

Overview

The SIMOTICS FD 1L.16 crane motors have been specially designed for the application-specific requirements encountered during hoisting duty in crane installations. The focus is on cranes located in seaports that are often exposed to adverse weather conditions, which means that special measures must be taken here to protect the motors against corrosion and the ingress of dust and water. The squirrel-cage motors with the IVIC-C premium insulation system are suitable for operation with a SINAMICS S120 converter. Since the crane motors in particular operate over a large speed range during converter operation, you must check – alongside the usual design criteria such as thermal load (effective torque) and maximum acceleration torque – whether the motor can still generate the required maximum torque in the field weakening range.

The three-phase induction motors are either force-ventilated in IP55 degree of protection (1LQ16) or IP23 (1LIP16) or self-ventilated in IP55 degree of protection (1LM16).

Detailed configuring information for crane motors can be found in Catalog CR 1 "Drive and Control Components for Cranes".

The innovations in the field of modern crane installations place ever higher demands on compact induction motors. The compact 1L.16 induction motor covers the increased performance requirements, e.g. for intermittent duty S3 – 25% with up to 2.1 MW. This motor series is a converter solution which has been specially developed for use in conjunction with the SINAMICS S120 drive system.

The 1L.16 induction motors have the following distinguishing features:

- Force-ventilated and self-ventilated induction motors with squirrel-cage rotor in IP55 degree of protection
- Force-ventilated induction motors with squirrel-cage rotor in IP23 degree of protection
- The motors are force-ventilated as standard by a radially mounted separately driven fan unit
- A second shaft extension is possible as an option
- The 1LM16 crane motors comprise as standard a bidirectional fan impeller (for frame sizes 400 and 450 it is not necessary here to select order code **K99**).
- The degree of protection of the 1LQ16 and 1LM16 motors can optionally be increased to IP56 (non-heavy-sea) (order code **K52**). The additional information "non-heavy-sea" means that the machine must not be flooded or submerged by a wave.

Externally mounted encoder systems are available as an option. For the optional version of the motor with a second shaft extension, the bearing-free incremental encoder MHGE 200 (order code **H65**) is available.

The crane motors must be protected by placing them under a roof or enclosing them. If they are enclosed, an adequate supply of air must be ensured. For installation in salt-laden or humid ambient air, the motor must be ordered with improved corrosion protection (order codes **E83**, **E82**, **E81** or **C19**, **C26**).

Benefits

The crane motors are distinguished by the following design criteria:

- High overload torque at rated speed
- Large field-weakening range as well as high torque also at max. mechanical speed
- Low moment of inertia
- Optimized for line voltage 480 V and operation with SINAMICS S120 with controlled infeed (ALM)

The following features of the SIMOTICS FD motor platform also apply to the SIMOTICS FD crane motors:

- Low-voltage motor series optimized for converter operation
- High level of flexibility due to modular design principle
- Host of possible uses thanks to various design variants
- Rugged cast-iron housing
- Wide range of options
- Generously dimensioned terminal boxes
- Wide speed setting ranges
- Compact unit with high power density
- High rotational accuracy, even at very low speeds
- Fitted as standard with regreasing system and insulated NDE bearing – optionally with spent grease removal and automatic regreasing system

Application

The Siemens crane motors are particularly suitable for harsh hoisting duty. These rugged motors have:

- High degree of protection in conjunction with ordering options for increased corrosion protection and are thus especially suitable for adverse conditions of use
- Torque reserves that allow high short-time overloads
- High torque and low intrinsic moment of inertia for optimum acceleration
- The particularly rugged IVIC-C premium insulation system that permanently withstands the increased voltage loads encountered during hoisting duty

For other crane applications, such as trolley, the SIMOTICS FD platform offers further motor series. The selection and ordering data can be found in chapters 4 to 9.

Technical specifications

Duty types

Motor type	Overload factors for short-time duty – duty type S2			for intermittent, periodic duty – duty type S3				
	10 min	30 min	60 min	15 %	25 %	40 %	60 %	80 %
1.M.....	1.80	1.20	1.10	2.10	1.65	1.40	1.16	1.02
1.P.....	1.70	1.15	1.05	2.20	1.75	1.47	1.22	1.07
1.Q.....	1.80	1.20	1.10					

With 1LQ1 and 1LP1 it is not permitted for the cooling to be interrupted.