet its requirements.

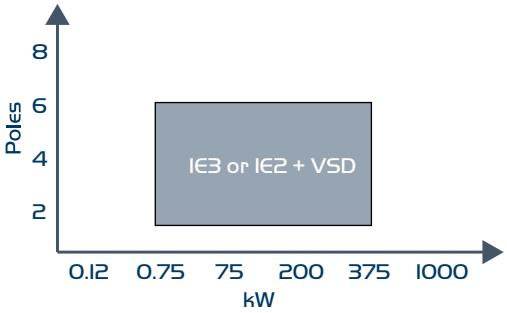
Since it was first introduced, the regulation on ecodesign for electric motors has seen a phased expansion in its scope where electric motors are concerned, with amendments in 2011, 2015 and 2017.

In July 2021, a further expansion of scope comes into force with a new, more demanding, version of the regulation – 2019/1781/EU.

A copy of the revised regulation can be found at: www.bit.ly/20191781

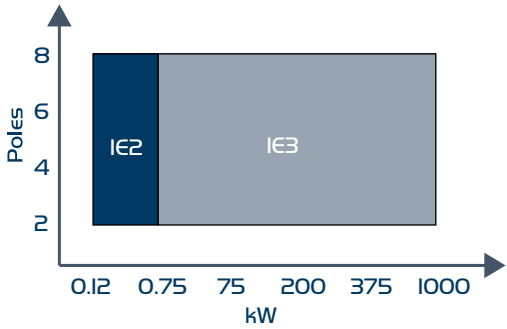
PRIOR TO JULY 1, 2021, THE FOLLOWING REQUIREMENTS WERE SET UNDER THE REGULATION ON ECODESIGN FOR ELECTRIC MOTORS

- All 2 to 6 pole, 3-phase, low voltage, single-speed motors above 0.75kW must meet the minimum energy efficiency standard IE2, except…
- 0.75 – 375kW DOL rated motors which must meet the minimum energy efficiency standard IE3, or IE2 if fitted with a variable speed drive (VSD)



FROM JULY 1, 2021, THE FOLLOWING REQUIREMENTS CAME INTO FORCE

- 0.12 kW to 0.75 kW 3-phase motors must meet the minimum energy efficiency standard IE2
- The requirement to meet the minimum energy efficiency standard IE3 is extended to:
  - 3-phase motors rated from 0.75 to 1000kW
  - Motors with protection types Ex ec, Ex d, Ex de, Ext
  - 8 pole motors
  - 60Hz motors
  - Motors with IC418 cooling
  - Brake motors with an external brake
  - Totally Enclosed, Air Over (TEAO) motors
- The IE2 efficiency class becomes mandatory for AC drives. The regulation covers 3-phase standard drives (diode rectifier) from 0.12 kW ≤ Pn ≤ 1,000 kW.



In addition, it is no longer acceptable to use an IE2 motor with a VSD to meet the regulation's requirements.

EXEMPTIONS

The regulation for motors excludes:

- Ex eb rated motors
- Single-phase motors > 0.12kW
- Motors designed specifically for traction of electric vehicles
- Explosion-protected motors specifically designed and certified for mining
- Motors specifically qualified for the safety of nuclear installations
- High voltage motors
- DC motors

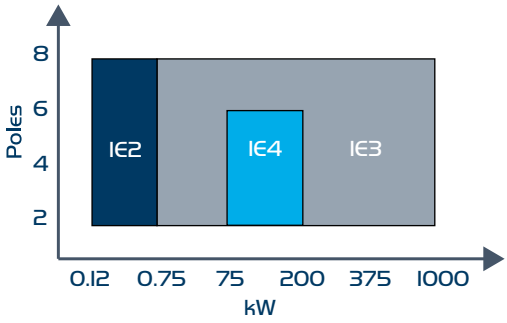
The regulation for VSDs excludes:

- Regenerative AC drives
- Low-harmonic AC drives (THD < 10%)
- Multiple AC-output drives
- 1ph drives
- Drive cabinets built from conform modules
- MV Drives
- DC Drives
- Traction Drives
- Integrated motors

FUTURE CHANGES

Further changes to the regulation on ecodesign for electric motors come into force on July 1, 2023, including:

- IE4 for 3-phase motors will become mandatory for 2-6 pole single speed motors rated between 75-200 kW
- Ex eb motors and single-phase motors will need to meet the minimum energy efficiency standard IE2



For more details of the scope of the regulation on ecodesign for electric motors, including the tolerances for the efficiency (IE) levels, please visit. **www.bit.ly/AEMTtol**

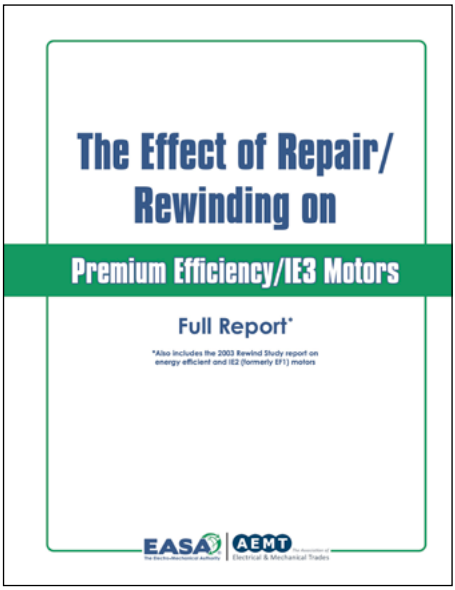
WHAT DO THE CHANGES MEAN FOR USERS OF MOTORS WITHIN THE SCOPE OF THE ECODESIGN DIRECTIVE?

- Motors already in service do not need to be changed
- New motors and VSDs which are in scope and supplied to you on or after July 1, 2021, must meet the requirements of the new regulations
- Distributors can supply lower IE rated motors from stock as a direct replacement if placed on the market before 2022
- If you buy motors for use in a manufactured product or system, they must meet the revised regulation
- Motors rated below the required IE can be repaired

REPAIRING MOTORS AND EFFICIENCY

A good repair or rewind by an AEMT member using the latest specification winding wire and insulation systems and good quality bearings will maintain the efficiency of a motor within its original rated efficiency level band. Indeed, depending on the design of the original motor, modern materials and repair techniques can increase a motor's efficiency.

A study carried out by the AEMT and the US-based Electrical Apparatus Service Association (EASA), updated in 2019 to cover IE3 motors, showed that over a broad cross-section of motor specifications, the rewound motor retained its efficiency class.



The study can be downloaded at: www.bit.ly/AEMTstudy

A list of AEMT members who can help with further information, a repair or a compliant replacement can be found on the AEMT website: www.theaemt.com/members-search