



FEDERATION EUROPEENNE DE LA MANUTENTION
Section IX
SERIES LIFTING EQUIPMENT

FEM
9.683

Selection of lifting and travel motors

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Introduction

This rule contains the selection criteria for lifting and travelling motors in series lifting equipment. Booklet 5 "Electrical equipment" revision 1992.10.01 of the rule FEM 1.001 "Rules for the design of lifting appliances" (3rd edition: 1987.10.01) of the FEM-Section I "Heavy lifting appliances" served as a basis reference. This rule deviates from the booklet referred to above in order to take into account the specific requirements of series lifting equipment.

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5.8.1 Criteria for motor selection (IEC 34-1)

- required powers - the thermal power is also included in these required powers,
 - maximum rated torque and maximum acceleration torque,
 - cyclic duration factor,
 - number of cycles/hour,
 - type of control (type of braking),
 - speed regulation,
 - type of power feed,
 - degree of protection, (environment conditions),
 - ambient temperature,
 - altitude.
- } drive systems

For the dimensioning of the motor, account has to be taken of:

- the thermal calculation as per clause 5.8.1.3.
- the maximum required torque:
 - for hoisting mechanisms as per clause 5.8.2.1.
 - for horizontal motions as per clause 5.8.3.1.

The motor has to comply with both requirements.

If the required torque diagrams, in order to define the mean equivalent torque (as per 5.8.1.3.1) are not available, these can be assessed with the help of tables 5.8.2.2.b and 5.8.3.2.b respectively.

5.8.1.1 Remarks on the selection of motors

The motors must be suitable for the operating conditions (criteria for motor selection 5.8.1) and ensure safe operation under related conditions.

In the event of electronic power control, the motors must be specified taking into account the cooling system and the speed range.

An external fan may be provided to increase the number of starts per hour and number of cycles per hour.

5.8.1.2 Degree of protection (IEC 34-5)

5.8.1.2.1 Indoor application

For indoor application, under normal conditions, motors must comply with IP 23 at least.
In dusty environment, motors must comply with IP 44 at least.

5.8.1.2.2 Outdoor application

For outdoor application, motors must comply with IP 54 at least.
In case of water condensation risk, care should be taken that the water condensation drain holes remain open.

5.8.1.2.3 Particular application

Motors may comply with a lower degree of protection if they are appropriately protected, or protected by external means for their particular application.

5.8.1.2.4 Explosive environments

In potentially explosive environments, motors must be explosion-proof as specified in EN 50014-50020.